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Agricultural Matters.

KAFFIR CORN.

(*Andropogon sorghum vulgaris*.)

From Farmers' Bulletin No. 57, United States Department of Agriculture, by Prof. C. C. Georgeson.

VARIETIES.

There is at present a lamentable confusion in the names of the so-called non-saccharine varieties of sorghum, and it is difficult to determine how many should be classed as Kaffir corn. The Kansas Experiment Station grew nearly a hundred kinds of these sorghums in 1891 and 1892, the seed of which had been collected by United States consuls at points in Africa, India and China. Most of them failed to mature seed, but of those which succeeded several would answer the description of Kaffir corn. At present there are at least three varieties popularly called Kaffir corn. They may be described as follows:

Red Kaffir Corn.—Plant from four to six feet tall, according to soil, season and culture. Stalk close-jointed, producing nine to fourteen leaves. Leaves thick, somewhat rough, and stiffer than corn leaves. The plant rarely suckers, but it will occasionally throw out branches from the upper joints. The sheaths are quite generally colored red or purple in patches and spots due to a blight. Head upright, long and narrow, always pushing clear of the sheath of the upper leaf; spikelets short, compact, and held close to the head. Seed red or light brown, small, almost round, brittle, starchy and packed so closely in the head that the stems and hulls are scarcely visible. Hulls (glumes) small, thin, brown, covering less than half of each seed.

White Kaffir Corn.—Like the red variety, the plant is short-jointed and has an abundance of foliage, but does not grow quite so tall. The head is upright, slender, compact, but frequently fails to shoot out of the enveloping sheath, the portion remaining covered being worthless, as it either fails to form seed or the seed formed molds and spoils. The seed is white, slightly flattened sidewise, starchy, and pleasant to the taste. The hulls are gray or greenish white, hairy, somewhat larger and more conspicuous than those of the red variety. The ripe seed shells out readily in handling.

Black-hulled White Kaffir Corn (African millet).—Plant like the foregoing. Head upright, rather shorter, broader, and looser than that of the red sort; sometimes narrow below and broad above, making it somewhat club-shaped. This is due to the fact that the spikelets are longer than those on the white variety, with a tendency to spread. Seed white, many grains having a reddish or brown spot, somewhat larger than the red. Hulls, gray, brown, or black, hairy, larger than the hulls on the red sort. The head shoots clear of the enveloping sheath. The variety goes by the three names of black-hulled white Kaffir corn, white Kaffir corn, and African millet.

The red and white varieties have been grown at the Kansas station for several years, with the following results: Under the same conditions the red variety has invariably outyielded the white, both in grain and fodder; it grows some six to nine inches taller; it matures its seed a little earlier, and the head always pushes clear of the upper sheath; it does not shell in handling, and has a more succulent stalk. On the other hand, the white variety has a pleasanter taste and produces grain which is not at all astringent, and is therefore better relished by stock.

The black-hulled white Kaffir corn has only been grown here the past season, but it appears to have all the good qualities of the red variety, and has in addition a white seed. The seed coat also is non-astringent, a characteristic of all white seed of the sorghum tribe. If further tests show that the black-hulled white variety yields as well as the red, it will undoubtedly take the lead.

There appears to be a strong tendency to variation in this group of sorghums. With skillful selection and breeding, varieties could doubtless be developed

superior to any now known. Great care in the selection of seed and to prevent crossing with other sorghums is necessary in order to prevent deterioration.

SOILS AND CLIMATE ADAPTED TO KAFFIR CORN.

Like all other crops, Kaffir corn yields best on rich land. It responds well to generous treatment. Its culture, however, is not limited to soils of certain classes and qualities. It may be grown on stiff clays and on light sand, in river bottoms and on poor uplands, and it will yield profitable returns on soil too poor for corn.

Perhaps the strongest recommendation of Kaffir corn lies in the fact that it will produce a crop on less rain than is required for corn, and that it is not affected so disastrously by hot winds. It is, therefore, especially adapted to the semi-arid West, where corn succeeds only once in five or six years because of hot winds and drought. It is owing chiefly to this quality that its culture has spread so rapidly in Kansas and Oklahoma. Hot winds are the main cause of the failure of the corn crop in this region, and they are never more destructive than when they happen to come when the corn is tasseling. They cause the pollen to dry up, and the silk is not fertilized. Even with a sufficient rainfall, a few days of these withering blasts from the southwest, in tasseling time, may reduce the yield of corn 50 per cent. Kaffir corn is not affected in the same way. Fertilization takes place more readily and the whole plant is better adapted to stand dry weather. The leaves are thicker and coarser than corn leaves, and do not dry out so readily; they are closer together and partly protect each other, and the plant is not so tall and, therefore, not so much exposed. When corn has once been stunted by drought or hot winds, it never recovers. Not so with Kaffir corn. It may remain stationary and curled for days and even weeks, but when the hot winds cease and rain comes it will revive and, if not too late in the season, will still produce a crop of grain.

While it can be grown to perfection in southern and middle latitudes, the northern limit of its successful culture is as yet not well defined. In tests at the Ontario Agricultural college, the season appeared to be too short for the grain to mature. Henry does not consider it suited to Wisconsin. The Michigan station regards it as inferior to corn for forage. Possibly further trials may cause a revision of these opinions, but it will, nevertheless, be wisest for the farmers in the northern tier of States to grow it at first only on a small scale.

PREPARATION OF THE SOIL.

The soil should be prepared as for corn. Plow and harrow to bring the soil to a fine tilth. If it has been subsoiled the previous fall, all the better. If the surface is rough, it should be worked with a pulverizer till reduced. An even, mellow surface facilitates cultivation. The young plants are feeble and of slow growth during the first six weeks, and a rough, uneven surface cannot be worked without covering them up.

Seeding takes place, according to the latitude, from the middle of March in the South to the beginning of June in the North. At the Kansas station the seed is usually put in the ground about the middle of May. There is nothing gained by seeding before the soil is warm. A good rule to follow is to seed as soon as corn-planting is finished.

METHODS OF SEEDING.

Kaffir corn can be grown either in hills or in drills, but the latter is considered preferable. The rows should be from 2.5 feet to 3.5 feet apart. The stalks will vary in height from four feet to 6.5 feet, according to richness of soil and thickness of stand, the richer soil producing the heavier growth and therefore requiring the wider rows. It may be seeded with a corn planter fitted with sorghum or broomcorn plates. At the Kansas station a shoe grain drill with press wheels and force feed is generally used. The shoes are eight inches apart; therefore, by leaving the first and fourth feeds open and covering up all the others, the rows are sown thirty-

two inches apart. It requires about six pounds to seed an acre. A little practice on bare, hard ground, where the seed can be seen, will soon show how the feed-bar should be set to discharge the right amount. It is better that the stand should be a little too thick than not thick enough. For a maximum crop of grain on soil of moderate fertility, the plants should stand from four to six inches apart in the row, and on rich soil nine inches. If a maximum crop of fodder is wanted in addition to a good yield of grain, put in ten to twelve pounds of seed to the acre.

Kaffir corn is sometimes sown for hay, that is, it is sown thick, either with a drill or broadcast, and the crop, when headed, cut with a mower and treated as a hay crop. If cut early, it may produce two crops. Some variety of sweet sorghum, however, is better suited for hay. In the middle West the Kansas Orange is a good variety, and in the north the Early Amber.

Listing Kaffir corn, as corn is listed, is not recommended. The plants are spindling and of slow growth during the first few weeks, and if a heavy rain should fall during that time it would either wash the soil into the furrows and bury the plants or the furrows would serve as drains, with the result that the crop would be washed out. There is another objection to listing. On account of the slow growth of the plants, the weeds soon get the start of them, and it is practically impossible to cultivate without covering the plants. If listing is practiced at all, the furrows should be very shallow.

CULTIVATION.

The crop should be cultivated like sorghum or corn. The weeds should be kept down from the start, using preferably a spring-toothed cultivator, which will not throw the earth much, with fenders attached while the plants are small to prevent covering them up.

The roots are near the surface. Investigations at the Kansas station last summer showed that the roots reach out four to six feet laterally in all directions and that most of them are from two to six inches from the surface. Deep culture is, therefore, a mistake, since it destroys a large portion of the feeders and to that extent weakens the plants. The surface soil should be kept mellow until the crop begins to head, when cultivation should cease. If seeded about the middle of May, the plants will head early in August and the grain will be ripe about the middle of September.

HARVESTING.

The crop should be cut and shocked as soon as the grain is ripe. English sparrows will damage it badly if they have the chance. Over-ripeness also causes the white Kaffir corn to shell when handled. Unlike corn, all varieties have the very desirable quality of remaining green, after the grain matures, until killed by frost. The fodder is, therefore, still in excellent condition when the grain ripens, and when cured will make better feed than if the plant had dried up as the corn plant does.

The crop can be harvested in several ways. At the Kansas station it is usually cut with a sled cutter, which takes two rows at a time. The cutter is pulled by one horse and requires two attendants, one to care for each row. The crop is collected in armfuls as cut, and shocked. Any good corn-cutter will do the work. It can, of course, also be cut by hand, if a machine is not available. A light, short crop may even be cut with a self-binder. Some growers use a header, collecting the heads only and leaving the fodder to be eaten off by stock. The header will cut off a large per cent. of green leaves with the heads, which renders the curing of the latter, preparatory to the threshing, more difficult. In that case, it is best to pile them with layers of dry straw to prevent heating.

When the heads are cured and ready to thresh, there are again several modes of procedure. The most common way is to cut the heads off with a corn-knife. A large armful is laid with the heads across a block of wood, when a few strokes sever them. It may be threshed without severing the heads, either by running the whole plant through the thresher—which, however, is not desirable, as it breaks the leaves up very badly—or by sticking the heads of an armful of plants into the cylinder for an instant until the grain is beaten out.

Still other growers cut the heads off

A Sufferer Cured

"Every season, from the time I was two years old, I suffered dreadfully from erysipelas, which kept growing worse until my hands were almost useless. The bones softened so that they would bend, and several of my fingers are now crooked from this cause. On my hand I carry large scars, which, but for



AYER'S

Sarsaparilla, would be sores, provided I was alive and able to carry anything. Eight bottles of

Ayer's Sarsaparilla cured me, so that I have had no return of the disease for more than twenty years. The first bottle seemed to reach the spot and a persistent use of it has perfected the cure."—O. C. DAVIS, Wautoma, Wis.

AYER'S

THE ONLY WORLD'S FAIR
Sarsaparilla

AYER'S PILLS Promote Good Digestion.

one by one in the field and throw them in a wagon, as they would gather corn that has not been cut. This, however, would seem to be too slow a process to suit many people.

Lastly, many farmers do not thresh the grain at all, but feed the stalk, head and all, as cut. But even though it is fed in tight boxes, so that waste by shattering is largely prevented, there is, nevertheless, a large waste in feeding the seed whole, since it is not masticated and goes through the animals undigested.

Heads which are not perfectly dry should not be thrown in large piles, as they will heat. They can be stored in narrow corncribs or in narrow rail pens, built so as to let the air pass through the mass.

In threshing, the grain, especially of the red variety, will break badly unless the concave is removed from the machine and boards put in its place.

YIELD OF KAFFIR CORN.

The yield per acre of grain and fodder must, of course, vary with the season. The red variety, as grown at the Kansas station, has invariably outyielded both white Kaffir corn and Indian corn. The average yields per acre of these three at this station for the years 1889, 1890, 1891 and 1892 were as follows:

Yields of red and white Kaffir corn and of Indian corn.

Variety.	Grain.		Fodder.
	Bushels.	Tons.	
Red Kaffir corn.....	58.25	6.05	
White Kaffir corn.....	32.55	5.33	
Indian corn.....	45.50	3.07	

The grain yields refer to clean seed, fifty-six pounds to the bushel, and the fodder yields to the field-cured weight.

In 1893 the white variety was discarded as being too light a yielder. In that year the red Kaffir corn yielded forty-nine bushels of seed and 5.25 tons of fodder, while corn yielded thirty bushels of seed and 1.75 tons of fodder. In the extremely dry season of 1894 even the red variety failed to produce more than a light sprinkling of seed, scattered over the field, and it was not threshed; but the fodder averaged two tons per acre. In 1895, fifteen acres of the red Kaffir corn averaged forty-one bushels of grain and two tons of fodder per acre. Black-hulled white Kaffir corn (grown at the Kansas station for the first time in 1895) yielded in plots at the rate of 34.03 bushels of grain and 1.23 tons of fodder per acre, and corn produced 23.05 bushels per acre. In 1891 the red variety produced the highest yield on record here, viz., ninety-eight bushels per acre. The same year the Nebraska station reports a yield of 112.5 bushels of grain per acre, variety not named. At the North Louisiana station, in 1893 Kaffir corn produced four tons of fodder and ten bushels of grain per acre. In the same year, at the Arkansas station, it produced 5,178 pounds of dry fodder per acre.

(To be continued.)

The Stock Interest.

THOROUGHbred STOCK SALES.

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

SEPTEMBER 17—W. H. Wren, Poland-Chinas, St. Joseph, Mo.
OCTOBER 1—E. E. Axline, Poland-Chinas, Oak Grove, Jackson Co., Mo.
OCTOBER 30—J. R. Killough & Sons, Poland-Chinas, Richmond, Kas.

SWINE PLAGUE.

In order to better supply the information sought of the experiment stations by many inquirers, respecting the nature and symptoms of and treatment for swine plague, Director Wm. Stowe Devol, of the Arizona Station, Tucson, has sent to the KANSAS FARMER the following communication respecting this very important subject:

"Swine plague is a contagious and infectious disease of the hog, caused by minute bacterial forms, frequently found present in the air passages of swine, and sometimes of other domestic animals. The yare, however, except under certain conditions of environment, in a state apparently harmless to animals. But when the proper external and internal conditions combine the bacteria multiply rapidly and produce a virulent form of disease which is contagious and terminates fatally in a majority of cases. The swine plague germ is a small, oval, non-motile bacterium, easily distinguished under the microscope from the hog cholera bacterium, the latter being larger, rod-like, and possessing flagella.

"Swine plague may be produced in a herd of hogs by inclement weather and unwholesome food, or other causes producing an unhealthy, weakened or unthrifty condition. The most noticeable symptoms characterizing this disease are: A tendency to lie upon the belly in some secluded place; refusing to eat, or eating but little, causing the animal to soon look gaunt; when aroused it will usually give one or two dry coughs, hang its head and arch its back as if in pain; the eyes will water in the early stages, but later the secretion becomes yellowish, thick, accumulating in the corners and frequently gumming the eyes shut. Sometimes the skin of the abdomen, under surface of the neck and inner surface of the legs becomes congested and reddish in color. An eruption sometimes appears under the body, most frequently upon those parts where the congestion shows. Scabs form over the small eruptive spots, which heal, and when the scabs fall leave bare spots upon the skin. The pig walks with an irregular, tottering gait. The animal usually has the 'sniffles' and the breathing is labored and short. The animal usually has diarrhea, which frequently becomes very fetid towards the last. There is usually shivering and fever, the temperature rising to 106° or 107° Fahrenheit. In one case I saw it as high as 108.4°.

"In making a post-mortem examination the following appearances may be noted: The lungs are the principal organs affected in most cases. These are often much inflamed and have numerous small colorless or yellowish spots where the tissue has become lifeless. In cases of long duration there will frequently be found spots or masses of cheese-like substance. Spots of the lung tissue, angular in outline, or in some cases a large part of the lung, may be dark red in color and in substance resemble liver. Frequently the serous membrane of the pleura, peritoneum and pericardium are inflamed and have upon them false tissue or fibrinous deposits. These fibrinous deposits may appear upon the surface of the intestines, which may also be more or less congested.

"Once established in a herd, swine plague spreads rapidly, especially if the pigs sleep together and are permitted to pile up in the shed or under a shelter, as the disease is communicated almost entirely by inhalation. Under the above mentioned conditions the well pigs breathe the infection exhaled by the sick ones and thus 'catch' the disease. The disease germs may be carried for some distance in the air, and upon the clothing of man, fur

of animals and plumage of birds. Where buzzards abound they are undoubtedly a prolific cause of spreading the disease, especially if the affected swine are permitted to die and be devoured by them. Rabbits and dogs are also a source of danger in spreading it, and men passing from herds of diseased swine frequently take with them enough germs to cause an outbreak in a well herd.

"When in any locality an outbreak occurs of swine plague or any disease which may be suspected of being swine plague or a contagious disease of any kind, every precaution should be taken to prevent its spread. No one should be permitted to pass from a farm having the disease upon it to one where there are swine and no disease among them, without first disinfecting. Dogs should not be permitted to run at large. Every pig or hog, young or old, should be killed as soon as it shows symptoms of having the disease, and the carcass should be burned, or at least deeply buried. All well animals should be removed at once from the pasture within which diseased animals are found, and kept from mingling with them. Provision should be made, when possible, for removing the well hogs to another fresh pasture if any sick ones should be found among them, and the moving process repeated if necessary.

"The regimen should receive attention. Wholesome food and good water should be provided for the well and sick hogs. A few drops—about eight to twelve drops per animal—of carbolic acid in the water each day is found beneficial as a preventive, and also in treating sick animals. The following mixture, recommended by Dr. Salmon, of the Bureau of Animal Industry, has been found beneficial in many cases, but no 'sure cure' is known:

- 1 part wood charcoal.
- 1 " sulphur.
- 2 " sodium chloride (common salt).
- 2 " sodium bicarbonate.
- 2 " sodium hyposulphite.
- 1 " sodium sulphate.
- 1 " antimony sulphide.

"These ingredients should be well pulverized and then thoroughly mixed. The dose is one tablespoonful for each 200 pounds weight of hog, once a day. Those weighing less should receive smaller doses in the same ratio as the reduction in weight. It is best fed by mixing with bran, middlings or some other soft feed. After having been induced to eat it once hogs will usually return to it with a relish. It must not be understood that this is a specific for swine plague, though there are many cases of record where its use has apparently cured the disease. It has been of greater value, perhaps, as a preventive, and when so used the dose may be somewhat reduced in quantity.

"During the time the disease is found upon the place all sleeping quarters, breeding places, feed lots and other places where the swine congregate should be thoroughly disinfected every few days. This is best done by sprinkling well with air-slacked lime or a 5 per cent. solution of crude carbolic acid, or with some other germicide. No stagnant water should be permitted in the pasture or feeding lot, and the disinfectant of lime or carbolic acid should be used liberally about the water hole or water trough. All litter and bedding should be frequently removed and burned. In irrigated regions waste water should not be permitted to pass from the pastures of infected swine to carry the disease to other herds, and after the disease subsides the pastures should be thoroughly dried to kill stray germs that may be lurking among the vegetation.

"The swine plague bacterium is a comparatively delicate organism and may be destroyed by a proper observance of the above mentioned regulations. There are circumstances under which it would be impossible to observe the requirement to dry out the pasture and pens. In these cases if they could be thoroughly flooded the germs could be killed, as they drown easily.

"It must be remembered that the disease does not always attack a herd with the same severity. Some outbreaks are comparatively mild and none but the weak hogs and little pigs succumb, and the percentage of mor-

tality among these may at times be small; whereas, in other outbreaks the mortality reaches 90 per cent. or more and old hogs are taken off with the little ones. The condition of the animals also has much to do with the mortality. Swine plague may be expected to carry off a greater percentage of the unthrifty animals than of those well and hearty. I have found also that in herds where the constitutions of the swine were much weakened by close inbreeding the mortality is much greater than where the herd is kept thrifty by out-crossing.

"In the Mississippi basin and some other localities hog cholera is associated with swine plague. Although this resembles swine plague in a great many respects, and the treatment for the two diseases is the same in all essential particulars, in the matter of ridding a place of hog cholera there is much difference. The hog cholera bacterium is much harder than that of swine plague, and it will live and multiply in stagnant water and moist soil and litter, thus making it a very difficult matter to completely eradicate the disease from a place upon which it has once appeared. But with care a few months during the hot weather of the summer will suffice to clear a place of swine plague."

Horse Breeding.

In selling the brood mares, farmers have destroyed the bridge of access to future supply that they must cross to resume breeding, and breeding must be resumed. Now that the supply of good horses is gone, we will have to begin again at the bottom and lay our foundation work over. True, we have our experience left of how to raise horses and we are rid of the great prejudice that induced many to believe that the draft and coach horses would soon play out, and we have been so thoroughly discouraged with horses that we thought not of the future in the panic to dispose of every horse that dealers would buy, and thus broke down the market prices. The *Western Horseman* says, referring to the warnings of so many writers who are loudly proclaiming the fact, that a serious shortage in the horse stocks of this country is bound to occur within the next half-dozen years—a great shortage in quality and kind wanted exists at the present time—but this philosophical for boding is only the natural result of the mad rush that thousands have made during recent years to rid themselves of what they supposed to be an inexhaustible surplus. Three-fourths of the people have acted as though even seed for a future crop of horse stock was a foolish luxury, and breeding stock of the very best grades—the bridge that spans the river that the human race will always have to cross—has been dumped overboard into the miscellaneous channels of menial servitude till, in many sections—while mere horses in name are still abundant—scarcely a good, desirable brood mare can be found.

A leading characteristic of the human race, especially in this glorious land of the brave and the free, and bustle, is to all want to do the same thing at the same time. A few years ago everybody wanted to breed horses—and did, but later, everybody concluded all at once to quit breeding horses—and they did.

There are bright times coming for the intelligent horse breeder if he can only manage to hold on to his heavy draft horses, his large-sized trotting-bred colts and fillies, and give them plenty of care and feed for the next two years; there will then be a rush for horses that will bring the value of good ones higher than it has been for years. Every one knows that horse-breeding operations in this State have been at a standstill, and, in fact, they have not become active even at this writing. The large stock farm owners have shipped all their young colts and fillies East, and the breeders on the small farms have turned their thoughts in another direction. In a few years they will wish they had studied the horse question a little better and had a few good ones to sell.—*Western Agriculturist*.

Merit

Is what gives Hood's Sarsaparilla its great popularity, increasing sales and wonderful cures. The combination, proportion and process in preparing Hood's Sarsaparilla are unknown to other medicines, and make it peculiar to itself. It acts directly and positively upon the blood, and as the blood reaches every nook and corner of the human system, all the nerves, muscles, bones and tissues come under the beneficent influence of

Hood's Sarsaparilla

The One True Blood Purifier. All druggists. \$1.

Hood's Pills cure Liver Ills; easy to take, easy to operate. 25c.

The British government has opened the doors to encouraging pure-bred stock breeding by supplying pure-bred stallions to several horse-breeding districts at a nominal fee, and now give \$725 in prizes for the encouragement of the pure breeds of cattle in Ireland.

Most coughs may be cured in a few hours or at any rate in a few days, by the use of Ayer's Cherry Pectoral. With such a prompt and sure remedy as this at hand there is no need of prolonging the agony for weeks and months. Keep this remedy in your house.

A new chemical dehorner is to be introduced in the shape of small rubber thimble tips, that contain the chemical to kill the calf's horn, with enough sticky adherent to retain the tip on the horn until the horn is killed. They are cheap and efficient. The world moves.

TOPEKA, JUNE 15.

MONDAY.....

The new aggregation one of the most powerful in the world.—New York Herald.

THE GREAT, GLORIOUS A DAM FOREPAUGH and SELLS BROTHERS

America's Greatest Shows
CONSOLIDATED.
GREATEST IN EVERYTHING!



The Greatest Capital,
The Greatest Trains,
The Greatest Tents,
2 Greatest Menageries
2 Greatest Circuses,
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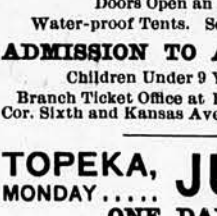
Hippodromes,
Greatest Exclusive Features,
Greatest Arenic Feats,
2 Greatest Herds of



ELEPHANTS!
Great
Trained Sea Lions,
Great Educated Seals
2 Great
HIPPOPOTAMUSES,
Great
Sumatra Rhinoceros,



Greatest
Performing Beasts!
Greatest Races,
Greatest Charlatans,
Greatest Jockeys,
Greatest
Thoroughbreds,
Greatest Course,
Greatest Track Successes,
Great Circus
Maximus,



4 Great Rings,
2 Great Stages,
Great Aerial
Triumphs,
300 Star Artists,
100 Great Acts.
2 Greatest Parades
United,
At 10 a. m., JUNE 15.

TWO PERFORMANCES ONLY, 2 & 8 p. m.
Doors Open an Hour Earlier.

Water-proof Tents. Seating Capacity 15,000.

ADMISSION TO ALL, 50 CENTS.

Children Under 9 Years, Half Price.

Branch Ticket Office at Rowley Bros' Drug Store, Cor. Sixth and Kansas Ave.

TOPEKA, JUNE 15.
MONDAY.....
ONE DAY ONLY.

Irrigation.

THE ARID AND SUB-HUMID REGIONS.

From a paper on "Irrigation: Its Bearing on Transportation," by Jas. A. Davis, in *The Bond Record*.

THE ARID REGION.

There is scarcely a subject in connection with the physical characteristics and agricultural conditions of our country about which so much misinformation exists as that concerning the extent, nature and possibilities of this vast expanse of territory. In extent this region embraces all that portion of the country west of a line running irregularly along the 100th meridian, except the western counties of the States of Washington and Oregon, of which States it embraces only the thirteen eastern counties of the former and sixteen eastern counties of the latter. Major Powell, of the United States Geological Survey, in his report to the government divides this region into three classes—the high forest lands of the mountains, the middle or plateau lands and the lower plain and valley lands. The last named portion, that which would ordinarily be available for agriculture, is now mostly a blistering barren waste. Its redemption and development is the first step toward that of the other two classes. It is popularly believed that this region is entirely without rainfall, a natural conclusion for a traveler over any of our trans-continental systems to arrive at. In some localities the precipitations are exceedingly great, but, being more or less irregular and infrequent, there being also no means of determining in advance when they are likely to occur, their opportunities cannot be improved; and though the mean annual rainfall, according to gauge, may be large in some localities, the precipitation rarely occurs at a season when it is of benefit to the growing crop. Agriculture within this region, except in specially favored districts in its northern part, is possible only by providing, in lieu of rainfall, the necessary moisture by artificial means from artesian wells, surface and sub-surface streams. The surprising development which this section has reached can be attributed mainly to its immense mineral wealth. The reclamation of the vast acreage of the now barren plains and peopling them with a population of thrifty farmers is the problem now in hand, which, when accomplished, will bring the entire region to a state of that even development and prosperity only possible to those sections wherein diversified pursuits and enterprises are possible and are energetically followed.

THE SUB-HUMID REGION.

A broad belt running north and south separates the arid region of the West from the humid region of the East. This is known as the sub-humid region and is in extent of area equal to one-tenth of the entire country, exclusive of Alaska, or 300,000 square miles, 192,000,000 acres. The line of twenty inches mean annual rainfall, or one which runs irregularly along the 100th meridian, is accepted as the eastern limit of the arid region and the divisional line between the arid and sub-humid conditions, and is, therefore, the western boundary of the sub-humid region, the eastern limit of which is the isohyetal line of twenty-eight inches or about the 95th meridian. It includes portions of North and South Dakota, Nebraska, Kansas, Oklahoma and Texas.

The limit of successful agriculture without irrigation has been set at twenty inches mean annual rainfall, but at twenty inches, according to Major Powell and the experience of Western farmers, agriculture is not uniformly successful from season to season. In the western portion of the sub-humid region, therefore, disastrous droughts are frequent, which, though decreasing in frequency toward the eastward, no portion of this region is entirely exempt from.

THE MEANS OF RECLAMATION.

The fact, then, as it bears upon railroad territory and the transportation problems of some of the great Western systems, is that the vast extent of

country known as the arid region must have its millions of acres of barren land redeemed and under cultivation and the sub-humid region adequately developed before the great railroad mileage through those regions will receive the traffic support it requires to earn in dividends a fair return on the capital invested. Irrigation is the one and only means by which these results can be accomplished. Not only by its means will it be possible to transform the millions of acres of barren land, the remnants of the great desert, into fruitful gardens, but by it also may the farmers of the sub-humid region free themselves from the disasters of droughts so frequent and ruinous in that section.

Holland, through indomitable pluck and engineering skill, was wrested from the waters of the North sea. Here within our own borders is an empire vastly greater to be reclaimed by engineering skill from torrid waste by means of water. Redeem it, and where there are now but five millions of people there will be room and wealth for fifty millions more.

THE HISTORY OF IRRIGATION.

Irrigation as a system of land treatment is of great antiquity. Of its use by ancient nations of the most advanced civilization as by those of the most primitive there is abundant authority. In ancient Hebrew, oriental and Egyptian records there are frequent allusions to it as a system of cultivation pursued by the people of those nations.

The Chinese have employed it from that early period where record emerges from tradition into history.

In the older countries of southern Asia it has been in use from a time equally remote. On the conquest and occupation of India the English found extensive reservoir and canal systems in use by the natives in the cultivation of the soil. In southern India a massive dam of unhewn stone, 1,080 feet long and forty to sixty feet broad, built across the Kaveri, which was constructed, as near as the records can determine, in the fourth century, is still in excellent repair and is taken as a model by British engineers. Ceylon, by means of its vast network of irrigation reservoirs, ducts and canals, long maintained itself as the granary of southern Asia. Some of these works were of enormous size. One of them, Menneriya, an artificial lake formed by damming across the valleys between the low hills which surround it with an embankment sixty feet wide at the crest, is twenty miles in circumference. Cato among the Latin authors refers to its employment by the Romans. The water meadow irrigation in England is in some localities directly traceable to Roman inauguration at the time of their occupation. In Egypt there are records of the existence of an extensive system of artificial ponding reservoirs or lakes with a network of distributing canals at a time at least as early as Sesostris.

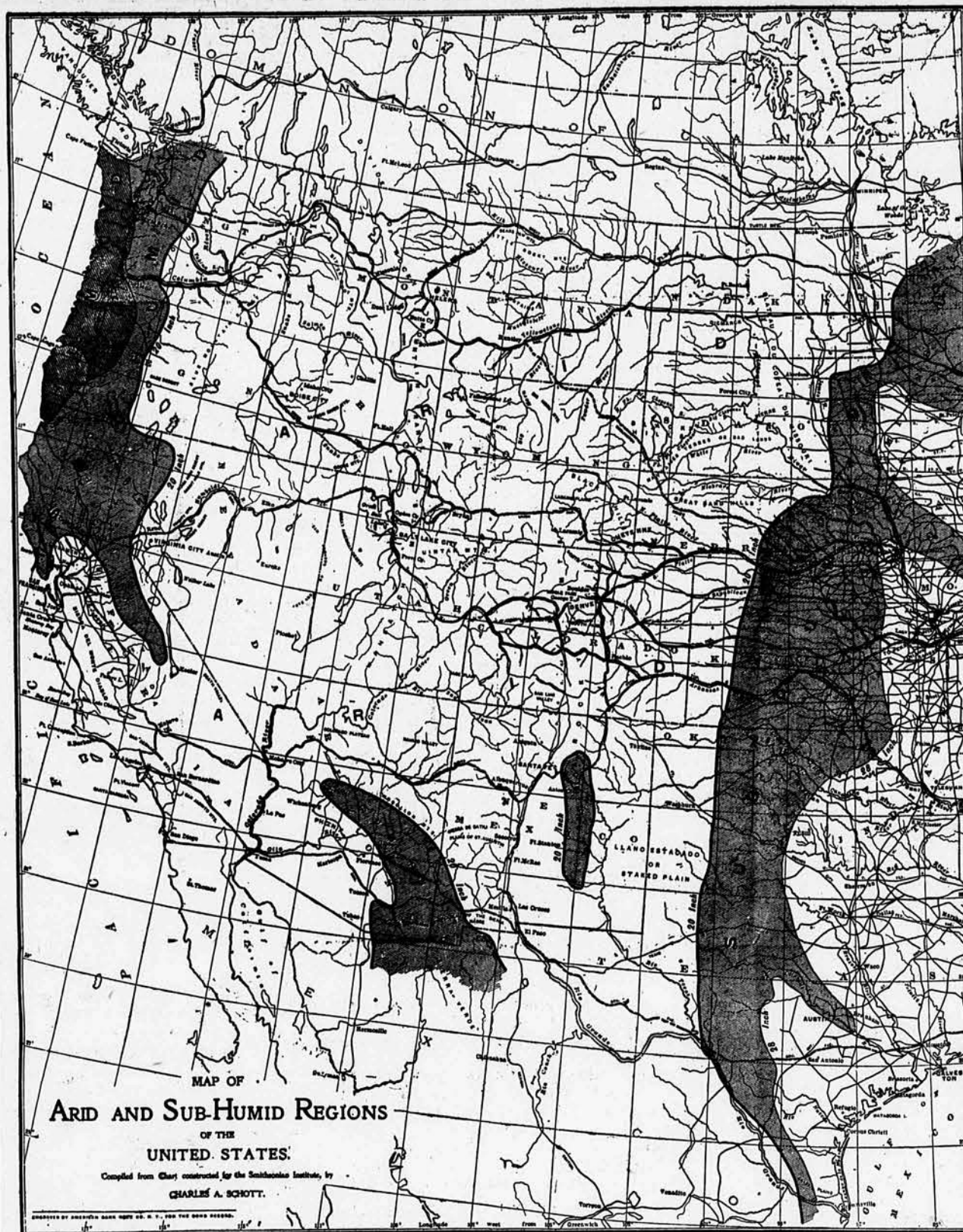
Irrigation was encouraged and its adoption caused in Italy by the Lombard kings. It is now in extensive and general use in that country. Through the Moors it was introduced into Spain. In two provinces of that country, Catalonia and Valencia, in which agriculture is most advanced, the river

valleys are thickly meshed with a network of irrigating canals. In neither province is the soil naturally fertile, and to irrigation solely can their greater productivity over the other provinces be attributed. From Spain it was gradually introduced into France. Wherever introduced it soon became an established and profitable system of cultivation.

That it was practiced by the early inhabitants of our own country there are numerous evidences to prove. In Arizona and New Mexico are found the well-preserved remains of an extensive irrigating system employed by the mysterious race or races, of whom both tradition and history are silent, who peopled that section prior to those who were there when it was discovered and explored by the Spaniards. Some of the recently constructed canals in Arizona are built along the lines, and in some cases upon the beds of the ruined canals used by these prehistoric Americans.

THE THEORY AND APPLICATION OF IRRIGATION.

The theory of irrigation and its application to the soil by the cultivator is simple, but its adaptation on a large scale and the providing of an adequate water supply for a large area of land and a number of cultivators, involves problems requiring for their effective solution a high grade of engineering skill. Various means have been adopted in the West, where irrigation has been successfully carried on, for providing a water supply for the fields to be irrigated. Flowing streams now supply the greater part of the water used for this purpose, which is distrib-



uted by means of gravity ditches and canals over the land. Where the geological conditions permit of it, artesian wells have been successfully employed. Reservoir dams and lakes for storing the precipitations of excessive rainfalls which rarely occur during the summer, and the retention of the smaller mountain streams, are considered by those most competent to pass upon the questions of water supply, the most effective and surest methods for serving economically the greatest number of acres of land, and such means will no doubt be adopted for all the larger undertakings in extensive irrigation.

It is estimated that the island of Madeira would not produce one one-hundredth of its present yield without irrigation. The system maintained there is that of the ponding reservoir and is one in the construction of which greater physical difficulties have been overcome than probably anywhere else in the world. There also an extraordinary as well as simple economy in the application of the water is observed by which its service is made many times more effective, and a greater area is treated by the same volume than anywhere else where irrigation is practiced.

ADVANTAGES OF IRRIGATION.

One of the great advantages of irrigation is that it is a method by which through flooding land, moisture is not only provided to germinating seeds or growing plants when and to the extent it is needed, but the flood also deposits upon the land in a rich sediment, the animal and vegetable matter accumulated in its washings, thereby not only supplying moisture to the growing crop, but fertilizing and enriching the land as well, precluding impoverishment under great productivity. Such a system of land cultivation, one by which land cannot only be reclaimed, made extraordinarily productive and enriched at the same time, but one also whereby the losses by droughts, frosts and the trials of freshets and exhausted land are eliminated, is certainly an ideal one, and when the great plains are reclaimed and small farms which can be cultivated under such a system are to be had, to them will be attracted the thriftiest of the small farmers of the world, the richest and best of material for prosperous communities. The fertility of soil reclaimed and cultivated by irrigation is inexhaustible, of which no better evidence is needed than that afforded by the products of irrigated land in Arizona and Utah.

PROGRESS IN THE WEST.

The Mormons found Utah a desert. What they have made it is history. The primal means by which this transformation was effected, the foundation for the development of every other industry in the State, was irrigation. George Q. Cannon, in speaking of the conditions of that State as the Mormons found them when they settled there, says:

"The dryness of the country at that time was something dreadful. It seemed as though the land was dead. One of the first ditches dug was taken out of the creek near where the large co-operative store now stands. The ditch was dug to convey the water to the fort in which the people then lived, which was about a half mile distant and the ground was so thirsty that it took two days for it to run that distance." He also says: "Very large areas of land that we are now cultivating were at one time thought incapable of irrigation and could not be used."

"I brought a friend of mine in the year '58 to settle in a town near by and he found that there was no water to irrigate the land. Since that time hundreds of families have gone in and have had water enough. In 1853 it was thought we had reached the utmost capacity of water to irrigate land, while now it is extending for miles in every direction and we have water enough and to spare. Now we have proved through long years that poor people can settle on this arid land and make a living and a good living, too." These statements are but an epitome of the history of irrigation in this country by its later inhabitants. His opinions are corroborated by all who have given the subject any attention.

The wizard-like transformation of

desert into garden is remarkably instanced in the Salt River valley of Arizona and the Pecos valley of New Mexico. But a few years ago these valleys were the dreariest, driest and apparently the most irreclaimable of deserts. To-day verdure and fertility are on every hand and the most abundant crops of the finest fruit in the world, as well as of every known agricultural product attest the success of irrigation, and the hardihood, skill and energy of the conquerors of aridity. No better instance can be cited of the successful application of irrigation to the problem of agriculture under the adverse conditions of irregular rainfall than that of the development and productions of California. The rainfall in a greater part of this State, though in its mean annual register as great as that of some of the humid States of the East, is subject to great fluctuations month by month. There is almost a complete lack of precipitation during the months of August, September and October. The evil effects on orchards and vineyards of these long droughts are avoided by the complete and extensive canal systems and other means of irrigation employed by the very successful cultivators of that State.

The total area of irrigated land within the arid and sub-humid regions, according to last census, aggregated 3,631,381 acres or 5,674 square miles, a little less than one-half of 1 per cent. of the total land area west of the 100th meridian. This area, according to conservative estimates, has been doubled since then, which would make the total area now under irrigation but 1 per cent. of the total of the arid region.

THE EXTENT OF IRRIGABLE LAND.

Though the exact extent of irrigable land within the arid region is not known, there is an abundance of it yet to reclaim and cultivate. Its metes and bounds will extend with development and cannot be located by survey. As irrigation progresses its limits will extend, and more and more of that land which would now be classed as irreclaimable will yield to the pioneers' energy and pluck and the revivifying influences of water. The reclamation, settlement and cultivation of the millions of acres now available and irrigable would accomplish wonders in the general development of the whole Western country. The pasture lands of the plateaus would become great pastures, and the forests of the mountains would resound with the blows of the lumberman's axe; mining would be profitable in regions where now the cost of maintenance makes it prohibitive. Some meteorologists have maintained that the climatic conditions of the whole country would be changed if the great plains and arid region were fully irrigated, and that the conditions now so adverse to prosperous agriculture in the sub-humid region would entirely disappear. Captain Glassford, U. S. A., who has given the arid region and irrigation the closest study for many years on behalf of the government, says: "When the engineer has found the way to construct reservoir dams sufficiently firm to resist the tremendous force of the converging mountain torrents rushing through canon walls and debouching upon the many valleys found in arid America, a new world will rise from the dust of seeming aridity. When we view the beauty, grandeur and extent of what has been done by means of the gravity ditch fed from the flow of streams, depended upon at their minimum, and have noted the tremendous volumes of water that periodically waste their benefits in haste to seek the sea, the question of adequate water supply for the irrigation of the valleys of arid America is not one that disturbs the faith born of practical experience and observation by those who have witnessed this phenomenon and confidently rely upon American engineering genius and skill to solve what appears to them the only remaining problem."

GOVERNMENT RECOGNITION.

The necessity of irrigation and its prominence as a factor in the future progress of the whole country has been recognized by our government, and not only have exhaustive investigation of the arid region and irrigation been made under the auspices of the Depart-



The WITTE ALWAYS TAKES FIRST PREMIUM.
The only engine for successful IRRIGATION. Can be used for feed-grinding, shelling, etc.
WE GUARANTEE RESULTS!
WITTE IRON WORKS, Kansas City, Mo.

ment of Agriculture, but laws governing the selection and settlement of arid land have from time to time been enacted, in which every encouragement has been held out to settlers intending to reclaim and cultivate these lands. These inducements are slowly being taken advantage of, and when the opportunities in all their phases and prospects reach those who now earn but scant subsistence out of unpromising hard labor on worn-out soil in many of the countries of Europe, a flood of the best emigrants to so encouraging a field ought to, and more than likely will, be the result.

THE ADVANTAGES TO WESTERN ROADS.

What the pictured and possible development of this region would mean for our great Western systems of railways is almost incalculable. Their territories filled with the population they should and are able to maintain, all the industries now dormant developed, and avenues to new ones continually opening, these systems would more than justify their existence in earnings netting a liberal return on every dollar invested. The field for railroad construction is exhausted; let capital now come to the aid of itself and assist in the development of resources for those enterprises in which it is so greatly interested. The concerted, well-considered action of the government, railways and capital can bring about this redemption and development of the arid lands of the West in the full measure of the most sanguinely pictured possibility, without requiring a very great outlay or the assumption of a heavy burden by any one of these powers. The object is worthy of the effort.

Young men or old should not fail to read Thos. Slater's advertisement on page 15.

Christian Endeavor Washington Convention.

Excursion tickets for it will be sold July 4, 5, 6 and 7, via Vandalia-Pennsylvania Short Lines from St. Louis. W. F. Brunner, A. G. P. agent, St. Louis, Mo., will furnish tickets and information about the through trains, low rates and return limit upon application. A postal card will do.

People who wish to go to Buffalo to attend the N. E. A. convention, who want fast time, the most excellent train service and superior accommodations, will do well to consider the Nickel Plate Road before purchasing tickets. A fare of \$12 for the round trip will apply with \$3 added for membership fee. Tickets will be on sale July 5 and 6 with liberal return limit and with privilege of stop-over at Chautauqua Lake. Additional information cheerfully given on application to J. Y. Calahan, General Agent, 111 Adams street, Chicago, Ill. 95

TO THE NATIONAL CAPITAL.

Vandalia-Pennsylvania Short Line.

For Christian Endeavor Convention, low rate tickets to Washington will be sold to all applicants, July 4, 5, 6 and 7, via Vandalia-Pennsylvania Short Lines from St. Louis, the direct route through Pittsburgh, historic Johnstown, over the Alleghenies, around famous Horse Shoe Curve, along the Blue Juniata. Ask W. F. Brunner, A. G. P. Agent, St. Louis, about low rates, return limit and fast through trains.

Important to Teachers.

Low rate over the Great Rock Island Route to Buffalo and return to attend the convention, July 8-10, 1896.

Next month, in Buffalo, N. Y., the teachers from all over our land will meet in annual session.

They are perhaps the most truly representative body of any citizen gathering in our Union.

They are the instructors of the youth who belong to all classes and sects. The Great Rock Island Route realizes this and expects to transport with its elegant equipment thousands of these educators.

For tickets and sleeping car reservations, maps and time tables, call on nearest ticket agent and ask to be routed over the C., R. I. & P. Ry.

A beautiful souvenir, called the "Tourist Dictionary," has been issued and will be sent postpaid. Address John Sebastian, General Passenger Agent, Chicago.

The Family Doctor.

Conducted by HENRY W. ROBY, M. D., consulting and operating surgeon, Topeka, Kas., to whom all correspondence relating to this department should be addressed. Correspondents wishing answers and prescriptions by mail will please enclose one dollar when they write.

Answers to Correspondents.

DEAR FAMILY DOCTOR:—I have always been troubled with constipation, more or less, but since my confinement, three years ago, I have had a great deal of trouble with my bowels, often going a week without a movement of them. I suffer a great deal with headache (frontal) and feel tired, weak and worn-out. I am as tired when I get up of mornings as when I retire. Am thirty years old and weigh ninety-eight pounds. Lead an active life, as we live on a farm and I do all the work for our family of five, including cooking, washing and ironing, care of milk, garden, chickens and two small children. Fruit and vegetables have very little effect. My color is badly spotted and sallow. Will you please prescribe through the columns of the KANSAS FARMER.
Mrs. J. McK.
Hiawatha, Kas.

A dose of nux vomica 3x at night and a dose of sulphur 30x in the morning. If not better in a week, write me.

ONE HONEST MAN.

DEAR EDITOR:—Please inform your readers that if written to confidentially, I will mail in a sealed letter the plan pursued by which I was permanently restored to health and manly vigor, after years of suffering from Nervous Weakness, Loss of Manhood, Lack of Confidence, etc. I have no scheme to extort money from any one whomsoever. I was robbed and swindled by quacks until I nearly lost faith in mankind, but thank heaven, I am now well, vigorous and strong, and anxious to make this certain means of cure known to all. Having nothing to sell or send C. O. D., I want no money. Address
JAS. A. HARRIS, Box 807, Delray, Mich.

THE STRAY LIST.

FOR WEEK ENDING MAY 21, 1896.

Franklin county—J. K. Bailey, clerk.

PONY—Taken up by M. A. Smith, in Peoria tp., one chestnut sorrel mare pony, 10 years old, white face and both hind feet white, brand similar to D with bar underneath in right flank; valued at \$15.
MARE—By same, one black two-year-old mare, small star in forehead, both hind feet white; valued at \$9.

Chase county—M. C. Newton, clerk.

MARE—Taken up by W. C. Hagans, in Strong City tp. (P. O. Strong City), April 29, 1896, one mare, 8 years old, brand supposed to be T on right shoulder, white stockings on hind legs about to knees, left front foot white, collar mark on neck, foretop clipped off.

FOR WEEK ENDING MAY 28, 1896.

Cherokee county—T. W. Thomason, clerk.

MARE—Taken up by J. L. Church, in Pleasant View tp., April 27, 1896, one dark bay mare, fifteen hands high, white strip in face, collar marks, 5 years old; valued at \$25.
HORSE—By same, one light bay horse, fifteen hands high, white strip in face, four white feet, shod in front, 14 years old; valued at \$10.
HORSE—By same, one dark bay horse, fifteen hands high, white strip in face, three white feet, shod in front; valued at \$15.
MARE—Taken up by R. F. Hartley (P. O. Baxter Springs), April 25, 1896, one gray mare, fourteen hands high, shod all round; valued at \$15.
MARE—By same, one sorrel mare, white strip forehead, two white feet; valued at \$15.

Johnson county—J. W. Thomas, clerk.

MARE—Taken up by W. C. Montgomery, in Oxford tp. (P. O. Morse), April 15, 1896, one bay mare, sixteen hands high, 6 years old, star in forehead; valued at \$20.
MARE—By same, one sorrel mare, 6 years old, fifteen and a half hands high, white hind feet, blaze in face; valued at \$20.
MULE—Taken up by W. J. Wedd, in Shawnee tp. (P. O. Lenexa), April 20, 1896, one dark bay horse mule, 9 or 10 years old, collar mark on each shoulder; valued at \$20.

FOR WEEK ENDING JUNE 4, 1896.

Sumner county—Chas. Sadler, clerk.

MULE—Taken up by John F. Gift, in Seventy-six tp. (P. O. Wellington), April 3, 1896, one black mare mule, branded O on left shoulder, collar marks; valued at \$20.
MULE—By same, one light brown horse mule, branded O on left shoulder; valued at \$20.

Allen county—James Wakefield, clerk.

PONY—Taken up by Newman Crowell, in Elm tp. (P. O. Iola), April 28, 1896, one dark bay gelding pony, about 10 years old, shod on front feet, harness marks; valued at \$17.

FILLY—By same, one dark brown filly, fourteen and a half hands high, about 3 years old, white spot in forehead, slender built, had halter on.

Cherokee county—T. W. Thomason, clerk.

MARE—Taken up by R. P. Hall, in Pleasant View tp., May 2, 1896, one bay mare, scar on left front foot, lump on left hind leg, star in forehead, 4 or 5 years old; valued at \$15.
FILLY—Taken up by De Dorsey, in Pleasant View tp., May 8, 1896, one sorrel filly, fourteen hands high, star in forehead; valued at \$15.

DEAD • EASY!

The Great Disinfectant Insecticide
KILLS HEN LICE
By simply painting roosts and dropping-boards. Kills Mites and Lice, cures Colds and Cholera, also kills Hog Cholera germs. Half gallon, 45c.; gallon, 75c.; two gallons, \$1.25; five gallons, \$3.
THOS. W. SOUTHARD,
General Agent, 1411 Main St., Kansas City, Mo.

The Home Circle.

SWEETHEART, GOOD-BY.

The dew is on the summer rose,
The summer moonlight sadly glows;
And softly, too, the night wind blows,
And echoes sigh for sigh.
Ofttimes goodnight with smile and bow
I've said, while laughter lit thy brow;
But comes a sadder parting now,
Sweetheart, good-by.

Good-by! If we should never meet
Thy smile hath made the past so sweet
Fair memory's lamp shall light my feet
Where e'er my pathway lie.
But now, when fortune bids me stray
From all that makes the present gay,
Alas! how hard it is to say,
Sweetheart, good-by.

Good-by, sweetheart, with eyes of blue,
Whose glance can shame the morning dew,
And teach the stars to shine more true,
For thee I'd gladly die.
You are my dream asleep or wake,
For thee my heart would rather break
Than live in bliss for other's sake;
Sweetheart, good-by.

—Boston Transcript.

WONDERFUL TRESSES.

San Francisco Lady Who Has Over Six Feet of Hair.

Mrs. D. J. Davis, of San Francisco, Cal., has the longest hair in the world. It clusters in a great mass about her head, and though she is a tall woman, being five feet nine inches in height, her long tresses, when uncoiled, sweep upon the ground for nearly a foot. Her hair is just six feet and eight inches in length.

Mrs. Davis comes of a family remarkable alike for their height and the length of their hair. Though Mrs. Davis is five feet and nine inches in height, she is shorter by nearly an inch than either of her three sisters. But while they have the advantage in height, they cannot equal her in the matter of hair, notwithstanding that all three have curls over a yard and a half long. Not the least remarkable part of this wonderful hirsute development is that while all three of Mrs. Davis' sisters had



LONGEST HAIR IN THE WORLD.

long hair from early childhood, the young lady herself could never induce her tresses to fall below her shoulders, so that it is only within the past years that they have developed such a tendency to eclipse Paderewski's shaggy mane.

But it is not surprising that Mrs. Davis and her sisters should have such a "crowning glory" to boast of, for the mother of this interesting family had hair that dangled five feet from the crown of her head. Mrs. Davis seems to have lived all her life among long-haired people, for her sister-in-law, with whom she now resides at the Union hotel in the Potrero, has over four feet of hair, and her niece, a little girl scarcely three years old, has a braid 21 inches in length, which she succeeds daily in tangling badly, and for which she as regularly does penance when the comb is applied.

"I never brush my hair," said Mrs. Davis, as she removed those long coral pins that held great coils in place about her head so that her hair might be measured, "for the reason that I do not believe it is good for the hair. In fact, I have demonstrated my belief to my own satisfaction by experimenting. When a girl I gave very little attention to my hair, and in consequence it did not grow at all. Sometimes I felt very much chagrined to see how much longer and prettier was the hair of all

three of my sisters, but I was somewhat careless. When I became a woman I suddenly developed a desire to have long hair like theirs, and began to take the utmost care of what little I had. Every morning, and sometimes twice a day, I brushed it thoroughly, but it did not grow any better. Then I noticed that the brush, after the daily application to the hair, even when the latter had no tendency to fall out, would be filled with very fine hairs, and soon I realized that while the brushing had no effect upon the long hair it effectually killed the new growth, and I decided to stop.

"Since then I have used nothing but a very coarse comb. Every morning I go over the hair thoroughly and carefully, removing every snarl until it is as free and flowing as water. Then I braid it and coil it into varied coiffures about my head. I never used cosmetics on my hair."—N. Y. Sunday Journal.

SHE READS TO SAVE.

A Housekeeper Gives Her Reasons Why She Studies Advertisements.

I study advertisements, and I know where and when and how to purchase the household supplies. My husband used to laugh at me for reading advertisements so carefully, and he has long since learned that I save many dollars every month, says a writer in Woman-kind. I know of no better way to practice economy, and do you know it is a wonder how soon you learn to detect the real from the false, intuitively, almost? I do not think I have ever been "taken in" by an advertisement; there is always something about the false ones that repels me. You hear a good deal nowadays about the "practical pages" of magazines and newspapers, but for me the practical pages are those containing the business announcements of reputable houses. The housekeeper who takes advantage of the practical hints in those pages shows a great deal more common sense than does the one who tries to furnish a seven-room cottage with a lot of soap boxes covered with denim worked in fancy stitch, and to feed her growing family with never-ending reminiscences of the meal that went before. To the economical housekeeper the advertisements are the most important part of any publication.

THE BLOUSE WAIST.

In Spite of Determined Opposition It Is as Popular as Ever.

Although writers, importers and modistes have condemned the blouse waist, it continues to thrive and apparently gain by its condemnation. It certainly has not disappeared, for at recent high class dress exhibits it was one of the decided features of the elegant and wonderful display. Fitted and draped blouses in silk, satin, chiffon, lace, Indian muslin, velvet and brocade were variously shown. The blouse, once chiefly recommended for its economy, is now a costly confection. Once it was merely and strictly used for negligé costumes, now it appears at the most fashionable evening functions, worn by the most fastidious, and made of the most expensive textiles; and granted that its vogue in this domain will be short and that the blouse has really become too general to be elected for by the very particular ones of society, still its trimness, usefulness, freshness and adaptability will prevent it from going out of vogue, or at least out of very general use. Ultrafashionable women may possibly abandon it after this summer, but for cool, neat wear under the jacket of a traveling costume, for tennis, boating, golfing, cycling and indeed all simple uses, what can take its place?—N. Y. Post.

She Has Consolation to Sell.

It has taken the ingenuity of a London woman to transcend all previous efforts of either sex to crystallize the intangible and turn the emotions into a source of revenue. She has consolation for sale, sympathy packages, so to speak, at so much a pound. Her advertisement reads: "Sympathy offered to those who are in trouble and have no one to whom they can tell their sorrow. Interviews by appointment."

Health and happiness are relative conditions; at any rate, there can be little happiness without health. To give the body its full measure of strength and energy the blood should be kept pure and vigorous by the use of Ayer's Sarsaparilla.

Scott's Emulsion

of Cod-liver Oil,
with Hypophosphites, feeds
the exhausted tissues and
strengthens the nerves.

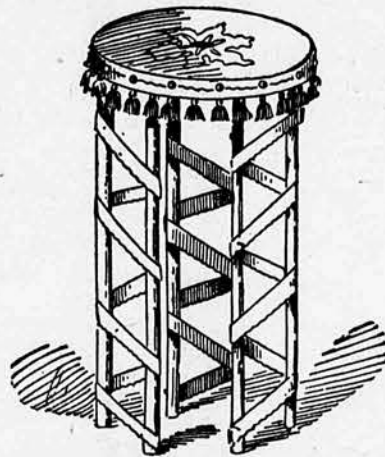
50c. and \$1.00 at all druggists.

Opium and similar drugs may quiet pain to-day, only to have it return again, for these drugs weaken. Scott's Emulsion permanently cures because it feeds and strengthens.

COUNTRY-HOUSE TABLES.

Pretty and Useful Little Things Covered with Linen.

A charitable woman, who uses her artistic talents for the benefit of others, utilized her Lenten leisure this year in making tables for country houses, which she has placed for sale at the woman's exchanges, and which are so pretty and dainty that a description may be welcome. They are of various shapes and colors, and are entirely covered with linen. The blue denim ones, trimmed with white braid, resembling the blue and white delft which is the latest popular fad in china, are perhaps the prettiest, although the rose



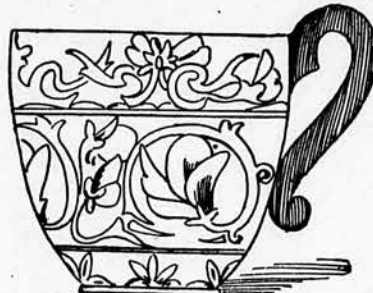
or yellow duck are lovely with certain colorings.

All white ones are also very effective, trimmed with blue and white braid and tassels, also touched with blue, with blue nails, the latter being covered with fine Bolton cloth. The white linen braid and tassels may be made to match the material by working in cotton of the same color as the covering. The sketch represents a tall table for a palm pot; the low tea-tables may be made after the same design; the legs may be either round or square. Old-rose linen, white linen braid, white buttons of Bolton cloth and a design embroidered in white cotton on top are the materials used in this table.—N. Y. Tribune.

SWEET PEA DESIGN.

Cup and Saucer Done in Violet and Gold Are Very Pretty.

The accompanying design of sweet peas for a cup and saucer is charming if done in violet and gold. After sketching the design in India ink, fill in the surface first with a pale tinting of violet and gold, not in an even grounding tint, but showing faintly the brush marks and letting it shade from a deep tone to a paler. When this is finished dry it in a hot oven until perfectly hard, so you can work over it. Then with violet of gold moistened slightly with turpentine wash in the sweet pea



petals, adding a bit of black with the violet to make a grayish violet for the conventionalized stems and the leaf-like figure that finishes the edge. After you have done as much work on it as possible without smudging, send it to be fired. When it returns you can work over it further, adding a touch of deeper shadow where it is not intense enough. Then use your gold, carefully outlining the sweet peas, the stems and the border, with a touch here and there whenever you think a

bit of gilding will improve it. Gild the handle and edges, only be careful in using gold that it does not come in contact with unfired color, else it will turn black and unsightly.—American Agriculturist.

INEXPENSIVE COUCH.

Something Dainty and Useful to Hold One's Best Gowns.

A dainty woman who has a passion for the elusive odor of heliotrope has evolved for herself an idea whereby she can impregnate her belongings at light expense and very satisfactorily. From two clean packing boxes she has made two boxes of another shape.

One was six feet long by 18 inches or so deep, and about 36 inches wide. Another was made just as long and just as wide, but not quite so deep. Both boxes were made quite strong, and one, the deepest, had short, strong legs finished with casters. This deepest box was lined neatly with wrapping paper, and over this a lining of pale blue silesia was tacked. For the bottom of this box three large sachets were made which formed a soft bottom, and this was thoroughly scented with her favorite odor.

The second or shallow box had its bottom also covered with a large sachet or padded lining, and the top was upholstered with springs and filling. Then the two boxes were joined together, one above the other, by three stout hinges. A piece of tapestry cloth was plaited around the edge of the lower box, and tacked with gimps falling in a rich valence to the floor.

The upper box was covered smoothly over the upholstering, and the edge that touched the lower one was also finished with gimp. Several attractive pillows completed the outside arrangement, and a very artistic couch was the result. A bunch of tassels at either outside corner served to lift the upholstered top, revealing a receptacle for gowns and wraps where they could rest in scented seclusion with immunity from creases or crushes, as the box was fashioned with sufficient length to admit of their being laid in without a fold. Any carpenter could make the boxes, and the upholstering will cost but a little, the tapestry being most expensive, but any other material preferred could be substituted, thus bringing the cost even lower.

Hall's Hair Renewer is pronounced the best preparation made for thickening the growth of the hair and restoring that which is gray to its original color.

There is lots of pleasure,
satisfaction and health corked
up in a bottle of HIRES
Rootbeer. Make it at home.

Made only by The Charles E. Hires Co., Philadelphia.
A 25c. package makes 5 gallons. Sold every where.



LADIES

Know the
Certain
Remedy for
diseases of the
Liver, Kidneys and Urinary
Organs is

**Dr. J. H. McLEAN'S
LIVER AND KIDNEY
BALM**

It Cures Female Troubles

At Druggists. Price, \$1.00 Per Bottle
THE DR. J. H. McLEAN MEDICINE CO.
ST. LOUIS, MO.

The Young Folks.

WILD FLOWERS.

Oh, beautiful blossoms, pure and sweet,
Agile with dew from the country ways,
To me, at work in a city street,
You bring fair visions of bygone days—
Glad days, when I hid in a mist of green
To watch spring's delicate buds unfold;
And all the riches I cared to glean
Were daisy silver and buttercup gold.

'Tis true, you come of a lowly race,
Nursed by the sunshine, fed by the show-
ers;
And yet you are heirs to a nameless grace
Which I fail to find in my hothouse flowers;
And you breathe on me with your honeyed
lips,
Till I thought I stand on the wind-swept
fells,
Where the brown bees hum o'er the ferny
dips,
Or ring faint peals on the heather bells.

I close my eyes on the crowded street,
I shut my ears to the city's roar,
And am out in the open with flying feet—
Off, off to your emerald haunts once more.
But the harsh wheels grate on the stones be-
low,
And a sparrow chirps at the murky pane,
And my bright dreams fade in an overflow
Of passionate longing and tender pain.
—Chambers' Journal.

BRAVE CHINESE BOY.

His Presence of Mind Rewarded by the
Council of Mandarins.

More than 1,000 years ago the great city of Peking was called Min; its inhabitants felt very proud of its many ornaments, but exhausted their speech in praising the public gardens. These were really very beautiful, and great care was exercised that each shrub and flowering plant should be displayed to the best advantage.

Often, in times of drought, the plants had suffered for water, so that the wisdom of the mandarin council was tried to find some way of averting this calamity. At last a number of large earthen jars were set in different parts of the gardens for the purpose of catching the rain as it fell.

The central one was a huge affair, ornamented on the sides with dragons and fishes in raised work. It was very costly, for it had taken both time and skill to produce so large a piece of pottery.

One bright day a party of merry little boys entered the gardens and began to play games. Tiring at last of their sports, they rested themselves in the shadow of this large jar.

One, more adventurous than the others, proposed to climb to the top of the jar, and try to catch a glimpse of



"LET US BREAK THE JAR."

the water-god, who was said to live at the bottom of it. But they were all afraid, so he commenced his ascent alone.

It was not hard work, because he could easily step from one fish or dragon to another. At last he reached the top, and, waving his hands, began to walk on the rim. Suddenly his foot slipped, and he disappeared inside the jar.

A scream of terror broke from the boys below, for they believed the water-god was angry at being disturbed, and had dragged him in.

But one of the number, whose name was Shiba Onko, cried boldly:

"Let us break the jar, for only last night I heard my father say it was nearly empty."

Again they were afraid, for would not the chief gardener be very angry, and then, too, might not the dreaded water-god devour them? So Onko said:

"Well, cowards, run away and I will break the jar," and he seized a large rock and hurled it with all his strength. It broke in several pieces, and the water

gushing out, Onko saw his little friend huddled together, greatly frightened, but not much hurt.

When the gardener heard the great crash he came running and reached the spot just as Onko was trying to help his companion out.

When he heard the story, he exclaimed:

"Ah, brave lad that you are! What are a million such beautiful jars in comparison with the life of a human being? I must at once report the matter to the council. Fear not, but come with me."

So, leading the little fellow by the hand, he went to the chief mandarin and told him the whole story.

Then Onko was summoned before the council. When they heard of his bravery and presence of mind, they inquired about his family, and it was declared that his father was very poor, so that the little boy could not be educated.

Then the council addressed Onko through the chief mandarin and decreed that he should be supported and educated for some worthy station in life.

Year by year Shiba Onko won the highest commendations from his teachers. When he arrived at a suitable age he was placed in the imperial army, where he was constantly honored for his bravery. At last he held the highest place, and even now the name of Shiba Onko is revered, for never lived in China a braver or more famous general.

STORY OF A STORK.

How It Carried a Letter to Africa and Brought One Back.

A story that comes from Germany is as quaint as it is true, says Our Animal Friends. Some children living in the northern provinces discovered that a stork had made its nest upon their roof. Being orthodox little Teutons they hailed the newcomer with favor, as storks are supposed to bring luck to a house. All the summer they shared their tidbits with their long-legged friend, which became very tame and companionable.

At the first signs of approaching cold weather the stork prepared to flit to warmer climes. The children were sad at the thought of losing their pet, but their parents consoled them with the assurance that the bird would surely return the next spring. The children, still uneasy at the idea of the stork not being cared for through the long winter, consulted together and evolved a brilliant idea, which they immediately proceeded to put into execution. They wrote a note in their best German script, stating that the stork was very dear to them and begged the good people in whose country it might spend the winter to be kind to their pet, and send it back to them in the spring.

They sealed the note, fastened it to a ribbon, tied it around the bird's neck and tucked it under its wing. The next day they sadly watched the stork wing its way toward milder skies. The snow and ice came; Christmas time brought the children gifts and fresh amusements, but their summer pet was not forgotten. When the spring came round again their little feet used to climb to the roof day by day, looking and longing for the stork's return; and behold! One fine morning there it was, tame and gentle as ever.

Great was the children's delight, but what was their surprise to discover round its neck and under its wing another bright band with a note attached, addressed to "the children who wrote the letter the stork brought." The ribbon was quickly untied and the missive opened. It was from a missionary in Africa, stating that he had read the children's note and had cared for the stork, and thought that children whose hearts had prompted them to provide for the comfort of a bird through the winter would be willing to help clothe and feed the little destitute children of his mission. A full name and address followed.

The children were full of sympathy, and the missionary's note won a golden answer from the family. Other letters came and went by post between them until by and by the children learned to know the missionary and his little black waifs almost as well as they knew the beloved stork that had proved so trustworthy a messenger.

DOGS AND WOODCHUCK.

How Rover Fooled His Two Companions, Sport and Zip.

A correspondent sends to the Youth's Companion from Paris, Me., an entertaining story of three dogs and a woodchuck.

"Some years ago," he says, "I owned a dog, Sport, who was a famous woodchuck hunter. In the course of one season, when woodchucks were unusually numerous and troublesome, Sport caught 25 by actual count."

"One day in June, when I was hoeing corn, I heard a good deal of barking in an adjoining field, and knew pretty well what must be going on. On my way to the cornfield after dinner, therefore, I went across lots to see what Sport was about, and to help him a bit, if need be, by removing a stone or two from the wall in which the quarry had taken refuge."

"A chorus of excited yelps and barks guided me to the spot, and as I drew



ROVER CARRIED OFF THE SPOILS.

near I saw that Sport had plenty of help. Zip, a neighbor's dog, was on one side, of the wall with him, and on the other side was Rover, a large hound.

"All three dogs had their noses under the stones, and they were digging and making the dirt fly with their paws, and barking and yelping as dogs will when game is almost won. From within the wall I heard the woodchuck's peculiar, defiant whistle."

"Just as I approached Sport jumped back and dragged forth the woodchuck. At almost the same instant Zip withdrew his head from the wall and fixed his teeth in the game; and then began a struggle for supremacy, each dog evidently setting up a claim for the woodchuck."

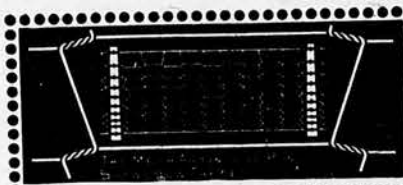
"Rover, on the other side, with his head in the wall, was so eagerly engaged that he did not at once comprehend what had occurred; then it flashed upon him, and he sprang upon the wall, and for a moment looked down on the struggling dogs."

"Like a whirlwind he launched himself from the stones upon the woodchuck, tore it from the mouths of the other dogs and bore it off in his teeth."

"It happened so suddenly that Sport and Zip didn't know what to make of it. They seemed dazed, and looked this way and that as if to ascertain what had become of their prey. As for Rover, he disappeared over the brow of a hill, and I do not think the two dogs left behind ever fairly realized what became of that woodchuck."

Knew What He Was Saying.

In an Edinburg school an inspector, wishing to test the knowledge of a class in fractions, asked one boy whether he would rather take a sixth or a seventh part of an orange, if he had his choice. The boy promptly replied that he would take the seventh. At this the inspector explained at length to the class that the boy who would choose the smaller part, as this boy had done, because it looked the largest fraction, was very foolish. Then there was a laugh. But presently the laugh was on the other side, when another boy got up and said, boldly: "He's my brother, and he don't like oranges!"



KEYSTONE WOVEN WIRE FENCE.

Practical farmers say it is the best. Fence in use seven years still in first-class condition. Can also be used as a portable fence. Write for catalogue.

KEYSTONE WOVEN WIRE FENCE CO., 12 Rush St., PEORIA, ILL.

Leather gets

hard and brittle—use Vacuum Leather Oil. Get a can at a harness- or shoe-store, 25c a half-pint to \$1.25 a gallon; book "How to Take Care of Leather," and swab, both free; use enough to find out; if you don't like it, take the can back and get the whole of your money.

Sold only in cans, to make sure of fair dealing everywhere—handy cans. Best oil for farm machinery also. If you can't find it, write to VACUUM OIL COMPANY, Rochester, N. Y.

Sad and Singular Meeting.

An Akron (O.) man died recently, and a telegram was sent to two of his sons in the New England states to come to the funeral. The two brothers had not met for 20 years, and it happened that they took the same train at Boston for the west. In the same coach, sitting on opposite sides of the aisle, they traveled all the way to Akron, and neither suspected the other's identity. They left the train, and taking different routes, met again in front of their father's house, and after exchanging a few words, discovered that they were brothers. It was both a sad and singular meeting.

Dr. M. W. Stryker, president of Hamilton college, told this story the other day in an address before the New York Hardware club: "The braggart spirit anywhere is absurd. Some little school girls (it is chronicled of Chicago) were discussing their clothes. 'I've a lovely new dress,' said one, 'and I'm going to wear it to church next Sunday.' 'Pooh!' said another. 'I've a new hat, and I'm going to wear it every day.' 'Well,' said a third, 'I've got heart disease, anyway!'"

Do NOT DESPAIR because you have tried many medicines and have failed to receive benefit. Remember that Hood's Sarsaparilla cures when all others fail to do any good whatever.

HOOD'S PILLS are the best family cathartic and liver medicine. Harmless, reliable, sure.

THOS. B. SHILLINGLAW, Real Estate and Rental Agency, 115 East Fifth St., Topeka, Kas. Established in 1884. Calls and correspondence invited.

Washburn College, Topeka, Kansas.

For catalogue, address the Registrar, Washburn Academy. For information, address the Principal.

FREE trial in your home. Cut this out and send for catalogue. Prices to suit you. Oxford Sewing Machines awarded World's Fair Medal. **FREE** WHAT ANY WILL DO. FULL SET OF ATTACHMENTS. TEN YEAR GUARANTEE. FREIGHT PAID. ADDRESS: OXFORD MFG. CO., 240 Washburn Ave., CHICAGO.

Wanted, an Idea. Who can think of some simple thing to patent? Protect your ideas; they may bring you wealth. Write John Wedderburn & Co. Patent Attorneys, Washington, D. C., for their \$1,800 prize offer and list of 200 inventions wanted.

BRASS BAND
Instruments, Drums, Uniforms, Equipment for Bands and Drum Corps. Lowest prices ever quoted. Free Catalogue, 400 Illustrations, mailed free; it gives Band Music & Instructions for Amateur Bands. **LYON & HEALY**, Cor. Adams St. and Wabash Avenue, Chicago, Ill.

A Southern Home

In lower Alabama or Mississippi where the climate is delightful and you can reap bountiful crops the whole year long. Easy terms and low rate of interest on deferred payments. If this appeals to you, write for full particulars and our low railway rates to land seekers.

HENRY FONDE, President, Alabama Land and Development Co., Mobile, Ala.

Forty for \$1.00...
For the next 60 days we make this extraordinary offer on our **HIGH-ARM SINGER** Sewing Machines. On receipt of \$1 we will send our No. 3 High Arm on 30 days' trial (price \$12.25), or our No. 1 (price \$16.75). Our machines are the best made; our No. 1 beats the world; 10 years' guarantee with each. Deal with a reliable house; buy at factory prices. **H. R. Eagle & Co., 70 Wabash, Chicago.**

FREE A GENUINE 14 K. GOLD-FILLED WATCH and chain to every reader of this paper. Cut this out and send it to us with your address and we will send you FREE for examination the Best and Only Genuine American watch ever offered at this price. It is 14k. Solid Gold filled, with Genuine American Movement, 30 Years' Guarantee, and looks like a Solid Gold Watch sold at \$40. Examine at express office and if you think it a bargain, pay \$7.50 and express charges, otherwise pay nothing. A Handsome Gold Filled Chain, sold in certain stores for \$3 goes free with each watch. **OUR GRAND OFFER.** **FREE** One of these \$7.50 watches and a chain, if you buy or sell SIX. Write to-day, as this price holds good for 60 days only. **ROYAL W. CO., 501 Unity Bldg., Chicago, Ill.**

KANSAS FARMER.

ESTABLISHED IN 1863.

Published every Thursday by the

KANSAS FARMER COMPANY.

OFFICE:

No. 116 West Sixth Avenue.

SUBSCRIPTION PRICE: ONE DOLLAR A YEAR.

An extra copy free fifty-two weeks for a club of six, at \$1.00 each.

Address KANSAS FARMER CO.,
Topeka, Kansas.

ADVERTISING RATES.

Display advertising, 15 cents per line, agate, (fourteen lines to the inch).

Special reading notices, 25 cents per line. Business cards or miscellaneous advertisements will be received from reliable advertisers at the rate of \$5.00 per line for one year.

Annual cards in the Breeders' Directory, consisting of four lines or less, for \$15.00 per year, including a copy of KANSAS FARMER free.

Electros must have metal base.

Objectionable advertisements or orders from unreliable advertisers, when such is known to be the case, will not be accepted at any price.

To insure prompt publication of an advertisement, send cash with the order; however, monthly or quarterly payments may be arranged by parties who are well known to the publishers, or when acceptable references are given.

All advertising intended for the current week should reach this office not later than Monday.

Every advertiser will receive a copy of the paper free during the publication of the advertisement.

Address all orders—

KANSAS FARMER CO., Topeka, Kas.

SPONTANEOUS COMBUSTION OF HAY.

Two destructive fires have occurred recently in Kansas City. The Kaw Feed and Coal Co.'s warehouse, at Nineteenth and Wyoming streets, was wrecked, with about 2,000 tons of hay entirely destroyed. A little later J. A. Brubaker's warehouse caught fire and a \$1,700 loss was sustained on building and hay. This is the second fire for Mr. Brubaker within two months, he having lost his warehouse full of hay at Rosedale, worth about \$5,000 and insured for only \$2,000. There seems to be something wrong about the construction of these buildings, as all the fires are laid to spontaneous combustion, and unless there is more care exercised in ventilating warehouses and storing new hay, hay men will find insurance rates out of reach entirely. If proper care in baling is observed there is no danger of spontaneous combustion.

ALFALFA IN CORN.

An interesting alfalfa item is furnished by Secretary Coburn, of the Board of Agriculture, who last week visited the fourteen-acre alfalfa field of Mr. H. D. Rice, three miles east of Topeka. The seed for this was cultivated in, between rows of (listed) growing corn, from the 17th to the 20th of last July, a time when chinch bugs were doing considerable damage to the corn. The alfalfa is an unusually good stand, beginning to blossom, and will be ready to cut during the first week of June. It is thought this first cutting will yield three-fourths of a ton per acre. The land is high Kansas prairie—in fact, a limestone ridge, with occasional spots of hard-pan. A sample of alfalfa, selected at random and pulled by hand, shows roots twenty-six inches long and a growth above ground of twenty-three inches. An interesting query with Mr. Rice at the time of sowing had been whether the chinch bugs in the growing corn would not destroy the young alfalfa as fast as it came up, but he says they let it severely alone, and he now feels certain that alfalfa, like red clover, is a crop which can be considered chinch bug proof.

RIVAL MARKETS WANT KANSAS TRADE.

The reduction of grain rates to the Gulf of Mexico has brought out the Kansas City Board of Trade with a demand for proportionate reduction to that point. The new tariffs to St. Louis have given rise, also, to a contention for reductions on rates from the west to Kansas City. The rivalry of these markets for the trade of Kansas is likely to result in rates on our products which will place this, the central State of the Union, in as favorable position as to markets, as if near the coast.

Kansas farmers can have no objection to the great rivalry, just now at its beginning, between the markets to the

east of us and the markets to the south of us. This rivalry will more and more make the boards of trade of these several markets fight the Kansas farmers' battles for lower rates of transportation. It seems inevitable that the victory shall eventually be won by the gulf ports and that Galveston, if she grasps her opportunities, will finally secure the lion's share of our export and import business. But Kansas City, St. Louis and Chicago, and even New York, are likely to contend for a long time for such low rates as shall enable them to retain a portion of the business they are so reluctant to lose. In the meantime, the interests of the gulf ports is strengthening, and the contention for reductions on transportation rates to these ports will be made with increasing persistence, force and effectiveness.

Kansas is willing.

KANSAS STATE AGRICULTURAL COLLEGE.

The catalogue of this prominent Kansas institution of learning, for the college year 1895-96, is just published. It shows a full Board of Regents, consisting of seven members, including the President of the college. The Board of Instruction consists of twenty-four members. There are eight assistants and foremen, besides twenty-five student assistants. There are also five "other officers."

The experiment station, which is a part of the institution, has a Council of seven and a Secretary and eight assistants. The Council consists of the President and six professors of the college, and most of the assistants are also engaged in other college work.

The students number in all 647, of whom 353 are pursuing the studies of the first year of the course, 121 the second year, 67 the third year, 71 the fourth year, 32 are pursuing post-graduate studies and 3 have special studies. Of the entire number of students, 419 are gentlemen and 228 are ladies.

It is often remarked, and is undoubtedly true, that if the young men and young women on the farms of Kansas could be informed so as to be able to fully realize the advantages provided for their education at the State Agricultural college, the present dimensions of the buildings would accommodate but a small fraction of those who would attend. But it is not possible to convey in a newspaper article or in any other writing an adequate idea of this institution. It cannot be compared with any other school in the State, and has only a few peers, in its line of work, in the world. It is planned in every detail to meet the educational needs of the young men and the young women from the farm, to furnish them such training as will best fit them for the activities of life in any station, and especially for those of farmers. The earnestness, industry, thrift and economy of farm life are in fashion at this college. Here is also exemplified the truth that these noble characteristics of the country are in perfect harmony with culture, refinement and the courtesy characteristic of the best bred people.

There is enough of farm work and work of the kinds which the farmer should know how to do to preserve the connection between the material and the intellectual sides of life and for purposes of instruction not to be had from books and apparatus alone.

The equipment of the college with illustrative apparatus is good and growing more complete each year. The farm, stock, orchards, vineyards, etc., the shops and printing office and other appliances of practical utility, are made subservient to the instruction of students.

The expense of conducting the college is paid from the income (about \$30,000 per year), from the endowment and from the government appropriation (this year \$22,000), so that no tuition is collected.

The experiment station connected with the college receives direct appropriations from the government of \$15,000 each year. At this station experiments are made to determine some of the many undetermined problems which confront the farmer, the orchardist and the gardener. This is, in

the nature of the case, original investigation, a questioning of nature for her secrets, and recording the conditions, circumstances, treatments and results.

The only complaint recently made against the Kansas institution with a semblance of reason is as to the amount of work reported from the experiment station. But this description is not intended as one of criticism, but rather as a conveyor of information useful to the young men and the young women on the farms of Kansas who are anxious to know how they may make the most of the opportunities of their youth, now here, but rapidly passing and nevermore to return. For these the KANSAS FARMER can scarcely wish a better fortune than to be able to take the four years' course at the State Agricultural college at Manhattan.

CRIMSON CLOVER IN THE ORCHARD.

The Rhode Island Experiment Station has found crimson clover a valuable fertilizer for orchards. At that station it winter-kills, but sown in spring or summer it makes a great growth, and being a gatherer of nitrogen, has the good effects of the other clovers in enriching the soil.

In a recent bulletin, Prof. L. F. Kinney, of that station, reports that in a young apple orchard where crimson clover seed was sown at the rate of sixteen pounds per acre, August 21, there were taken from a single square foot of land ninety-seven crimson clover plants. These were weighed, roots and all, after the roots had been carefully washed, and found to be twelve ounces in all. The professor estimates that at this rate the yield of green matter would exceed sixteen tons per acre. From a similar area in the same orchard, where red clover seed had been sown, the yield was only one-third as much. The report says that no spring plowing of the orchard is necessary after crimson clover, as no sod is formed, and the use of the harrow is sufficient to keep the surface soil mellow. When crimson clover was sown in the spring the plants reached mature growth during July. On good soil the spring growth may be cut and used for a mulch about the trees or plowed into the soil to good advantage early in June.

How Make Alfalfa Hay?

EDITOR KANSAS FARMER:—I would like to get some information from some one who has had experience in making alfalfa hay. Which is the best way to make it? For instance, will it do to make it like clover, taking it up from the field with the hay-loader as the machine left it, or is it better to work it more? What time is best to make it, when in full bloom or before?

JOHN WITSCHY.

Fairview, Brown Co., Kas.

Kansas City Hay Market Review.

From the KANSAS FARMER staff correspondent:

"There is absolutely no tone to this market. The dealers are very much discouraged at the low prices and heavy receipts of hay. No sales are made unless to fill an actual necessity, and the shipping demand is practically gone. It is a question among dealers as to what they will do with their hay. The two recent fires have caused no more ruffle in the dull state of affairs than a bonfire would. No. 2 hay was offered for \$3.50, with only \$3 bid. No. 1 is salable at about \$4.50 to \$5, and possibly \$5.50, owing to buyer's necessity. Choice hay is salable at \$6 and \$6.50, were there any in the market. New hay has not made its appearance here yet, but is looked for soon. The timothy hay market has always been fairly firm but is suffering slightly in sympathy with prairie. Shippers should be wary of shipping too heavily of any but choice grades of hay, as there is absolutely no sale. A few dealers continue to send out quotations, but quite a few have ceased to quote the market."

If you want KANSAS FARMER and Semi-Weekly Capital, send us \$1.50. Or, KANSAS FARMER and Topeka Advocate, send \$1.50.

STATE FAIR AT WICHITA.

The big fair of Kansas this year will be held at Wichita, September 22-26. The State Fair Association, of Wichita, is already exhibiting unusual enterprise and activity in the preliminary work of a fair which the association is determined shall eclipse all former efforts and they believe they will succeed in having the biggest fair ever held in Kansas. The prospect for large crops of all kinds encourages the management to make extraordinary efforts to attract a representative exhibit of all kinds of Kansas products from every part of the State.

Replanting Corn.

A correspondent of the *Southern Farmer* advocates replanting corn some weeks after the regular planting, for another purpose than that of securing a full stand. It is not even yet too late to secure some of the benefit mentioned. The same plan has been pursued by farmers in Kansas and advantages claimed. The correspondent says:

"There is a conflict of opinion among certain farmers in regard to the advisability of replanting corn. In the writer's experience there is an importance and value attached to same, which, from personal experiments made, are novel and worthy of mention. We have always considered replanting of corn of so much consequence that, irrespective of the necessity, the following plan was adopted, after experimenting and being satisfied with successful results: Two or three weeks after planting of the crop and the stand an assured fact, a hill is planted in every fifteenth row each way, equalizing the distance and number of hills, according to the length of field or cut. If the weather should prove dry during the filling time, the silk and tassels both become dry and dead. In this condition, and with a seasonable change, the silk revives and renews its growth; but the tassels do not recover. Then, for want of pollen, the new silk is unable to fill the office for which it was designed. The pollen from the replanted corn is then ready to support the silk and the filling is completed. All the abortive ears so common in all corn crops are caused by the want of pollen, and we have known ears to double their size in this second filling. Replanting of corn in every missing spot, and at the right time, is, therefore, most desirable, as it will certainly conduce to an improvement in the yield, judging from above-mentioned experiments and rational effects."

For the N. E. A. Meeting

at Buffalo, N. Y., July 7 to 11, it will be of interest to teachers and their friends to know that arrangements have been successfully accomplished by the Nickel Plate Road providing for the sale of excursion tickets at \$12 for the round trip with \$2 added for membership fee. Tickets will be on sale July 5 and 6 and liberal return limits will be granted. For further information as to stop-overs, routes, time of trains, etc., address J. Y. Calahan, Gen'l. Agent, 111 Adams street, Chicago, Ill. 98

Low Rates to Cleveland.

The Nobles of the Mystic Shrine will meet at Cleveland, June 23 and 24.

For this occasion the B. & O. R. R. Co. will sell tickets at reduced rates from all points on its lines west of the Ohio river, for all trains of June 21 and 22, valid for return passage until June 25. The fare from Chicago will be \$8.50 and correspondingly low rates from all other points. Tickets will also be on sale at all points throughout the West.

The B. & O. is the only line running Pullman sleeping cars between Chicago and Cleveland.

For full information write to L. S. Allen, A. G. P. A., Grand Central Passenger Station, Chicago, Ill.

Vandalia-Pennsylvania Short Lines from St. Louis. Excursion tickets on sale June 6, 7 and 8. Solid trains from St. Louis Union Station to Pittsburgh Union Station. For particulars address W. F. Brunner, A. G. P. Agent, St. Louis.

The method pursued by the Nickel Plate Road, by which its agents figure rates as low as the lowest, seems to meet the requirements of the traveling public. No one should think of purchasing a ticket to Buffalo N. E. A. convention, during July, until they first inquire what the rate is over the Nickel Plate Road. For particulars, write J. Y. Calahan, Gen'l. Agent, 111 Adams street, Chicago, Ill. 94

Every man should read the advertisement of Thos. Slater on page 15 of this paper.

Weekly Weather-Crop Bulletin.

Weekly Weather-Crop Bulletin of the Kansas Weather Service, for week ending June 1, 1896, prepared by T. B. Jennings, Section Director:

GENERAL CONDITIONS.

The temperature has ranged much above the normal this week, the average daily excess being about 7°; in the western half of the State it was 8°, and in the eastern 6°. The precipitation has been above normal in the extreme southeastern counties, also in Clark and the northern half of Clay, but below the normal over the other counties, yet the rainfall has been abundant for all needs over the eastern half of the State.

RESULTS.

EASTERN DIVISION.

In general this has been a good growing week, though too wet for work in the southeastern counties. The cultivation of corn has been pushed and the corn is growing finely. Wheat harvest has begun in the south and the first alfalfa cutting in the north. In the south early-planted corn is being laid by.

Allen county.—Grass is the only crop that is doing well; corn looks sickly—too wet; early clover is ready to cut.

Brown.—Wheat improving; corn growing nicely and is being cultivated; oats fine; pastures splendid.

Cherokee.—Very wet week; farming at a stand-still; potatoes rotting; fruit damaged by storm.

Elk.—Good growing week; corn generally well advanced and doing well, early-planted being laid by.

Johnson.—Week favorable for all crops; ground in good condition for cultivating corn.

Labette.—Too wet to cultivate corn, which is getting foul; wheat ripe, some being cut, but generally too wet for harvesters; oats in full head and fine; fruit light but doing well.

Lyon.—Crops somewhat backward because of too much rain.

Marshall.—Good week for all crops; all farmers busy cultivating corn.

Osage.—Good growing week; crops doing well; corn growing nicely and farmers busy cultivating it; pastures and gardens doing well.

Pottawatomie.—Fine growing week; potatoes in bloom; first crop of alfalfa being cut; cherries ripening; millet and sorghum being sown; hay prospects fine.

Riley.—An ideal week; farmers cultivating corn; gardens looking fine; springs that have been dry for years now running.

Woodson.—All kinds of crops making good growth and fast recovering from the effects of the late hail storm; early flax in bloom.

Wilson.—A good growing week but ground too wet to cultivate and weeds are growing; whole fields of corn will have to be replanted on account of the flood this week.

MIDDLE DIVISION.

The week has in general been a growing one and favorable to handling crops. Harvest has begun in the southern counties, but the wheat does not give as good promise in the western counties as heretofore. Corn is in good shape and being worked. The first alfalfa cutting is in progress. Fruit appears all the better for the previous thinning out. Hot winds reported in Barton and Pratt on the 24th.

Barton.—Hot wind on 24th damaged everything pretty badly; oats and barley getting spotted like the wheat; unusually warm week, rain needed.

Butler.—Wheat harvest commenced; oats light; corn looking fine but weedy, owing to wet weather; alfalfa and pastures first-class.

Clay.—Good growing week; wheat generally headed out, and, with oats and pastures, is in first-class condition; corn in good condition and a good stand except where listed, much of which will have to be replanted, owing to wash-outs and standing water.

Cloud.—Everything in fine condition, never looked better.

Cowley.—Wheat harvest begun; late wheat is growing, but thin in places; corn growing nicely; an insect is cutting wheat heads.

Dickinson.—Good growing week and crops responding nobly; farmers culti-

vating corn; wheat improving daily; new potatoes in market.

Harper.—Rain needed to keep corn in fine growing condition; wheat harvest begun—large part of the acreage sown will not be cut.

Harvey.—Everything growing nicely; wheat turning color.

Kingman.—Harvest commenced, but crop not so promising; corn very fine; oats will not amount to much.

McPherson.—Wheat, except the hail-stricken, looks fine; corn and oats doing well, but rain is needed.

Osborne.—Very favorable for growing crops; pastures were never better and cattle are in good flesh; fruit doing fine; corn grand—also weeds.

Ottawa.—A fine rain the 30th, which keeps everything in first-class condition; first alfalfa crop being cut; a worm is eating wheat heads in many fields; they begin with the bottom kernel and eat upward.

Phillips.—Wheat, rye, oats, corn, millet and sorghum doing finely; fruit doing well but thinned some by wind of 27th.

Pratt.—Hot wind on 24th, but no damage to corn or Kaffir; corn has been cultivated twice; a few fields of wheat and oats will be cut.

Reno.—Fair growing week; corn doing well, some injured by hail; oats and wheat badly injured by drought.

Rice.—Crops look well.

Russell.—Wheat has been suffering for rain, but the week closes with a good rain following.

Saline.—Farmers working in corn, which is growing rapidly; some rust on wheat; alfalfa-cutting in progress.

Sedgwick.—All crops appear to be growing well.

Ness.—Wheat suffering in some localities for lack of rain.

Thomas.—Wheat well put in looks good; poorly put in wheat is suffering; corn doing fine; need more rain.

Trego.—No perceptible change in barley, oats, rye or wheat; gardens and buffalo grass show signs of drought in places; cool nights, hot afternoons.

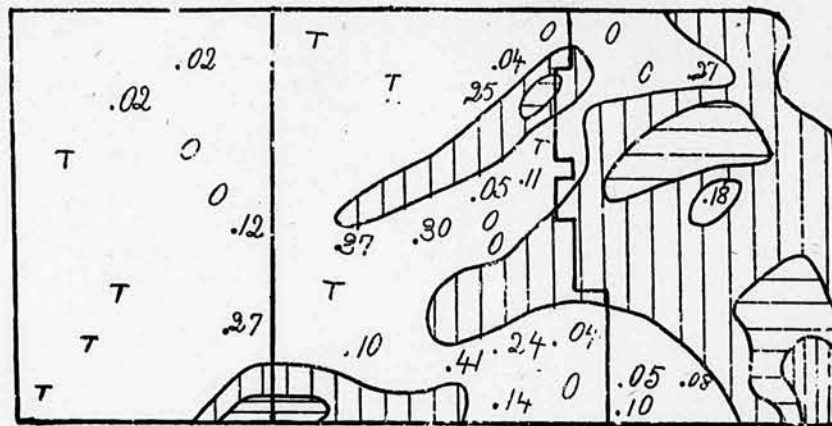
Wallace.—Some wheat drying up; corn growing very slow; alfalfa good; we need a rain.

Hog-Raising.

EDITOR KANSAS FARMER:—One serious mistake many farmers make is in not having some system in breeding and feeding hogs. Sows are bred any time, without any regard as to the time or season of farrowing, and the pigs are scattered throughout the year. This is a mistake, for various reasons. First, where more than one sow is kept, one must necessarily make separate provisions for each litter of pigs, as a lot of pigs of different age and size will not feed together and make equal growth; the younger and smaller ones will be crowded from the feed by the stronger ones, and the consequence is more or less runts. This can be avoided by breeding the sows so as to farrow as near the same time as possible.

Where men make hogs a specialty, as breeders of fine stock for sale, they are quite generally prepared to care for their sows separately, but for the average farmer without these facilities, it is always best to have all the pigs farrowed as near the same time as possible.

Then in breeding, one should breed



Scale of shades less than 1/4 1/4 to 1/2 1/2 to 1 1 to 2 over 2 T Trace
ACTUAL RAINFALL FOR WEEK ENDING MAY 30, 1896.

Stafford.—Good week; corn clean and growing rapidly; wheat a total failure in western parts; oats and barley about dried up; pastures drying up; grasshoppers numerous.

Sumner.—A dry week; May wheat cut, hard in bloom; some corn laid by; good growing weather.

Washington.—Favorable week for everything.

WESTERN DIVISION.

The condition of wheat has gone backward this week, including the other small grains, owing to continued dry weather. Corn is holding its own, while alfalfa has given a good harvest. Crop conditions are better in the northern than in the southern counties. The week closes with promise of more rain.

Clark.—A growing week, but rain came too late to help small grain.

Decatur.—Warm, cloudless, dry week, not so favorable to crops, but nothing suffering and the week ends in rain.

Ford.—Wheat looks badly; corn, oats and barley look first-class; pastures and fruit prospects good.

Grant.—First suggestion of hot winds on 24th; small grain must have rain in a few days or will be a total loss.

Gove.—Hot, dry week; wheat and rye needing rain badly; corn and sorghum "O. K." yet.

Kearney.—Though the cool nights and dew have aided vegetation, the small grain crops are in a precarious condition.

Morton.—Another dry, hot week, hard on gardens and dry farming crops; wheat and rye drying up, short straw; oats and barley same; corn not coming up.

with some definite end in view. The most important points to be considered, perhaps, are as to when the sows should farrow, the age at which one wants to sell, possibilities of the weather at farrowing time, and whether we raise one or two litters of pigs from the same sows a year. I have made it a practice for a good many years to raise two litters a year from the same sows. Some breeders object to this, as being too hard on the sows, claiming that pigs from sows raising two litters a year are not so strong and hearty as where only one litter is raised each year. I have not found it so in practice, and am inclined to think this objection only theoretical, when sows are given rational treatment. As a matter of course, where sows are bred twice a year they must have proper care and feed adapted to that end. A sow shut up in a close pen or in a bare lot, with only corn and water to eat and drink, is in no condition to raise even one good healthy litter, to say nothing about two. But where sows can have the run of a pasture lot and are supplied with a ration in which the nitrogenous elements predominate, a sow can raise two litters of pigs in a year without injury to herself or deterioration in the offspring.

I have gleaned these facts from experience and observation of the results of others who breed for only one litter a year.

M. E. KING.

Elm City, Kas.

Saengerfest Rates to Pittsburgh.

Special excursion tickets via Vandalia-Pennsylvania Short Lines from St. Louis to Pittsburgh will be sold June 6, 7 and 8, for North American Saengerfest. W. F. Brunner, A. G. P. Agent, St. Louis, for details.

A FREE CURE.

Dr. Hartman's Treatment for Female Diseases.

Chronic invalids who have languished for years on sick beds with some form of female disease begin to improve at once after beginning Dr. Hartman's treatment. The Doctor's experience and knowledge of this class of cases enable him to discern with great accuracy the wants of each. These patients apply for treatment by letter, giving all their symptoms. The Doctor then writes them what to do and what to get. Thousands have already applied, and still there is room for more. Each case receives careful and separate attention. In writing be sure to give all the symptoms and a complete history of the case, so as to make sure of valuable advice. Dr. Hartman's address is Columbus, O.

For a short time the Peru-na Drug Manufacturing Co., of Columbus, O., are sending free to any address Dr. Hartman's hand-book on female diseases, devoted entirely to the description and cure of diseases of the female sex.

Publishers' Paragraphs.

PERFORMING SEALS AND SEA LIONS.—The double menageries of the Adam Forepaugh and Sells Brothers aggregation of America's greatest shows, which will exhibit at Topeka on Monday, June 15, and at Leavenworth June 16, contain a wonderfully big, rare and precious collection of wild beasts and amphibia, many of which are shown in remarkable and hair-raising performances. Among the wild and timid creatures thus brought under the dominion of man's intelligence the icy waters of the Arctic regions furnish a delegation which has no counterpart in any other exhibition. It is Capt. Woodward's school of educated seals and sea lions and their combined aqueous and stage repertoire includes the most surprising and comical tricks; enough to convulse grim old Neptune himself. These huge ocean lions and gentle-eyed seals are endowed with a combined docility and intelligence, which affectionate and prolonged training has developed to such a degree that they accomplish many feats seemingly impossible to animals of their shape, the poetry of motion in water and the acme of grotesque clumsiness on land. With naught save flippers to supply the places of legs and arms, they are the most wondrous, winning and laughable soldiers, musicians, mimics and merry-makers of the animal kingdom. Everybody admires and applauds them and the children go wild over them, and no wonder.

THE JUNE ARENA.—The June Arena opens its sixteenth volume, appearing in a new dress, and being printed by Skinner, Bartlett & Co. It is an unusually strong number, opening with a brilliant paper by Rev. Samuel Barrows, D. D., the distinguished editor of the *Christian Register*, of Boston, on "The First Pagan Critic of Christian Faith and His Anticipation of Modern Thought." Justice Walter Clark, LL. D., of the Supreme Bench of North Carolina, contributes an instructive and delightful paper on Mexico, the interest of which is enhanced by several excellent illustrations, including a recent portrait of the President of the Mexican Republic. The President of the Mercantile National Bank of New York contributes "A Proposed Platform for American Independents for 1896," which illustrates how strongly the silver movement is taking hold of Eastern financiers no less than the mass of voters in the South and West. Recently Jay Cook, the veteran banker, who floated the government bonds in 1861, at the time of our sorest need, came out boldly for free silver. Mr. St. John, who has made finance a study for more than twenty years, and who is President of a bank having a capital of \$1,000,000, is no less pronounced on this subject. Another paper of special merit, on "Bimetallism," appears in this number by A. J. Utley. It is able and from a silver point of view very convincing. Prof. Parsons, of Boston University, Law School, continues his masterly papers on the "Government Control of Telegraph," a series of careful papers hitherto unapproached in authoritative character. Mr. B. O. Flower, the editor of *The Arena*, writes in a most captivating manner of Whittier, considering him in the aspect of a "Poet of Freedom," and giving many of Whittier's most stirring lines. A fine portrait of the Quaker poet forms a frontispiece to this number. The editor also discusses somewhat at length in his editorials, the message of Whittier to men and women of to-day, and the proposed platform of Mr. St. John. Another interesting feature of this issue is Mr. Eltwed Pomeroy's illustrated paper on the "Direct Legislation Movement and its Leaders." Students of the higher metaphysical thought of our time will be deeply interested in Horatio W. Dresser's paper entitled "The Mental Cure in its Relation to Modern Thought." Will Allen Dromgoole continues her powerful series of "Tennessee Life," and Mrs. Calvin Kryder Reifsnider's "Psychical Romance," which opened a few months since, is prefaced by a digest of the preceding chapters. It is also profusely illustrated with exceptionally fine drawings. These are by no means the full quota of the strong attractions of this brilliant number of America's great progressive, reformatory and liberal review.

Horticulture.

SPRAYING ORCHARDS.

By J. C. Evans, President of Missouri Valley Horticultural Society, read before that society, February 15, 1896.

This is a subject that is attracting more and more attention each year, and the experience of each year broadens and deepens our knowledge of its effects on the various enemies of the fruit-grower, as well as on the trees.

While we have always had more or less confidence in the theory, our first experiences were often quite discouraging, simply because we did not know how, when, or what with. We have gradually gained knowledge by practical experience and improvements in machinery until now we believe we do know the "how and the what with," but it will take a long while yet to make us able to give a rule that will apply in all cases, as to the proper or best time. There are so many different conditions existing always that we cannot be governed by any certain rule, but must use common sense largely, and then often our results are somewhat discouraging. I do not believe that any one can tell the average fruit-grower so that he can go out and do the work properly from the start, but he must learn by practical experience and good judgment.

Our most satisfactory results have been obtained on apple orchards by using the regular formula for Bordeaux mixture and giving the trees, "branch and body," as well as the earth all over the surface, a thorough wetting just before the buds open in the spring. The object of this is to destroy the germs of any of the fungous diseases, such as black rot, bitter rot, scab, etc. After the trees have bloomed and the blooms have all fallen and the fruit is well set and as large as small peas, the same operation is performed, using the same Bordeaux mixture with the addition of Paris green. In about ten days this is repeated, and ends the spraying of the apple orchard for the season. In the last two operations care should be exercised lest the mixture be applied too heavy and stand in drops on the fruit and foliage and cause brown spots to appear, which is damaging to both fruit and foliage. In the last two sprayings the mixture is used partly to destroy any fungous disease germs that may have escaped the first, and partly as a body to carry the Paris green to poison any fruit-eating insect, particularly the codling moth. I see the Department of Agriculture at Washington recommends the addition of cheap molasses to the mixture. This we have used to some extent, last year, with good satisfaction. It causes the mixture to form a better body and stick to the foliage and fruit better, and it is claimed by some that the sweets invite the insects to eat the poison more readily.

I speak here of spraying apple orchards only, because our experience in any other does not justify us in giving any advice. We have sprayed peach, pear and plum orchards to some extent, but the results have never been very satisfactory. The foliage of stone fruit is so different from that of the apple, and its sensitive nature so varied at the different stages of growth, that we have not yet learned even one of the principles to lead us to success. It is a singular fact that the foliage of the peach and plum is less sensitive to the mixture when quite young and tender than when fully developed, and this accounts in part at least for the sad failure of some in spraying peach trees. There is no doubt in my mind, however, but that we will, by a persistent effort in our experiments each year, learn to handle our stone fruit trees as we have our apples, so that we will be able to control our enemies, and will then have only to look to nature and the elements for success.

Here is a good opportunity for our experiment stations. They should take up this question of spraying stone fruits and work it out for us, so that we will know exactly how, when, and what with, to spray our stone fruit orchards.

The time is coming, and is not far

in the future, when the fruit-grower who does not attend to all the details of proper planting and thorough pruning, thinning, fertilizing, cultivating, picking and packing and judicious marketing will be classed in the unsuccessful list, and have to look for some other occupation for a means of support. The question of overproduction is staring us in the face and already many are deterred from planting trees, but as long as so many are careless or ignorant of their interests we need not fear anything in that direction.

A Few Criticisms.

EDITOR KANSAS FARMER:—Some time since, in an essay read before a Kansas Horticultural society and published in the KANSAS FARMER, it was figured that cull apples could not be utilized in any of the legitimate ways—that is, manufactured into some wholesome food product, except at a loss, but if they were manufactured into alcoholic beverages there would be a great profit. I would add, for "the saloon-keepers." It is the same argument, and just as practicable, as the distillery making a market for corn. The farmer sells a bushel of corn for 12 cents and it is retailed back to him for \$12. Of course, he doesn't take the whole \$12, because he only received 12 cents, but some one furnishes the other \$11.88, who would otherwise spend that money for beef, poultry, apples, strawberries and other good and wholesome things which the farmer produces.

On account of numerous requests for a home method of making wine, for medicinal purposes, there are many ways of preserving rich and wholesome grape juice without fermenting and totally destroying its food qualities. A method was given for manufacturing wine by the barrel. The editor thought a barrel rather a liberal supply for sickness. According to my observation that is correct. After one once commence to take wine for medicine, or any other purpose, he wants it continually. I once met a person who said, years before he had some stomach trouble, and was advised to take a glass of wine before each meal. He was still taking his wine and his body was about four feet one way and five the other.

C. Wood Davis is criticised a good deal on account of the failure of his prediction of a considerable rise in the value of wheat. I like Davis' articles; there is a great deal of information in them. He states facts and sometimes draws conclusions different from mine. For instance, India, with one-half the area and three times the population of the United States, goes to show that dense populations can raise a surplus of food products. Then, again, there are many substitutes for wheat which would be used if it were to become scarce and high. C. STIMSON. Passaic, Kearney Co., Kas.

H. H. Logan, of Phoenix, has this to say respecting the planting of grapes: "I would choose a rich sandy or gravelly loam, with a moderate depth of subsoil. Too much labor cannot be expended in the preparation of the ground. The soil in this part of the country has lain dormant for many years and should be loosened thoroughly to a depth of twenty to twenty-four inches. Where the sun is so hot as it is here it is necessary to encourage the roots to go down deep. A grape vine will use all the ground that you will give it, say 100 square feet; therefore, set the vines not less than ten feet apart each way or eight feet apart in rows, the rows twelve feet apart. They may be planted either as cuttings or rooted plants, the latter being more satisfactory, although vineyardists generally use cuttings made at the time of pruning and kept in moist sand until the proper season to set them. Water should follow immediately upon planting. The month of February is the best time to plant. When first set the vineyard should be irrigated thoroughly and then again as soon as it shows a real need of water. This will cause the roots to extend further into the deep soil. As soon as the ground is dry enough it should be cultivated thoroughly and the surface kept mellow."—Bulletin 18, Arizona Experiment Station.

Spraying Protects the Trees.

EDITOR KANSAS FARMER:—I see a good deal in your paper about the dreaded canker worm and tent caterpillar. This year they seem to be worse than common. But if the trees are properly sprayed their damage does not amount to much.

During the past six years I have sprayed my orchard regularly and it is hard to find worms in my orchard of over 1,500 trees. I first commenced spraying for the peach leaf curl, and in two years no signs of the curl were to be seen. The past four years I have sprayed in the spring, before the leaves came out, with London purple and Bordeaux mixture, one pound London purple to 250 gallons of water and six pounds sulphate of copper and four pounds of quick-lime to fifty gallons of water. After trees bloom I use one pound Paris green to 300 gallons of water, and Bordeaux, strength as above. After that I use Paris green, one pound to 300 gallons of water. I have twenty acres of orchard and I use about six barrels of solution going over my orchard. Worms are a scarce article in my orchard. I have 400 bearing plum trees and Mr. Curculio gives me more trouble than all the worms.

If our State law-makers would only follow the example of Michigan, and make a compulsory law that every owner of an orchard should spray his trees, we would not get so many of our neighbors' pests.

Some of my neighbors' orchards look badly eaten up by worms. Say anything to them about spraying and they say: "Oh, let the trees and worms go. It is too much trouble and expense to spray."

I see the papers generally are teaching spraying, and I hope to get orchardists and farmers to get a move on them and destroy insects and thus get more and better fruit.

I sprayed my trees last September and I think it did a good deal of good. Latham, Kas. W. B. WRIGHT.

Millet Among Potatoes.

EDITOR KANSAS FARMER:—Mr. M. F. Tatman, of Rossville, Kas., under date of May 16, writes me an interesting letter. It seems that he runs a drug store for pleasure and a farm for profit, as he says the store is not in it with the farm for money-making. It seems that he and several of his neighbors take the KANSAS FARMER and are close readers of it.

Some of them tried sulphuring seed potatoes and the dry sulphur blew in their eyes while planting and caused much trouble. I sulphured mine as soon as cut and it all adhered, and the wind did not cause any of the sulphur to blow while planting. Mr. T. says he did not use it because his seed came from Sabin, Minn., and did not need it. Here is where many make a mistake. My own seed did not need it, but I think one should always take proper precaution. It is also said that sulphur increases the yield to quite an extent, and the claim is also put that the keeping qualities of the potatoes are very much better when sulphured.

Mr. T. says he is trying a half acre of Freemans. The Freeman is of no account in Kansas, and Mr. T. will probably find it out. He also says a friend is trying Maule's Thoroughbred. I have a man on the American bottoms in Illinois, who is trying this potato against my four new seedlings and I will publish the result. In the Rural New Yorker's trial test, last year, this potato yielded only about one-half as well as Early Kansas, which they also tried, the latter beating all early and medium sorts, yielding 363 bushels per acre.

Mr. T. wants information about raising German millet among his potatoes, saying several of his neighbors are going to try it. The best authority on this subject is Scott Kelsey, of Topeka. He was the first man to list in Kansas, the first one to subsoil, and the first one to publish results of sow-

ing millet in potatoes at the "laying by" period. His experience goes to show that on unsubsoiled ground, the millet always failed, but grew well on subsoiled land, up to the very row where the two kinds of land met. That on unsubsoiled land dried all up in July and he did not harvest a pound from it, but right alongside, on the subsoiled land, the yield was one and a half tons per acre, or twenty tons in all, that was worth \$100 in cash. This millet reduces the cost of producing potatoes to so small a sum that, no matter what the price, there is money in it. In fact, the millet crop was about as good as if the potatoes were not there, and if the millet had not been sown the crab-grass would have made two tons per acre, anyway, and we can take our choice. As we have to mow and rake off the crab-grass, anyway, it is no more trouble to do the same with millet, and the revenue is much increased, and besides the millet crop is the very best crop in the world to fit the ground for corn the next season. If one digs the potatoes with a lister-shaped digger, the ridges can be split in the spring and corn listed in so easily as to also reduce the cost of that crop very materially. After the potatoes are dug, the subsoiler can be used in the bottom of the trenches, and this manner of subsoiling also reduces the cost of this work. On the whole, it looks as though subsoiling for potatoes, with millet instead of crab-grass, followed by listed corn, would be a money-making scheme, even with low prices. The corn rows would be rather close, but the stalks could be farther apart in the row. Let us hear from Kelsey. Morantown, Kas. C. NORTON.

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In the Dairy.

Conducted by A. E. JONES, of Oakland Dairy Farm.
Address all communications Topeka, Kas.

He Walketh in the Ruts.

The following trite and true sayings are credited to that excellent dairy writer—now dead—Mr. A. L. Crosby, for a long time dairy editor of the *National Stockman*. They first appeared in the *American Farmer*, of January 15, 1889:

"He ploweth his ground with a cast-iron plow, which is like unto the one his grandfather used.

"He harroweth with the straight-toothed harrow, and when you tell him the papers say that the disc and the spring-tooth harrows are the best he curleth up his lips with scorn and sayeth that he has forgotten more about farming than the papers ever knew.

"He milketh the cow that is big, for lo! when he selleth her he getteth much money for the beef.

"He considereth not the cost of feeding that beef for many years, nor the fact that in all those years the big cow maketh not so much as 150 pounds of butter in the space of one year.

"He wintereth his calves at the straw stack, and in the spring verily their bellies are like unto a pot and their backs have the curve that is called sway.

"He goeth to milk the cow and he telleth her in an exceeding loud voice to back her leg, and he thumpeth her on the back with the milking stool to emphasize his remark.

"He getteth some manure in the pail while milking, but he straineth it all out through an old stocking strainer.

"He setteth his milk in crocks, for did not his grandmother do the same?

"He churneth with a dash churn, and his conversation is full of dashes while he turneth the crank.

"He gathereth the butter in a lump in the churn, and refuseth to try the granular method.

"He wrappeth his butter in pieces of his old billed shirts, and he tradeth it off for groceries, which he bringeth home in a jug.

"He feedeth his cows on corn, and giveth you to understand that it is the right kind of feed for all kinds of stock.

"He keepeth scrub stock and believeth not in pedigree.

"He feedeth his brood sows on corn and water, and when they eat up their pigs he sayeth luck is against him again.

"He driveth his cows with a dog to save time, and loafeth half a day at the corner store talking politics.

"He planteth his potatoes in the dark of the moon and the potato bug eateth them up in the light of the sun.

"He goeth to the fair and spendeth many shekels at the side-shows, but he regardeth not the live stock exhibited, because it is owned by rich men and cost more than it is worth.

"He buyeth Bohemian oats at \$10 per bushel, because the seller engageth to give him \$8 per bushel for all he can raise, and giveth him the bond of the company to that effect.

"He giveth one of his sons a colt, and when it is grown he selleth it and he spendeth the money.

"His hens roost on his wagons, and he getteth no eggs until late in the spring.

"He cutteth his grass when it is dead ripe, for by so doing he reseedeth his meadows.

"He sitteth down by the fire and railleth at his sons because they don't do more work.

"He taketh the horse and buggy and driveth where he listeth, but when any one else wants to drive the horse he can't be spared."

Speaking of feeding dairy cattle, Chaplain Scott says, in Bulletin 18 of the Arizona Experiment Station: "In feeding forty or fifty cows I used sugar beets and added a certain quantity of corn meal. I increased the quantity of milk five to eight gallons a day and also increased the quantity of cream. I raise large quantities of sweet potatoes and get more milk and better quality, apparently, when I feed sweet potatoes in the fall."

Kansas a Dairy Region.

EDITOR KANSAS FARMER:—We frequently hear people talking of the dairy regions of Wisconsin, Iowa, Illinois, Ohio or New York, as if those localities were particularly adapted by nature to dairying, and as if dairying outside of these localities were doomed to failure, or as if these favored localities were charmed places for dairying. But when one travels through these famed regions, they appear the same as do localities that are not noted as dairy regions.

When we first came to this State and proposed to make dairying a leading feature of our farm operations, our new neighbors assured us that this country was not suitable to dairying, and that we would soon find out that we were not dairying in Ohio, where butter brought good prices and where everything was favorable to the business. We were told that the price of butter ruled very low, etc. We, of course, considered all this free advice, but it did not deter us from dairying, and our experience justifies the conclusion that we have made no mistake in doing so. We make just as good quality of butter here as we were able to make in the famous dairy regions of Ohio. Nor is this all. We made butter last winter at a present cost of 6 cents per pound, while it usually cost us from 11 to 15 cents per pound to make butter in the East.

The question of cost is the great factor in any business. If an article costs as much as one is able to get for it after it is made, one is no farther along for his labor. And right here is where farmers of this State have the advantage over their brethren in the Eastern States. Kansans, with their cheap lands and cheap feed, have a great advantage over Eastern dairymen, who are compelled to come to these Western States for a good deal of the feed they give to their cows. For this they pay our market prices, then pay transportation and commission bills besides. They do this year after year and make a profit on their dairy products. But let us get the idea that these famous dairy regions exist only in fancy, and that dairying can be successfully conducted wherever a cow grazes. Localities may have certain advantages over others, but man himself is the great factor, and not location, as so many think.

The late Henry Tallcot once said: "There is no mountain so high nor valley so low but if the cow exists good butter can be made." The question of locality in dairying is of minor importance. Some localities do have certain advantages over others, but no locality has all the advantages and none of the disadvantages, and when one averages them up he finds but little difference. We have here in Kansas one great advantage, as stated before, that of cheap feed and cheap pasture. These are the great factors in dairying. We may have some disadvantages, but they can be easily overcome by the determined dairyman. Then the price of good dairy products is very nearly as good here as farther east. We get market reports from the Eastern market, where we formerly sent our butter, and it generally ranges from 1 to 1½ cents per pound higher there than we get here, and compared with first cost leaves us better profit after all.

M. E. KING.

Elm City, Kas.

Cheese-Making in Switzerland.

In Switzerland, the making of cheese is not left to hazard and to the whim or ignorance of the peasant. Not only is its consumption very large, but the exportation of cheese from the little republic last year amounted to \$11,000,000. For these reasons, the government takes a paternal interest in this industry, and to this end has established cantonal schools, the pupils of which are taught the theory and practice of cheese-making, by eminent professors. The course of twelve months, and the curriculum includes hygiene, physics, chemistry, pasturage, manufacture and accounts. Not content with this, the federal government sends young men abroad to study, and at present forty students are in Italy investigating the

methods of the production of the famous Pauncsan and Modena cheese of that country.

Kaffir Corn.

"Kaffir Corn—Characteristics, Culture, and Uses," (pp. 12, fig. 1), by C. C. Georgeson, Professor of Agriculture in the Kansas State Agricultural college, is No. 37 of the series of Farmers' Bulletins issued by the United States Department of Agriculture. It will be sent free to all who apply to the Secretary of Agriculture, Washington, D. C. Kaffir corn is a native of South Africa, and belongs to the same group of plants as broomcorn and other non-saccharine sorghums. It was introduced into this country about ten years ago by the United States Department of Agriculture, and distributed all over the country. The report of the Commissioner of Agriculture for 1887 gives most favorable comments on Kaffir corn from Arkansas, Florida, Mississippi, North Carolina, and Texas, and since then it has become very popular in California and Kansas. It withstands drought better than Indian corn and gives a larger yield. An analysis shows that it is not so rich in protein as Indian corn, and an experiment at the Kansas Agricultural college shows that it is not equal to Indian corn as a feed for fattening hogs. However, the author says that "the farmers of Kansas and Oklahoma have given it much attention during the three or four years past, and finding it valuable stock food, are cultivating it on a large and ever-increasing scale. Its drought-resisting qualities have recommended it especially to farmers living in localities too dry for the best development of corn."

Notes for June.

Keep down the weeds.
Stir the soil frequently.
Cut the clover in good season.
Clover cured too much wastes in handling.

Underfeeding ruins more stock than overfeeding.

This is a good month to plant cucumbers for pickles.

If necessary to stack hay outside, put in large ricks.

Wheat ought to be cut before the grain gets too hard.

So far as possible, stack the clover hay under shelter.

When fattening pigs make them eat all that they will.

Clover too ripe when cut contains too much woody fiber.

Do not breed all of the cows so as to come fresh in the spring.

In nearly all cases the last cultivations pay the best profits.

A good garden can be made the best paying plat on the farm.

So far as possible have everything in readiness for harvest.

So far as can be done, do not allow any weeds to mature seed.

Keep up the cultivation until the crop can be considered made.

The colts will grow faster and better if they have good pasturage.

A good part of the necessary mulching should be done this month.

Watch the pastures and do not allow them to be pastured down too close.

Keeping the surface of the soil fine and level will help it to retain moisture.

All kinds of grass makes better hay if cut before the plants are allowed to become too ripe.

If the second growth of clover is to be allowed to mature seed, the first growth should be cut reasonably early.

Give the work teams good care. The difference in drivers will often make several years difference in the life of a horse.

Whether the cultivations given the crops be few or many, the last cultivation should always leave the soil clear of weeds and in a good condition.

If well mulched with wheat straw after planting, potatoes may be planted early this month and yet mature a good crop before there is a hard frost.

If not done before a sollar crop of sorghum cane, Kaffir corn or something of this kind can yet be planted, especially if fodder is needed for winter.

Better results in every way can be secured with growing pigs if, in addition to having good pasturage, they are fed a light feed of grain or slop twice a day.

When the first crop is being harvested is the time to commence saving up the supply of feed for winter. Nothing should be allowed to go to waste now that can be used for feed or bedding next winter.

While it is of no advantage to keep young growing stock fat, and especially so during the summer, yet it is very essential if the best profit is realized that they be kept in a good, thrifty condition.

Eldon, Mo.

N. J. SHEPHERD.

DURABILITY OF ROLLER BEARINGS.

Some Astonishing Figures Showing Their Ability to Withstand and Prevent Wear.

When a four and one-half foot mower cuts an acre it travels almost two miles. The ability of the Deering roller and ball bearings to stand wear is illustrated by frequent reports from the field showing very large acreage cut. For instance, as early as 1894 a Deering Ideal mower near Wichita, Kas., had cut 600 acres of grass, having traveled in that time fully 1,100 miles. Messrs. W. O. McDaniel, Fred R. Stephenson and J. D. Gilbreath took the machine to pieces after the 1894 harvest, making the following report on it:

"We found all the bearings in perfect condition. The ball and roller bearings are certainly a success. This mower was put in perfect working condition for the harvest of 1895 with a small outlay, for a set of wearing plates, and we must say, after thoroughly examining this mower, we were surprised to note the perfect condition this machine was in after having cut so large an acreage."

In the alfalfa-raising districts of North and South America, where the machines are in constant use from June till October, a total of 1,000 acres or nearly 2,000 miles a year with a single Deering roller bearing mower is not unheard of.

Roller bearings not only resist wear themselves, but they prevent wear of the parts that move on them. They can be quickly and cheaply replaced by the farmer after years of service, giving him practically a new machine.

The important subject of roller bearings is interestingly discussed in the *Deering Farm Journal* for February and a handsome pamphlet called "Roller and Ball Bearings on the Farm," both of which are sent free to farmers by the Deering Harvester Co., 16 Fullerton avenue, Chicago.

Thos. Slater has a message for every man on page 15.

FARMERS

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Gossip About Stock.

E. E. Axline, Oak Grove, Mo., who has been advertising Poland-China swine, reports that he is entirely sold out except spring pigs, which he is holding for a public sale next October.

The Chicago *Drovers' Journal* says: "Don't lose courage. Hogs have sold lower than at present, but prices recovered and will do so again. The question of when the change will come is an important one, but one that takes smarter people than we claim to be to tell, but we do know that the reaction will roll around in due time."

The result of the Powell Bros. Short-horn sale, at Lee's Summit, Mo., last week, was quite unsatisfactory, making an average of only about \$50 for thirty-five head. It was a good offering of very desirable cattle, but the sale was advertised in such a meagre and half-hearted way that but little impress was made. It don't pay to hold a public sale without proper advertising.

"We have had the largest demand for bulls this season we have ever had and could not supply the demand with bulls old enough for service and consequently shipped out quite a number of young calves," writes L. K. Haseltine, breeder of Red Polled cattle and Cotswold sheep, at Dorchester, Mo. The secret of Mr. Haseltine's success is that when he starts in with a paper like the *FARMER* he never drops out his card, consequently gets his share of business.

Chester White swine are in demand and breeders cannot keep a surplus of them. Mr. J. T. Lawton, successor to John Kemp, of North Topeka, informs the *FARMER* that he has sold out everything except spring pigs, of which he has 100 of the very finest, he thinks, ever produced in Kansas. His herd boars, Kaiser and Bell Boy, have proved exceptionally fine sires. Mr. Lawton states that he never before had so many inquiries for stock or such satisfactory sales as this year.

Profit in fowls depends on management. Few realize how much profit may be made from a small flock of hens. One farmer's wife began last year with a flock of fifty hens and ended with seventy-three. The account of expenses and receipts foots up a profit of \$56.73, and the eggs sold for 1 cent each and the chickens disposed of brought only 5 cents a pound. This little flock is, then, clearly worth as a money breeder the sum of \$1,000, for it brought interest on that sum at 5% per cent.

The Chicago *Stockman* says that "the worn-out horses which are slaughtered for meat in this country are not sold here to be palmed off upon our own markets, but are cured, canned and made up into sausage for European markets by foreign unscrupulous ghouls, and do much to injure our legitimate trade in beef and other meats." According to a Kansas man, the domestic consumption is confined to the "free lunch route." Men who drink beer and whisky and partake of the free lunches offered may have the satisfaction and experience of devouring horse meat.

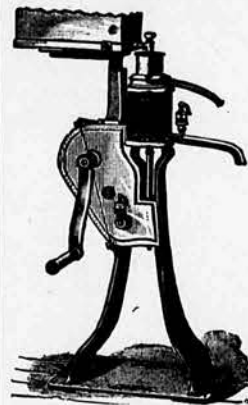
ROME PARK STOCK FARM HERD—Of Poland-China and Berkshire swine is located at Rome, Sumner county, Kansas, a few miles south of Wellington. This herd is one of the largest and best combination herds of swine in Kansas and is owned by that genial, large-hearted and public-spirited citizen, Tom Hubbard, or rather the Hon. T. A. Hubbard, as he is known among statesmen and politicians, but in breeding circles, where he is at his best, he is popularly known as Tom Hubbard, and as such last winter at the annual meeting of the Kansas Improved Stock Breeders' Association he was unanimously re-elected President, a position which he prizes more highly than any political position he ever held. Mr. Hubbard informs a *FARMER* representative that he has had his political outing and now proposes to make "Rome howl" with the melody of classic Berkshires and embonpoint Poland-Chinas, and proposes to make all Kansas glad with his pretty pigs and popular prices. The foundation of the present herds was made fifteen years ago and has been kept up to date ever since. The Poland division contains the blood of Challenge 4939 by Success 1999, Cleveland 6807 by Cora's Victor 3553, Tom Corwin 12853 by Cleveland 6807, Gilt Edge 11451 by Ohio King 5799, Dandy 11139 by Cleveland 6807, Chip 21156 by Tecumseh's Chip 10211, Hubbard's World Beater 4498 by Chip 2156, Reciprocity 7921 by King Quality 6967, and Good Luck 9724 by King Quality. The present offerings, consisting of twenty boars ready for service and twenty gilts, some of the latter being bred, are by the very excellent individual and breeder, Jumbo 11803 by Avalanche 7765 S. and out of Lone Lawrence 20752. There is also a strong draft by Hubbard's World Beater 4498 S. A number of the yearling breeding sows are by Good Luck 7924 S., he by King Quality 6967 S., that was bred by the noted Ohio breeder, Ed. Kleaver. One of the late recruits that is being used on gilts that are ready to go is Tecumseh U. S. 15673,

sired by Tecumseh Chief 10077 S., and he by King Tecumseh 2d 8196 S. His dam was Kickapoo Girl 80464 A., by Black Chip 21815 A. The Berkshire division is *comme il faut*, as is evidenced by the list of noted sires like Jumbo 12771 by British Champion 4495, Royal Duke 13923 by Sovereign 2d 1757, Stumpy Duke VI. 16468 by Duke of Monmouth 11861, Fancy Boy 15329 by Jumbo 12771, Champion 13975 by British Champion 4495, Joker 1900 that won first at Kansas, Nebraska and Missouri State fairs, also sweepstakes at Topeka in 1887 was by Royal Peerless 17173, Hubbard's Model 25741, a son of Joker, Gladstone—Sherwood—and Onward is enough to give the reader up in Berkshire history an idea of the high character of the up-eared division. Longfellow's Model 27058, a Gentry-bred fellow, sired by Longfellow 16835 and out of Lady Lee VII. 25107, stand at the head of this herd and a major portion of the youngsters now in the herd are by Model Boy 29736 and Gladstone 33302. A few are also by Independence, a son of Gladstone 28310 and out of Maid 5th 17076, both lines showing a long line of noted English prize-winning history. Out of the 200 head of pure-bred stock at Rome Park stock farm, surely any purchaser can be suited as to style of individual excellence or blue blood. The *FARMER* trusts that the swine fanciers will make "Rome howl" this summer and help popular Tom Hubbard to renew his youth.

ELM BEACH STOCK FARM—Has enlarged its advertising space in the *KANSAS FARMER* and the owners, Messrs. Irwin & Duncan, of Wichita, feel that their herd of Poland-Chinas, which was recently augmented by the transference of much of the cream of Sunny Slope farm dispersion sale, has enlarged their opportunity for a more extensive trade than heretofore and also rounds out their breeding stock to such an extent that they can now readily meet the demand of the best breeders who desire stock bred in the purple. With the breeding stock on hand and the up-to-date equipment for the proper handling and development of Poland-Chinas, they take pride in having breeders visit their establishment and inspect their stock. At the head of their breeding herd of twenty-five Poland-China sows is found the famous boar, Sir Charles Corwin 33095, that at the Sunny Slope farm bore the reputation of being one of their very best breeders. Mr. Lou Burke, the famous live stock artist, who has an international reputation as an expert judge and critic, after spending several weeks at the Sunny Slope farm preparing sketches of their best stock, upon learning that the herd was to be sold, wrote Mr. Cross a personal letter and in speaking of Sir Charles Corwin said: "I want to say a few words in behalf of your great bear, Sir Charles Corwin, as that blood is now recognized as the best in existence and I believe this hog to be as good, if not the best breeder in this country to-day. In all my travels in this country I have never seen in the get of any boar such uniform excellence, in short, so perfect in make-up as can be seen on your farm to-day." As evidence that Mr. Burke spoke advisedly we only need refer to the fact, in order to secure Esmerelda, a gilt by him, Mr. Irwin had to pay \$265. Sir Charles Corwin is an ultra-fashionably bred fellow. His sire was Latest Fashion, a grandson of Black U. S. and a full brother to Hadley 27105, dam Josie Wilkes 1st, she by Corwin U. S., the sire of J. H. Sanders, second dam Josie Wilkes by Adam. His assistants in service will be Harry Faultless, Wideawake and Johnny Ko Ko. The former is a son of the great Hadley Jr. and out of the phenomenal show and breeding sow, Faultless Queen Corwin. Wideawake is a boar of size, heavy bone and an all-around good hog. He is a grandson of the \$500 Tecumseh Chip and out of Carrie Andrews 19258. The last named boar is a son of the Nebraska State fair yearling winner, Ko Ko, and out of Black Empress by Black Rock 12715. Of the brood sows of course Lady Longfellow, with her size, show record and litter of eight pigs by the prize-winning boar, King Hadley, the best son of Hadley Jr. of the 1895 spring farrow, leads the list. Next to her stands Esmerelda, above referred to. She has been bred to Hadley Jr. Following these is Miss Hadley (by Hadley Jr. and out of Darkness 2d by Longfellow), Martha Washington, J. H. S. and Lady Tecumseh J. H. 1st and 2d. The three last are daughters of J. H. Sanders Jr. and cost \$305, \$300, \$250 respectively. They are handsomely bred sows and are bred to Hadley Jr. One of the best and largest sows in the herd is Martha Washington 9th, a daughter of Longfellow and the dam of Andrew King's boar, Andrew Hadley. She is now close to her farrowing to the service of Sir Charles Corwin. Mr. C. M. Irwin, the senior member of Elm Beach stock farm, informs the *FARMER* that out of 200 1896 pigs, sired by such distinguished boars and out of illustrious dams, he can supply the best demand at prices that must insure a lively trade. Readers of the *FARMER* are cordially invited to visit the establishment or write their wants to Irwin & Duncan, Wichita, Kas.

Wonderful Efficiency

Recognized by the Experiment Stations.



Our Dairyman has made a number of very careful tests with the No. 6 Improved United States Separator, and says that he does not find enough fat with the Babcock test, after running the milk through, to enable him to read it. The separation is almost absolutely perfect; a mere trace is all that can be detected.

Wooster, O.,
April 6, 1896.

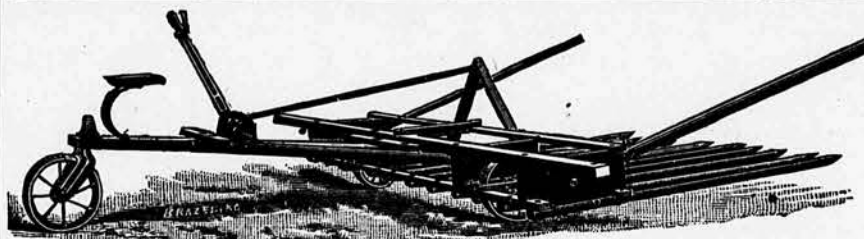
J. FREMONT HICKMAN, Agt.,
OHIO AG'L EXPERIMENT STATION.

Would you know more of this Separator? Write for catalogue and prices.

WE WANT AGENTS in all unoccupied territory.

VERMONT FARM MACHINE CO., Bellows Falls, Vt

Topeka Business College
TOPEKA, KAN. BEST BUSINESS, SHORTHAND, PENMANSHIP COURSES.



CHAMPION HAY RAKES AND STACKERS ARE BEST.

Write for Circulars. KANSAS CITY HAY PRESS CO., Kansas City, Mo.

The Kansas City Stock Yards

are the most complete and commodious in the West,

and second largest in the world! The entire railroad system of the West and Southwest centering at Kansas City has direct rail connection with these yards, with ample facilities for receiving and reshipping stock.

	Cattle and calves.	Hogs.	Sheep.	Horses and mules.	Cars.
Official Receipts for 1895.....	1,689,652	2,457,697	864,713	52,607	103,368
Slaughtered in Kansas City.....	922,167	2,170,337	567,016		
Sold to feeders.....	392,262	1,876	111,445		
Sold to shippers.....	218,505	273,909	69,784		
Total Sold in Kansas City, 1895.....	1,533,234	2,446,202	748,244	41,588	

CHARGES: YARDAGE, Cattle, 25 cents per head; Hogs, 8 cents per head; Sheep, 5 cents per head. HAY, \$1 per 100 lbs.; BRAN, \$1 per 100 lbs.; CORN, \$1 per bushel.

NO YARDAGE CHARGED UNLESS THE STOCK IS SOLD OR WEIGHED.

C. F. MORSE, E. E. RICHARDSON, H. P. CHILD, EUGENE RUST,
V. Pres. and Gen. Manager. Secretary and Treasurer. Assistant Gen. Manager. Gen. Superintendent.
W. S. TOUGH & SON, Managers HORSE AND MULE DEPARTMENT.

This Person Made Money.

DEAR SIR:—I take my pen in hand to tell you what I did in the dish-washer business. This spring I saw a dish-washer advertised and sent and got one. A. B. Dawson, Columbus, O., said he would exchange my dish-washer for the Queen if I would put it in my kitchen and show my neighbors how it washed dirty dishes, vegetables, silverware and clothing in one minute without putting my hands in the water. They all saw it was the best machine and I sold three the same day. The whole neighborhood is worked up over the success of the Queen, and I want any of your readers who have not made a success in the dish-washer business to know what I have done. I can make easy \$21 a week, \$84 a month, for five years to come with the Queen, as everybody wants one. My sister got a sample Queen, free, and she's doing as good as I have. Mr. Dawson referred me to the Cardington bank, the Mt. Gilead bank and the Quaker City bank, which shows he is responsible. Any one who wants to make money should write to the address as above.

Republican Convention at St. Louis,
via Burlington Route.

For the National Republican Convention, at St. Louis, June 18th, 1896, excursion tickets will be sold at very low rates over the "Burlington Route."

This will be the greatest political gathering since the War. Preparations are being made for entertainment on a grand scale; scores of marching Clubs in uniform will take part in Parades; all the prominent Republicans of the Country will be present.

Write Major C. C. Rainwater, 910 Washington Ave., Chairman of Hotel and Boarding House Committee, in regard to your accommodations.

Consult your Ticket Agent in regard to time and rates. L. W. WAKLEY,
Gen. Pass. Agt., St. Louis, Mo.

Uniformed Attendants for Eastern Passengers via Vandalia-Pennsylvania Lines.

Uniformed Parcel Porters will, free of charge, look after the comfort of all arriving and departing passengers over the Vandalia-Pennsylvania route at Jersey City Passenger station and will accompany them

(if desired) between Cortlandt street ferry, New York city, and the American Line Pier, Sixth Avenue Elevated Railroad, and the Central Railroad of New Jersey station; also between Desbrosses street ferry, New York city, and the Ninth Avenue Elevated Railroad. They will also meet Vandalia-Pennsylvania Line trains at Philadelphia Broad street Passenger station and assist passengers who may desire their aid; take charge of rolling chairs when needed; meet carriages and make themselves generally useful to passengers. They will be in attendance from 6 a. m. until 12 midnight, and when accompanying passengers will carry parcels and hand baggage.

DOGS.

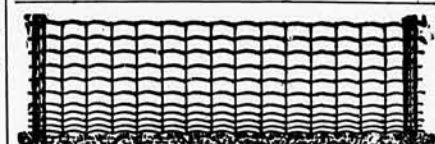
HIGHLAND KENNELS, TOPEKA, KAS.—Great Danes and Fox Terriers. The first prize and sweepstakes winner, Great Dane King William, in stud. Dogs boarded and treated for all diseases; also, remedies by mail. Correspondence solicited.

KENDALL'S SPAIN CURE. Certain in its effects and never blisters. Sold everywhere.

RUSSELL'S STAPLE PULLER

AND WIRE SPlicer
Drives and pulls staples, cuts and splices wire. Its special use is in building and repairing wire fences, but may be used for many different purposes about a farm. Saves its cost in one day's work. You can't afford to be without it. Price \$1.25. Ask your hardware merchant for it.

Russell Hardware & Implement Manuf'g Co.,
Kansas City, Mo.



REFERENCES REQUIRED.

Before hiring a man you want to know where and how well he has worked. Just so with fences. Plenty of careful, thrifty farmers have had ours in use eight or ten years. Can you do better than ask their opinion. Send for our monthly paper free.

PAGE WOVEN WIRE FENCE CO., Adrian, Mich

SANTA FE ROUTE

The Apiary.

Conducted by A. H. Duff, Larned, Kas., to whom inquiries relating to this department should be addressed.

Introducing Queens.

The entire change of a colony is brought about by the introduction of a new queen. The average life of the worker bee is about forty-five days, hence the change of stock, especially in the spring time, when the average is the shortest, is brought about very rapidly. The queen is the mother of the entire colony. She receives fertilization but once in her life-time, and her stock never changes. A queen will live and do good service two or three years, and in many instances four or five years. If you get an Italian queen and introduce her into your hive of common bees, and she goes to laying eggs, as she should do, her young stock will make their appearance in twenty-one days. If you have a pure Italian queen, her young stock will make their appearance wearing three golden bands around their body, without an exception. This is the test of purity of the Italian bee. It is an easy matter to talk about introducing queens, but it is a neat little job to perform. By simply turning a queen loose in a colony of bees, would be sure death to the queen ninety-nine times out of a hundred. In a case of this kind, it would be the duty of the bees to kill her on sight; and they most generally perform this duty. If they do not, there will be a "battle royal" when the old queen of the colony meets her, in which case one or the other must die. If the new queen is successful in gaining the battle (but the chances are always against her) she will then reign supreme.

In introducing a queen, the first thing always in order is to remove the old queen. She should be thoroughly secured, either by caging or by killing her, for, if she gains her liberty, she is almost certain to get back to the hive again. After thus securing the old queen, place the cage containing the new queen in the hive among the bees. The cages used for shipping queens by any regular breeder are always suitable for introducing the same, hence the cage, just as received, is placed among the bees, usually by securing it between two frames of comb in or near the brood nest, and allowing it to remain thirty-six or forty-eight hours, at the end of which time the queen may be liberated. There is always a possibility of losing a queen when introducing, even if the bees have forty-eight hours in which to get acquainted with her, through the wire gauze of the cage, as they may attack her when liberated. When this occurs the queen should be secured and placed back in the cage. Cages usually made now for introducing are arranged so as to be self-liberating, so to speak. The entrance to the cage is filled with candy, and the bees will, in time, eat it out, thus liberating the queen.

No two queens will occupy the same domain, under any circumstances or conditions, either in a colony of bees or in a cage or in any place or manner in which they are placed together, with but very few exceptions. Their meeting thus always results in the death of one queen, and one only. Why both queens in some instances do not die from injury resulting in a battle of this kind remains a mystery. This seems to be such an important part of their nature, that the young queen just hatched out of the cell will tear open every other queen cell in the hive and sting the young queens to death while yet in the cells.

Queenless Colonies.

Colonies often become queenless, and in this condition they will prove to be but little account, and more especially if they become queenless during the winter. Usually at this time they do not have the necessary brood from which to produce another, and if they had, there would be no chance for young queens to become fertilized at this season of the year, on account of the absence of drones. But little success is attained on this account, in produc-

ing fertile queens after the first of September and until the following May or June. A careful examination of every colony for queens should be made in early spring, and if found to be without queens, the best thing to do with them is to unite such colonies with others having queens. In every case queenless colonies, just coming out of the winter, will be a dead loss, and will become a prey to robbers.

Weak Colonies.

Seldom a winter passes that does not leave weak colonies to doctor up in early spring. Frequently we find them past redemption, and all that can be done with them is to unite with other colonies and save the queens if possible. We usually have strong colonies that we can draw from to strengthen weak ones. In this case it requires a supply of young brood just hatching from the comb to insure a force of bees for strengthening such weak stocks. It is useless to draw on bees for the purpose, as they will return to their old home on the first day they can fly.

"Swarming Out."

There are several causes for which bees will "swarm out" or abandon their homes. This will occur frequently in early spring. Colonies that are destitute of provisions will often issue like a natural swarm and leave their home. They seem to prefer to take their leave entirely, rather than to stay at home and starve. A little timely feeding will save this trouble and bring contentment and happiness to their would-be deserted home. They may become affected with dysentery, so as to make their home disagreeable, when they will desert it. In this case, give them a clean set of combs, and, if possible, a frame of brood from some other hive.

MEN of all AGES



Quickly, Thoroughly, Forever Cured. Four out of five who suffer nervousness, mental worry, attacks of "the blues," are but paying the penalty of early excesses. Victims, reclaim your manhood, regain your vigor. Don't despair. Send for book with explanation and proofs. Mailed (sealed) free.

ERIE MEDICAL CO., Buffalo, N. Y.

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KILLS AND PREVENTS TICKS, LICE AND SCAB. MAKES WOOL GROW.

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\$2 packet makes 100 gallons; 50c. packet, 25 gallons. If druggist cannot supply, send \$1.75 for \$2 packet to Evans-Gallagher Co., Kansas City, or J. W. Allen & Co., Atchison, Kas.

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If you want a mill that will grind corn and cob and all small grains. The largest mill made, hence the greatest capacity. FULLY WARRANTED! Made in sweep and power styles and five different sizes. Write for illustrated circulars.

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THE MISTRESS OF THE HOUSE is always interested in having painting done, and the great variety of shades or combinations which can be produced by the use of

Pure White Lead

and the Tinting Colors will afford her an opportunity to exercise her judgment and taste and secure the best and most durable paint. The brands shown in list are genuine. For colors use the NATIONAL LEAD Co.'s Pure White Lead Tinting Colors. No trouble to make or match a shade.

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Used and endorsed by Adams Express Co.

FOR COLIC, CURBS, SPLINTS, Contracted and Knotted Cords, Shoe Bolts, Callous of all kinds, Sweeney, Horse All, and most diseases to which the horse is subject.

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is a sure and reliable remedy. It is warranted to locate lameness when applied by remaining moist on the part affected. The rest dries out. If it fails to satisfy, money will be refunded.

Dr. S. A. Tuttle, Boston, Mass.—Dear Sir: Having tested your Elixir for the different purposes for which you recommend it, would say: We use it on all horses in our department, and I must state that I have not found one instance where I have not received more benefits than advertised. We adopted it in our whole department. Men as well as horses are using it, and I cannot speak in terms of too high praise of it, as I never saw its equal.

Yours very truly,

DR. EUGENE SULLIVAN, In Charge of the Horses in the Chicago Fire Dept.

Tuttle's Family Elixir is the best for Rheumatism and all pain. Sample bottle free for three 2-cent stamps for postage; 50 cents buys either Elixir of any druggist, or it will be sent direct on receipt of price.

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At factory prices. Our record for the past eight years is the best guarantee that we turn out the finest, strongest and lowest priced vehicles in the world, for the money. All work guaranteed. Send for our beautifully illustrated Catalog for 1896. Prices in plain figures. Offices, sales-rooms, factories: Court St. Alliance Carriage Co. Cincinnati, O.

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WIND IS MONEY TO USERS OF MILLS
Goodhue Pump and Power Wind Mills
Back Geared and Direct Stroke, Galvanized Steel and Wood; 5-ft. to 18-ft. New principle in governing; no weights or springs; leads in simplicity, durability, strength and effective work. Most successful power mills for grinders, feed cutters, shellers, etc. \$5000.00 worth of our power mills in daily use in one township. 3 and 4 corner galvanized steel towers. Strongest in use. Never one blown down. Our line of "Hero" and "American" Grinding Mills, Fodder Cutters, Shellers, Wood Saws, etc., the best and most complete, 2 to 8 horse Sweep Powers, 2 and 3 horse Tread Powers; Success One Horse Tread Power for Cream Separators, pumping, etc. Our new 150-page catalogue tells all about machines for preparing feed, pumping water, irrigation, etc. Send for it.
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"QUEEN" ALL Steel Sulky Rake.
Lock-Lever; Continuous Solid Steel Axle; Steel Wheels.
Steel Teeth with Spring Temper. Combination pole and shafts with 8 and 10 ft. rakes. Pole only with 12 ft. rakes.
Large, comfortable Seat.
Also Manufacture PLOWS, CULTIVATORS and other AGRICULTURAL IMPLEMENTS.
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Windmill Owners
Can get a double-acting spring that stops all jerking breaking, wearing of mill and expense bills. Sent on trial. So good, so cheap, they always stay. Agents wanted. Egls Mfg. Co., Marshalltown, Iowa.

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Machines drill any depth both by
steam and horse power. We chal-
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Address, KELLY & TANEYHILL,
WATERLOO, IOWA.

VICTOR COW CLIP.

Holds cow's tail to her leg
and keeps it out of the milk
and milker's face.

Carried in the pocket.
30c. SINGLE; FOUR, \$1.
If dealer hasn't it, sent
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VICTOR NOVELTY WORKS
974 Warren Av., Chicago.



FRENCH BUHR MILLS

28 sizes and styles. Every mill warranted.

For All Kinds of Grinding.

A boy can operate and keep in
order. "Book on Mills"
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All kinds mill machinery. Flour
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IRRIGATE or IMMIGRATE!!

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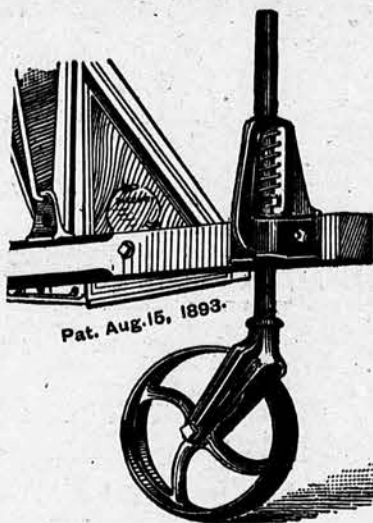
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peace and plenty—the Ideal
Irrigator is the only mill
on the market made espe-
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and cannot stand continuous
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pumping. Ask your dealer
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STOVER MFG. CO.,
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Emerson's Patent Binder Tongue Support



Pat. Aug. 15, 1893.

Meets a want which is felt by every man
using a Binder, and is for sale at the low
price of \$6, or will be sent to any address
freight prepaid, on receipt of

\$6.00.

The wheel is a three-inch face, ten-inch diameter,
shaft two feet long, one and a fourth inch steel,
spring-tempered, which allows you to set your ma-
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whether you are on or off your machine, or have to
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Every owner of either fowls or horses
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New and Complete

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224 PAGES.
92 ILLUSTRATIONS.

Many new and advanced ideas are giv-
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you are raising poultry for the market or
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It is not generally known that the food best
adapted to producing fat is not the best for
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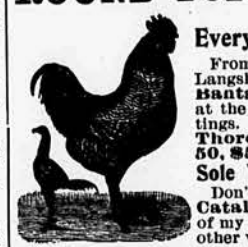
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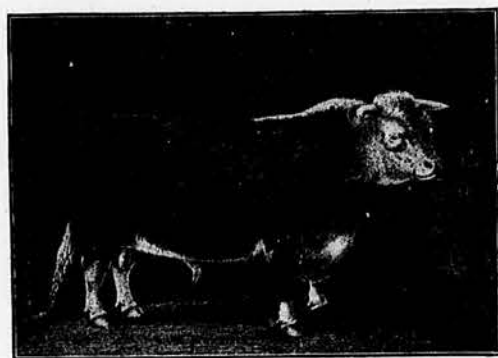
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