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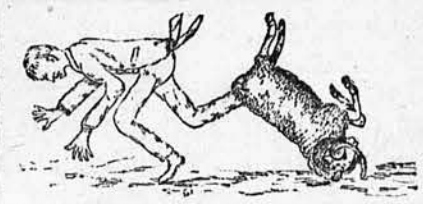

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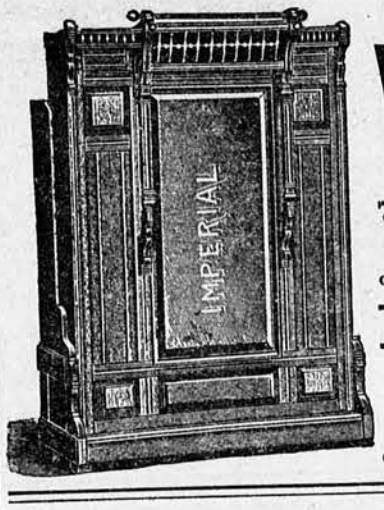

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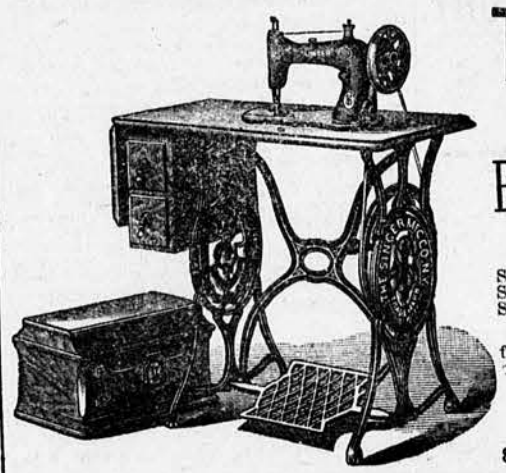

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Agricultural Matters.

The Relation of the Inter-State Commerce Law to the Agricultural Interests of the West.

A paper read by W. K. Stone, A. B., before the Farmers' Institute held at Nortonville, Jefferson county, Kansas, by the Experiment and Test Club of Jefferson county, Kansas, and the Acme Experiment and Test Club of Atchison county.—[Published by request.]

The value and importance of the inter-State commerce law to the farmers of the West, even in its embryo and necessarily imperfect state, is clearly apparent to every individual who has given the question of transportation a thought. The law is necessarily imperfect because the question of controlling certain branches of industry by commissions in our country, is as yet in its infancy. That the experience of little more than half a century under various forms and conditions of civilization has not been sufficient to remove the regulations of railways from the field of experiment, has been shown by the various methods on trial to-day both in Europe and America.

But the principle upon which the present law is based is certainly a sound one and worthy the attentive consideration of every American citizen, from the Chief Executive to the most unassuming farmer or merchant inhabiting our Western domain, since it embodies in it the spirit and principles of the laws controlling railways in the principal governments of the old world, namely: That of the right of each nation to control the railways and other common carriers within its boundaries.

In France a perpetual committee supervises the management, arranges the tariff charges, settles all disputes between competing lines, and between the public and the railways. In Prussia the control of the government over all railways is practically absolute. Austria is similar in her government of common carriers to that of France, whilst Italy owns a portion of her railroads and is negotiating for the remainder. The history of English legislation with regard to railroads, and its results bears closest resemblance to our own. After having labored for a time under the erroneous idea that competition had the power to cheapen rates and control commerce, in spite of the warning of some of her wisest statesmen that "where combination is possible competition is impossible," during which time 3,300 acts passed parliament regulating the powers of railways and punishing the offenders of said acts, a commission was instituted having both judicial and executive powers, to whom the oppressed could directly appeal.

If, then, the various nations of Europe have assumed the right to control their railways, and by so doing the extortions and discriminations have been averted, the oppressed relieved and commerce benefitted, much more should we assume control of our railways, since the United States contained at the commencement of 1885, according to *The Railway Age*, 125,000 out of 265,000 miles, the whole extent of the railroads constructed in the world. The capital stock and bonded indebtedness show a value of $7,795,000,000, or more than four times the national debt, and 20 per cent. of the estimated wealth of the entire country. These figures appear magnified when the short period of their growth is considered. In 1828 we had only three miles of railroad; in 1830, forty-one miles; in 1840, 2,200; in 1850, 7,500 miles; in 1860, 29,000 miles; in 1870, 49,000 miles; in 1880, 93,000 miles. Just think of it—125,000 miles of railroad and scarcely three score years since only three miles were within our borders, and this almost limitless extent of road has been built by contributions from the State, and by bonds, taxes, etc., upon the producers of the nation. Who are these producers of the nation? Four-ninths of all the people in the United States employed in gainful occupations are engaged in agriculture, more than double the number of all those engaged in manufacturing, mechanical, and mining industries taken together. The agricultural interests alone furnish more than half the freight moved annually on all the railroads in the United States, and 50 per cent. of these products are the result of Western labor. Is it in accord with the spirit of the universal law that the railroad kings shall impede the great tide of commercial prosperity now sweeping over the nation from west to east, by using the $7,795,000,000 voted into their coffers by the farmers and merchants of the nation, as a power behind the throne to deprive these same classes of the great benefits that might and should be derived from them as common carriers?

That railroads have been a great advantage to the farmers of the West cannot be denied. By giving them an outlet to the commercial centers of the world they have given them a market for their products which otherwise would have never been produced, because they could not have been realized. The type of enlightenment among them has been greatly elevated by these innovations, hence their value cannot be overestimated both commercially and intellectually. To no class of people, then, are the economic problems springing from the rapid development of the railway of more interest than to the Western agriculturist, for it is to the great commercial centers of the East and the over-populated countries of Europe that he must find a market for his surplus, and it is to these common carriers, that have been principally built with his money, that he must look for transportation. What the interests of the West demands, therefore, most of all, is a railway service that is at once cheap, non-fluctuating and reliable.

The immense capital concentrated under the control of a few, as the railroad interests of our country are, renders it difficult to enact laws to advance the interest of both shipper and railroad. That great injustice has been done to the shipper by extortionate rates and discriminations cannot be denied. Recourse has been had to the courts to obtain redress for grievances; but the great disparity of means to contend for rights failed to give satisfactory results when it was undertaken to enforce the common law; hence the necessity of a more direct way by which the existing evils of railway government might be remedied, evolved the present inter-State commerce law, creating a commission of five, appointed by the President, with powers judicial and executive, whose duty it is to hear all complaints and act immediately thereupon without recourse to any courts; to stand, as it were, between the injured parties and railroad companies, besides otherwise controlling the traffic between and through the different States, thereby securing a prompt, thorough and inexpensive investigation of every grievance, and immediate punishment for all offences.

With State commissions established in each State—which is rapidly being done—to control the traffic within the limits of each and to act in conjunction with the inter-State commerce commission, the railroads will soon be reduced to the capacity of servants instead of masters, as they should be They are beneficent servants, but tyrannical masters, and if not supervised and controlled by legislation, they will soon have become as firmly fixed in their grasp upon continued power commercial, social, and political, as the Hohenzollerns or Guelphs. Those reigning houses were born of force. They were the triumph of the strong over the weak. But these modern dynasties which have been born of law and of concession shall never win the triumph of the creature over the creator.

Soon the plain people of our land, the mechanic, the farmer, and the artisan, who know that the history of the men whom America has delighted to honor have risen from the humblest beginnings, because in this free land there is nothing to restrict or fetter the development of the American citizen outside of himself, will note a new era in the railroad management of our land, the power to destroy their homes and the well-being of their happy families, by the secret arrangements of the railroad monopolies, which it is the object of the commission to correct, will, it is hoped, soon be reckoned of the past. All that the citizens of the West ask in the future is a fair chance, nothing of the government but its protection, for which their lives are pledged, and its schools for which their money is paid.

"Special privileges for none, equal rights for all."

Broomcorn Culture.

EDITOR KANSAS FARMER:—Now is the time to procure seed and prepare it for planting. There are quite a number of different kinds of evergreen seed, almost any one of which will do, plump seed of a light or golden color being preferred. Red seed is very objectionable, and should be discarded.

In buying seed from a distance be very certain that you have not bought musty seed. The better plan would be to test it, which can be done in the usual manner of testing other seeds and grain.

To clear the seed, take a box or barrel of any convenient size with a good smooth bottom, sharpen a spade as sharp as you would an ax for chopping and *keep it so;* fill the box in debth to about three-fourths of the length of the spade, chop until there is not to be found a seed with a single stem on; stir the seed frequently while being chopped; then put through a wind-mill, or in the absence of a mill spread a sheet on the ground and pour from the side of a convenient sized box. The box is speedier than a bucket or half bushel. A great deal of the seed will lose the hull in chopping, which is none the worse for it. The main thing is, be sure your seed is perfectly clean of stems and trash.

Prepare the land as for corn, and when the weather becomes warm, smooth the ground with a board drag. The drag should be heavy enough to make the surface perfectly smooth. The two-horse corn planter with drill attachment is the best broom-corn planter I have been able to find. The eveness of depth it puts the seed in the ground, and the condition it leaves the ground in immediately next to the row, are features most favorable to the planter, besides uniformity in width of rows is a very necessary thing, of which I will speak farther on. The improved Barlow planter has an arrangement by which the driver can see four or five hills ahead. I think it would be an excellent broom-corn planter. The drill attachment is not expensive, costing six or eight dollars.

The exact amount of seed that should go on an acre of land depends very much on the kind of land and the season, but two quarts of clean seed per acre is what experience has proven to be about right. This amount will require a drop of from four to six grains of seed every fourteen inches.

There are two things to be avoided in planting broom-corn, a thin stand and a thick stand. The former will produce long, coarse, and of a good growing season a great deal of crooked brush; and the latter a short slim brush, and of dry seasons a large stem will grow in the middle of the brush which makes it almost worthless. Don't be afraid of fooling away a little time getting a planter work right. See that the drop contains the right number of seed, see that the distance between the drops is correct. Measure your ground and seed if you can. Put your best man on the planter. Be around four or five times during the day; see if the seed is going out of the sack about right, and remember everything depends on the seed, and the stand largely depends on the management previous to and during the planter. Whatever planter is used the cut off just above the heel of the runner should be removed, which will allow the seed to fall full length of shank, allowing the seed to scatter well before striking the ground. There should be an interval of eight or ten days between plantings. Number of acres in each planting should be regulated by the capacity for handling the crop. Wait for warm weather to plant. First planting should be coming through the ground before second is planted. Cultivate soon as it can be done. Then is when the good effects of the drag is plainest to be seen. No trouble to get close to the row, and no clods in the way. Keep the weeds down until broom-corn is knee high, and then it will take care of itself so far as weeds are concerned. Cultivate throughout as you would corn. More soon.

Truly Yours,
A. H. Cox.

Quincy, Greenwood Co., Kas.

Farm Notes.

The farmers of Ohio are seriously considering the question of feeding wheat to hogs. In fact it has been tried successfully and with the best results.

Skim-milk thickened with shorts and cornmeal makes almost a perfect food for growing pigs, and if given three times a day it will cause them to grow rapidly. If a mess of chopped clover hay (scalded) be also given once a day the pigs will need nothing else.

There may be a sentimental objection to burning 10-cent corn instead of 20-cent coal, something of a desecration, but it is no more a desecration of good wheat to feed it to a well-bred pig than it is to feed corn to a scrub. The pig has to be fed on the cream of the farm anyhow.

As cold weather approaches it is very important for the health and thrift of swine that extra attention should be given them Those who have not piggeries for housing should, at least, provide dry yards or fields for them to roam in during the day, and a comfortable, well-littered shed under which to sleep at night.

The larger and older swine should be kept separate from the smaller, and especially from pigs under six months old, and a few only should be allowed to nestle in the same place at night. For the sake of warmth they will huddle closely together, or pile up, one on top of the other, and if the smaller ones happen then to be at the bottom, they are often smothered.

A little extra food goes a long way in keeping up condition. For eight-months lambs and young, growing sheep, a half pound of bran, with one or two gills of corn, or a half pound of oil meal, will keep them thriving. For fattening sheep, to be sold in late fall or early winter, give one pound of corn and a half pound of oil meal; this, with part pasture, will push them forward favorably.

A good many feeders advocate grinding the cob with the corn. Prof. Stewart, who is an excellent authority, says that when the cob is finely ground, it is evenly mixed with the cornmeal, that taken thus into the stomach of the animal, it separates the concentrated food of the cornmeal, is made more porous and all is far better digested, and thus keeps the animal in better health than when fed on pure cornmeal.

The Stock Interest.

REFORMS IN THE HERD BOOK.

From an address by Col. W. A. Harris, of Linwood, Kansas, before the Kansas Short-horn Breeders' Association, Topeka, December 16, 1887.

Other breeds and breeders are working at the problem; there is a standard horse, there will soon be a standard Jersey and Holstein, and I fear there will be a standard Hereford and Angus before there is a standard Short-horn. A difficulty has been suggested that there is a variety of types, owing to local uses and tastes; but I insist that the variation is comparatively slight in esseetial qualities. The universal end and aim of all Short-horn breeding is the production of (1) a perfest beef animal with (2) a capacity for giving milk, and as each quality is developed to its highest point at different times, we know that they are not incompatible.

As all the varied laws of motion are in the higher mathematics reduced to a few algebraic formulas, it is surely not impossible to find a general equation that will express the model Short-horn. Even if there are variable factors which must be considered in solving the equation, they are but few and their value is known.

If judges in one part of the country use one of these variables and attract a higher value to one point than those in a distant locality, they cannot vary to any great extent, and it will be in a known direction, so that the personal equation will be easily understood and allowance made.

In a resolution which I introduced at the annual meeting of the National Association, for the purpose of calling out discussion on this subject, the first section was as follows:

"The Board of Directors shall carefully prepare and publish a standard of the qualities and points deemed typical of a pure Short-horn, with a scale of points similar to that adopted by the Short-horn Breeders' Association of Kansas."

This, I think, even if nothing more were to follow, would be a wise and proper thing to do. The great mass of stockmen, the breeders of grades, have a very faint and indistinct idea of the points and qualities that go to make up a first-class bull or cow, and even among breeders of a higher class, there is a decided lack of clear, well-defined knowledge of the relative value of the different parts of an animal; and even among those who can readily tell which of several animals standing side by side, is the best, and why, many will fail to show why and where that beast falls short of the highest excellence. This is often seen in the purchases by one man at different sales; advising and bringing what in each sale, is best, perhaps; yet when the purchases are brought together, they are wholly unlike, and display that most important fault in a herd—lack of uniformity.

Besides these, are still others, veritable cranks, who are color-blind, or fanatically devoted to a certain shape of head, or horn, or neck, or tail, or flank, or some fanatic theory of value which has no foundation in fact, to the exclusion of all the really valuable points; men who "strain at a gnat and swallow a camel," all legs, flat ribs, hump-backed, narrow-chested and bony. It is not unreasonable to suppose that a body of men such as the National Short-horn Breeders' Association, many of whom have given almost a life-long study to this subject, could devise a chart or description that would show every point and quality in proper proportion that go to make up a good Short-horn, in any time and place, so clearly that there could be but little controversy or difference of opinion.

In the many descriptions of the model animal given by the best writers for nearly a hundred years, the differences are surprisingly slight and confined to minor points, and is the best evidence that in things essential, unity can be attained. Such a standard having been prepared and published, who can doubt that it would be a most important educational aid, checking an undue overestimate at one point, enlarging appreciation in another, and giving conciseness, tone and vigor to the ideal which every breeder or buyer should have.

Even those who might dissent would have to give to themselves and others a clear and reasonable argument for their preference.

The latter part of the resolution read:

"2: When any breeder having animals to record, eight months old or over, shall desire it, the executive committee, upon application, shall appoint two inspectors who shall be members of this association and breeders of known skill and judgment, resident as near as practicable to the herd to be inspected, who shall meet and inspect the animals for which such record is desired, and their sires and dams when practictable. If they shall find upon careful inspection that said animals are in individual merit up to the standard adopted they shall make a certificate to that effect, under oath, fully describing and naming the animals, which certificate shall as attached to the pedigree sent for record by the owner.

3. When such pedigrees are recorded a star shall be attached to the number given the bull and to the names of females, which star shall be used whenever such number or name is used in subsequent reference to said animals.

4. The traveling expenses and a per diem (to be fixed by the board of directors) shall be paid said inspectors by the owner of the animals upon the completion of their duties.

5 The secretary shall have prepared and furnish the inspectors the necessary directions and blank certificates, free of charge, which the directors deem necessary for a full and uniform performance of their duties."

This action taken, no man's cattle are ruled out, no obligation is imposed on any one. No expense incurred that is not voluntarily assumed and that will not be made up in the increased value of each single animal so recorded, as I know of few or no localities where the expense would exceeed forty or fifty dollars. The way will simply be opened for those who desire it, and the national pride in the production of superior animals with the certainty of increased profit, can be safely relied upon to do the rest. It will become "fashionable" to have good animals, to treat them well till old enough for inspection, if not afterwards, and to have pedigrees with as many stars at the top, as possible. At a glance the animal's record will show its promotion for merit with no increase in the work or cost of the herd book, while those families that are persistently "weighed in the balance and found wanting" will drop out and find their profit in the feed yard and the shambles.

There is no possibility of deception; there can be no "corners," no exclusive family pride; it will end "the purses that patient merit of the unworthy take," and following upward nature's great law, that "like begets like" will lead to a higher development in the uniformity of excellence of the royal Short-horn than has ever been known.

Since the weather has become cold, late pigs should be left with the sow as long as possible, or they may be stunted in growth. The sow should be fed plenty of rich slop, and the pigs should be taught to eat by placing milk in a small trough as soon as possible in order to lessen their dependence on the sow for a supply. If there be not too many pigs in a litter, they should not be weaned under eight weeks of age.

Value of Improved Stock to the Farmer.

Address delivered by Joshua Wheeler, before the Kansas Short-horn Breeder's Association, Topeka, December 16, 1887.

We will define the term improved stock as being the animal that will give the best results and make the larger gain to the food consumed. It is sometimes said "that the breed is in the feed." Experience proves this to be fallacy. It is true that proper care and proper feed are essential to the development of any animal, but you could not by any kind of feeding bring the Shetland pony up to the size an proportions of the Clydesdale or Norman, nor would any kind of feed make the mustang the equal of the thoroughbred. The wild hog of the woods by any feeding process could not be made to compete with the Berkshire or Poland, neither could the Texas steer by feed alone be given the parts and smooth form of the Short-horn. The combination of breed and feed are what make the perfect animal. The old maxim "that blood will tell" is not a theory, but a fact well established. The question may be asked what is the gain in dollars and cents, and will it pay the common farmer to invest in full-blooded stock? We answer positively in the affirmative. A good blooded steer fed the usual time of feeding, from the middle of October to the 1st of May, will put on at least 100 pounds more meat than the scrub with the same amount of feed, and will be worth 2½ cents per pound more, making the cash value of the blooded steer $10 more than the scrub. Our experience of fifteen years feeding (on a small scale) confirms this statement. We will give a single experiment of last winter when grade Short-horn steers were put in our yard on the 15th of October. The average weight 1 070 pounds. They were delivered May 30, weighing 1,602 pounds, after a shrink of 3 per cent. making a gain of 532 pounds, an average gain of 2½ pounds per day. They eat 106 bushels of corn per head, which was fed to them in the shock and in the husk up to the 1st of April. After that time they were fed husk corn and timothy hay. They were all the same age (3 years.) All raised together and from the same sire, yet those from the best blooded cows made the largest steers and the best gains. The heaviest one weighing 1,840 against 1 430 of the lightest. We were fortunate enough to contract in March for 5 cents a pound, making their value when delivered $80,10 each. Their value when put in the pen to feed at $3 25 per 100 pounds would be $34 77, giving us $45.53 for the 106 bushels of corn. Even at the low price of beef last spring, those steers would have paid for feeding. Their market value at the time they were delivered was about $4.25 per 100 pounds, making them worth $68 08, which would have given us $33 31 for the 106 bushels of corn. The average price of corn fed did not exceed 28 cents. We are feeding ten steers this season which promise to do as well as those of last year. There was a little better blood in their sire and it makes its mark in them. We think the farmer that breeds fifteen cows a year has the increased value of one crop of calves, which would pay the cost of a good full-blood bull, and he can be used in the same herd for three years. The farmer might ask the question, which is the best breed for us to invest in—Short-horn, Hereford or Black cattle? After all the tests that have been made at fat stock shows, and given due credit to all the breeds, we can see no reason for discarding the Short-horn, or changing to any other breed. Their record at the late fat stock show in Chicago was a good one. Among the 3-year-olds that were slaughtered the Short-horn Prentice in gain from birth and pounds net to gross weight of carcass was only excelled by the Angus steer Sandy. Among the 2-year-olds the Short-horn Glick in gain from birth was only excelled by the Hereford Ruby 1.92 to 1 93. Among the yearlings the Short-horn was excelled by the Angus and two Herefords in gain from birth, but in pounds net to gross weight he was nearly the equal of any; but there is one fact these tests do not show, the gain of the animal to the feed consumed. There is a question, whether any breed can excel the Short-horn in this. But there is another point in favor of the Short-horn, that is their milking qualities. I think I am not mistaken when I state that neither the Hereford or Black cattle have made any record as milkers, while some strains of Short-horns have made records equal to the milking breeds. A late issue of the New York *Tribune* states that at the late annual dairy show in London the Short-horn cow May Duchess took the first prize as a milker. She contested against the best milking breed of England, also cows from the Channel Islands. Her milk proved to be richer than those noted Jerseys. One also took the first prize as a Short-horn.

Our experience has been that grade Short-horn cows are better as milkers than the grade or even pure-blood Devon. Our advice to any farmer that wishes to improve his stock of cattle would be to take the Short-horn.

In conclusion we are of the opinion that the successful farmer in Kansas or the West will be the one that raises stock. The products of the farm should be converted into beef, pork, butter and cheese, mutton or wool. These products, if good, will always be in demand, but in these days of close margins and sharp competition to succeed in stock-raising the improved breeds must be kept. The opportunities to obtain improved stock were never better, the prices are so low that they are within the reach of any good farmer, and they can be obtained almost anywhere in our own State. The Short-horn breeders of Kansas have shown commendable enterprise in obtaining the best blood. The Linwood herd, the Oakland Farm herd, the Blue Valley herd, and other herds in other parts of the State, contain as good blood as there is in the world. Kansas has a world-wide reputation for her intelligence and her progress as the tillers of her soil show by their superior products, by the improved character of their stock and herds, that they are abreast with the times, that they are doing their part in the development of this great commonwealth.

Stock Notes.

An Indiana farmer says that last year he made 146 pounds of pork from the skim-milk of each of his dairy cows.

At the South there is an excellent food for horses—cottonseed. This highly muscle-forming food, which, when decorticated and ground, is exactly adapted to be fed with corn-fodder.

Save all the small sweet potatoes for the pigs. Nothing will fatten a pig so quickly as sweet potatoes, and they are very cheap when only the culls are used. They should not be fed to laying hens, but are excellent for poultry intended for market.

Boiled corn is said to produce more pork than the raw kind, and of as good quality. The question to be considered, however, is not which is the more nutritious, but which is the cheaper, as the fuel and labor required to cook the corn must be deducted as expenses.

The study of horse-feeders should always be to furnish a combination of food containing all the requisite elements, both respiratory and muscle-forming, and never confine for any great length of time to one kind of food Farmers should grow oats instead of corn for their horses.

In the Dairy.

THE OLEOMARGARINE QUESTION.

It is a question. That is to say, there is a strong effort being put forth to have the law repealed, and the question is, ought that to be done? Readers of the KANSAS FARMER know where this paper has been on the imitation butter business all the time. It is not our business if some people prefer oleomargarine to butter; but it is our business when manufacturers of oleomargarine or dealers in it, sell it as and for butter, at butter prices, to persons that want butter and nothing else in its stead. It is our business when men undertake to practice any kind of fraud on the people at large. The dairy proper has nothing to fear from oleomargarine factories if, and as long as, the imitation is sold for just what it is, and not palmed off on the people for something which it is not, and which they do not want, and which they would not buy if they knew what it was. We have all along insisted that oleomargarine should not be made or sold at all unless it is done honestly on the merits of the article as it is. The national law undertakes to enforce that doctrine; therefore we favor the retention of the law and object to any change that would weaken the power and effect of the law.

We are in receipt of a pamphlet of sixteen pages, being a review, by Robert M. Littler, Secretary of the National Butter, Cheese and Egg Association, of a document which has been circulated among members of Congress lately, for the purpose of inducing them to favor a repeal of the law. Here are a few of the pertinent points made:

"Now, all the legislation complained of has had but one end in view, that of prohibiting the counterfeiting of an honest article, and of preventing the imposition of the counterfeit upon the consumer under a false guise and name. To this extent only has the legislation been prohibitory—to the extent that it has compelled an honest exhibit and an honest sale of the bogus article.

"We thank the bogus butter-men for the open confession that the legislation, to suppress the counterfeiting of honest goods and prevent their sale under a false name in the States of New York and Pennsylvania, 'has been particularly effective in destroying the oleomargarine business;' and we recommend the speedy adoption of this legislation by all the States in the Union. We have only to enforce the practice of honesty to kill the eleomargarine business. We have but to treat hotel-keepers, boarding-house-keepers, restaurant-keepers, steamboat, dining-car, and all other public caterers who supply their customers with bogus butter, as retailers, and compel them to notify their customers what they set before them, as butter, in order to wipe out the rascally oleomargarine business altogether.

"It cannot be honestly sold. If it could no one would object. It is its dishonest, not its honest, sale that is objected to. It is the right of any one to buy and eat knowingly whatever he pleases; but it is not the right of any one to impose upon others a counterfeit article in the guise and name of a genuine one. All our State and National legislation has had no other end in view than to prevent the honest consumer from being swindled by the dishonest dealers, and to pretect the honest manufacturer against the counterfeiting of his wares. Nobody has anywhere or at any time attempted to interfere with the honest manufacture and honest sale of oleomargarine, or any other substitute for butter. Had it been honestly made and honestly sold, no one would have thought of legislating against it.

"The enemies of the dairy interest are disappointed and apparently grieved because creamery butterhasnot advanced in price to 40 and 60 cents a pound as they testied before the Congressional committees it would. Poor innocents, they should know, legislation against 'bogus butter' was not asked for that purpose, but to compel frauds and counterfeits to appear in their true character, and thus protect the health and happiness of the unsuspecting consumers, and to give agriculture and the dairy interest a fair chance in the markets of the world. The millions of pounds of bugus butter put upon the market by these slaughter house dairies displaced just that quantity of dairy or butter made upon the farms in the United States from milk and cream, which butter could not be manufactured at a price to compete with the mixture of tallow, lard, chemicals, etc. Since the enactment of the national law, despite the fraudulent practices of some makers and venders of oleomargarine the market for farm dairy butter has improved or advanced in price from 3 to 5 cents a pound. This comprratively a small matter to the consumer aggregates in value a goodly sum on the entire annual production of dairy butter, estimated at one thousand million pounds. The comparatively few creamerymen, who from purely selfish and mercenary motives are allies of the bogus butter men, should have broader and more liberal ideas—and give the farm dairy a chance. There is trade enough for both 'creamery' and 'dairy,' butter; each will sell on its merits. Their prayers of 'Good Lord and Good Devil' should not save them.

"The bogus butter gang are very solicitous for the cattle raisers' welfare and declare that the oleomargarine law depreciates beef cattle $2 a head. They are not disposed to be fair and say, that because of unusual drouth and fear of pleu-ropneumonia thousands of cattle were forced upon the market and that did affect the market. But they have no sympathy for the dairy farmer, who, if oleomargarine makers have full swing—no national or State law to regulate the sale of the bogus butter product, would have a loss of at least from $5 to $10 in value per head upon each milch cow.

Device for Watering Cows in the Stable.

There have been manydevices for this purpose, some very expensive, but the simplest and cheapest plan we know is a trough placed directly in front of the stanchions and under the floor of the manger. This trough may be made of iron or of two planks nailed together in shape of a V. The plank may be of pine, ten inches and twelve inches wide. This trough should be the whole length of the feeding floor or stable, and the sections may be halved together and made tight with white lead. It should have just fall enough for the water to run, say one inch to fifty feet; any surplus to be drawn off at the lower end into a drain, which must not get obstructed. The cover to this trough will be a part of the floor of the manger. Some use the trough to slop the cows in, as well as to water them, but in such cases it is a little more trouble to keep it clean.

In this arrangement, the bottom of the manger is on a level with the feeding floor, and two feet from the stanchions a plank eight inches wide is set up edgewise, to prevent the cows from pushing away their feed. It will be seen that this trough, or manger, can be swept the whole length very quickly, and thus easily kept clean. The lid of this trough is twelve inches wide, and there is a strip four inches wide between the lid and stanchions, so as the cow can easily get her head into the trough. With a feeding floor eighty feet long, and a stable upon each side, and one of these watering troughs in each, eighty feet long, twenty-four cows in each stable may all be watered in ten minutes. The lids are opened and the water let in at the highest end from a cock discharging a one and a half inch stream, which runs along the trough and is drank by each animal as it passes. When the cows have finished drinking, the surplus water is drawn off and the lids shut. This enables each cow to drink as quietly as she takes her feed. —*National Live Stock Journal.*

Dairy Notes.

Every dairyman should strive to have pastures of clean, sweet grasses and the land should be enriched with top-dressing.

A cross cow in a herd keeps the others always in perpetual fear, and in that manner lessens the milk from the others in quantity more than may be sufficient to balance that given by the cross one. A cross or domineering cow should be got rid of.

The improvement of the cow by expert breeding, by which her capacity for profitable production has been so largely increased that when formerly an average of 2,000 pounds of milk and 125 pounds of butter would do, we are not now content with 6,000 pounds of milk and 300 pounds of butter per year.

It is not the nature of a cow to exercise much. She prefers in the open field to quietly crop the grass until her stomach is full, and then lie down in the shade and peacefully chew her cud with a dreamy expression of the eye that denotes rest and enjoyment. She does not run and cavort like the horse. This is not her mission.

The average milk cow of the United States does not yet average 400 gallons of milk per year, and in the special milk-making regions the average does not exceed 500 gallons. Yet there are numerous single herds of ordinary breeding, but well selected, where the annual yield is from 800 to 900 gallons per cow, and others of pure dairy-bred animals where the average ranges from 1,000 to 1,200 gallons per cow.

The New York *World*, in a lengthy article on butter-making, advises its readers to market a uniform grade of butter, and then says: "Don't use any artificial coloring, as it will be readily detected, and, therefore, spoil its sale." The *Dairy World* thereupon remarks: A wonderful wise and well posted editor that, but listen. He thinks the "best package for butter is a porcelain vessel, with a tight-fitting cover." Ye Gods! Why not wrap it up in dollar bills and inclose it in silver-lined water coolers? The dairymen are all rich, you know.

The late Mr. Wm. Bowey, after careful trial, adopted the following plan: The quantities are given for fifteen cows. A furnace containing seventy gallons of water, the water hot to the boiling point; then meal at the rate of ten pounds per cow to be well stirred in and boiled gently for an hour. Half of this to be poured over chaff (three bushels per cow) placed in a long trough, for the morning's meal; the remainder being used in the same way in the evening. The chaff and soup are thoroughly mixed and left for about half an hour to cool before being used.

It is suggested by some of the dairy associations that laws concerning the manufacture and sale of oleomargarine and other imitations of butter ought to be uniform throughout the United States. That is good doctrine, as applied to many other subjects, as land, marriage, descent of property, etc. Our system of government will never be perfect until there is a general code of laws applicable to the whole country, excepting only as to matters of purely local concern, and for which no general system would be useful or convenient. State lines should remain for some purposes and be wholly obliterated for others.

COAL AND COKE.

Another Splendid Christmas and New Years' Annual for 1888.

Thousands who have perused with delighted interest the pages of "Watt Stephens, the Genius of Steam" (1885), "Voltagal, the Genius of Electricity" (1886), and "Petroleum and Natural Gas" (1887), will be pleased to know that the Chicago, Rock Island & Pacific Railway will issue another magnificent souvenir for the Christmas and New Year season of 1888, which surpasses in many respects anything of the kind heretofore published. "Coal and Coke" is the title of the work, and the subject has been exhaustively treated. It is written in a captivating colloquial style, embodying a vast amount of information in regard to coal strata; their relative position in the earth's crust; where the deposits occur—their nature and extent; the different processes of underground mining; how coal is converted into coke, and some of its varied and multiple uses.

The book is profusely illustrated from original sketches. Although the expense has been very great, the Rock Island has concluded to supply "Coal and Coke" at the nominal rate of ten cents (for postage) per copy. Enclose your address plainly written (also ten cents in stamps) to E. A. Holbrook, General Ticket and Passenger Agent at Chicago, Ill., and a copy of "Coal and Coke" will be mailed to you, prepaid, to any part of the world.

A French breeder says that by putting his rams in the prime of life to old ewes in the decline of life, he never failed to get a large proportion of ram lambs. When he coupled ewes in the prime and vigor of life with ram lambs before they were matured, he got a large proportion of ewe lambs.

Catarrh Cured.

A clergyman, after years of suffering from that loathsome disease, catarrh, and vainly trying every known remedy, at last found a prescription which completely cured and him and saved him from death. Any sufferer from this dreadful disease sending a self addressed stamped envelop to Prof. J. A. Lawrence, 212 East 9th St., New York, will receive the receipt free of charge.

These Western horses, although carrying a finely-rounded form and an attractive appearance, yet are often found wanting in stamina and endurance when put upon omnibus and street-car lines. This is owing to the practice of raising them upon corn alone, which is exactly adapted to making beef and pork, but not horse-muscle.

HEN LICE.—"Rough on Rats" is a complete preventive and destroyer of Hen Lice. Mix a 25c box of "Rough on Rats" to a pail of whitewash, keep it well stirred up while applying. Whitewash the whole interior of the hennery, inside and outside of the nests, or after hens have set a week, dust the dry "Rough on Rats" powder lightly over the eggs and nest bed. The cure is radical and complete. For potato bugs it has no equal.

WELLS, RICHARDSON & Co's
IMPROVED
Butter Color.
EXCELS
IN STRENGTH
PURITY
BRIGHTNESS
NEVER TURNS RANCID.
Always gives a bright natural color, and will not color the Buttermilk.
Used by thousands of the best Creameries and Dairies. Do not allow your dealer to convince you that some other kind is just as good. Tell him the BEST is what you want, and you must have Wells, Richardson & Co's Improved Butter Color.
Three sizes, 25c. 50c. $1.00. For sale everywhere.
WELLS, RICHARDSON & CO.
BURLINGTON, VT.

Correspondence.

Behavior of Mammoth Clover in the Season of 1887.

EDITOR KANSAS FARMER:—To determine the adaptability of a crop to soil and climate it is essential to pursue a series of experiments covering several consecutive seasons.

I wrote you, a year ago, of my success with the above mentioned clover. The very dry fall of 1886, and the severe winter following killed nearly all the old clover, but the seed which was thickly scattered over the ground in harvesting and handling the crop of '86, made a beautiful stand last spring, and an excellent pasture all summer. It would not have made a crop of seed of any account as it never does the first season of sowing; but at this present writing it is in fine condition and as promising for a good crop of seed the coming season as I ever saw. So much for the old crop.

I seeded to this clover, last spring, thirty-six acres—twenty acres of it with flax, sixteen acres alone. The first mentioned piece is about one-third of a stand; the second piece, seeded alone, is an excellent stand—as good as can be. Sometimes one may get a good stand of grass by seeding with some one of the crops of small grain; but it is unsafe, as I have always said. I do not think it pays to take the risk, and I shall never do it again, however great the temptation may be to get one crop and start another on the same ground at the same time.

We have had two very hard seasons for seeding to grass. Hundreds of thousands of dollars have been lost by Kansas farmers in grass seeds, and very much of this loss is due to our own mismanagement in sowing too early or too late; sowing too thin, or in allowing the weeds to choke the young grass, or in being too greedy trying to raise two crops at the same time on the same piece of land.

I have had twenty-one years experience farming in Kansas. I have attained my majority as a Kansas farmer, and I have a few simple rules upon the subject of seeding to grass.

First—Prepare the ground by plowing shallow or cultivating or harrowing smooth.

Second—Sow at the rate of one bushel, mixed, equal parts clover and timothy seed. per six acres, and follow with smoothing harrow.

Third—Sow from April 1, to 15.

Fourth—Mow with mowing machine as often as the weeds appear to be getting the better of the grass (usually twice through the summer) and trust in Providence.

Follow these rules on a fair soil and you will succeed forty-nine times out of fifty.

In conclusion it is my opinion that Mammoth clover is as handy as its smaller cousin, the common red, and only differs in being larger and coarser.

EDWIN SNYDER.

Oskaloosa, Kans., Dec. 20.

Tame Grasses in Southern Kansas.

EDITOR KANSAS FARMER:—I was well pleased with the communication in the FARMER of Dec., 8, from our friend Jacob Nixon, upon the above subject. Just such articles from farmers who have observed and experimented with various farm productions will give the knowledge that no one man can find out for himself in this short busy lifetime.

We live some twelve miles south-east from Mr. Nixon and midway between the Walnut and Arkansas rivers. Our soil is a black sandy loam, under-drained at no great depth, and my experience, though not so extended as friend Nixon's is altogether different, perhaps on account of difference of soil, We sowed six acres of timothy four years ago, and with continuous fall and spring pasturing, when wild grass was dead, have reaped the best of results, and never have had anything do us so much good, with so small an amount invested. Throughout the winter whenever not covered with snow it has afforded us good pasturage and has colored our butter such a golden yellow as no butter chemicals could do. We never mowed for hay as I considered it of more value for pasturing. This fall we plowed it up as the weeds had gradually taken the ground until I thought it not practical to let remain longer, and I also thought it had given as full value for space occupied. We sowed a little strip of orchard grass two years ago and although pastured closely spring and fall, it has stood the drouth exceedingly well and I am pleased with it. I have a hillside, washy piece of land, a gravely gumbo soil, about a quarter of an acre which I sowed to alfalfa last spring, Stock was kept off until this fall after corn was husked. In a couple of days after stock turned in they had eaten it down to the ground. I shall sow more alfalfa in the spring, I like it because my horses do.

I have talked with a number of our farmers who have sown timothy, orchard grass, and alfalfa, and they all report being well pleased with them. But my observations go to show that we have not yet found the right kind of grass for a lasting, heavy pasturage, or our ground is not old enough for tame grasses to be grown with success.

But I am encouraged and will keep on sowing timothy, clover, orchard grass, alfalfa, millet, rye, sorghum, and all things else recommended, for I know that good pasturage can be had from some of these, and any of them will be profitaple to us in the valley, though they last but a couple of seasons.

I would be pleased to hear from other farmers, for by telling of our failures and successes do we profit.

JOHN C. SNYDER.

Posey Creek Farm, Constant, Cowley Co., Kan.

Room for a Nursery at Concordia.

EDITOR KANSAS FARMER:—There is now no nursery in Concordia, Cloud county, Kansas, the third and last one having closed out last fall.

This is a good opening for some one who has an old and well established nursery from which to obtain supplies, since it is not advisable to attempt growing grafts or cuttings in this locality. If you don't believe it, just come along and plant a hundred thousand grafts, and have the experience of watching them blacken under the scorching blast of summer, then watch the perennial fruit agent perambulate the county and take in your trade, and wind up the business for you by giving away all the orders the farmers can't pay for. I dont wish to discourage you, but lest you all come at once thought it best to give you some pointers.

The money loaners are building "more barns and enlarging their granaries," while the farmers are buying corn to feed their live stock. I was informed that ninety car loads of corn had been sold in Concordia for this purpose the last of November.

When I drive through the town and see the palatial bank buildings and mammoth stores looming up, then a few miles into the country and see the desolate fields, the droves of cattle already showing effect of scant feed, nothing to sell, everything to buy, nothing to buy with, and reflect how many homes it takes to build those palatial banks and run the heavy stocked stores, I feel that things have gotten fearfully out of balance, and that we really need some sturdy farmers to represent us in the coming legislature, to see that the "reduction of taxation" and the "national bank question" are not made a hobby for some political party or parties, to draw the farmers votes. Profession is not representation. The farmers are literally the working bees in the great govermental hive. They see their stores robbed, and endeavor to repulse the robbers, but still retain the traitor guards who let the robbers in.

M. J. HUNTER.

A Kansan in Mississippi.

EDITOR KANSAS FARMER:—Some weeks ago you gave an account of corn growing by Maj. Bissell, of Iowa,—growing large crops by shallow cultivation. Now, I am deeply interested in that question and have been for years, and want to know the how and the implements with which such results are obtained. I have for years cultivated as shallow as I could with the corn plow and do a good job. Grew crop of corn in Sumner county, Kansas, this year and a good one. Want to do so here next year.

ALBERT SEAVEY.

West Point, Miss.

Read the KANSAS FARMER regularly, and you will learn.

Too Much Fuss and Flurry.

EDITOR KANSAS FARMER.—I am well pleased with the KANSAS FARMER. It seems to me that all the fuss and flurry of a reduction of the government income is utterly uncalled for when we remember that September 1st, 1891, $230,544,600 of 4½ per cent. bonds are due and must be paid by the government, or issue its bonds. We have 10,000 old, worn-out soldiers in the poorhouses of the country. If we take these deserving men who risked everything, even life itself, to save the government, and give them a living by giving each one a good pension, and pay off our bonds as they mature, it will not be such a very difficult task to regulate the revenue as some would make it appear. The interest on 230 millions per year at 4½ per cent. is over ten millions, which, if given to the old, deserving union ex-soldiers, would distribute a little of the surplus over the country.

GEO. D. ARMSTRONG.

Wellington, Kas.

Corn Culture.

EDITOR KANSAS FARMER:—The FARMER of Dec. 1, '87, contains an article signed "Observer," asking for correspondence on the best methods of corn culture and concludes his article by saying: "I have been till now an advocate of deep cultivation of corn, but have seen this season the ruinous effect of it on corn ready to tassel out in a dry season."

Observer is wrong in his conclusion. Had the cultivation been shallow, the effect on corn ready to tassel out in a dry season would be the same. I believe in deep cultivation for the same reason that I believe in deep plowing. The culture of corn in Kansas should be all done by the time corn is three feet high.

The farmer who cultivates his corn when it shows tassel will lose twice to his gain once. One of my neighbors last year commenced to cultivate the last time about July, and cultivated deep. It rained a good rain about the time he finished and he had a fine crop. This year he commenced to cultivate the last time about July, but he set a small boy to do the work with an old riding cultivator; cultivated shallow; no rain after cultivation; corn nearly all dead in a week after the cultivation was done.

I believe the farmer should plow his land every year from five to six and a half inches deep. Do the work thoroughly. Plant the first day that corn will grow, and if you err let it be on the side of being too early. The farmer that swaps a given number of days in the early part of the season for the same number in July or August makes a losing swap.

Plant a variety that is early enough to show silks by the 4th of July. I never have seen corn killed in Kansas after the ears were set.

W. W. MILLS.

Riley Center, Riley Co., Kan.

Scrub Stock--Scrub Papers.

EDITOR KANSAS FARMER:—I see that one of your correspondents says that scrub stock is where the farmer loses his money. I beg leave to differ with him. I think the largest mistake, the one most frequently made, the one that costs the most, that has done the most damage, and the one that is hindering us daily, is the county political paper, price $1,50 in trade, that prates week in and week out about the wisdom and fitness of Mr. Moneybags and his chances for Congress. Three-fourths of the farmers take no other paper, so they get nothng but second-hand political garbage, unfit for any farmer and his family to read. These papers are the stepping stones that are made use of by the crafty to climb into office, and Mr. farmer gets his pay in those fine laws that are found in our statutes dictated by Mr. Moneybags. These papers are the mouth-pieces of the large journals of both parties and bark when they growl. And as the large journals are governed by the political leaders, so the farmer is under the control of the political kings like a flock of sheep.

To remedy this take instead good farm and stock journals. My choise for the West would be the KANSAS FARMER and the Kansas City *Live Stock Indicator*. I know these to be papers that work for the farm and stock man's interest. If such journals were more generally taken and read the farmer and stock man would be less liable to be influenced by the oily tongued politician, who has his praises blown week by week through the Slabtown Trumpet, edited by Sam Sawbones, Esq.

Brother farmer and stock man, commence the coming New Year by cutting loose from those scrub papers. Take the money and subscribe for a live paper, one that works for your interests and those of your wife and children. I put scrub papers at the head of the leaks in the farmers and stock men's pocket-book.

UNCLE BEN.

Cowley Co., Kan.

Letter from Sherman County.

Sherman is not very old—some two years, but is like a young man with snowy hair and wrinkled face. It looks old because its head and face is seamed up with furrows of the plow and covered over with fields of corn.

The busy farmers are at the present time preparing the sod for more crops next year. We will have plenty of rough feed and almost enough grain to do the county until the next crops come in; that is, the farming class. Men in the towns will have to buy more or less.

We have had snow three different times, but it is almost melted away now and makes good breaking. I live eleven miles from the county seat, which is Goodland, elected such by 179 majority the 22d of last month. I can see the town from my farm. We have got the smoothest faced county I have seen in the State. The people in general are well pleased with their homes and are trying to improve them. I have a homestead and a timber filing joining, and of course I am interested in the forestry stations of Kansas, and would like to know if the trees on these stations are sent out to every farmer that wants them, and on what terms. And I think it would be a good thing for the farmers and State also, if they would keep all kinds of seeds for sale at these stations, so that men could get good reliable seed and get them without paying three prices for them, for there are lots of men that would send for seed in place of trees, because you can plant a seed quicker than a tree, and I believe that all common trees would do better from the seed out here than to be set out as trees. I would like to have 10,000 trees next spring if I could get them from the station. Please state through your paper how the trees will be sent out from the forestry farms and oblige,

J. R. GREEN.

Ruleton, Sherman Co., Kas.

Tired of Monopoly.

EDITOR KANSAS FARMER:—Enclosed find postal note for one year's subscription to the KANSAS FARMER. Your efforts are appreciated in making the FARMER the peoples' paper. You judge correctly when you say the people are getting tired of monopoly and the rough and tumble scramble to appropriate the earth and all it contains, by the select few whose greed is fostered by the national and state governments, who wink at their aggression.

J. LOGAN,

Myer Valley, Kas.

If you are making a collection of calendars, send ten cents in stamps or cash to Messrs. Doliber, Goodale & Co., of Boston, Mass., for their elegant one for the New Year. It was designed and engraved by John A. Lowell & Co., and is an exquisite work of art.

The *National Stockman* says: "Granting that the male is one-half the herd, it is well to give some thought and care in securing a good one. And in making the purchase it is well to season haste with discretion. Buy early, but not the first that offers, except in rare instances. If you have time and means at your disposal visit the herds in your reach and buy what pleases you best, considering the quality and ability to purchase. But above all things, whatever you may buy, don't expect to get what you may want at or below fat stock prices."

General Lord Wolseley,

Who took part in the siege and relief of Lucknow, and was severely wounded at Sebastopol, and who has been at the head of the British army in Ashantee and Zululand, has written a paper on "Young Men in Battle," for the *Youth's Companion*, giving instances of daring and fidelity which he has seen among youthful soldiers in his various campaigns. The article is full of thrilling incidents.

THE STATE HORTICULTURAL MEETING.

(Continued from last week.)

Special Correspondence Kansas Farmer:

The second meeting convened at 2 o'clock p. m., with Hon. M. Allen in the chair, and George C. Brackett, Secretary.

DROUTHS AND DROUTH LESSONS,

by Hon. L. A. Simmons, of Wellington, commanded the attention of the Society at this juncture. It was a paper of great merit. [It will be printed in the KANSAS FARMER. Part of it appears this week.] The paper elicited a good deal of discussion.

Mr. Willis—I have given much thought to the question of drouth, and as yet have come to no conclusion. I have expended a large amount of money and have planted a great number of trees, and I find that upon the season depends a profit or failure, according to the amount of labor expended at its proper time. Prolonged drouth causes serious results, and hardships follow failures. Can it be obviated? The people want fruit. The reputation of Kansas has gone abroad and should be sustained. Choice fruit is a matter of importance, and the profits to be derived from a good orchard of well selected fruit is far beyond that of any other product. Even government bonds do not pay as well. I believe that no remedy could be devised that will fully overcome the drouth. However, I think that, for a small tract of land, a system of water supply can be made that would avert the effects of drouth. There is a gentleman living in Ottawa who has a celery bed of about five feet in width and about one hundred feet in length, in which he grew eight hundred plants that brought him ten cents apiece, or three for twenty-five cents. The bed was kept well tilled and watered, and the result was an immense profit for so small a piece of land. The way corn has yielded this season it would take at least one hundred acres to make the owner as much money as was procured from that little five-by-one-hundred-foot tract. Potatoes do well and are worth one dollar per bushel, and one acre yields readily one hundred and fifty bushels, by careful tillage and a proper supply of water. What better is wanted? Take advantage of circumstances and one will find room and money for all products.

J. W. Byram—I would counteract drouth by a deeper cultivation. To substantiate this I will refer to a strip of land lying along the east side of Marion county, where a number of years ago only twenty or thirty bushels of corn to the acre was procured; while now that same land yields readily from fifty to sixty bushels per acre. Nearly double in twelve years, and all brought about through deep and thorough cultivation. In this section irrigation is impracticable. My son has a farm in the Cottonwood valley, upon which he broke twenty acres, very deep, with a strong plow to which was attached a four-horse team. The result was thirty-five bushels of corn to the acre, while his neighbors only harvested twenty bushels to the same amount of ground. Hitherto the people have been content with ordinary cultivation, but now it is different. There is a Frenchman residing in my vicinity who has a vineyard in which he put men to work spading up the soil to a depth of two feet. The result was wonderful. The vines thus treated knew nothing of dry, hot weather, but through it all continued to grow and prosper, bearing an abundant supply of the choicest fruit, while the vines growing on shallow tilled ground struggled hard to live and in many instances succumbed to the dire effects of the drouth.

Capt. E. P. Diehl—I heartily endorse what has been said. About eighteen years ago I provided a subsoil plow by taking an old plow to the shop and getting the upright beam drawn out and strengthened. With this my ground was deeply subsoiled, thus enabling it to withstand successfully all drouths.

Mr. Shephard—I believe it best to sink wells and use pipes to convey the water wherever desired. I grow forest trees on my place and herewith show you a cut from off the end of a cottonwood, of nine years' growth, which measures twelve and one-quarter inches in diameter. I have seven acres from which I obtain all my firewood and poles for fencing. I have lived on my present farm twenty-two years, and cottonwood slips that I could easily pull up a few years ago, now make a cord of stovewood.

J. W. Robison—I believe that ordinary planting will suffice. My vines grow about four feet a year which I think is too fast. Had I tilled my vines to the depth referred to by Mr. Byram I would have to, long before this, procure a ladder in order to reach the top of the vines, and as to their bearing, the only fault that I find is that they bear too much. Give clean and thorough tillage, four inches deep, and good results will follow. Plants, vines or trees will not thrive in packed soil. They need breath. Stirr the ground. An orchard pays, and a tree can be grown to bearing for one dollar. In planting corn have ground in good order and list shallow, to obtain the best results. Such has been my experience.

F. Wellhouse—I am very much interested in discussions on irrigation, and have tried to count up the number of times this subject has come up before our society. I find that a diversity of soil is necessary so that the roots of our plants can go down to moisture sufficient to convey us over at least two weeks of the dry weather, then all would be well. We can't all irrigate alike. One-half of the rainfall would produce a crop could it be retained. I believe that ponds or reservoirs could be made during idle time, having capillary pipes conveying the water where desired, and that at a very small cost. The amount of water lost by evaporation is very small.

J. W. White, of Kent—I planted last year one hundred and ten apple trees, one hundred and nine grew, and a more satisfactory growth I never before have seen. I planted seventy-five trees last spring, fifty of one variety, lost none, big growth and in excellent order. My Early Victor grape vines attained a growth of over five feet in one year. I accomplish this by thorough cultivation with plenty of mulching, and by watering after mulching. Never water before you mulch. I put from one to two bucketsful to a plant, vine or tree.

L. A. Simmons—I think it time to close this discussion. Nature supplies the porous soil with moisture. All others require supplying by some method best suited to each locality. The drouth years is the time to make our selections of fruit-bearing trees, for then we learn which kind will stem the tide as it were and come through victorious.

Adjourned until 7 p. m. HORACE.

(To be Continued.)

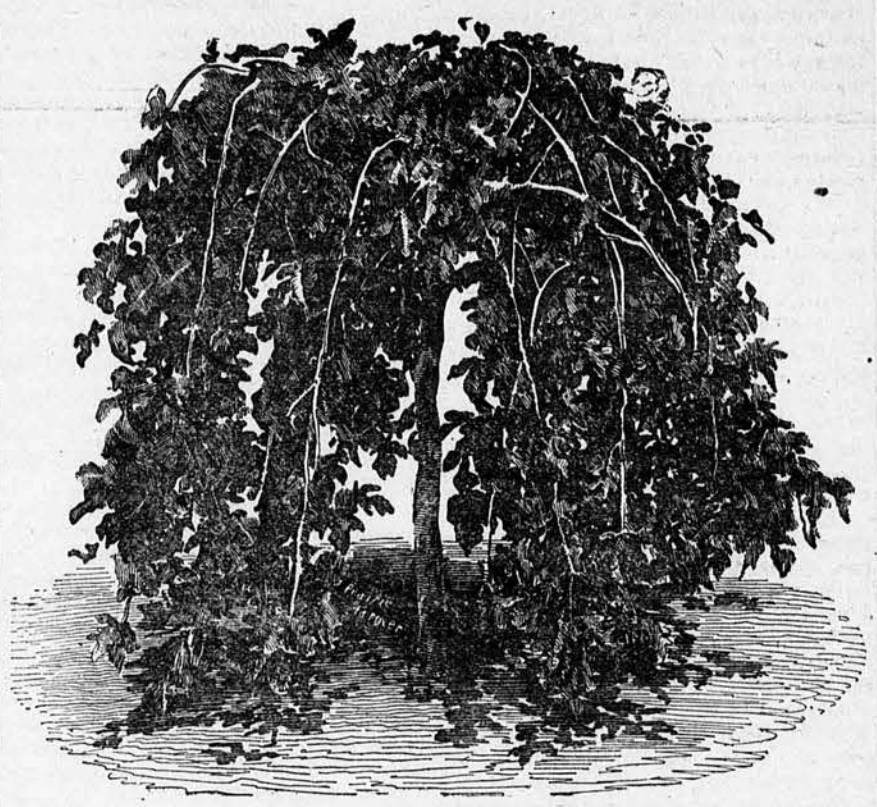
Dorset horn sheep have been crossed with but few breeds, but among those that have been tried, none have done so well as that between a horn ewe and a good Down ram, producing, as it does, a sheep well adapted for grazing, and much prized by butchers, as it carries a large amount of lean flesh, with fine quality, and weighing, from grass, from twenty to twenty-five pounds per quarter at eighteen months old.

Keep your blood pure and you will not have rheumatism. Hood's Sarsaparilla purifies the blood, and tones the whole system.

Kansas Weeping Mulberry.

The illustration of the weeping mulberry herewith, was engraved for the *Prairie Farmer* from a photograph. This new candidate for public favor originated on the grounds of J. J. Measer, Hutchinson, Reno county, Kansas. It is a chance seedling among many thousand. Mr. Measer furnishes the following particulars and description: The tree is now four years old from seed, and the only treatment it has received was to cut off the first years growth, then training the second years growth to a stake to form the main body, the top being two years without care or assistance, being perfectly hardy, withstanding our highest heat in summer and the lowest degree of cold in winter, neither drooping in heat, nor winter-killing by cold. In fact there is no hardier weeping tree, nor one that makes a more dense shade during the summer; has beautiful rich green leaves, and graceful drooping branches.

From a residence of seventeen years in Kansas, and an extensive observation of tree growth on the plains. I think it is destined to exceed in value any weeping tree that has been grown which withstand heat, cold, and storms.



KANSAS WEEPING MULBERRY.

This weeping Russian mulberry is similar in habit to the other Russians, making a wonderful growth on rich moist soil, and a fair growth on any soil where any other tree can find moisture to exist on. The form of tree seems to be perfect, every limb bending gracefully to the ground, thickly set with beautifully lobed leaves.

LEAF OF KANSAS WEEPING MULBERRY.
(One-half natural size.)

There will be no trees for sale from this tree until in fall of 1888.

Where the weeds have been mowed and have become dry, it would be best to burn them in the field where they fell rather than to do so in heaps, if they had seeded before being mowed, as burning them in that manner will destroy a large number of seeds which would be shaken out on the ground if the weeds should be heaped in piles.

THE WORLD'S VICTOR.

A Great Triumph for United States Manufacturers Over Foreign Competition.

In Australia, that great grain-producing region, for the past two years there has been a bitter struggle going on between English and American manufacturers of harvesting machines. Each seemed determined to capture this valuable trade. Under the auspices of the Royal Agricultural Society there have been held a series of field trials, conducted under the most severe tests to which machines have ever been put. Last year an American machine—the Buckeye—carried off the honors, having been awarded the first prize, the grand gold medal of Victoria. Ever since then, Hornsby, the great English manufacturer and a director of the Royal Agricultural Society, and Howard, a British nabob, have bent their best efforts to regain or recapture this gold medal which was held by the Buckeye. This year other contests have followed, the final trial closing on the 25th of October. The last steamer from Australia brings intelligence of the closing contest, which is pronounced by the press of that colony to have been the greatest and most exhaustive field trial ever conducted in that or any other country. Roseworthy Agricultural College farm, Adelaide, was the scene of the struggle. The rules laid down for the government of the trial were rigid in the extreme, and not a single point which went towards perfection of work and durability of machines was left untouched. The official record shows seven machines engaged, and it will be cheerful news to our readers to learn that the English machines were defeated, two of the American machines scoring a greater number of points. The maximum number of points was 270, of which the Buckeye scored 246, the highest number attained by any of the contestants. The judges awarded the prizes in the following order: Buckeye, first; McCormick, second; Hornsby, third; Woods, fourth; Osborne, fifth; Howard, sixth; and Esterly, seventh. It will be observed that the McCormick, another American machine, although taking second place, also stood higher than the Hornsby, the great English machine. To defeat the enemy on his own ground, among his own friends, is a grand triumph and demonstrates the superiority of American genius over foreign talent. While the manufacturers of American machines which fell below the Buckeye may in a measure feel disappointed at their defeat, they should have sufficient national pride to rise above mere personal feeling, and rejoice with others in this magnificent triumph of the United States over foreign competitors. The Buckeye will hereafter be known as the victor of the world. Messrs. Aultman, Miller & Co., the manufacturers of this famous machine, are receiving congratulations from public-spirited citizens all over the nation, and we cheerfully extend ours.

Doubt No Longer.

That able and veteran agricultural writer and weather student, J. C. H. Swann, is writing the second edition of his book, which is the result of records of weather and crops from 1847—over half a century. His articles in the KANSAS FARMER and other papers and the book for six years are proof positive that he is correct in saying what the future crops will be, also the character of the seasons to come. There will be arranged complete rules by which you can read what the future years will be so long as you will need information in that direction. It has much other information of value. This book will prove a grand, happy and useful surprise to all who order it. Citizens of townships who club an order, fifty or more copies at once, should write at once and learn terms. If you can't send money now, send your address, and be ready when the book is. It will be ready the 1st of March, 1888, and all men need it who have homes. Price $1, postpaid. Address Neil Wilkie's Bank, Douglass, Butler Co., Kas.

If your work be of a heavy nature and large and powerful horses be required to do it, then select such stallions to serve your mares, no matter what the cost. It may be more expensive at the start, but it will be cheaper in the end. Breeding has been brought down to such a certainty that the results can be foretold very closely.

Remember the FARMER is now $1 a year.

The Home Circle.

For the KANSAS FARMER.

A Christmas Carol--A. D. 1887.

BY M. J. HUNTER.

Shall I sing that sweet old story,
Sing of how the King of Glory
Lay a sleeping cherub infant on the Virgin
Mary's breast;
Born and laid within a manger
In this world of sin and danger,
With the angel guards around Him, watching
o'er His quiet rest?

Earth in silence then was sleeping
While the shepherds watch were keeping
O'er their flocks that naught might harm them,
nothing give them cause to fear;
And upon the night air falling,
Came no sound except the calling
Of the lambkin for its mother, and the shep-
herd's word of cheer.

Lo! a messenger elysian
Bursts upon their startled vision—
Heaven's glory shining round them; but he
said "be not afraid;
With great tidings I have sought you,
For this day a King hath brought you;
Find the Christ in David's city—in a manger
He was laid."

While the messenger yet lingers,
Lo! a glorious band of singers—
Heaven's own choir with heaven's own music
—celebrate our Savior's birth;
And their chanting sweetly breaking
Through the night air, earth awaking,
Judea's hills with answering echoes fill with
music all the earth.

Then did Mary list and ponder?
Did His sweet eyes ope with wonder?
Did she fold Him fondly closer to her pure and
loving heart?
While the music of their singing
O'er Judea's vales kept ringing,
Did she dream that mother-love was "yet to
pierce her as a dart?"

Did the "wise men" pause to listen,
While the Eastern star did glisten—
"Glory, glory in the highest," ringing loud
the glad refrain?
As the angels homeward winging,
Fainter, sweeter falls their singing,
And the hills still fainter echo, "Peace on
earth, good will to men."

Echoes still adown the ages
From the lips of saints and sages,
"Glory, glory in the highest!" song of songs,
both now and then.
Rocks and hills repeat the story;
Nature's voice proclaims His glory,
While his ransomed hosts still answer, "Peace
on earth, good will to men."

Sabbath Morning.

The deep-toned bell to worship calls,—
Peace is abroad in earth and skies;
The light in solemn splendor falls
Through windows stained with gorgeous
dyes!

The organ tones, so rich and deep,
Rise to the vaulted roof above;
Then fall, as one who sinks to sleep,
Safe-cradled in the arms of love.

We listen to the earnest prayer
For guidance through the sacred day;
A sense of rest is in the air.—
Life's cares and sorrows fall away.

The pastor's earnest, thoughtful words,
The hymn of praise—divinely sweet!—
Each in its wonted place affords
The help that makes the days complete.

Our Father's house! O, let us leave
Outside its doors our worldly cares—
Our sinful thoughts that round us weave
Unseen, but strong and subtle, snares.

There is no place for envy here,
No room for pride or vain display;
But words of heavenly hope and cheer,
To guide us on our earthly way.

Sweet Sabbath morn! All earth and sky
To worship calls. We hear a voice:
"Praise ye the Lord who dwells on high;
Rejoice again, I say, rejoice!"

—*Clara B. Heath, in Good Housekeeping.*

Habits of Neatness and Order.

Too much cannot be written with regard to the formation of neat and orderly habits in early life. As soon as the little child has learned to make rational use of its hands and feet, the training should begin, and if enforced by example as well as by precept, the results will be beautifully apparent in after life. One often hears the excuse, "O, I have too many children to properly train them;" but my own experience has taught me that if I had a "baker's dozen" it were only a greater reason why the training should not be neglected.

"It is hard to teach an old dog new tricks" is a saying more true than elegant, but to my certain knowledge the feat is not an impossible one. In many homes where space and conveniences are limited, daintiness and order are secured only by eternal vigilance and a determination worthy of—I had almost said a better cause. I believe that there is no better cause to which a woman should devote the greatest amount of energy and the truest wisdom at her command than that of house and home-keeping. I have somewhere read of a lady to whom it was remarked—"You are scrubbing that table more than is needful." She replied: "The poetry of housekeeping consists in doing everything a little better than is absolutely necessary." I fancy I hear some over-burdened, nervous wife and mother sigh as she thinks of the daily tangle which her domestic affairs get into, and the careless, disorderly habits of men and boys which so often tax her patience. She feels that it is almost of no use for her to try to remedy the matter. I would urge any such to make a "new departure" at once, and persistent effort will be rewarded by increased comfort and a happy satisfaction of mind. An aunt of mine used often to remark that anybody could put a house in order, but it took a good housekeeper to keep it so. In these days of wall-baskets, stocking-bags, shoe-boxes, etc., there is no excuse for not having a place for everything; and if John's boots and slippers are always to be found in a certain place, he will soon learn to put them there himself. I do not advocate such immaculate housekeeping as will drive husband and children into the streets, or any place outside the walls of of home, but only that happy medium which, if faithfully adhered to, will make home the sweetest, dearest spot on earth.

DORCAS PETINGILL.

Company Manners.

I know a woman who is always harping about "culture" and "refinement" and "etiquette," and who does not this minute know the meaning of that old-fashioned term, "good manners." She is always regretting the lack of culture among her neighbors, and there is not one of them who is not more polite than she is. I have heard her actually yell at her servants, and storm at her children, and I do not think her husband is the happiest man in the world. In society she is a charming woman. She knows always just what to say and how to say it. I never saw a woman who could excel her in gliding across a room and sinking gracefully into a chair. Her little boys can tip their hats so prettily to ladies on the street; her little girls can enter a room with toes properly turned out and with the grace of little queens; and, alas! both the little boys and the little girls can be as impertinent and display the worst manners of any children I ever saw. And they literally fight among themselves. They are not taught to be polite to each other. Their mother seldom favors them with her own properly chosen words and graceful manners when they are alone with her. Discord reigns until the door-bell rings and then the entire household must put on good manners.

"If we don't," one of the children said, "we catch it when the company's gone!" This is an extreme case, but do we not all have our "company manners?" Do we speak just as gently and sweetly to our children, to our husbands and wives, when we are alone with them as when in the presence of the chance caller? Do we say to a transgressing Johnnie or Katie, "Don't do that, dear," or, "Stop that this minute, I tell you?" Which is it? Do we say "please" and "thank you" to each other and to our servants at all times, or are these pleasing little words held in reserve with the rest of our "company manners?" Is it only in the presence of strangers that we smilingly overlook or gently chide the trifling faults of our children?

Oh, these "company manners!" They are the ruination of a household. They cannot always be put on and off at will. Traces of the every-day discord and lack of harmony will manifest themselves through the affectation of all the mere "company manners" one can assume. Habitual politeness and kindness and gentleness should be the unwavering rule in every house, even on "Blue Mondays."

I have been in homes in which it seemed to me that every member of the household seemed bent on seeing how hateful and disagreeable they could be to each other. The mother would speak in a nagging, fretful tone; the father "ordered everybody around;" the children quarreled; the servants went around with their noses in the air, ready and eager for little tilts with anybody and everybody. How wretched such homes are? In some of them they don't even have "company manners."

Sometimes my wife and I say on Sunday: "Now let us agree that we will not say a single cross word to any one this whole week. Let us be studiously polite to each other and to the children. Let us be very mindful of the feelings of every person with whom we may come in contact. Let us not fret nor complain nor do anything that good, well-behaved Christians should not do." And if when the next Sunday comes we have, through the grace of God, kept this resolve, it goes without saying that we have been happy and the world has perhaps been made a little better for our being in it.—*Zenas Dane, in Good Housekeeping.*

Save the Boys.

Women who have sons to rear, and dread the demoralizing influences of bad associates, ought to understand the nature of young manhood. It is excessively restless. It is disturbed by vague ambitions, by thirst for action, by longings for excitement, by irrepressible desires to touch life's manifold ways. If you, mothers, rear your sons so that their homes are associated with the repression of natural instincts, you will be sure to throw them in society that in some measure can supply the need of their hearts. They will not go to the public houses at first for love of liquor—very few like the taste of liquor; they go for the animated and hilarious companionship they find there, which they discover does so much to repress the disturbing restlessness in their breasts. See to it, then, that their homes compete with public places in attractiveness. Open your blinds by day, and light bright fires by night. Illuminate your rooms. Hang pictures upon the wall. Put books and newspapers upon your tables. Have music and entertaining games. Banish demons of dullness and apathy that have so long ruled in your household, and bring in mirth and good cheer. Invent occupations for your sons. Stimulate their ambitions in worthy directions. While you make home their delight, fill them with higher purposes than mere pleasure. Whether they shall pass boyhood and enter upon manhood with refined tastes and noble ambitions depends on you. Believe it possible that, with exertion and right means, a mother may have more control over the destiny of her boys than any other influence whatever.

Good Rules for Winter.

Never go to bed with cold or damp feet.

Never begin a journey until the breakfast has been eaten.

Never take warm drinks and then immediately go out into the cold.

Merely warm the back by the fire, and never continue keeping the back exposed to the heat after it has become warm.

Never omit regular bathing, for unless the skin is in active condition, the cold will close the pores and favor congestion or other diseases.

After exercise of any kind never ride in an open carriage or near the window of a car for a moment; it is dangerous to health or even life.

When hoarse, speak as little as possible until the hoarseness is recovered from, else the voice may be permanently lost, or difficulties of the throat be produced.

Keep the back, especially between the shoulder blades, well covered; also, the chest well protected. In sleeping in a cold room, establish the habit of breathing through the nose, and never with the mouth open.—*The Sanitarian.*

"The American people believe that temperance is better than debauchery, that sobriety is better than hilarity, that Christian culture is better than a life of sensuous indulgence, and that Sunday afternoon without the saloon gives a better opportunity for the healthful enjoyment by the people of their day of rest than a Sunday afternoon with an open grog-shop. Of course a law cannot enforce virtue on men who do not love virtue, but it can do something in restraining vice and in guarding from temptation those whose habits are yet unformed. Laws which hold such an end in view do not encroach on personal liberty; they are rather the expression of the virtuous purpose on the part of society to provide those conditions under which it shall be easy for men to emancipate themselves from the slavery of vice. We may say now of those who advocate the repeal of such laws, as Milton said of a certain class of men in his day, 'License they mean when they cry liberty.'"—*Chautauquan.*

Mason & Hamlin Organs Abroad--Progress in Pianos.

"One could not spend a pleasanter morning anywhere than in the music room of the agents for these organs. There will be found all sorts and conditions of American organs—from those that can be packed in a box and conveniently carried to camp-meeting in a quiet by-street, to the famous Liszt model, which has no rival for power and beauty of tone. There is also the Queen's model, which received Her Majesty's warmest approbation. The London music room of this firm, with its comfortable lounges and old engravings, is open to all comers, and there you will meet in its precincts the most celebrated musicians of the day. Many of them come and listen with rapt attention and admiration to the brilliant improvisation of celebrated organists, who are always kind enough to play for visitors who wish to hear them. Here you will find Sir Arthur Sullivan, Sir George Grove, Maud Valerie White, Gywllym Crowe, Charles Godfrey (Horse Guards), Bucalossi, Lawrence Kellie, and even, on some mornings, the beautiful Mary Anderson and the gifted Mrs. Kendall; but, indeed, as every one goes there, the list is endless."

Messrs. Mason & Hamlin bid fair to become as famous for their improved pianos as they have long been for their world-renowned organs. The peculiar feature of the Mason & Hamlin piano is that the strings are directly secured to the iron frame by metal fastenings, instead of being wound around iron pins set in wood as in other pianos. The results of this important improvement are claimed to be remarkable refinement and musical purity of tone, much decreased liability to get out of tune, and increased durability. A circular containing testimonials from three hundred purchasers, musicians, dealers and tuners will be sent, free, to any one addressing the manufacturers, Messrs. Mason & Hamlin, Union Square, New York city.—*London Lady's World.*

Fashion Notes.

Gloves are worn as long as ever with evening toilets.

The braided cloth jackets are the fancy of the moment.

The new long Russian polonaises are cut with Japanese sleeves.

Brocaded stuffs are still in vogue for both long and short wraps, and appear in these garments almost as frequently as the newer striped, barred, plain checked and plaided materials.

The favorite holiday dress colors for little girls are cardinal red, mahogany, terra cotta, pink, turquois blue, and Gobelin blue in the lighter shades, with braiding in gold, silver and tinted metals.

Fancy muffs made to match the toilet, and formed of a combination of rich materials, are small and compact. Muffs of fur will be much larger, and in Paris and London are quite immense in size.

Bonnet frames are so covered with velvet, put on in loose, uneven pleats and folds, as to need but little other trimming, the velvet frequently forming high, conical points above the forehead; then with the addition of a few curled cock's feathers among these velvet points, and two or three loops of ribbon on one side and an ornament on the other, the bonnet is made.

The "Gladstone" is an English long coat which this season takes the place of the ulster. It is made of dark blue or wine colored broadcloth, and is a trim-fitting wrap, simple in shape, without the usual box pleatings in the back, and is double-breasted and fastened by a row of good-sized gold or bronze buttons, which reach half the length of the garment. The wrap has a narrow band of blue fox fur outlining the edges, and is finished at the back by a graceful pointed hood which is lined with a silk matching, not contrasting with the color of the coat itself.

GRANITEVILLE, S. C., May 13th, 1887.

DR SHALLENBERGER, Rochester, Pa.—*Dear Sir:* I have been using your Malaria Pills for two years and find nothing equal to them for chills and Malaria. We have had no doctor in our family, but when any of us feel badly we take the Antidote, and are soon all right. Would not be without it for any money.

Respectfully yours, GODFREY GREEN.

The Young Folks.

The Orphan's New Year.

Cold is the night, and the wind blows wild,
And the clouds scud swiftly by,
And the beating rain falls pitiless
On a little orphan boy,
Wandering, friendless alone in the dark,
Alone in the crowded street—
Less than naught to the human throng,
That careless pass and meet.

I wonder if ever a home had,
This desolate orphan, and where?
The mother who bore him, did she love
This child with the tangled hair?
I wonder if brother or sister he had,
If ever a father he knew?
Or if he ever eat of bread in his life,
Or of meat, as the rest of us do?

Scarcely human he seems somehow,
As he steals along the street,
Like a faint shadow of bygone things,
With his listless, frozen feet;
And he almost falls as he creeps to a gate
And crouches with desolate cry;
"Mother, oh, mother, make me get warm,
Or tell Jesus to please let me die!"

I wondered, as I saw them raise
The corpse of that friendless one
Whether 'twas better to die as he died
Than to live as he had done;
And I almost forgot that he had starved,
For that cold and shelterless gate
Had been the portal to paradise,
Where the welcoming angels wait.

But yet I wondered if those that saw
That piteous, still young face
Would, when they met a starving child,
E'er think of the time and place
Where they helped to lift that little form,
With its frozen look of pain,
And, thinking of him so wan and white,
Pass a hungry face again.

—*American Press Association.*

The glories of our birth and state
Are shadows, not substantial things;
There is no armor against Fate—
Death lays his icy hand on kings;
Scepter and crown
Must tumble down,
And in the dust be equal made
With the poor crooked scythe and spade.

From soul to soul the shortest line
At best must bended be;
The ship that holds the straightest course
Still sails the convex sea.

I'd be a butterfly, living a rover,
Dying when fair things are fading away.

The Great Wall of China.

Of course we had to go to the great wall of China. Squeezing through the last deep gorge and a deep rift in the solid rock, cut out by ages of rolling wheels and trampling feet, we reach the great, frowning, double-bastioned gate of stone and hard-burned brick, one archway tumbled in. This was the object of our mission, the great wall of China, built 213 years before our era; built of great slabs of well-hewn stone, laid in regular courses some twenty-five feet high, and then topped off with large, hard-burned bricks, filled in with earth, and closely paved on top with more dark, tawny bricks, the ramparts high and thick and castellated for the use of arms. Right and left, the great wall sprang far up the mountain side, now straight now curved to meat the mountain ridge, turreted each 300 feet, a frowning mass of masonry. No need to tell you of this wall; the books will tell you how it was built to keep the warlike Tartars out, twenty-five feet high by forty thick, 1,200 miles long, with room on top for six horses to be driven abreast. Nor need I tell you that for 1400 years it kept those hordes at bay; nor that, in the main, the material used upon it is just as good and firm and as strong as when put in place. Twelve hundred miles of this gigantic work, built on the rugged, craggy mountain tops, vaulting over gorges, spanning wide streams, netting the river archways with huge, hard bars of copper, with double gates, with swinging doors and bars set thick with iron armor, a wonder in the world before which the old-time classic seven wonders, all gone now except the great pyramid, were toys. The great pyramid has 85,000,000 cubic feet; the great wall has 6,350,000,000 cubic feet. An engineer in Seward's party here some years ago gave it as his opinion that the cost of this wall, figuring labor at the same rate, would more than equal that of all the 100,000 miles of railroad in the United States. The material it contains would build a wall six feet high and two feet thick right straight around the globe. Yet this was done in twenty years.—*Mining World.*

Doors of Paper.

"Feel the weight of this door," said a New York builder to a reporter who was looking at an unfinished apartment house up town. The reporter prepared to lift what appeared to be a polished mahogany door, but it proved too light for any wood. "It is made of paper," said the builder, "and, while it costs about the same as wood, is much better, because there is no shrinking, swelling, cracking or warping. It is composed of two thick paper boards, stamped and molded into panels and glued together with glue and potash, and then rolled through heavy rollers. It is first covered with a waterproof coating, then painted and varnished and hung in the ordinary way. Few persons can detect that they are not made of wood, particularly when used as sliding doors."

Interesting Scraps.

Modern needles first came into use in 1645.

Coffee is named after Mount Caffa, Abyssinia.

Double-deck omnibuses are now running on Fifth avenue, New York.

In the United States there is published one paper to every 4,433 inhabitants.

In some counties of Kentucky the salary of the county judge is as low as $250 a year.

Every time you refrain speaking in defense of a friend you prove that you are not a friend.

The average daily wages paid to New York sewing women is fifty cents for fifteen hours work.

The great Thames tunnel in England, the work of Sir I. Brunel, was begun in 1826 and finished in 1843.

A Bridgeport, Conn., farmer's wife shooed one of Barnum's escaped lions out of her husband's barn with her apron.

Since October 20, 1886, four different crops have been gathered in succession from one plat of ground at Starke, Fla., viz: Rutabagas, beans, corn, sweet potatoes.

Italy ceased to be the center of the Roman world with the removal of the capital from Rome to Byzantium (Constantinople) by Constantine, in the fourth century.

Abraham Burbank, who died recently in Pittsfield, Mass., worked all his life as a brick and stone mason, and at his death owned real estate valued at $1,000,000.

London has more Jews than are to be found in Palestine, as many Irish as would fill the city of Dublin, and more Roman Catholics than would fill the city of Rome.

Husking corn by means of a thrashing machine is the new agricultural wrinkle, and it is getting to be very popular in some parts of the West. The corn is husked and shelled at the same time.

The carriage which was made by the United States government especially for the use of Lafayette during his visit to this country in 1824 is owned in Chicago. It is a quaint old ark, hung on big springs and wide straps, and from his lofty seat the old Frenchman used to descend to the ground by steps with many foldings.

An Old-Fashioned Dinner.

The following is the list of the dishes at Thanksgiving dinner on a Pennsylvania farm. Everything with the exception of the pudding was placed on the table at once, to obviate the necessity of rising, as the dear old hostess was none too strong, and kept no servants, and yet cooked it all herself. At the head of the table was a large chicken pie, in the middle two roast chickens, and at the foot was an enormous turkey, and opposite the chickens a roasted pig. There were fourteen pies of different kinds, three large cakes, crullers, preserves, pickles of four kinds, boiled onions, mashed potatoes and turnips, apples, cheese nuts, custard, head cheese, biscuit, brown and white bread, and lastly a big plum pudding and coffee. All this for thirteen persons. This dinner was twelve years ago, and all the diners still live.

Did Niagara Cease to Flow.

On the 30th of March, 1847, the water almost ceased to flow over the rocky ledge at Niagara, dwindling away to the appearance of a mill dam. The rapids above the falls disappeared, leaving scarcely enough on the American side to turn a grindstone. Islands and places where no human foot had trod appeared, and were visited, and flags placed and mementoes brought away.

The reason for this cessation to the flow of the water was an accumulation of ice at the lower extremity of Lake Erie, which formed a sort of dam between Fort Erie and Buffalo.

Rheumatism

We doubt if there is, or can be, a specific remedy for rheumatism; but thousands who have suffered its pains have been greatly benefited by Hood's Sarsaparilla. If you have failed to find relief, try this great remedy.

"I was afflicted with rheumatism twenty years. Previous to 1883 I found no relief, but grew worse, and at one time was almost helpless. Hood's Sarsaparilla did me more good than all the other medicine I ever had." H. T. BALCOM, Shirley Village, Mass.

"I had rheumatism three years, and got no relief till I took Hood's Sarsaparilla. It has done great things for me. I recommend it to others." LEWIS BURBANK, Biddeford, Me.

Hood's Sarsaparilla is characterized by three peculiarities: 1st, the *combination* of remedial agents; 2d, the *proportion;* 3d, the *process* of securing the active medicinal qualities. The result is a medicine of unusual strength, effecting cures hitherto unknown. Send for book containing additional evidence.

"Hood's Sarsaparilla tones up my system, purifies my blood, sharpens my appetite, and seems to make me over." J. P. THOMPSON, Register of Deeds, Lowell, Mass.

"Hood's Sarsaparilla beats all others, and is worth its weight in gold." I. BARRINGTON, 130 Bank Street, New York City.

Hood's Sarsaparilla

Sold by all druggists. $1; six for $5. Made only by C. I. HOOD & CO., Lowell, Mass.

100 Doses One Dollar.

390 Funny Selections, Scrap Pictures, etc., and nice Sample Cards for 2c. HILL CARD CO., Cadiz, Ohio.

Beautiful Cards. Agents' sample book and full outfit for 2c. stamp EAGLE CARD WORKS, Northford, Conn.

ONE PACK May I C U Name Cards, One Pack Escort Cards, One Pack Flirtation Cards, One Pack Hold-to-the-Light Cards, The Mystic Oracle, with which you can tell any person's age; and large sample book of Hidden Name Cards. All for only a 2-cent stamp. Banner Card Co., Cadiz, O.

941 HIDDEN NAME CARDS, scrap pictures, puzzles, games, tricks, money making secrets, album verses, and the largest and finest sample book of new style cards ever issued. All for a 2-cent stamp. Steam Card Works, Station 15, O.

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NEW CARDS. 40 Samples and AGENTS Canvassing Outfit for 2c. stamp. CARD WORKS. Northford, Conn.

WORK FOR ALL. $50 A WEEK and expenses paid. Outfit worth $5 and particulars free. P. O. Vickery. Augusta, Me

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AGENTS WANTED, either sex, to sell our new book, EARTH, SEA and SKY; 864 pps. 329 Illustrations. (Eng. or German print.) Good pay. Experience unnecessary. Success certain. Headquarters for Bibles, Albums and Gift Books. E. P. JORDAN & CO., Pubs., St Louis, Mo.

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KANSAS FARMER.

ESTABLISHED IN 1863.

Published Every Thursday, by the

KANSAS FARMER COMPANY.

OFFICE:
821 Kansas Avenue, Topeka, Kas.

S. J. CRAWFORD, - - - PRESIDENT.
J. B. McAFEE, - - GENERAL AGENT.
H. A. HEATH, - - BUSINESS MANAGER.
W. A. PEFFER, - - MANAGING EDITOR.

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KANSAS FARMER CO., Topeka, Kas.

Hon. Thomas Ryan has our thanks for a large invoice of public documents.

The *Woman's Tribune*, Beatrice, Neb., began its fifth volume December 10, inst., as a weekly. It is a bright, cheery, earnest friend of woman and her progress. The subscription price is one dollar a year. Clara Bewick Colby is editor.

The people will be pleased to learn that a resolution has been prepared for introduction in the House of Representatives in Washington providing for an investigation of the "Trust" business so as to secure information necessary in legislation to prevent their hurtful tendencies.

SPECIAL NOTICE!

A number of our subscribers who have been notified by postal that their subscription to the FARMER expired during December, 1887, will not receive the first issue in January, 1888, unless they renew at once. Please consider this a cordial "last call" to send in your dollar for 1888; also induce some *new* subscriber to do likewise. No farmer in Kansas can afford to deprive himself of the KANSAS FARMER during 1888.

Be Patient.

We have on file some excellent papers prepared by members of Farmers' Institutes, stockmen's meetings, horticultural associations and others, also some good letters from correspondents, reports of meetings, etc., which we would be pleased to print all in one issue of the paper; but it is impossible to do that; some of them must "lie on the table." But they are good enough to keep; they will lose nothing by age. In fact they will do much more good by not being given all at once. They will all appear in due time. Let interested persons be patient.

KANSAS SUGAR INDUSTRY.

We present to our readers this week an official report on what the KANSAS FARMER has long believed would be one of the leading industries in Kansas—sugar-making. Prof. Cowgill, a very competent chemist, was specially commissioned to study the work at Fort Scott and report all the facts. He has done so. His report is elaborate and complete, containing a good deal of relevant matter outside the operations at Fort Scott. We are pleased to see that he refers, though briefly to the history of sugar-making in the State; for while Mr. Parkinson and other gentlemen now prominently connected with the business justly deserve great praise for their energy, pluck and perseverance, there are other persons entitled to credit among the pioneers. Father Bennyworth, Messrs. Stout, Hawk, and others, made sugar in Kansas a dozen years ago. Among the men who became interested in the sugar industry early and who are still active workers are Senator Plumb, Mr. Parkinson, Professors Swenson and Cowgill. Mr. Plumb has not been at work in the factories, but he was on duty at Washington, and it is quite safe to say that Plumb only could have done the work he did there in obtaining appropriations of money to carry on the work. After the first crude efforts in experimentation, nobody in Congress except Mr. Plumb had faith enough in the sorghum industry to appropriate a dollar for it. He went before the committees and urged the matter, and the responsibility of the appropriation was thrown upon him personally. Other members had so little hope of success in sorghum sugar-making that they were not willing to risk their official judgment and reputation by favoring the use of public money in further experiments. But Mr. Plumb took the burden upon himself, made it a personal matter and got the money which has hastened the final victory half a dozen years at least. We have lying before us as this is being written, a copy of one of the Senator's speeches in the Senate, delivered February 20, 1885, in which he urged the appropriation in such a business-like way as to overcome the opposition and obtain what he asked. We also have a letter from Senator Plumb, written to the editor of the KANSAS FARMER, under date of February 12, 1885, eight days before the delivery of the speech referred to—asking for that gentleman's views on the sugar question. He has been a faithful worker continuously, and now he is engaged privately in an effort to cheapen processes of manufacture so as to get whatever benefits are to follow close to the farmers. Attention is called to this in another part of the paper. His resolution to set aside the Swenson patent was the first matter presented to either House of Congress this session.

As we are writing this an envelope is dropped on the table; it contained the letter of Commissioner Colman in reply to the Plumb resolution, from which we quote one paragraph—

(1) That the above patent is held by Mr. Swenson in trust for the use and benefit of the government and its citizens, the discovery patented having been made by him while specially employed in experimentation, and under an implied contract grant ing to the government all property in the results of such experimentation.

Mr. J. W. Williams, one of the early settlers of Jackson county, was in Topeka last Saturday, and took time to come to the KANSAS FARMER office and renew acquaintance. It is nearly thirty years since he moved on the land he now occupies, and among other interesting things which he told us, was that he has been using all the firewood he needs from a grove of five acres of trees that he raised himself, and he has been doing this so long he has forgotten the particular year when it began. His farm is on high prairie, and his sucsess in tree-planting ought to encourage new settlers in the western part of the State to raise trees. Mr. Williams says that any farmer in Kansas can raise all the timber he needs for farm use, and he can raise a good deal on a small piece of ground if he will take care of it, and cultivate the ground carefully from the beginning until the trees are large enough to shade the ground. He has had best success with elm, black walnut and red cedar.

CHEAPER SUGAR-MAKING.

We are in receipt of a letter from Senator Plumb in regard to sugar-making. The Senator has taken an active, earnest and very useful part in forwarding the Kansas sugar industry from the beginning. A few days ago, looking among some old letters, one of Senator Plumb's was found several years old, written then, as this one is now, to the editor of the KANSAS FARMER, concerning the sugar interest in Kansas.

The present letter is purely private, but we take the liberty of printing one paragraph, as follows: "I have just learned that the government agent at Rio Grande, N. J., claims to have developed a plant for sugar-making whereby it can be carried on on such a scale that the machinery will not cost more than four or five thousand dollars, and yet the operation be attended with as much relative profit as though carried on on a much larger scale. This hardly seems credible, and yet there may be something in it. I have arranged to have the whole question thoroughly examined by a competent person."

The Senator says, further, that he has information which he regards as credible, to the effect that the general understanding as to the cost of sugar-making machinery is not well founded, that published figures are much too high, and that machinery now in use can be duplicated for much less money than it is said to have cost. He says he is having the whole subject thoroughly examined and will keep us posted at this end of the line.

It was wholly through the personal influence of Senator Plumb that Congressional appropriations were made for the development of sorghum sugar manufacture, and he does not feel that he has done all that is to be done until our sugar is made cheaply as possible.

HAPPY NEW YEAR!

The KANSAS FARMER wishes every one of its subscribers, readers, friends and enemies a happy New Year, a peaceful, prosperous, useful life, and an eternal succession of unending joys in the better world beyond.

THE SUGAR REPORT.

We print a very large addition of the KANSAS FARMER this week, because it contains the report of Prof. Cowgill on Kansas sugar-making. The demand for this particular issue is very large. We have a large number of extra copies to supply persons who have not yet ordered. They are sold at 5 cents a single copy, 50 cents a dozen, $4 a hundred.

Oak Grange Farmers' Institute.

Arrangements are completed for a Farmers' Institute at Oak Grange Hall, a few miles southwest of Topeka, on the 12th and 13th days of January. Two or three of the Agricultural college professors will be present and take part in the proceedings. The program will be published next week. A cordial and general invitation is extended to farmers and others to attend.

WORK IN CONGRESS.

The first thing done in either branch of Congress after convening was the introduction of a resolution in the Senate by Senator Plumb, of Kansas, to set aside the Swenson sugar patent. A number of important bills and resolutions were introduced in the Senate. The House committees have not yet been announced, and no business can be transacted in that body until that is done. Both houses adjourned last Thursday until the 4th of January.

Among the bills introduced in the Senate, the following are the most important:

By Senator Beck—For the retirement of United States legal tender and national bank notes of small denominations and the issue of coin certificates in lieu of gold and silver certificates.

By Senator Dolph—To provide fortifications and other seacoast defences. It appropriates $126,377,800 to be expended during a period of twelve years—a certain part named every year.

By Senator Paddock—For the erection of a building for the exclusive use of postoffices of the first and second class, none of the buildings to cost more than the aggregate gross receipts of the office for which it is intended for the two preceding fiscal years.

By Senator Eustis—To provide for a joint celebration at Washington in 1889 by the sixteen American republics, in honor of the centennial constitution of the parent republic—the United States.

By Senator Edmunds—To provide for the establishment of a postal telegraph. (It is the Edmunds postal telegraph bill of two years ago.)

By Senator Cameron—To promote foreign trade and encourage the American merchant marine. It is the subsidy bill introduced by Mr. Cameron two years ago.

By Senator Vance—To amend the civil service act.

By Mr. Dolph—For the admission of the State of Washington into the Union; also, repealing the pre-emption and timber culture laws; also, to encourage the manufacture of steel for modern arms and armor; also, to provide heavy ordnance.

By Senator Bowen—For the free coinage of silver.

By Senator Morrill—To credit and pay to the several States and Territories all moneys collected under the direct tax act of 1865; also, to regulate immigration.

By Senator Aldrich—To authorize the Secretary of the Treasury to apply the surplus money in the Treasury to the purchase of United States bonds or to the payment of interest on the public debt.

By Senator Manderson—Granting a pension to every soldier and sailor who is incapacitated for the performance of manual labor and for pensions to dependent relatives of deceased soldiers and sailors. He said that he introduced this bill at the unanimous request of the Grand Army of the Republic. Also, for the admission of the State of Dakota and the organization of the Territory of Lincoln.

By Senator Gibson—To establish a navy yard and depot of supplies on the Mississippi river at Algiers.

By Senator Stewart—To encourage irrigation by the segregation of lands from which the water can be obtained. Also, for the issue of coin certificates to circulate as money.

By Senator Hale—To prohibit the letting of government work to contractors employing convict labor.

By Senator Vest—To establish United States courts in the Indian Territory.

By Senator Wilson, of Iowa—To create peace among the nations by an arbitration committee.

By Senator Sherman—For the encouragement of closer commercial relations and in the interest of a perpetuation of peace between the United States and the republics of Mexico, and of Central and South America and the empire of Brazil.

By Senator Farwell—To perpetuate the national banking system.

By Senator Blair—For a constitutional amendment extending the right of suffrage; also, for the relief of women employed as army nurses; also, to restrict the use and sale of opium in

the District of Columbia and the Territories.

By Senator Turpie—For the admission of the States of Washington and Dakota.

By Senator Hoar—For the erection of a monument to the negro soldiers and sailors who gave up their lives for the preservation of the government.

By Senator Chandler—Fixing the salaries of the Judges of the United States District courts at $5,000.

By Senator Hawley—To reimburse prisoners of war who were in the military or naval service during war of the rebellion.

By Senator Edmunds—Providing the inspection of meats for exportation and to prevent importation of adulterated articles.

By Senator Mitchell—To amend the act of the 3d of March, 1887, restricting the ownership of land in American citizenship; also, abrogating all treaties with the Chinese empire, so far as they permit the coming of Chinese into the United States, and absolutely prohibiting the same, except as to diplomatic, consular and other officials.

By Senator Plumb—A bill to make it an offense punishable by fine and imprisonment for any railroad, sleeping car, telegraph or express company to offer any Congressman or other government employe any free pass or reduction from the ordinary rates charged. It is also made an offense of like gravity for any government employe to accept such a pass.

By Senator Gibson—A bill to repeal the act forbidding the appointment to any position in the army of any person who served in any capacity in the military, naval or civil service of the so-called confederacy.

By Senator Wilson, of Iowa—A bill to strike out the words: "Under satisfactory circumstances and conditions," where they occur in sections 2 and 4 of the inter-State commerce act.

By Senator Reagan—To amend the inter-State commerce act so as to bring express cars, Pullman cars, sleeping cars and all other cars owned by private citizens or corporations within its operation, the same as if they were technically "common carriers."

By Senator Frye—Giving the consent of Congress that the laws of the several States relative to the sale of distilled and fermented liquors within the limits of each State, may apply to such liquors when they have been imported in the same manner as when they have been manufactured in the United States.

By Senator Ingalls—To amend section 6 of the act for the adjustment of railroad land grants so as to provide that where the lands in quession have been sold for State and county taxes and the grant afterwards forfeited, the purchasers of the lands shall have for one year a prior right to purchase the lands from the United States at the government price.

By Senator Sherman—Providing that all persons on the pension rolls for the loss of limbs shall be entitled to receive arrears of pension from the date of discharge for disability.

By Senator Stewart—For the appointment of a Chief Justice and two Associate Justices, to sit at Washington and have jurisdiction to hear and decide contested land cases.

By Senator Platt—To prohibit the manufacture and sale of spirits or intoxicating liquors in the District of Columbia.

By Senator Palmer—To extirpate contagious pleuro-pneumonia, foot and mouth disease, and rinderpest among cattle, and to facilitate the exportation of cattle and exports of live stock.

By Senator George—To annex the public land strip south of the Indian Territory to the Territory of New Mexico. Also, to protect innocent purchasers of patent articles, making it a valid defense against actions for infringement that the article was bought for use or consumption, not for sale, or in good faith and in the usual course of trade; and providing that all patents be subject to purchase by the government for general use, at a reasonable valuation.

By Senator Ingalls—To remove limitation in the payment of arrears of pensions; granting arrears in certain cases to those pensioned by special acts of Congress.

By Senator Sherman—For the preservation of woods and forests adjacent to the sources of navigable rivers and their affluents.

By Senator Hoar—A constitutional amendment for the extension of the Congressional term till the last Tuesday in April.

By Senator Cullom—To amend h inter-State commerce law; also, for the establishment and operation of a United States postal telegraph; also, to equalize the rates of pensions in certain cases; also, to extend the pension laws to steamboat men and others acting under orders of United States officers.

By Senator Jones, of Arkansas—Opening the Great Sioux reservation in Nebraska to settlement.

THE WORD IS ORGANIZE.

TOPEKA, KAS., December 24, 1887.

EDITOR KANSAS FARMER:—In your issue of the 15th inst., under the caption "State Farmers' Association," you claim, and correctly, too, that "there are many things about which farmers need to consult," and very properly ask, "how are they to combine their influence and make it felt as an organized force?" You also refer to the Grange, as the farmers' organization which has done a great deal of good, and claim for it "the confidence and support of every farmer, but think it not strong numerically, nor increasing in membership fast enough to make its influence immediately felt except in particular localities," and then suggest the calling together of representative farmers from the different counties to consider the propriety of forming a State association, to be followed by county and township organizations, and thus secure for the farmers of the country the facilities for that consideration of their interests due to an industry so important as that of agriculture.

Now, Mr. Editor, I have no fault to find with your statement of the case, and but little with the plan of action proposed. In fact, I think your suggestion timely, and worthy of the thoughtful consideration of every true friend of agriculture, and well calculated to induce that consideration of the subject presented which its importance demands. But in view of the thorough and complete organization of the order of Patrons of Husbandry, now well established, growing stronger yearly, and to which, during its twenty-one years of continuous work, is due more of the important reforms secured in the interest of agriculture than can be attributed to all other influences combined, and which is now able to furnish conclusive evidence of its nearer approach to the requirements of the agricultural classes than any other association of like character yet presented to the American farmer, I beg leave, very respectfully, to question the propriety of diverting attention, by the formation of another organization of the same general character, with like aims and purposes, the effect of which, if consummated, must of necessity divide our forces, weaken our influence, and lessen our chances for final success.

Our order teaches, and history proves, that "successful results of general welfare can be secured only by general effort; that unity of action cannot be acquired without discipline, and that discipline cannot be enforced without organization," and that every advance in the world's progress, pertaining to the general welfare, or affecting directly the interest of any considerable number or class, has been made by the combined effort of men and women exerted through organization. We therefore hold concert of action on the part of those engaged in any given industry, to be necessary to success, without which general progress cannot be counted upon with reasonable certainty, and individual effort, however well directed, must of necessity fail of its just reward, and that the farmers' calling, though much longer neglected than other interests, is no exception to the rule. In short, that organization and co-operation is the demand of the times, and that the future of agriculture will depend largely upon the ability of its votaries to comprehend and intelligently apply the true principles of co-operation as suggested in your article and taught in our order, not only to the work of the farm, but also to questions of public policy, in which all have a common interest.

It therefore seems that we agree fully as to the importance of systematic working together on the part of those engaged in agricultural pursuits, and differ only as to the methods best calculated to accomplish desired results; and for our order, or the Grange, if you please, I only claim the advantage of being now well established—one of the fixed institutions of the country—upon whose foundation, so well laid, it would be easier to continue to build, than to construct another of the same general character.

The Grange brings farmers, their wives, sons and daughters together at stated periods; relieves the monotony of the isolated condition in which they generally live; enables them to extend acquaintance; to cultivate the social amenities of civilized life, and to consider, in a friendly manner, and to the fullest extent, all questions relating not only to the farm, but of general public interest as well, in which every citizen should, to the extent of his ability, take an active part.

With your permission, Mr. Editor, I desire to say that the State Grange has made all necessary arrangements to send lecturers, or other competent members of the order, to such localities as those desiring to institute organizations in the interest of agriculture, or to reorganize Granges which have ceased to work. These lecturers will explain fully the necessity for organization, the principles and purposes of our order, and the methods to be employed in bringing about desired results, and assist in the formation of such associations as those assembled may, after explanation, deem best.

Correspondence respectfully solicited.

WM. SIMS,
Master Kansas State Grange.

A WORD ABOUT POLITICS.

We are in receipt of two letters, both, as we think, written in bad taste. This is not a partisan paper in any sense. We do not intend to discuss party politics ourselves in these columns, and we do not intend to let anybody else do it. We discuss measures, not parties. We are in favor of the free and unlimited coinage of silver; we favor a divorce of the government from all banking institutions and the issue, direct from the government, of all paper money in circulation; we favor a reduction of public revenues to an amount equal to the necessities of the government economically administered, and in effecting the reduction, we would abolish taxes on sugar and tobacco, put lumber, coal and salt on the free list, removing duties from every article not produced in this country and which is still subject to duty, and reducing duties on all manufactured articles wherever it can be done without increasing the revenues or weakening the protection to which American workers of all classes are entitled; we favor the utter suppression of drinking saloons in every part of the country; we believe the changing of the name of St. John county was an exhibition of partisan malice that every man engaged in it ought to be ashamed of; we believe that farmers in all the different parties in Kansas ought to control their party nominations, and that the best men should be selected for office. There is nothing partisan in that. We would be pleased to give to every party in the State which proposes a farmer for Governor, as much space as we gave to Mr. Smith last week, and we would as cheerfully urge his nomination by the party to which he belongs, provided, of course, that he is a fit person. It is impossible for one to express an opinion on any important public question without agreeing with or differing from some person or party; but that does not make one a partisan. Men properly choose between parties, yet every party advocates some good doctrine. The principles advocated by the KANSAS FARMER are those which are advocated by advanced thinkers in all parties.

If these critical correspondents will break through their own party crusts, as we have done in relation to all these great matters, they will know how good it is to be free.

Inquiries Answered.

CAKED BAG.—I have a 2-year-old heifer just come in, and her bag is hard and large and teats the same, and one does not give any milk. It does not seem to be much sore nor the milk thick, neither fever in the bag and she seems to enjoy having it rubbed.

—It needs to be gently rubbed frequently, and poulticed with warm applications to soften the cake, and frequent milking is important, and if there is soreness, handle carefully. Feed loosening but not rich food, and keep the cow in comfortable quarters.

CHESS.—Is cheat good for horse feed if cooked? Does it injure pregnant mares or cows? Will cheat answer the same as corn or oats in summer? Is it good for pasture? Should it be sown in the spring or fall?

—We always tried to get rid of chess, so as to have none of it about. We know personally of but one instance where chess, enough to "take the ground" grew on the place, and as soon as its true character was discovered, it was plowed under like weeds. Our judgment is against it. If any reader has a good word for chess, let him speak out.

TREES ON THE ROADSIDE.—Will you tell as near as you can the proper distance from center of road to set trees that may be used as posts or ornamental, and also the most beautiful, that stock will not destroy, and what you consider the best for wind-breaks for young orchards?

—Kansas roads, usually, are sixty feet wide. In that case, the trees should be set about thirty-one feet from the center of the road—so as to be sure you are not in the roadway. The best tree for use, while growing, as posts, is Osage orange, probably. The tree most free from depredations of stock is the red cedar. And cedar is the best wind-break. The trees named do not grow fast, however, and that is an objection. In our opinion the hardy catalpa would be next best for the roadside tree.

SPRAINED BACK.—A correspondent sends the following: "I think the KANSAS FARMER is mistaken regarding the colt described on page 7, Dec. 15. I had a colt similarly affected many years ago and have a young mule that has just outgrown the trouble."

—The colt referred to is probably growing rapidly and is too soft and loose-jointed; has straight hind legs and steps long. He occasionally straightens the leg too far, bringing the joint into, or past the "dead center," so that the cords fail to bend it again. A slight tap with the hand on the front side of the joint will throw it off the center and relieve it immediately. Keep him in yard or pasture where he will have plenty of room to move about and so far as practicable feed on the ground which will tend to keep his feet well under him. The trouble will gradually disappear as the bones mature and harden."

The last number of the *Saturday Evening Lance* was an exceptionally good one. Mr. Frost, the proprietor, manager and editor, is doing his full share in advertising Topeka.

The Christmas season at Topeka was unusually lively this year. A much larger business was done than ever before. The express companies say they handled about three times as many packages as they ever did in any one holiday season and the stores never sold half as many goods in the same time before.

OUR TWO-CENT COLUMN.

So many of our subscribers have availed themselves of our reduced advertising rates in the TWO-CENT COLUMN, that we have concluded to continue the rates for their benefit until further notice. The regular rate is two cents a word; reduced rate (to subscribers only) *one cent a word*. We propose to take our share of the "hard times."

Horticulture.

DROUGHTS AND DROUGHT LESSONS.

Prepared by L. A. Simmons, Wellington, Kas., and read at the recent meeting of the State Horticultural Society, at Marion, Kas.

"The shuddering tenant of the frigid zone,
Boldly proclaims that happiest spot his own;
Extols the treasures of his stormy seas,
And his long nights of revelry and ease.
The naked negro, pant at the line,
Boasts of his golden sands and palmy wine,
Basks in the glare, or stems the tepid wave,
And thanks his Gods for all the good they gave.
Such is the patriot's boast, where'er we roam,
His first, best country, ever is at home.
And yet, perhaps, if countries we compare,
And estimate the blessings which they share.
Though patriots falter, still shall wisdom find,
An equal portion dealt to all mankind;
As different good, by art or nature given
To different nations makes their blessings even." —*The Traveler, Goldsmith.*

Whether or not the philosophic theory of the poet, based on the idea that patriotism renders all mankind boastful of the blessings they enjoy, is correct, I do not care at present to inquire. Even if he has, with poetic license named causes as effects, and *vice versa*, I pass it by as quite immaterial; for I am assured there is an innate inclination in the mind of each individual living to dwell upon, gloat over, and be boastful of the good things afforded by his surroundings, and to gloss over, treat lightly, and as far as possible ignore the ills or misfortunes of his situation, and that this is the chief source of contentment among all mankind.

This natural inclination is perhaps nowhere more generally manifested than in our young, rapidly-developing, and progressive State. Who is there, that after a few years, perhaps only months, residence in any portion of it does not constantly speak in glowing terms of the pure air, clear skies, and productive soil of sunny Kansas? Who in conversing with those of another State does not dwell upon the charms of our delightful climate, as well as on the State's rapid growth and wonderful progress, and the unexampled prosperity of its citizens? Who of us does not boast of our early, lovely springs, our late, delightful falls, and our mild, open, clear-skied winters, as well as point with pride to our schools, colleges, railroads, mills, etc., and in gushing terms of praise gloat over our fine fruits, and wonderful cereal productions? Yet each may be checked in his boastful strain, given an almost electric shock of tongue paralysis, when vaunting the mildness and geniality of our climate, by the mention of droughts and blizzards. The fierce chilling Manitoba wave in winter, the dearth of rainfall, occasionally accompanied by a simoon blast from the "Staked plains" of western Texas, once experienced, compels those who endure them to admit that we have not a perfect climate; that while the blizzard is no longer a terror, nor the drouth an overwhelming calamity, they are each so seriously unpleasant and uncomfortable that they cannot be readily forgotten, nor their visitations ignored. Hence, while naturally inclined to vaunt and dwell upon the manifold blessings we enjoy in Kansas, as do mankind elsewhere and everywhere, we should not overlook the unpleasant vicissitudes--I will not call them curses—of our climate, which we are compelled to endure. By comparison we may readily prove our climatic conditions more favorable than those of other States, and so give good reasons for our preference of a Kansas home. yet realize that it is folly to deny the fact that we anticipate "northers" each winter, and if numbered among the "old settlers" expect "dry spells," and possibly a drought, during the latter portion of each summer. Conceding, then, that apparently unfortunate climatic conditions exist, that the blizzard is an incident to each winter, and a drought usually of only a few weeks, but which may extend to months, is a concomitant of each of our semi-tropical summers, is it not the part of wisdom to prepare for the recurrence of these ills, so far as possible protect ourselves from their injurious effects? and thus seek to palliate what we cannot wholly remedy. No one pretends to believe that our usually mild winters will ever be without some, and it may be frequent "northers"—possibly downright blizzards; yet the idea has obtained no small share of credence that the cultivation of the soil, the planting of orchards, groves and timber tracts, will in time so increase the amount of rainfall and modify climatic conditions. that real droughts will be far less frequent and severe, hence greatly less injurious to crops of all kinds. This cherished theory we find by a careful examination of statistics, the records made by meteorological observers during the past twenty-five years, has but a slight foundation of fact; for while we discover that the average annual rainfall has perceptibly increased, yet the increase is so small that unless it shall progress in an accelerating ratio, we may calculate that a trace of drought will remain five hundred years hence, and not cease to be known as a climatic misfortune in Kansas before the year A. D. 1999. As we do not belong to the Methuselah class of mortals, this outlook is not particularly cheering or soul-satisfying. "But," says my hopeful Kansas enthusiast, "if the increase of rainfall is extremely small, we need not be discouraged; for it is not the quantity of rainfall which is important, but its distribution; and the very meteorological records to which you refer show that while in an early day we had only spring and fall rains, and during late years, the rainfall has not been so excessive at those periods, and has been more common during July, August, and September, and in winter. Look at the published records and you will admit it. Plant trees! plant trees! extend the area of timber growth and drought will disappear." Ah! yes, I reply. I have diligently compared those tables, and was strongly inclined to believe that your theory had facts for its foundation; but the figures added to the tables during the past two seasons have been terribly damaging to your theory, and if not destructive of the hope which it engendered, has led many to doubt its truth, probably more to abandon it altogether. Still I say with you—plant trees, plant trees, add to the number and area of your groves and orchards, increase the timber growth on our Western plains year by year; and if this is continued for a few generations, I really believe permanent climatic changes will be effected. The tenth and probably the fifth generation of our descendants will rise up to call the early tree planters of "sunny Kansas" blessed, and will rejoice and take pride in the thought of the wisdom and foresight of their progenitors—us, who of to-day are meeting with so much adversity in horticultural pursuits, who plant and plant, and see so large a portion of all our plantings perish in the drought of the same, or some subsequent season.

Now, finding that our cheerful theories as to the increase and distribution of rainfall, while not utterly fallacious, promise almost nothing to us, but little to our immediate successors in the horticultural field, and only that in the far-distant future substantial and permanent climatic changes may be brought about of inestimable benefit to those who are then the dense population of our beloved State, the question arises—what can we do for ourselves, for the present generation, in the way of preparing for, contending with, and alleviating the injurious effects of the terrible droughts which afflict and so frequently scourge us? Surely, during the past two years, we have had ample opportunity for observation, during the past season have witnessed too many disastrous effects of a protracted drought, not to have given this whole subject our most careful and serious consideration, and have brought to bear the whole force of our ingenuity and skill in seeking out and applying the means which can alleviate the suffering and save from death our valuable trees and plants? Have we made the best possible use of our mental powers, and has the recent drought given us no lesson? Have we not, month by month, been earnestly thinking over and discussing with our intimate friends the means of defense against the dire calamity, of preventing the impending destruction of our favorite trees and plants? Assuredly, we have wrestled with the problem presented by a severe and protracted drought; then what have we learned?

My answer is, first, not to depend on any radical change in climate from the cultivation of the soil, the planting of orchards, groves, timber tracts, etc., but rather to expect a recurrence of very dry seasons at intervals of from six to eight years. The meteorological records show, and the experience of all "old settlers" corroborates the fact, that after about six seasons, during which the rainfall is sufficient to induce a vigorous growth of most kinds of vegetation, there comes one, possibly two, when it is deficient, then annual crops are seriously injured, and the growth of perennial plants and trees is comparatively small. That this succession has occurred in Kansas for more than a hundred years was demonstrated to this society, in the comparison of wood growths, by Prof. Gale, as early as 1874. Moreover, it is the experience of all, that during each season, save possibly about one in seven, there occurs a dry spell in some localities amounting to a drought.

Not having forgotten the drought of 1880, and having heard of, if we did not experience its predecessor or predecessors, did we prepare in the spring of 1886 for a dry season to be followed by one still drier? How could we prepare, says one? we could not irrigate our lands, but a small portion of the State can be irrigated. Admitted that irrigation is to a great extent impracticable in this State, and yet I will tell you how to prepare for the next drought. That it will come we need not doubt; that we cannot generally irrigate our orchards, berry fields and gardens stands admitted, and yet I maintain much may be done in the way of preparation. While we cannot supply the needed copious showers, cannot shelter our trees and plants from the scorching rays of the midsummer afternoon's sun, cannot allay nor escape the intense heat of August, nor check the hot winds which occasionally sweep across the State, still we are not powerless, nor compelled to allow each severe drought to ruin our gardens and berry plantations, or greatly injure our orchards.

We have a soil and subsoil which are capable of receiving and retaining a large amount of moisture, and by breaking up and loosening the compact formation of the subsoil, we may increase five and probably tenfold its capacity to receive the rainfall in seasons of superabundance. Let us understand that the subsoil is the reservoir, from which the soil in time of drought derives the supply of moisture which sustains the growth of vegetation, then, as we increase the capacity of the reservoir, we protect the period during which our trees and crops cannot suffer from deprivation. The quantity of water the subsoil is capable of holding gauges the ability of the soil to prevent vegetation from famishing, hence when we double or quadruple the quantity it may contain as a reservoir, we in like proportion extend the period in which the needed supply will not be deficient.

Further we well know that by mulching with straw, hay or coarse manure, we can greatly check and retard the constant evaporation from the surface soil during the dry season, and thus enable it persistently to retain and furnish only as it is needed by vegetation the rations of moisture essential to a fair or vigorous growth. Again, by thorough cultivation, the complete pulverization of three or four inches of the surface soil, we can provide a mulch vastly superior to that of straw, etc., for it can rapidly absorb moisture when a damp breeze sweeps over it, and drink in the dews from nightfall until an hour or more after sunrise, day by day. Few of our most skillful horticulturists and farmers, in my opinion, fully realize the importance of shallow and constant cultivation, I mean of keeping the surface of their ground to the depth of two, three, or four inches, so thoroughly pulverized that its consistence is about the same as pure dry sand or wood ashes. When they understand and ever bear in mind that the rake in their gardens, and the cultivator and harrow in the fields and orchards, must be constantly used to break to atoms the crust formed by each rain, that the unremitted shallow stirring of barely the surface is the best possible means of preventing a rapid loss of moisture, which, if a drought occurs, must be supplied from the subsoil, then they will each season, as the heat of summer approaches, and while it continues, give the surface of their plantations such constant cultivation as will freely pulverize and mellow its constituent parts, and thereby they will insure great, yea, ample protection from droughts.

(To be continued next week.)

Strawberry Culture.

EDITOR KANSAS FARMER:—In response to Mr. Sproul's article on strawberry culture in your last issue, I want to say, first, that his method in the main is not new, as I published my method some six years ago in the KANSAS FARMER, and the culture the first year and the mulching for winter was the same as his, though in preparing the ground for planting I first opened a furrow a foot or more deep with a two-horse plow, then by reversing the dirt made a low ridge where the furrow was, thus making the loose dirt a foot or more deep. On this low ridge I set plants eighteen inches apart. I then made other rows in the same way eight feet apart; then planted a row of sweet corn between each two rows of strawberries. I used Charles Downing and Crescent Seedling plants, two rows of Crescent, then one of Downing, thus alternating through the patch.

I consider April the best time to plant here. I am careful to set the plants while the soil is fresh and moist. In cultivating I allow the dirt to cover the tips of the vines an inch or more deep. They soon throw up sets that do not readily dry out. By fall I aim to have the ground about level, if anything the plant bed the lowest, so that the water will run onto the plants instead of off. If the rows of cornstalks are allowed to stand between the rows the first winter, they will keep the wind from blowing the mulching off.

Mr. Sproul will find that it will not do to leave the mulching on his plants

after they begin to grow in the spring, as they will rot, and cut-worms will be worse on them. The mulching should be gently raked off and left between the rows. Then the pulling of the big weeds is all that will be needed till after the crop is picked; then mow the weeds thereafter as they appear above the plants. My patches thus treated have paid, clear of expenses, from one to five hundred dollars per acre. A new patch should be planted each year, as by this method the patch will be profitable only four to six years. C. BISHER.

Hutchinson, Kas.

The Poultry Yard.

Winter Layers.

In order to have an abundant supply of eggs in the winter season, the stock must be of the right kind. At this season eggs are scarce and dear, and how to secure them is something of interest to every poultry-keeper. We have said that the stock must be of the right kind. There can be no question that the breed of fowls kept has a very great influence on the result. Some varieties are very much more apt to lay in winter than others. These are the breeds which have the most abundant feathering, and hence as a rule the Asiatic varieties are more disposed to become good winter layers than those which have a thinner coating of feathers. The reason that fowls cease laying in cold weather is that the cold eliminates heat very rapidly, and the elements which at other seasons of the year go to the formation of eggs are required to provide for the constant and great expenditure of heat. In case of varieties that are well feathered the lesser exposure of the body makes the expenditure of heat a much slower process, and therefore they are able to lay much better than do thinner-clothed varieties where no special attention is given during the winter season (or any other season on small farms) to the fowls, as is frequently the case upon farms. If good winter layers are required they must be selected from the heavier breeds, such as the Brahmas, Langshans, Wyandottes, or Cochins. Very good winter layers may be produced by crossing between one of the heavier and one of the non-sitting varieties.

The next prerequisite in obtaining a good supply of eggs in the winter season, and one that is absolutely necessary, is an early hatch. No matter what the breed, they must be hatched early in order to lay in winter. This very important point cannot be remedied now, but preparation for next winter can be made now while at leisure. An early-hatched chicken will begin laying in October and continue until spring. They should be hatched as early as March or April. If delayed until May or June the probabilities are that there will be no eggs until the following spring.

The next consideration is necessarily that of housing, for upon this very much will depend. It is quite reasonable to conceive that the fowls might be all that could be wished, and yet from want of proper housing they would not produce a single egg during a winter. One thickness of a wooden building, the walls of which are but very little better than brown paper, so far as keeping out the cold is concerned, is not sufficient. To secure eggs the hens must be comfortably and warmly housed. Wooden houses should be much thicker in the material than they generally are. If, however, there are none other at hand they should be lined with tarred paper or straw matting, or what is better, make a *Homestead* poultry house, a description of which was given in our columns some time since.

Food must cut a figure in the production of eggs. The food is the material from which the eggs will be produced and unless it is supplied in the right nature and in sufficient quantities the desired end cannot be obtained. The hens should never be allowed to become too fat, as they will not lay if too fat. They should be encouraged to take exercise, as in that way the system is strengthened and the powers developed. —*Iowa Homestead.*

Of Interest to Poultrymen.

The American Poultry Association will meet at Indianapolis, January 18 to 25 1888, for the purpose of revising the "Standard of Excellence," a book which contains descriptions of all recognized varieties of land and water fowls, and which is the official guide for judging and scoring thoroughbred poultry all over the continent. As this book is revised but once in five years, the importance of such a meeting may be readily understood. All the leading fanciers of the United States and Canada, besides a number from England, are expected to be present. At the same time and place will be held the National Poultry Show. Reduced rates have been secured from railroads, express companies, and steamship lines, so every energetic breeder can be represented.

Premium lists of the show and further particulars may be obtained from the Secretary, Richard Twells, Montmorenci, Ind.

Poultry Notes.

Salicylic acid, when used in connection with garlic and assafœtida for the cure of gapes, should be in proportion of one drachm to a gallon of water.

The cold, damp weather is more damaging to poultry than the cold, dry days of winter. Hens do not like to be in the wind, and a covered scratching place should be provided for them.

Some fowls may possess more desirable qualities than others, but all have some, and the fowl with the fewest may have just the qualities which make it desirable to a limited circle of men.

Care must be had to have the hen house thoroughly cleaned, whitewashed, and the perches wet with kerosene before winter, and new nests for the laying hens put in; these should be in the same house where the fowls roost, but a separate place must be had for the sitting hens, to which they should be removed when they become broody.

As market fowls the Plymouth Rocks are unequaled, and, if not kept too fat, are splendid layers. The color of their bodies is a grayish white, with blue bars across each feather which should be even on all parts of the plumage. Both the cock and hen have medium-sized single combs, which should be straight, with regular serrations.

When your fowls make a wheezing noise when breathing, it is most probably bronchial affection, and should be given immediate attention and a cure will be generally effected. Give five drops dilute nitric acid and five drops dilute sulphuric acid with a little sugar in each pint of drinking water. This will generally bring the bird out all right with careful handling and feeding.

Decrease the number of varieties and you decrease the poultry interest. We cannot afford to do that. We wish to see the interest greater instead of less. The greater the interest the higher will it rank as an industry, the larger number of men will it draw into its ranks, the greater good it will accomplish. There is room for all. Like an omnibus, there is always room for one more among breeds and among breeders.

The tanning of kangaroo skins is an important industry at Newark, N. J., about 6,000 hides being received there from Australia every week. Much of the leather is shipped to London and Paris.

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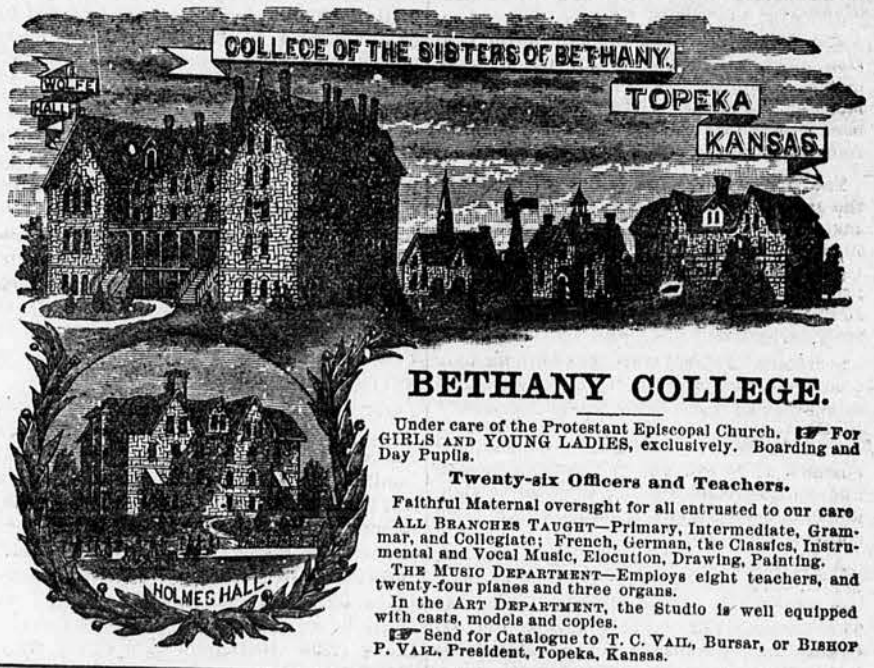

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CREAM OF A WEEK'S NEWS.

Daniel Manning, late Secretary of the Treasury, is dead.

An explosion of natural gas at Rochester, N. Y., destroyed several buildings.

John S. Barbour, of Virginia, is elected United States Senator to succeed Mr. Riddleberger.

A hurricane was reported as doing great damage among the shipping along the coast of Massachusetts.

Excursion passenger rates from Missouri river points to California have been fixed at $60 to $80, and $100 from Chicago.

Pennsylvania State Wool Growers Association met at New Castle and passed a resolution condemning the President's massage.

Employes of the Pittsburg & Erie railroad company have been systematically robbing trains, a little at a time, six months or more.

Coal handlers on the Reading railroad are on a strike because of the employment of a non-union crew in place of union men discharged.

The war feeling in Europe seems to grow. The placing of Russian troops along the frontier is offensive to Germany. An explanation was asked for but none was given.

A special says Congressman Guenther is preparing a bill which he will introduce in the House, calling for the appointment of a committee of three to investigate the Standard Oil monopoly.

The Chicago *Times* is sold to a company. A receiver has been appointed, the property transferred to him, and as soon as he gets the business in transferable condition, he is to sell to the company.

Value of goods imported into the United States during the last twelve months is almost $50,000,000 more than that of the imports for the same months for 1886; and our exports for the same months this year exceed those of last year about $25,000,000.

A statement has been prepared at the pension office which shows that the average length of military service of soldiers in the late war, who have in the last three months been granted invalid pensions, is two years, four months and thirteen days.

The *Northwestern Miller's* annual review of the milling industry in Minneapolis shows that the year's product of flour will be 6,616,700 barrels. The receipts of wheat for the twelve months of December have been 45,577,190 bushels; the shipments 12,337,700 bushels, against 32,832,020 and 4,729,750 bushels, respectively, last year.

Secretary (of the Treasury) Fairchild took official notice of the report that 2,000 Belgian miners are to be imported to take the places of the miners in the Lehigh region now on a strike. He sent telegrams to the collectors of customs at New York, Philadelphia, Boston and Baltimore, instructing them to be vigilant in preventing any violation of the alien contract labor law.

A Galveston (Texas) dispatch, dated December 22:—Freezing weather prevailed here all day, and the city is covered with a coat of ice. The freezing line extends beyond the Rio Grande some distance in Mexico. Dispatches to the *News* show that very cold weather prevails throughout all the great cattle distticts of Texas. Reports of suffering by exposed cattle are being received. A heavy sleet is falling here to-night.

The Titusville (Pa.) *Herald*, of the 20th says: There is no doubt any longer that the shutdown movement of the petroleum producers is already, and will continue to be a success, as comtemplated, namely: For one year which began on November 1. Several wealthy producers, who held aloof from it, have at last succumbed to the pressure of public opinion as well as their own interest, and agreed to join. Professional drillers have nearly all been induced to join, and agreed not to do any drilling whatever, and to be paid for remaining idle out of the funds of the Producers' association. This will make every person connected with production business interested in the success of the shut down. It is calculated that in consequence of the movement, as well as on account of the exhaustion of the best white sand territory, the total production by the first of April next will be but little if any over 35,000 barrels per day. The Standard Oil Company has joined the producers in this movement in order to use up their tanked oil. Upon the whole this is no doubt the strongest and best organized commercial movement ever inaugurated.

The Secretary of the Treasury transmitted to Congress estimates to meet the deficiencies in the expenditures of the various departments of the government for the fiscal year ended June 30, 1887, and prior years, amounting to $5,580,978. He also submits an estimate of $3,078,044 to cover the urgent demands upon the government for the fiscal year ending June 30, 1888, and a schedule of claims amounting to $383,703 allowed by the sixth Auditor on account of compensation of postmasters under the readjustment act of 1883.

It is announced at El Paso, Tex.. that the Mexican government has granted extraordinary concessions to real estate companies, to induce immigration to eleven states of Mexico. The company has obtained title to 55,000,000 acres in Chihuahua, Sinaloa, Durango, Coahuila, Zacatecas, Juan, Tamaulipas, Vera Cruz, Michavon, Jalisco and Guerrero, and propose to establish agencies in all the large cities of Europe and America. The government has granted exemption from taxation and duties to all settlers on those tracts, and insures proper protection.

Gossip About Stock.

J. M. Browning, of Perry, Ill., who has a swine ad. in this paper reports large inquiry. and informs us that he will dispose of a number of fine young boars at a bargain. Write him.

The seventh annual catalogue from that well-known and extensive draft horse breeder, John C. Huston, of Blandinsville, Ill., has been received and contains the largest and best lot ever offered. Mr. Huston bears a first class reputation among draft horse buyers.

I. L. Whipple, breeder of Poland-China and Duroc-Jersey swine, at Ottawa, Kas., renews his ad. for 1888, and states that he is having a good trade, having sold nineteen head of hogs last week, in all fifty sales during the last three weeks. He has on hand now one hundred head of choice males and females for ready sale.

The KANSAS FARMER is in receipt of the annual catalogue of Messrs. Smith, Powell & Lamb, of Syracuse, N. Y. It is one of the finest and the most complete catalogue of Holstein-Friesian cattle ever received by us. It should be in the hands of every breeder who desires the genuine first class animals of this valuable breed.

Dr. H. H. Miller, of Rossville, Kas., writes that he wishes to dispose of a No. 1 male hog weighing about 200 pounds, sired by Blackfoot, 2261, O. P. C. R., dam Attractive, 4514, O. P. C. R.; also the boar Roy, 160 pounds, sired by Blackfoot; also The Czar, farrowed April 14, 1886, a fine breeder, as can be seen by his get. He was sired by Corn King, 6873, dam I. X. L. 9th. Any of our breeders who desire a representative Poland-China male will do well to write or call on Dr. Miller, at Rossville, Kas.

Our advertiser, M. D. Covell, Wellington, Kas., has purchased a perfect Percheron horse, and bred in direct line from the best family of Percheron horses in the world of this time. His name, Theophile, 2795 (3746) imported by M. W. Dunham, of Illinois, and got by his celebrated Brilliant, 1271 (755), he by Brilliant, 1899 (756), he by Coco II, he by Vieux Chaslin (713), he by Coco (712), he by Mignon (715), he by Jean le Blanc (739). Brilliant's dam Favori (711), out of Aline by Coco (712), running back in the same royal line. Theophile's dam by French Monarch, 205 (834). In Theophile is concentrated through different lines the blood of the most noted stallions of Perche—directly to Jean le Blanc of world wide celebrity, and in him the blood of the famous Arab Gallipoli.

Rheumatism

Is undoubtedly caused by lactic acid in the blood. This acid attacks the fibrous tissues and causes the pains and aches in the back, shoulders, knees, ankles, hips, and wrists. Thousands of people have found in Hood's Sarsaparilla a positive cure for rheumatism. This medicine, by its purifying action, neutralizes the acidity of the blood, and also builds up and strengthens the whole body.

☞ Do you know of any young people who want to teach next year? If so, have them send for circulars of the Normal Department of Campbell University.

The Normal Department of Campbell University, Holton, Kas., admits students any week of the year. Young people who want to teach next year can be well prepared by July 26 by entering this winter.

If you have chapped hands or rough skin, use Stewart's Healing Cream. Only 15 cents a bottle. Gentlemen who suffer from a tender face after shaving are delighted with it. We only ask a trial. Stewart Healing Powder Co., St. Louis.

THE MARKETS.

By Telegraph, December 26, 1887.

Monday, December 26, was observed in most cities as Christmas; hence market reports are not extended.

LIVE STOCK MARKETS.

Chicago.

The Drovers' Journal reports:

CATTLE—Receipts 4,000, shipments 3,000. Slow, and 10a15c lower. Shipping steers, $3 60a 5 00; stockers and feeders, $1 75a3 20; cows, bulls and mixed, $1 25a2 85; Texas cattle, $1 75a 3 10.

HOGS—Receipts 16,000, shipments 6,000. Slow and 10c lower. Mixed, $4 25a5 45; light, $4 80a 5 20; skips, $3 00a4 65.

SHEEP—Receipts 1,000, shipments 1,000. Strong. Common to good natives, $2 20a5 00, Western, $3 50a4 00; Texans, $2 50a3 50; lambs, $4 50a6 00.

PRODUCE MARKETS.

Kansas City.

WHEAT—There was a strong market on 'change. On the call No. 2 soft was nominal, except May, which sold at 82c against 81½c bid yesterday No. 2 red winter, none on the market. On track by sample: No. 2 soft, cash, 78c.

CORN—Receipts at regular elevators since last report, 6,492 bushels; withdrawals, ... bushels, leaving stock in store as reported to the Board of Trade to-day, 52,856 bushels. On track by sample: No. 2 cash, 45c.

OATS—On track by sample: No. 2 mixed, cash, 29½c; No. 2 white, cash, 31c.

RYE—No. 2 cash, no bids nor offerings.

HAY—Receipts 18 cars. Strictly fancy is firm at $9 50 for small baled; large baled, $9 00; wire-bound 50c less.

OIL-CAKE—Per 100 lbs. sacked, f. o. b., $1 25; $11 00 per 1,000 lbs.; $20 00 per ton; car lots, $19 00 per ton.

SEEDS—We quote: Flaxseed, $1 05 per bu. on a basis of pure; castor beans, $1 00 for prime.

Topeka Markets.

PRODUCE AND PROVISIONS—Corrected weekly by W. W. Manspeaker & Co., 711 Kansas avenue. (Wholesale price).

Butter, per lb	$	18a 20
Eggs (fresh) per doz		19a 20
Beans, white navy, H. P.	per bus	2 50
Sweet potatoes	" "	50a
Apples	" "	75a1 00
Potatoes	" "	60a
Onions	" "	1 00a1 25
Beets	" "	40a
Turnips	" "	25a
Tomatoes	" "	50a
Cabbage	per doz	30a 40
Pumpkins	" "	75a
Squash	" "	60a1 00

HIDES AND TALLOW—Quotations furnished weekly by Smith, Biggs & Co., 228 Kansas avenue—opposite Shawnee Mills. HIDES—Lower. Green, No. 1, 5½c; damaged, 3½c. Dry, No. 1, 8c; damaged, 6c. Green bulls, 2½c per lb. SHEEP PELTS—Green, 25a75c each; dry, 5a7c per lb. TALLOW—No. 1, 3c; No. 2, 2c. Tainted, grubby, No. 1 branded, badly scarred, scored and murrain hides, also all light hides of 25 lbs. and under, shall be classed as damaged, unless they are very badly damaged, when they shall be classed as glue stock. A grubby hide is a hide having one or more grubs. All No. 2 or damaged hides are bought at 2c per lb. less than No. 1.

☞ Do you know of any young people who want to teach next year? If so, have them send for circulars of the Normal Department of Campbell University.

Farm Loans.

Loans on farms in eastern Kansas, at moderate rate of interest, and no commission. Where title is perfect and security satisfactory no person has ever had to wait a day for money. Special low rates on large loans. Purchase money mortgages bought.

T. E. BOWMAN & CO.,
Jones Building, 116 West Sixth street, Topeka, Kas.

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BAKING POWDER

Absolutely Pure.

This powder never varies. A marvel of purity, strength and wholesomeness. More economical than the ordinary kinds, and cannot be sold in competition with the multitude of low-test, short-weight alum or phosphate powders. *Sold only in cans.* ROYAL BAKING POWDER CO., 106 Wall street, New York.

For Sale, to Prevent In-Breeding.

Emma's Mohegan, A. J. C. C., Register No. 14668.

DROPPED MARCH, 1885.

Special Attention is Called to the Following Records:

NANCY LEE, { HIS GREAT GRAND DAM, tested 26 lbs. 2½ oz. Butter in seven days; 95 lbs. 3½ oz. Butter in thirty-one days, unsalted, when three months in calf.

LIZZIE C, { HIS GREAT DAM, tested 14 lbs. Butter in seven days.

EMMA RINGLING, { HIS DAM, tested 15 lbs. Butter in seven days.

For full information address GLENDALE FARM, P. O. Box 141, KIRKWOOD, MO.

PRICE $100.

J. E. BONEBRAKE, Pres't.
THEO. MOSHER, Treasurer.

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M. P. ABBOTT, Secretary.

Kansas Farmers' Fire Insurance Company,

—OF—

ABILENE, : : : KANSAS

Insures Farm Property, Live Stock and Detached Dwellings

Against Fire, Tornadoes, Cyclones and Wind Storms.

CAPITAL, FULL PAID, : : : : : $50,000.

The last report of the Insurance Department of this State shows the *KANSAS FARMERS' FIRE INSURANCE COMPANY* has more assets for every one hundred dollars at risk than any other company doing business in this State, viz.:

The *Kansas Farmers'* has $1.00 to pay $18.00 at risk; the Home, of New York, $1.00 to pay $46.00; the Continental, of New York, $1.00 to pay $50.00; the German, of Freeport, Ill., $1.00 to pay $70.00, the Burlington of Iowa, $1.00 to pay $75.00, and the State of Iowa has $1.00 to pay $79.00 at risk.

EMPORIA BUSINESS COLLEGE

—EMPORIA KANSAS.—

PROF. O. W. MILLER, : : PRESIDENT.

THE STRAY LIST.

HOW TO POST A STRAY.

TH FEES, FINES AND PENALTIES FOR NOT POSTING.

BY AN ACT of the Legislature, approved February 27, 1866, section 1, when the appraised value of a stray or strays exceeds ten doll rs, the County Clerk is required, within ten days after receiving a certified description and appraisement, to forward by mail, notice containing a complete description of said strays, the day on which they were taken up, their appraised value, and the name and residence of the taker-up, to the KANSAS FARMER, together with the sum of fifty cents for each animal contained in said notice.

And such notice shall be published in the FARMER in three successive issues of the paper. It is made the duty of the proprietors of the KANSAS FARMER to send the paper, *free of cost*, to every County Clerk in the State, to be kept on file in his office for the inspection of all persons interested in strays. A penalty of from $5.00 to $50.00 is affixed to any failure of a Justice of the Peace, a County Clerk, or the proprietors of the FARMER for a violation of this law.

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

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

No persons, except citizens and householders, can take up a stray.

If an animal liable to be taken up, shall come upon the premises of any person, and he fails for ten days, after being notified in writing of the fact, any other citizen and householder may take up the same.

Any person taking up an estray, must immediately advertise the same by posting three written notices in as many places in the township giving a correct description of such stray, and he must at the same time deliver a copy of said notice to the County Clerk of his county, who shall post the same on a bill-board in his office thirty days.

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

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

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

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

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

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

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

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

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

FOR WEEK ENDING DEC. 15, 1887.

Coffey county—H. B. Cheney, clerk.

COLT—Taken up by J. H. Burguer, in Pleasant tp., November 19, 1887, one bay mare colt, 13 hands high, some white on both hind feet and right front foot, star in forehead, 1 year old; valued at $20.

COLT—By same, one 2-year-old mare colt, 15 hands high, black, branded F on right shoulder; valued at $30.

COLT—By same, one dark brown mare colt, about 15 hands high, 2 years old, both hind feet white and left fore foot white, white spot in forehead; valued at $35.

MARE—By Fred Stone, in Burlington tp., November 22, 1887, one bay mare, about 15 hands high, no marks or brands, 3 years old; valued at $50.

FILLY—By W. H. Dinsmore, in Neosho tp., November 21, 1887, one 2-year-old filly, bay, black mane and tail, star in forehead, no marks or brands; valued at $75.

MARE—By Alex Lyle, in Ottumwa tp., November 14, 1887, one sorrel mare, 15 years old, pigeon-toed in front, no marks or brands visible; valued at $30.

STEER—By T. O. Mitchell, in Liberty tp., one 2-year old red steer, no visible marks or brands; valued at $14.

COW—By C. M. Stout, in Liberty tp., one red and white spotted 3-year-old cow, right ear cropped; valued at $16.

Lyon county—Roland Lakin, clerk.

STEER—Taken up by Geo. W. Lester, in Agnes City tp., November 21, 1887, one 2-year-old steer, red and white, no marks; valued at $20.

COW—By Mrs. M. E. Marshall, in Elmendaro tp., November 12, 1887, one 5-year-old red and white spotted cow; valued at $12.50.

MARE—By J. D. Lee, in Americus tp., December 10, 1887, one 3-year-old brown mare, hipped in right hip, unknown brand on left shoulder; valued at $30.

Linn county—Thos. D. Cottle, clerk.

STEER—Taken up by A. J. Stanley, in Centerville tp., November 11, 1887, one red steer, star in forehead, 1 year old; valued at $14.

STEER—By same, one red and white spotted 1-year-old steer; valued at $12

HEIFER—By David Manlove, in Lincoln tp., November 19, 1887, one light red heifer with white spot on hind quarters, large white spot in forehead, bush of tail white, 3 years old; valued at $15.

Leavenworth county—J. W. Niehaus, clerk.

HORSE—Taken up by Thomas Highfield, (P. O. Easton), November 24, 1887, one dark brown horse, 12 years old, star in forehead, stove-up in shoulders, smooth shoes in front; valued at $25.

STEER—By R. R. Crane, (P. O. Easton), November 23, 1887, one red yearling steer, small white spot on left hind leg, swallow-fork in right ear; valued at $15.

Gray county—Geo. B. Antrim, clerk.

PONY—Taken up by Ed. Ryan, (P. O. Lone Lake), October 28, 1887, one bay horse pony, R on left shoulder and hip, 4 on right shoulder, W on right hip; valued at $20.

PONY—By same, one bay horse pony, blaze in face, four white feet; valued at $20.

Jefferson county—E. L. Worswick, clerk.

COW—One fair-sized red cow, left horn off; valued at $15.

STAG—One good-sized pale red stag, two unintelligible brands; valued at $15.

Nemaha county—R. S. Robbins, clerk.

HEIFER—Taken up by Oliver Wilkinson, in Gilman tp., (P. O. Oneida), November 9, 1887, one 2-year-old white and black heifer; valued at $15.

Brown county—G. I. Prewitt, clerk.

FILLY—Taken up by W. M. Gilmore, in Powhatan tp., one 2-year-old iron-gray filley, no marks or brands visible; valued at $35.

PONY—By same, one dun stud pony, 2 years old, no marks or brands visible; valued at $20.

Republic county—H. O. Studley, clerk.

STEER—Taken up by S. M. McBride, in Jefferson tp., October 18, 1887, one medium-size 2-year-old red steer, white feet, white face, flanks and dewlap, white stripe on left shoulder and small white spot on rump, no other marks or brands; valued at $18.

Wabaunsee county — G. W. French, clerk.

HEIFER—Taken up by Wilhelm Hemer, in Washington tp., November 11, 1887, one red and white spotted heifer, white in face, under-bit in right ear, about 18 months old, medium size; valued at $12.

HEIFER—By P. S. Taylor, in Minion Creek tp., November 24, 1887, one red heifer, some white on tail, legs and belly, small white spot on forehead, 3 years old; valued at $16.

STEER—By same, one red steer, some white on belly and tail, ear marks in each ear, 1 year old, S. D. on left hip; valued at $11.

MARE—By Franklin Adams, in Maple Hill tp., (P.O. Maple Hill), November 21, 1887, one bay mare, 3 years old, no marks or brands; valued at $18.

STALLION—By same, one gray 2-year-old stallion, light-colored face, no marks or brands; valued at $20.

Garfield county—C. Van Patten, clerk.

HORSE—Taken up by C. A. Ellis, in Essex tp., one sorrel horse, 12 years old, five feet five inches high, blind in left eye, collar marks on shoulder; valued at $30.

Wallace county—I. F. Teeters, clerk.

HORSE—Taken up by Thos. B. Rhoades, (P. O. Wallace, December 1, 1887, one black horse, no brand; valued at $50.

HORSE—By same, one black horse, no brand; valued at $50.

Pottawatomie county—I. W. Zimmerman, clk.

COW—Taken up by George Schatz, in Wamego tp., November 9, 1887, one red and white cow, about 4 years old; valued at $14.

COW—By Philip Immenschub, in Pottawatomie tp., November 1, 1887, one red and white spotted cow, line back, white on belly and tail, small white spot in forehead, drooping horns, dim brand on both hips; valued as $16.

HEIFER—By Geo. B. Williams, November 12, 1887, one 3-year-old heifer, white with red neck and head and legs as far up as the knees, a portion of tail off; valued at $16.

MARE—By J. H. Haid, in Pottawatomie tp., November 1, 1887, one Texas mare, supposed to be 3 years old, bay-roan, Mexican brand on right leg back of flank; valued at $15.

Harvey county—John C. Johnston, clerk.

COW—Taken up by John I. Davis, (P. O. Halstead), September 19, 1887, one brindle cow, 4 or 5 years old, horns sawed off; valued at $15.

Mitchell county—A. D. Moon, clerk.

PONY—Taken up by Major Porter, (P. O. Simpson), one bay pony mare, 7 years old, double anchor brand on left hip, white under lip, hind feet white, blaze in face, small split in right ear.

Bourbon county—E. J. Chapin, clerk.

STEER—Taken up by J. B. Dark, in Scott tp., one red steer, 3 years old, branded H on left hip, white spot on the inside of each hind leg and white between fore legs, horns thick; valued at $25.

HEIFER—By same, one red 2-year-old heifer, a little white under belly, horns inclined forward, cut in dewlap, marked with under-bit in each ear; valued at $14.

HEIFER—By A. S. Mason, in Walnut tp., one dark red heifer with white spot in forehead and white spot on side, 2 years old; valued at $12.

STEER—By A Payne, of Walnut tp., one dark red steer, 2 years old, no marks or brands; valued at $20.

Wyandotte county—Wm. E. Connelley, clk.

MARE—Taken up by H. J. Matney, in Shawnee tp., November 3, 1887, one gray mare, about 15 hands high, 11 years old, weight about 900 pounds, no marks or brands.

MARE—By same, one dark brown mare, about 15 hands high, 4 years old, weight about 850 pounds, no marks or brands.

Butler county—James Fisher, clerk.

HORSE—Taken up by J. C. Becker, in El Dorado tp., November 26, 1887, one roan horse, 7 years old, 15½ hands high, no marks or brands.

MARE—By same, one dark sorrel mare, 12 years old, 15 hands high, no marks or brands.

FOR WEEK ENDING DEC. 22, 1887.

Chase county—J. J. Massey, clerk.

STEER—Taken up by Burdett Hamliton, in Cottonwood tp. (P. O. Cedar Point), November 26, one red and white 1-year-old steer, end of right ear cut off; valued at $12.

STEER—By H. A. Riggs, in Cottonwood tp., November 25, one roan steer, 2 years old, branded U on right hip and circle on left hip; valued at $15.

STEER—By W. H. Cox, in Bazaar tp., (P. O. Matfield Green), November 28, one 2-year-old red and white spotted steer, branded ⌃ or T on left hip; valued at $18.

STEER—By J. T. Pratt, in Diamond Creek tp., (P. O. Elmdale), November 30, 1887, one red 1-year-old steer, three white feet and star in forehead; valued at $15.

COW—By Robt. Cuthbert, in Falls tp., (P. O. Cottonwood Falls), November 22, one red and white cow, 6 years old, branded C on left hip, under-bit out of right ear; valued at $15.

STEER—By D. J. Whitten, in Bazaar tp., (P. O. Bazaar), November 21, one red 1-year-old steer, dim brand on left hip; valued at $12.

MARE AND COLT—By L. R. Bailey, in Toledo tp., (P. O. Toledo), December 2, one sorrel mare, 10 years old, collar and saddle marks, star in forehead of each; valued at $20.

Woodson county—I. M. Jewett, clerk.

MULE—Taken up by A. J. Lynn, in Belmont tp., October 22, one dark bay mule, about 3 years old, 13 hands high, harness marks.

MULE—By same, one brown horse mule, about 4 years old, 12 hands high, harness marks.

STEER—By John L. Brown, in Liberty tp., November 2, one light roan steer, 2 years old, slit in brisket.

HEIFER—By John Lind, in Everett tp., November 25, one red heifer, 2 years old, no marks or brands.

STEER—By Henry Neiman, in Toronto tp., December 3, one red and white steer, 2 years old, branded on left hip.

Chautauqua county — A. C. Hilligoss, clerk.

PONY—By J. H. Sams, in Belleville tp., (P.O. Peru), November 17, one dark bay pony, 13 or 14 years old, white strip in face, left hind foot and ankle white, right hind foot white, spot just above hoof, left fore foot white, collar marks on top of neck, saddle marks, about 14 hands high; valued at $15.

STEER—By D. F. Davis, in Summit tp., (P. O. Rogers), December 1, one yearling steer, pale red, with some white, indistinct brand on right hip; valued at $12.

Wabaunsee county—G. W. French, clerk.

HEIFER—Taken up by L. T. Rice, in Mill Creek tp., December 2, one red-roan heifer, coming 2 years old, with short horns, branded J on right hip and 7 on right side; valued at $10.

HEIFER—By W. H. Marvin, in Wilmington tp., November 1, one roan heifer, 1 year old, no marks or brands; valued at $10.

HEIFER—By same, one red heifer, no marks or brands; valued at $10.

COW—By Alexander Levitt, in Newbury tp., November 26, one small red and white cow, no marks; valued at $18.

Greenwood county—J. W. Kenner, clerk.

STEER—Taken up by J. M. Cochran, in Fall River tp., December 5, one red and white spotted yearling steer, crop and slit in right ear and crop off left ear; valued at $12.

STEER—By Geo. R. Uhl, in Madison tp., November 28, one red and white spotted steer, 2 years old, notches out of both ears; valued at $18.

MARE—By Albert Thompson, in Madison tp., November 19, one sorrel mare colt, 2 years old, small strip of white in forehead; valued at $20.

STEER—By B. Z. Bentley, in Madison tp., November 19, one red and white spotted steer, 2 years old, branded with splotch brand on right hip; valued at $18.

Lyon county—Roland Lakin, clerk.

STEER—Taken up by H. Littler, in Center tp., one red and white 2-year-old steer, notch in right ear; valued at $18.

STEER—By Chas. Cowan, in Center tp., one 2-year-old red steer, slit in right ear and underbit in left; valued at $18.

STEER—By E. E. Watkins, in Center tp., one yearling steer, red with white spot in forehead, no marks or brands; valued at $11.

COW—By L. W. Ostrom, in Center tp., one bright red cow, 4 years old, no marks or brands; valued at $17.50.

STEER—By J. M. Quakenbush, in Center tp., one roan 2-year-old steer, blurred brand on left hip and under-bit in each ear; valued at $20.

MARE—By W. S. Gowgill, in Fremont tp., December 3, one iron-gray 3-year-old mare, slit in right ear; valued at $25.

Ellis county—Henry Oshant, clerk.

COW—By Elijah Smiley, in Lookout tp., November 1, one red and white cow, small under-bit in each ear, branded G on left hip; valued at $20.

Kiowa county— ——, clerk.

PONY—Taken up by J. H. Alderdice, in Kiowa tp., one bay mare pony, 6 years old, branded G on left jaw, M on left shoulder and hip: valued at $35.

Bourbon county—E. J. Chapin, clerk.

STEER—Taken up by E. McQues, in Marion tp., one red and white spotted 2-year-old steer, no marks or brands; valued at $17.

Anderson county—A. D. McFadden, clerk

STEER—Taken up by J. P. Bailey, in Weld tp., December 9, one dark red 2-year-old steer, no marks or brands; valued at $18.

Pratt county—Demcy Lewis, clerk.

HORSE — Taken up by G. B. Peauterbaugh, in Springvale tp., October 25, one gray horse, 15½ hands high, flea-bitten; valued at $15.

Cloud county—L. N. Houston, clerk.

PONY—Taken up by W. F. Gleason, in Sibley tp., November 25, one mare pony, white collar marks, indistinct brand on left hip, 5 years old, weighs 700 pounds; valued at $25.

Cherokee county—L. R. McNutt, clerk.

STEER—Taken up by J. W. Cool, in Lyon tp., November 26, one spotted brindle and white steer, no marks or brands, 1 year old; valued at $12.

Douglas county—M. D. Greenlee, clerk.

HEIFER—Taken up by Robert B. Hill, in Eudora tp., December 1, one red heifer with white spots, slit in under side of left ear; valued at $12.50.

FOR WEEK ENDING DEC. 29, 1887.

Greenwood county—J. W. Kenner, clerk.

STEER—Taken up by John Pegram, in Lane tp., November 5, one red yearling steer, four white feet and white on belly, bush of tail and face white, no marks or brands; valued at $12.

STEER—By Robert Wiggins, in Bachelor tp., November 8, one red yearling steer, no marks or brands; valued at $15.

STEER—By same, one white yearling steer, no marks or brands; valued at $15.

STEER—By C. E. Freeman, in Janesville tp., December 23, one 2-year-old red steer with white spots and white hind legs.

STEER—By same, one 2-year-old steer of a light roan color, tips of both ears cut off, no distinct brand.

Brown county—G. I. Prewitt, clerk.

STEER—By J. W. Gordon, in Mission tp., December 6, one white and red steer, 2 years old, no marks or brands visible; valued at $25.

Kingman county—J. J. Stevens, clerk.

HEIFER—By David Gillispie, in Ninnescah tp., December 1, one spotted roan heifer, no marks or brands; valued at $16.

Decatur county—R. W. Finley, clerk.

HORSE—By J. N. Patton, in Cook tp., one gray horse, 10 years old, weight 1,100 pounds, no brands; valued at $40.

Atchison county—Chas. H. Krebs, clerk.

MULE—By John Sauer, in Kapioma tp., (Arrington P. O.), November 12, one bay mare mule, 1 year old, large size; valued at $60.

STEER—By J. D. Armstrong, in Grasshopper tp., (P. O. Effingham), December 12, one dark red steer, white spots on belly, about 2 years old; valued at $15.

Johnson county—Henry V. Chase, clerk.

HORSE—By T. L. Horner, in Shawnee tp., one black horse, about 9 years old, 15½ hands high, three white feet, saddle and collar marks, star in forehead; valued at $40.

HORSE—By same, one chestnut sorrel horse, four white feet, blaze face, right hip down, knee enlarged, 15½ hands high, 15 years old, saddle and collar marks; valued at $15.

Cherokee county—L. R. McNutt, clerk.

COLT — By G. R. King, of Spring Valley tp., one 2-year-old light bay mare colt; valued at $50.

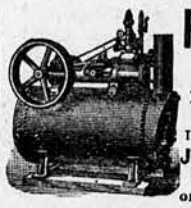
COLT—By same, one 1-year-old dark bay horse colt; valued at $35.

Ellis county—Henry Oshant, clerk.

COW—Taken up by C. A. Mayhew, in Logan tp., December 1, one red cow, 4 years old, no other marks or brands; valued at $15.

Labette county—W. W. Cook, clerk.

STEER—By J. S. Wimmer, in Elm Grove tp., December 5, one red 1-year-old steer, two mingled red and white spots on left side; valued at $12.



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THE SEMI-WEEKLY in any of these COMBINATIONS is $1.50 MORE than THE WEEKLY.

Do not forget that **IN 1888 A PRESIDENT WILL BE ELECTED**, and events of great importance are portending in Europe. At such times every family should have a thoroughly **reliable newspaper**. The fathers and mothers need it as well as the children. Send for sample copy of **THE INTER OCEAN**.

Remittances may be made at our risk, either by draft, express, postoffice order, express orders, postal notes, or registered letter. Address

THE INTER OCEAN, Chicago

The Veterinarian.

[The paragraphs in this department are gathered from our exchanges.—ED. FARMER.]

SPAVIN.—I have a fine standard-bred yearling trotting colt. He has a slight enlargement on his hind leg on the inside opposite his hock. It does not make him lame, but I am afraid it will. Can you tell me what to do? [Your colt has a spavin. Take it in time and you may remedy it. Use caustic balsam, half olive oil, so as not to blemish, and apply every evening to the spavin.]

HEAVES.—I have a fine driving horse that seems to be distressed for breath when he first goes out of the barn, but after he has traveled awhile and gets warm he breates easier. What is the difficulty? [Your horse has the heaves. He is incurable. Can be helped by feeding properly. Give him but little hay, and let that be alfalfa. When starting from the stable drive slow until he has cleared his wind-pipe, and do not check him high.]

BRONCHITIS.—I would like to know what is the matter with one of our fat steers. I found him standing by himself with his head dropped low, and he continued so for two days; then he commenced to froth at the mouth, with bloody water running from the nostrils, appeared to be in great misery and wouldn't lie down; eats but little. He has been sick four days. What ails him, and what is the cure? [Your steer is either affected with bronchitis or pneumonia, and the probability is that by the time this reaches you he will be either dead or convalescent. Keep indoors and steam the head with bran placed in a bag. Give mashes and plenty of cold water to drink.]

BONE SPAVIN.—A mare I have has spavin in both legs and is lame. Is with foal. It s bone and bog spavin. Would you advise to fire or blister it, or either? If so, what kind of instruments and what kind of blister would you use? Would it affect the foal? If so, in what way? [It is impossible for a non-professional to deal with a case of this kind. We would not advise you to interfere with the limbs till after the mare foals and the colt is weaned. It will be then necessary to allow the mare to go barren for a year and have her fired and blistered by a competent veterinary surgeon. Such a mare should not be bred from, as she will transmit the affection to her colt.]

SPLIT HOOF.—[(1) My colt has a split hoof—the left hind one—The crack commences at the toe in the middle of the hoof and goes up to within one inch of the hoof; the colt will be 1 year old this spring. (2.) The dam of the colt is 10 years old, she seems to be stiff in the shoulders, and when she pulls she turns her head out from the other horse with her nose as near straight out sideways as she can get it, and keeps her mouth open and nose drawn up. She has good appetite and is in fair condition. [(1) If the colt is not lame, pay no attention to the split, it will disappear as he grows older. (2) We would be inclined to think that the position taken by your mare in pulling is more a matter of habit than an evidence of disease in the shoulders. Make sure that the collar properly fits the mare.]

Cottonseed, economically fed, would furnish abundance of muscle to work every acre of the cotton crop. It might be used with hay, corn-fodder, rye, oat, wheat, or pea straw. Ten pounds of well-prepared cottonseed meal, with fifteen pounds of straw or corn-fodder, would make an excellent daily ration for an ordinary horse or mule. This, however, should be changed occasionally for other grain, so as to give a variety of food.

The corn that will keep best for seed is that which has cured well on the stalk and been hung in a dry place.

Sheep sometimes get sore feet by being pastured on grounds which have been burnt over. The alkali in the ashes causes the trouble.

Stewart's Healing Cream, for chapped hands, face, or gentlemen to use after shaving. The cheapest and best article for the purpose in the world. Please try it. Only 15 cents a bottle at drug stores.

Fine manure for crops is more valuable than coarse. Hens can break up manure better, perhaps, than any one of the machines invented for the purpose. Scatter some wheat over the pile and turn them on.

Consumption Surely Cured.

TO THE EDITOR:—Please inform your readers that I have a positive remedy for the above named disease. By its timely use thousands of hopeless cases have been permanently cured. I shall be glad to send two bottles of my remedy FREE to any of your readers who have consumption if they will send me their Express and P. O. Address. Respectfully, T. A. Slocum, M. C., 181 Pearl St., New York.

Sheep, like other animals, are sometimes troubled with intestinal worms. It is difficult to describe the symptoms so that a layman would know them, they are so very similar to those of some other diseases. It is better to keep watch of the excrement, if worms are suspected, where, if they exist, they will likely be found. A good vermifuge is linseed oil, two ounces, and oil of turpentine, half ounce, mixed in five gallons of water. Give a pint twice a week.

Consumption Cured.

An old physician, retired from practice, having had placed in his hands by an East India missionary the formula of a simple vegetable remedy for the speedy and permanent cure of Consumption, Bronchitis, Catarrh, Asthma and all throat and Lung Affections, also a positive and radical cure for Nervous Debility and all Nervous Complaints, after having tested its wonderful curative powers in thousands of cases, has felt it his duty to make it known to his suffering fellows. Actuated by this motive and a desire to relieve human suffering, I will send free of charge, to all who desire it, this recipe, in German, French or English, with full directions for preparing and using. Sent by mail, by addressing with stamp, naming this paper, W. A. NOYES, *149 Power's Block, Rochester, N. Y.*

Maple Grove Duroc-Jerseys.

We use only the choicest animals of the most approved pedigree, hence our herd is bred to a very high state of perfection. Pigs in pairs not akin. Stock of all ages and sows bred for sale at all seasons. Prices reasonable and quality of stock second to none.

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[Mention KANSAS FARMER.]

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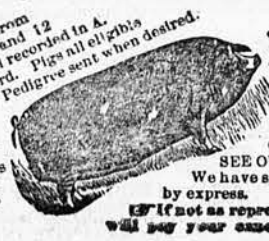

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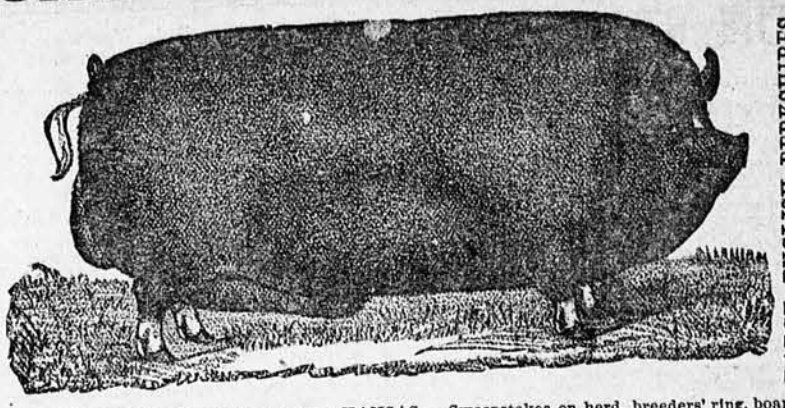
Swine Journal 25 Cents in 1 & 2-ct. stamps

COME AND SEE OUR STOCK. We have special rates by express. If not as represented we will pay your expenses.

ROME PARK STOCK FARM.

PURE-BRED POLAND-CHINAS. LARGE ENGLISH BERKSHIRES.



T. A. HUBBARD, PROP'R, WELLINGTON, KANSAS.—Sweepstakes on herd, breeders' ring, boar and sow, wherever shown in 1886, except on boar at Winfield, winning (75) premiums at four fairs, including *Grand Silver Medal for Best Herd, at Topeka.* Stock recorded in Ohio Poland-China and American Berkshire Records. In addition to my own breeding, the animals of this herd are now and have been prize-winners, selected from the notable and reliable herds of the United States, without regard to price. The **best and largest herd in the State.** I will furnish first-class hogs or pigs *with individual merit* and a *gilt-edged pedigree.* Single rates by express. Personal inspection solicited. Correspondence invited.

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Choice Spring, Summer and Fall Pigs of both sexes, for sale in pairs or trios not akin. All breeders recorded in A. P.-C. Record.

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Gold Dust Herd of Poland-Chinas.

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[Mention KANSAS FARMER.]

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—OF—

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J. J. & S. W. RENFRO, Collinsville, Illinois.

The prize-winning boar Champion 4565 stands at head of herd, assisted by Model Duke 77397, winner of first prize in his class at great St. Louis fair, 1887. Have for sale some choice young sows that will be bred to the above boars in December and January, or sooner if parties desire. Also first-class pigs of both sexes, from one to four months old.

☞ We are also breeding COTSWOLD SHEEP and LIGHT BRAHMA CHICKENS (Felch strain).

Parties desiring to purchase thoroughbred stock will find it to their interest to correspond with us before purchasing elsewhere. [Mention Farmer.]

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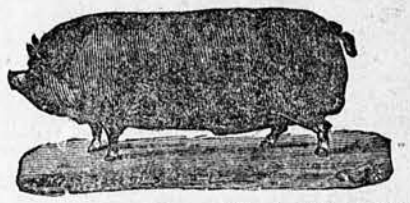

Headed by GOLDEN CROWN 14823, A. B. R. CHOICE PIGS FOR SALE, either sex. Everything as represented. Write me, and please mention this paper.

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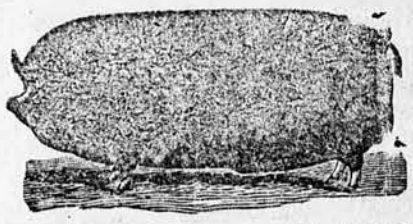

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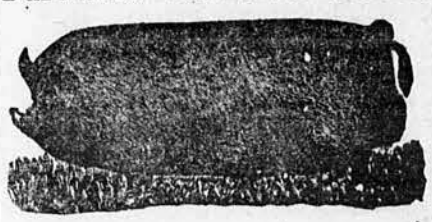

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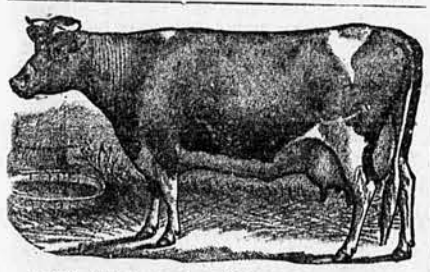

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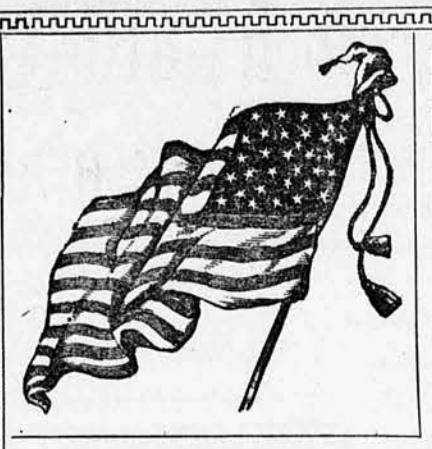


The United States Ahead!

The latest Australian Government Trial of Binders results in a Crowning Victory for America. • • • •

The Buckeye Downs the World!

Winning first place in competition with Hornsby and Howard, English Machines, and Wood, McCormick, Osborne and other American Machines.

The following news from Australia, indicating the result of the greatest Binder contest ever held in that country, will be welcome intelligence to all Americans who take pride in the triumphs of her manufacturers over foreign competitors:

The following letter, dated Adelaide, Australia, October 30th, 1887, explains itself:

MESSRS. AULTMAN, MILLER & CO., AKRON, OHIO, U. S. A.:

Enclosed herewith please find copy of rules and result of the Government Trial of Binders, held at Roseworthy Agricultural College, Tuesday, the 25th inst. This is considered the best and most exhaustive trial ever held in this country. It is a *great victory for the Buckeye.*

Yours Truly,
GEORGE WHITNEY.

GRAND NATIONAL GOLD MEDAL OF VICTORIA AWARDED LAST SEASON.

Accompanying Mr. Whitney's letter was a copy of the official score. The maximum number of points was 270. Of these the Buckeye reached the highest, scoring 246, and was unanimously awarded first prize. There were seven machines engaged. In the award of the Judges they stood in the following order: Buckeye, first; McCormick, second; Hornsby, third; Woods, fourth; Osborne, fifth; Howard, sixth, and Esterly seventh.

In speaking of the contest, the Otaga *Daily Times* says:—"The awards, which were received with applause, gave general satisfaction, and the spectators were not slow to declare that the winner performed the finest piece of harvesting ever seen in the Colonies. The Buckeye already holds the grand national gold medal of Victoria, and a legion of other field trial and show prizes. We consider that great credit is due to the manufacturers of this machine for the patient and practical manner in which they have brought their machine to the front, and solved the problem of superlative efficiency, combined with unequaled lightness of draught, simplicity and durability."

We are now ready to receive the congratulations of our friends. Although our home competitors may smile and [illegible] by an [illegible] defeat, we do not see how they can do otherwise than generously acknowledge the Buckeye Victor of the world [illegible]

Respectfully,

AULTMAN, MILLER & CO., Akron, Ohio.

LA CYGNE NURSERY.

MILLIONS

—OF—

Fruit Trees, Shade Trees, Small Fruits. Vines, Ornamental Trees, Etc.

TEN MILLION FOREST TREE SEEDLINGS.

ONE MILLION HEDGE PLANTS.

ONE HUNDRED THOUSAND TWO-YEAR APPLE TREES—Grown from whole root grafts.

FIVE THOUSAND IRISH JUNIPERS—Two-feet, SPLENDID WALNUTS, and other forest tree seeds and nuts, prime and fresh

☞ Full instructions sent with every order, and perfect satisfaction guaranteed. Send for full list and prices. Address

D. W. COZAD,
Box 25, LACYGNE, LINN CO., KANSAS.

The Western School Journal

TOPEKA, -:- KANSAS.

It is the official organ of the State Superintendent, containing the monthly decisions of that office of the Attorney General, and the Supreme Court on all matters relating to schools.

It prints and answers the Quarterly Examination Questions of the State Board of Education.

Its official, editorial, contributed and selected matter make it indispensable to school officers and teachers. Persons expecting to teach should subscribe.

☞ School officers are authorized to subscribe for their districts.

$1.25 per year. Clubs of five or more, **$1** each.

☞ Agents wanted in every county. *Write for Sample Copy.*

ORGANS & SEWING MACHINES.
50 Styles Cut Prices. Big Inducements. Goods sent on trial. New, perfect and warranted 5 years. Agents Wanted. Ask for Free Circulars at once. GEO. P. BENT, 281 Wabash Ave., Chicago.

SEEDS

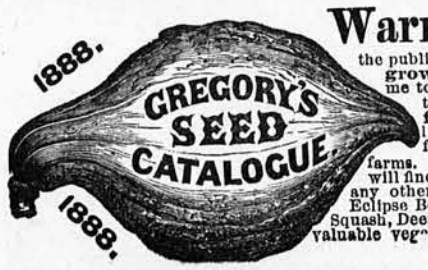
J. G. PEPPARD,
MILLET A SPECIALTY.
Red, White, Alfalfa & Alsyke Clover, Timothy, Blue Grass, Orchard Grass, Red Top, Onion Sets, Tree Seeds, Cane Seed, Etc.

1220 UNION AVENUE, (One block from Union Depot) KANSAS CITY, MO.

250,000 GRAPE VINES

[illegible]0 Varieties. Also Small Fruits. Quality unsurpassed. Warranted true. Very cheap. [illegible] sample vines mailed for 15c. Descriptive price list free. **LEWIS ROESCH,** Fredonia, N. Y.

BUY NORTHERN GROWN SEEDS.
WANTED:—The Names of **100,000** Farmers and Gardners to mail them Our Fall Catalogue of
GRASS AND CLOVER SEEDS, ETC.
Largest and most Complete Stock of Flowers, Vegetables and Farm Seeds in America.
JOHN A. SALZER, Seed Grower, Box F. La Crosse, Wis.



Warranted Seed.

I have founded my business on the belief that the public are anxious to get their seed **directly from the grower.** Raising a large proportion of my seed enables me to warrant its freshness and purity, as see my Vegetable and Flower Seed Catalogue for 1888, **FREE for every son and daughter of Adam.** It is liberally illustrated with engravings made directly from photographs of vegetables grown on my seed farms. Besides an immense variety of standard seed, you will find in it some valuable new vegetables not found in any other catalogue. As the original introducer of the Eclipse Beet, Burbank and Early Ohio Potatoes, Hubbard Squash, Deephead Cabbage, Cory Corn, and a score of other valuable vegetables, I invite the patronage of the public.
JAMES J. H. GREGORY, Marblehead, Mass.

Dana's White Metallic Ear Marking Label, stamped to order with name, or name and address and numbers. It is reliable, cheap and convenient. Sells at sight and gives perfect satisfaction. Illustrated Price-List and samples free. Agents wanted.
C. H. DANA, West Lebanon, N. H.

35,000 Sold.
HOW TO STUDY THEM
A manual of Character Reading for the people, an intensely interesting and attractive book. Every body should read it. 200 pages, 200 fine illus. 40 cts.

SENT FREE

A SAMPLE NO. OF THE
Phrenological Journal,
A magazine of HUMAN NATURE for every body. $2.00 a year, 20c. a no., and a list of **BOOKS** on Phrenology, Physiognomy, Health, Heredity, &c. Send address on postal.
FOWLER & WELLS CO., 775 Broadway, N. Y.

ESTABLISHED JAN. 1st, 1866.

CHEAP STRONG **WATER PROOF;** Applied by our new Patent method with ½ the labor of any other way. Unlike any other roof. **No rust or rattle.** An **Economical** and **DURABLE SUBSTITUTE** for **PLASTER** on walls. **Ornamental CARPETS** and **RUGS** of same material, **cheaper** and **better** than Oil Cloths. ☞ Catalogue and **Samples Free.**
W. H. FAY & CO. CAMDEN, N. J.
ST. LOUIS. MINNEAPOLIS. OMAHA.

RUPTURE

RELIEVED AND CURED

Without any operation or detention from business, by my treatment, or money refunded. Send stamp for Circular, and if not as represented will pay railroad fare and hotel expenses both ways to parties coming here for treatment.

DR. D. L. SNEDIKER,
Emporia, Kas.

I CURE FITS!

When I say cure I do not mean merely to stop them for a time and then have them return again. I mean a radical cure. I have made the disease of FITS, EPILEPSY or FALLING SICKNESS a life-long study. I warrant my remedy to cure the worst cases. Because others have failed is no reason for not now receiving a cure. Send at once for a treatise and a Free Bottle of my infallible remedy. Give Express and Post Office.
H. G. ROOT, M. C., 183 Pearl St. New York.

THE LITTLE WONDER

Fence Machine!

Excels them all. Simple, strong, practical, cheap and durable. Can be *worked* by *man* or *boy*. Stumps, brush, mounds and hollows do not interfere with its work. Will work where no other machine can. *Agents Wanted.* Particulars free. Address

FRANK W. BINFORD, Grant City, Worth Co., Mo.

MORRISON, PLOWS & CULTIVATORS, SURE TO BE LEADERS WHERE SOLD

WHY? Because they have patented improvements that every farmer WANTS.

SEND FOR PRICES & TERMS MORRISON, M'F'G. Co. FT. MADISON, IA.

IMPROVED EXCELSIOR INCUBATOR

Simple, Perfect and Self-regulating.

Lowest priced first-class Hatcher made.

Hundreds in successful operation. Guaranteed to hatch as large percentage of fertile eggs as any other hatcher. send 6c. for new Illustrated Catalogue.

Circulars Free.

GEO. H. STAHL,
Patentee and Sole Manufacturer,
QUINCY, ILLINOIS.

DAVID BRADLEY MFG. CO.
SUCCESSORS TO FURST & BRADLEY MFG. CO.
MAKERS OF RELIABLE PLOWS, CULTIVATORS, RAKES ETC.
CHICAGO ILL. U.S.A.

COOK FEED FOR YOUR STOCK

With the TRIUMPH STEAM GENERATOR and save ½ to ¾ of your feed. Also ENGINES & BOILERS, GRINDING MILLS, FEED CUTTERS and CORN SHELLERS. Send for Catalogue A and state what you want.

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42 & 44 W. Monroe St., Chicago.

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SHIPPED ANYWHERE TO OPERATE ON TRIAL AGAINST ALL OTHER PRESSES. PURCHASER TO KEEP ONE DOING MOST AND BEST WORK FOR THE MONEY.

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THE LANE & BODLEY CO.,

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MANUFACTURERS OF

SAW MILLS AND ENGINES

for all purposes. An experience of thirty years permits us to offer the best.
Good work at low prices. Send for circular.

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Water, Coal and Gas,

Hydraulic or Jetting.

Largest Stock in America. Farmers with small outlay (*experience unnecessary*), Can make large profits. No risks. Can direct buyers to paying territory. Prospecting for Water, Coal or Gas done on application. Also M'f's of WIND MILLS, HORSE POWERS, FEED MILLS, FODDER AND ENSILAGE CUTTERS, PUMPS AND WELL SUPPLIES. Mention this Paper. Send 14c. to cover cost mailing Catalogue.

CHICAGO TUBULAR WELL WORKS,
68 W. Lake St., Chicago, Ill.

THE VANELESS MONITOR.

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FARM MILL.

Has the only successful Rotary Power in the World

SEARLES BROTHERS

GENERAL AGENTS,

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Halladay Wind Mill.

PUMPS, PIPE, WATER TANKS, FEED MILLS, ETC.

Write for catalogue. Address

U. S. WIND ENGINE & PUMP CO.,
1311 West 12th St., KANSAS CITY, MO.

LIGHTNING HAY KNIFE

This OLD and RELIABLE KNIFE continues to gain in public estimation, and is

POSITIVELY THE

BEST

Hay Knife known for cutting HAY and STRAW from the Mow, Stack or Bundle. It is a rapid easy cutter, the blade of the best quality of cast steel, spring tempered, and it is easily sharpened by grinding on the corner of a common grindstone. The invention patented by WEYMOUTH is a sword-shaped blade provided with operating handles, the edge of the sword blade being provided with knife-edged serrations or teeth. We hereby CAUTION all persons interested against buying or selling knives bearing above description, other than the genuine "Lightning," as we shall *prosecute all infringements* to the full extent of our ability and the law.

For sale by the Hardware trade generally.

THE HIRAM HOLT COMPANY,
EAST WILTON, ME.—*Oct. 1, 1887.*

Well Drills

FOR EVERY PURPOSE

SOLD ON TRIAL.

Investment small, profits large. Send 20c. for mailing large illustrated Catalogue with full particulars.

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GOULDS & AUSTIN,
167 & 169 LAKE ST.
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ASPINWALL POTATO PLANTER.

BETTER THAN EVER.

PLANTS CORN
Distributes Fertilizers

Absolute Guarantee given to do PERFECT and RAPID WORK.
Write for illustrated circular, *Mention this paper.*

ASPINWALL MFG. CO.
THREE RIVERS, MICHIGAN.

WARM WATER FOR STOCK.

THE DECATUR TANK HEATER!

Put on coal once a week and the water in the stock tank is kept warm all winter. Saves more than its cost in feed in one winter. Saves more than its cost in time spent in chopping ice in the tanks. Stock Feeders and Dairymen who have used it say they would not be without it for $100. Will last several years. Price $20. Send in your orders early for it has been impossible to supply the demand during the last two winters. GOOD AGENTS WANTED.

FAIRBANKS, MORSE & CO., CHICAGO, ILL.

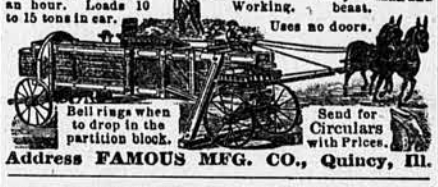
The Lightning Hay Press.

Superior to any other press made. Send for descriptive circular and price list.

K. C. HAY PRESS CO.,
Foot of Sixth street, KANSAS CITY, MO.
When writing advertiser mention KANSAS FARMER

CHAMPION BALING PRESSES.

Bales one to two tons an hour. Loads 10 to 15 tons in car. Double Working. Easy on man and beast. Uses no doors.



Bell rings when to drop in the partition block. Send for Circulars with Prices.

Address FAMOUS MFG. CO., Quincy, Ill.

TO ADVERTISE and meet with success requires a knowledge of the value of newspapers, and a correctly displayed advt. To secure such information as will enable you to advertise JUDICIOUSLY CONSULT LORD AND THOMAS NEWSPAPER ADVERTISING, CHICAGO, ILLINOIS

MISSOURI PACIFIC RAILWAY.

ONLY LINE RUNNING

3 DAILY TRAINS 3

BETWEEN

ST. LOUIS & KANSAS CITY.

Double Daily Line of Free Reclining Chair Cars to OMAHA.

Elegant Parlor Cars to KANSAS CITY, and Reclining Chair Cars Free on all trains.

2--DAILY TRAINS--2

ST. LOUIS TO WICHITA AND ANTHONY, KAS.

THE IRON MOUNTAIN ROUTE

Is the only route to the Great Hot Springs of Arkansas, and the most direct route to all points in Texas.

Only one change of cars St. Louis to San Francisco.

Through Pullman Buffet Sleeping Cars

to Memphis, Mobile, Malvern, Houston, Galveston, and all principal Southern points.

Information cheerfully furnished by Company's agents. H. C. TOWNSEND, Gen'l Pass. & Tk't. Agt.
W. H. NEWMAN, Gen'l Traffic Man., ST. LOUIS, MO.

UNION PACIFIC R'Y.

"THE OVERLAND ROUTE."

The Only Line Carrying the United States Overland Mail.

Commencing Sunday, December 4, 1887, baggage will be checked through from eastern points to Pacific Coast, and through sleepers run on all trains between Council Bluffs, Omaha, San Francisco and Los Angeles; also between Kansas City and Ogden on "THE OVERLAND FLYER," *saving one day* to all California and Oregon points, running from Missouri River to the Pacific Coast in seventy-one hours. Elegant Pullman Palace Car Sleepers and modern day coaches on all through trains. Eating houses under supervision of the company and meals furnished by Pacific Hotel Company, unsurpassed. In complying with the wish of our patrons, night trains between Omaha, Council Bluffs and Kansas City have been changed to day trains. Chair cars to Beatrice *free* of charge. Third class passengers carried on regular through trains running *free* family sleepers.

To accommodate increased suburban business extra cars are attached to 6:30 a. m. and 5:55 p. m. trains between Omaha and South Omaha to carry packing house employes.

For further information address

J. S. TEBBETS,
General Passenger and Ticket Agent,
OMAHA, NEB.

—THE—

CHICAGO, KANSAS & NEBRASKA R'Y.

ROCK ISLAND ROUTE

TOPEKA TIME CARD NO. 6.

On and after Tuesday, September 27, 1887, trains will arrive and depart as follows: (Central Standard Time.) All trains run daily.

GOING WEST.

	Arrive.	Depart.
From St. Joseph, No. 1	12:30 p. m.	12:50 p. m.
From St. Joseph, No. 3	11:40 p. m.	11:50 p. m.
From Kansas City, No. 1	12:35 p. m.	12:50 p. m.
From Kansas City, No. 3	11:35 p. m.	11:50 p. m.
Horton Accom., No. 23	7:30 p. m.	

GOING EAST.

	Arrive.	Depart.
For St. Joseph, No. 2	3:10 p. m.	3:20 p. m.
For St. Joseph, No. 4	3:45 a. m.	3:55 a. m.
For Kansas City, No. 2	3:10 p. m.	3:15 p. m.
For Kansas City, No. 4	3:45 a. m.	4:10 a. m.
Horton Accom., No. 26	.....	6:55 a. m.

NOTE.—Passengers for points in Nebraska should take the Horton Accommodation, leaving at 6:55 a. m., connecting at Horton Junction at 10:15 a. m., with the Mail and Express on Northwest lines.

Passengers desiring to take the *first* train out of the city in the evening, for WICHITA, WELLINGTON, CALDWELL, HUTCHINSON, PRATT and GREENSBURG, should take train No. 3, at 11:50 p. m. New Pullman Sleepers are attached to this train running through to points named, *two hours and thirty-five minutes in advance* of other lines—a fact worth remembering. Train No. 2, leaving at 3:20 p. m., has a New Pullman Sleeper attached, running *through* to Chicago, arriving there at 2:15 p. m., next day.

For Tickets, Sleeping Car Berths, and general information, call at Company's Ticket Office, No. 602 Kansas avenue, corner Sixth street, and at the Passenger Station, corner Kansas avenue and First street. City Office Telephone number is 430.

O. W. FISHER, Gen. Manager. T. J. ANDERSON, Gen. Agent. JOHN SEBASTIAN, Gen. Tick't & Pass. Agent.
TOPEKA, KANSAS.

The Line selected by the U. S. Gov't to carry the Fast Mail.

Burlington Route

H. & S. J. AND K. C. S. J. & C. B. R. RS.

5,000 MILES IN THE SYSTEM,

With Elegant Through Trains containing Pullman Palace Sleeping, Dining and Chair Cars, between the following prominent cities without change:

CHICAGO, PEORIA, ST. LOUIS, KANSAS CITY, DENVER, OMAHA, ST. JOSEPH, QUINCY, BURLINGTON, HANNIBAL, KEOKUK, DES MOINES, ROCK ISLAND, LINCOLN, COUNCIL BLUFFS, ATCHISON, TOPEKA, LEAVENWORTH, SIOUX CITY, ST. PAUL, MINNEAPOLIS.

Over 400 Elegantly Equipped Passenger Trains running daily over this perfect system, passing into and through the important Cities and Towns in the great States of

ILLINOIS, IOWA, MISSOURI, KANSAS, NEBRASKA, COLORADO, MINNESOTA.

Connecting in Union Depots for all points in the States and Territories, EAST, WEST, NORTH, SOUTH. No matter where you are going, purchase your ticket via the

"BURLINGTON ROUTE"

Daily Trains via this Line between KANSAS CITY, LEAVENWORTH, ATCHISON, ST. JOSEPH and DES MOINES, COUNCIL BLUFFS, OMAHA, SIOUX CITY, ST. PAUL and MINNEAPOLIS.

KANSAS CITY, ATCHISON, ST. JOSEPH and QUINCY, HANNIBAL and CHICAGO, Without Change.

J. F. BARNARD, GEN'L MGR., K. C., ST. J. & C. B., H. & ST. J., ST. JOSEPH.
A. C. DAWES, GEN'L PASS. AGT, K. C., ST. J. & C. B., H. & ST. J., ST. JOSEPH.

TWO-CENT COLUMN.

"For Sale," "Wanted," "For Exchange," and small advertisements for short time, will be charged two cents per word for each insertion. Initials or a number counted as one word. Cash with the order.

☞ **Special.**—*All orders received for this column from subscribers, during* **1887**, *will be accepted at* **one-half** *the above rates—cash with the order. It will pay you! Try it!!*

FOR SALE—Mammoth Bronze Turkey Gobblers. McClave heavy-weight. Strain finest in the West. $2 to $5 each, according to quality. One breeding pen of White Plymouth Rocks and Croad Langshan cockerels. Address James Elliott, Abilene, Kas.

200,000 RUSSIAN MULBERRY SEEDLINGS—One-half to one foot, per 1,000, $1.50; one to two feet, per 1,000, $4; two to three feet, per 1,000, $10. Also Catalpa, Ash and other forest trees, one or two years. B. P. Hanan & Co., Arlington, (on C., K. & N. R. R.), Reno Co., Kas.

FOR SALE.—$300 will buy a full-blood Clyde Stallion Colt; very fine. Also four Stallion Colts sired by horse with record of 2:27¼; all are fine; $100 each. G. L. Bailey, Eureka, Kas.

FOR SALE—To the highest bidder, on Tuesday, January 3, 1888, Draft Stallions, Brood Mares, Colts, Cows, Calves, etc. Stallion, Royal Charley, is a seven-eighths Norman and one-eighth Morgan; was billed as a 1,700-pound horse in Illinois. His colts can be seen to prove his quality. He is a beauty, and will be knocked off to the highest bidder. Those interested in good stallions should be on hand at J. Sifers', three and three-fourths miles southeast of Nortonville, Kas.

FOR SALE—Light Brahma, Langshan and Wyandotte Cockerels and Pullets. Cheap for quality of stock. Express rates low. M. D. Mulford, Guide Rock, Neb.

WANTED—The address of 500 farmers who want to improve their poultry by the use of thoroughbred males. M. D. Mulford, Guide Rock, Neb.

FOR SALE—Mammoth Bronze Turkeys. They are pure stock, none better. Would exchange a pair for geese—Embden, White China, Hong Kong, or the African. Write me what you have and how you want to trade. Address W. T. Sanders, Breckenridge, Mo.

50 NEW SAMPLE CARDS—For '88 and big outfit free. Card Works, Grand Island, Neb.

FOR SALE.—Five-column quarto newspaper and job office. Will sell at a bargain or trade in part for young stock—horses or cattle. Address, *News*, Waverly, Kas.

FOR SALE—Two Short-horn bulls, one yearling and one two years old, at $50 each, good ones, in good condition. Some nice Langshan cockerels at $1 each, also two good Dorkings. J. T. Williamson, Mulvane, Kas.

FARMS AND RANCHES—For sale in Osborne county, Kas. Cheap; terms easy. Write for list. C. M. Foquette & Co., Osborne, Kas.

FOR ANY PAPER OR MAGAZINE—At lowest prices, write or send to W. H. Morris, Payson, Ill.

CHOICE BROWN LEGHORN COCKERELS—For sale. T. F. Sproul, Frankfort, Kas.

FOR SALE OR TRADE—560 acres fine prairie land in Prairie Co., Arkansas, for cattle, horses, mules or Kansas lands. Box 182, Syracuse, Kas.

I AM ALWAYS IN THE MARKET—To buy Common or German Millet, Clover, Timothy, Cane Seed or Onion Sets, and have a full line of Grass, Cane and Tree Seed to offer. Correspondence solicited. J. G. Peppard, 1220 Union avenue, Kansas City, Mo.

WANTED—Partner in a store, with small capital. "Merchant," Bird Nest, Kas.

FOR SALE—160 Acres; all fenced and cross-fenced; two good barns, horse stable, granary will hold 3,000 bushels, carriage house, corn crib; a large variety of fruit trees in bearing; six-room house, nearly new. Four and a half miles from Stafford. Price $4,500—$700 four years at 7 per cent. C. G. McNeil, Stafford, Kas.

90-DAY AND WHITE CORN—For seed. Address A. D. Axton, Danville, Kas.

FOR SALE—A. J. C. C. solid fawn Bull Calf, dropped January 24, 1887. Large and fine. Price $50. C. G. McNeil, Stafford, Kas.

PATENTS.—Instructions, references, sample copy patent free. J. C. Higdon, solicitor of Patents, Kansas City, Mo. Reliable associate at Washington.

WANTED—Clover Hulling, with a Victor Clover Huller. Address D. B. Rice, box 208, Topeka, Kas.

WANTED—75,000 readers of the FARMER to read this column each week for great bargains.

FOR SALE—Space in this column to subscribers of the FARMER at *one cent a word*, if ordered during 1887.

FOR SALE CHEAP—Thirty-five thousand three-year-old Apple Trees; three thousand Wild Goose Plum Trees, and thirty-five thousand Concord Grape Vines. Address Geo. Pavey, Fort Scott, Kas. [Mention Kansas Farmer.]

FOR SALE—Five Registered Holstein Bulls, two 2-year-olds, three calves—two large enough for service now. These bulls must be sold to make room for more. Lord Clifden 3d No. 920 has stood at head of my herd two seasons. Will take good brood mares. M. H. Alberty, Cherokee, Kas.

WILL SELL OR TRADE—One-half blood Clyde Stallion, Annandale, Jr.; brought from Illinois; acclimated and a good breeder. W. Guy McCandless, Cottonwood Falls, Kas.

FOR SALE—Two yards Wyandotte Chickens, one yard Partridge Cochins. One cock and five hens each. I will sell cheap. Extra good stock. Jno. I. Hewitt, Tenth street east, Topeka.

FOR EXCHANGE—A year's subscription to the KANSAS FARMER, or a twenty-word advertisement in this column five weeks, for $1. Address Kansas Farmer Co., Topeka.

DO BUSINESS—By advertising in this column any wants, trades or sales you wish to make.

FOR SALE OR TRADE—One Norman Stallion; weighs 1,600 pounds; 7 years old; fine style and action and a splendid mover. Has taken leading premiums wherever shown. A bargain to some one if taken soon. Robert Ritchie, Peabody, Marion Co., Kas.

NO

TWO-CENT COLUMN—(Continued.)

FOR SALE—Good healthy Trees and Plants. Varieties most profitable in Kansas. Send list of wants for prices. J. S. Gaylord, Muscotah, Atchison Co., Kas.

WALNUTS—Fresh, for planting. LaCygne Nursery.

WANTED—Back volumes of "Kansas Farmer," 1863 to 1869, '77, '78, '79 and '85. Must be cheap. W. A. Weaver, Emmetsburg, Iowa.

WANTED—Sorghum, Millet, Clover and Timothy seeds. Send samples. Trumbull, Reynolds & Allen, Kansas City, Mo.

RED AND BLUE RIBBON PUZZLE—Latest "Yankee trick," for 12 cents in stamps. Curl, Fields & Co., Haddam City, Kas.

FOR SALE CHEAP—If sold by January 1, three sections choice school land in Stanton county, Kansas, on Santa aroya. Persons wishing good stock farms cannot find better bargains than by addressing E. Evershed, Tolaga, Kas.

FOR SALE—All kinds of Tree Seeds, Garden Seeds, Field and Grass Seeds, Planet, Jr., Garden Tools, and Daisy Garden Plow. Send for 1888 catalogue. Trumbull, Reynolds & Allen, Kansas City, Mo.

WALNUTS—Fresh, for planting. LaCygne Nursery.

FOR TRADE FOR STOCK—Two good Improved Creek Bottom Farms, with timber and water. Address A. M. Mason, Neodesha, Wilson Co., Kas.

FOR SALE OR TRADE—Dairy Farm of 280 acres, one and one-half miles south of Sedan. Also one-half block, house of seven rooms and good stone barn in the city. Half down in cash or good stock. Balance on long time. D. C. Baldwin, Hewins, Kas.

BUCKEYES, PECANS, PAWPAW, ASH, BOX ELder, Persimmon, Coffee Bean, Locust, Sycamore, Ailanthus, Mulberry, Peach Pits, Hazelnuts, Early Seed Corn, Amber Cane Seed, Root Grafts, etc. LaCygne Nursery.

FOR SALE OR TRADE—A first-class Well Machine, nearly new. B. F. Linderman, Tribune, Kas.

FOR SALE OR TRADE—Three hundred and twenty acres of land in western Kansas. Under high state of cultivation. Box 284, Coronado, Kas.

FOR SALE OR TRADE—Three full-blood registered Holstein Bull Calves, out of imported dams and sires and good ones. Also our imported Norman Stallion Benefactor; 9 years old, dapple-gray, kind and gentle; a sure foal-getter and a No. 1 producer; weight 1,800 pounds. Terms to suit purchaser. For particulars address J. L. Taylor & Son, Box 39, Lawrence, Kas.

FOR SALE—Holstein-Friesian Cattle, Aaggie and Netherland families. Choice yearling bulls, ready for service. Write for what you want. Terms easy. Address Henson & Rathbone, Council Grove, Kas.

FOR SALE—Plymouth Rock Cockerels, $1.25 each; three for $3. Good ones. F. Bortzfield, Mapleton, Kas.

MAMMOTH BRONZE TURKEYS—$1.50 apiece, if taken soon. J. H. Taylor, Pearl, Dickinson Co., Kas.

BLACK WALNUTS FOR SALE—Western hardy, for Western planting. W. J. Murphy, Wittrup, Hodgeman Co., Kas.

POLAND-CHINA PIGS—With gilt-edge pedigrees, shipped C. O. D. Dr. T. A. Stevens, Havana, Kas

THIRTY GRAND BROWN LEGHORN COCKERels for sale Combs 3 by 5 inches. Oakland Grove Poultry Yards. F. A. A'Neals, Topeka.

WANTED—Cane, Millet, Timothy, Clover and other seeds. F. Barteldes & Co., Lawrence, Kas.

TRY IT!—This column for cheap advertising. It is worth five times the price asked.

RICHMOND CHERRY SPROUTS—Warranted true to name, for from 5 to 10 cents each, for sale by C. H. Lovejoy, Baldwin City, Kas.

A GOOD FARM—To lease, from one to three years, on easy terms. Address Joseph Hamilton, Vanhem, Clark Co., Kas.

B. M. PAYNE & CO.—Practical dealers in Boots and Shoes, in the very best grades, where full value for cash is the ruling principle. 705 Kansas avenue, Topeka.

I NOW OFFER FOR SALE—A very fine lot of two-year-old Apple Trees at Willis' Nursery, Ottawa, Kas., of best varieties, packed carefully, in lots to suit customers, and delivered on board the cars or at the express office, at very low prices. A. Willis, Ottawa, Kas.

STRAYED OR STOLEN—From 1114 Taylor street, Topeka, October 4, 1887, a brown mare colt, six months old, white spot on forehead. Halter on when she left. Last seen going north. A liberal reward will be given for its return or information of its whereabouts. Benj. Boyd, Topeka.

BARTHOLOMEW & CO., Real Estate and Loan Brokers, 189 Kansas avenue, Topeka, Kas. Write them for information about Topeka, the capital of the State, or lands, farms or city property.

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For stocking ponds. All sizes, from 2 to 10 inches. Prices on application. J. J. MEASER, Hutchinson, Kansas.

FOR SALE!

Or exchange for Western Land, good herd of Short-horns. Also choice 16-acre farm. CHAS. A. KELLOGG, Kewanee, Ill.

A. D. FERRY & CO., Commission Dealers in

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225 & 227 Kinzie St., **CHICAGO.** Refer to Fort Dearborn National Bank and Lincoln National Bank, Chicago. ☞ Liberal advances on consignments.

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A NO. 1 STOCK AND GRAIN FARM, six miles from the beautiful city of Winfield **796 Acres.** Good Buildings of all kinds. Fenced and cross-fenced. At bottom figures to suit purchaser.
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KANSAS CITY, MISSOURI,

Are by far the most commodious and best appointed in the Missouri Valley, with ample capacity for feeding, weighing and shipping cattle, hogs, sheep, horses and mules. No yards are better watered and in none is there a better system of drainage.

Higher Prices are Realized

Here than in the markets East. All the roads running into Kansas City have direct connection with the Yards, which thus afford the best accommodations for stock coming from the great grazing grounds of Texas Colorado, New Mexico and Kansas, and also for stock destined for Eastern markets.

The business of the Yards is done systematically, and with the utmost promptness, so that there is no delay and no clashing, and stockmen have found here, and will continue to find that they get all their stock is worth, with the least possible delay.

Kansas City Stock Yards Company Horse and Mule Market.

FRANK. E. SHORT. CAPT. W. S. TOUGH.

F. E. SHORT & CO.

Managers.

This company has established in connection with the Yards an extensive Horse and Mule Market, known as the KANSAS CITY STOCK YARDS COMPANY HORSE AND MULE MARKET. Have always on hand a large stock of all grades of Horses and Mules, which are bought and sold on commission, by the head or in carload lots.

In connection with the Sales Market are large feed stables and pens, where all stock will receive the best of care.

Special attention given to receiving and forwarding.

The facilities for handling this kind of stock are unsurpassed at any stable in this country.

Consignments are solicited, with the guarantee that prompt settlements will be made when stock is sold.

C. F. MORSE, General Manager. **E. E. RICHARDSON**, Secretary and Treasurer. **H. P. CHILD**, Superintendent.

CHICAGO. KANSAS CITY. ST. LOUIS.

James H. Campbell & Co.,

LIVE STOCK COMMISSION MERCHANTS,

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CATTLE, HOGS AND SHEEP.

Rooms 23 and 24, Exchange Building, Kansas City Stock Yards.

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I WILL SELL OR TRADE

80 ACRES OF NICE LAND

adjoining the town of Wilmot, Kas. Will trade for Cattle or Sheep. Farm well improved; all under fence, in good condition.

Also a nice stock of

HARDWARE and LUMBER.

Goods all new and in splendid condition. Will sell or trade as above mentioned.

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$16 Buys our DAISY HARNESS, worth at retail $25. Sent to examine and return at our expense. Catalogue free. CHICAGO HARNESS CO., Wholesale Mfg., 375 Wabash Ave., Chicago, Ill.

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A pamphlet now in press on Farming by Irrigation in Colorado and its results will be sent free to any one sending their address to

JOHN M. WALLACE, President Board of Trade, GREELEY, COLORADO.

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A 16-page, 64-column poultry journal. Only 25 cents a year! The Fancier's paper! The Farmer's paper! Pithy and practical! Send for sample copy. Stamps taken.

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One hundred good responsible men wanted to engage in a New Enterprise. Light, easy work, that can be done right where you are located. No capital required. Work that can be performed by any man or boy who has the *push*. Address for further particulars, enclosing two stamps for reply,

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KANSAS FARMER---SUPPLEMEN

TOPEKA, KANSAS, DECEMBER 29, 1887.

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KANSAS SUGAR.

KANSAS TO BE THE FUTURE SUGAR STATE.

History of the Experiments in Sugar-Making—Final Success of the Parkinson Sugar Works at Fort Scott—Full Description of the Process of the

Manufacture of Sugar From Sorghum Cane—Cost of the Operation of the Plant at Fort Scott—The Circumstances Under Which Sugar Growing

Will be Profitable Business for Farmers.

The report will cover nearly forty pages of the forthcoming quarterly report of the state board of agriculture. We take such portions of it as are most important to the general reader, from advance sheets kindly furnished by Major Sims.

The report epens with a historical sketch of experiments made in Kansas by Messrs. Bennyworth and others prior to 1884, when Hon. W. L. Parkinson fitted up a complete sugar factory at Ottawa. Professor Wiley, of the agricultural department at Washington, made some experiments with the diffusion process and reported results. Enough had been done and enough had been learned to satisfy every student of the subject that if all the juice could be extracted from the cane, and all the sugar got out of the juice, the manufacture of sugar in Kansas would be profitable. But there was the trouble. "To make the necessary further experiments," says Professor Cowgill in his report, "required the expenditure of large sums of money." Private companies and individuals had lost time and money.

At this crisis, says the report, Hon. W. L. Parkinson and Mr. Alfred Taylor, of Ottawa, Kan., after consulting with others interested in the then languishing sorhum-sugar industry, went to Washington to call the attention of congress to the important results promised for the diffusion process, and to show that without the aid of an appropriation, all that had hitherto been accomplished would be practically lost. The Kansas delegation in congress became interested. Senator Plumb made a thorough study of the entire subject, and, with the foresight of statesmanship, gave his energies to the work of securing an appropriation of $50,000 for the development of the sugar industry. This appropriation was made during the last days of the session of 1884. The season was too far advanced to erect and use the diffusion apparatus with sorghum cane, and it was, by the commissioner of agriculture, sent to Louisiana, and sorghum got no benefit from this first appropriation.

In 1885 Senator Plumb, at the request of Judge Parkinson, Professor Swenson and others, again labored for an appropriation for experiments with diffusion. It was shown by Judge Parkinson, and all others interested in the sorghum-sugar industry, that this was the only hope for success. Fifty thousand dollars for this purpose was again added to the agricultural appropriation bill, on the amendment of Senator Plumb. This was expended at Ottawa, Kan., and in Louisiana. The report of the work at Ottawa closes as follows:

"The general results of the experiments may be summarized as follows:

"(1) By the process of diffusion 98 per cent. of the sugar in the cane was extracted, and the yield was fully double that obtained in the ordinary way.

"(2) The difficulties to be overcome in the application of diffusion are wholly mechanical. With the apparatus on hand the following changes are necessary in order to be able to work 120 tons per day. (a) The diffusion cells should be twice as large as they now are; that is, of 130 cubic feet capacity. (b) The opening through which the chips are discharged should be made as nearly as possible of the same area as a horizontal cross-section of the cell. (c) The forced feed of the cutters requires a few minor changes in order to prevent choking. (d) The apparatus for delivering the chips to the cells should be remodeled so as to dispense with the labor of one man.

"(3) The process of carbonatation for the purification of the juice is the only method which will give a limpid juice with a minimum of waste and a maximum of purity.

"(4) By a proper combination of diffusion and carbonatation the experiments have demonstrated that fully 95 per cent. of the sugar in the cane can be placed on the market either as dry sugar or molasses.

"(5) It is highly important that the department complete the experiments so successfully inaugurated by making the changes in the machinery mentioned above, and by the erection of a complete carbonatation outfit. Respectfully, H. W. WILEY, Chemist."

But while so much had been accomplished by the joint efforts of the United States department of agriculture and the Ottawa company, the financial results of the company were so disastrous as to leave them utterly unable to further co-operate with the government in the prosecution of the work.

At this junction Judge Parkinson saw that he must either submit to defeat or organize a new company to co-operate with the department of agriculture, should congress be wise enough to make another appropriation. In this strait, he went to Fort Scott and organized the Parkinson Sugar company. Taking up the work when all others had failed, this company has taken a full share of the responsibilities and losses, until it has at last seen the northern sugar industry made a financial success.

The report of 1885 showed such favorable results that in 1886 the house made an appropriation of $90,000, to be used in Louisiana, New Jersey and Kansas. A new battery and complete carbonatative apparatus were erected at Fort Scott. About $60,000 of the appropriation was expended here in experiments in diffusion and carbonatation.

In his report Dr. Wiley arrived at the following:

"In a general review of the work, the most important point suggested is the absolute failure of the experiments to demonstrate the commercial practicability of manufacturing sorghum sugar. The causes of this failure have been pointed out in the preceding pages, and it will only be necessary here to recapitulate them. They were:

"(1) Defective machinery for cutting the canes, and for elevating and cleaning the chips, and for removing the exhausted chips.

"(2) The deterioration of the cane due to much of it becoming over-ripe, but chiefly to the fact that much time would generally elapse after the canes were cut before they reached the diffusion battery. The heavy frost which came the 1st of October also injured the cane somewhat, but not until ten days or two weeks after it occurred.

"(3) The deteriorated cane caused a considerable inversion of the sucrose in the battery, an inversion which was increased by the delay in furnishing chips, thus causing the chips in the battery to remain exposed under pressure for a much longer time than was necessary. The mean time required for diffusing one cell was twenty-one minutes, three times as long as it should have been.

"(4) The process of carbonatation, as employed, secured a maximum yield of sugar, but failed to make a molasses which was marketable. This trouble arose from the small quantity of lime remaining in the filtered juices, causing a blackening of the syrup on concentration, and the failure of the cleaning apparatus to properly prepare the chips for diffusion."

After the expenditure of so much money, and the publication of so discouraging a report as that of 1886, the commissioner of agriculture declined to ask for further appropriations. But Senator Plumb again came to the rescue, and by a faithful presentation of the possibilities of the case again induced congress to make an appropriation of $50,000, of which $24,000 was to be apportioned to Louisiana, $6,000 to Rio Grande, New Jersey, and $20,000 to Fort Scott, Kansas.

This year the Fort Scott management made careful selection of essential parts of the processes already used, omitted non-essential and cumbrous processes, availed themselves of all the experience of the past in this country, and secured a fresh fusion of experience from the beet-sugar factories of Germany, and attained the success which finally places sorghum sugar-making among the profitable industries of the country.

The state of Kansas had by all reports been indicated as the center of the sorghum-sugar industry, where it should be developed. Kansas statesmen in the legislature, as early as 1885, concurred that the state should assist in the development of the new industry. In that year Hon. R. F. Bond, member of the house from Rice county, prepared and introduced a bill providing for a bounty of one and one-half cents per pound, to be paid out of the state treasury, on all sugar manufactured in the state for five years. The bill awakened a great deal of enthusiasm, and, at the same time, a factious opposition, and was lost. At the session of 1887 Senator Bawden, of Bourbon county, introduced a bill providing for a bounty of two cents per pound, to be paid upon all sugar manufactured in the state for five years, the maximum amount to be paid in any year being limited to $15,000. The bill became a law.

It will thus be seen that the present condition of the sorghum-sugar industry is due to private enterprise, aided by government and state appropriations, and directed by scientific and practical skill.

It should be mentioned in this connection that United States Commissioner of Agriculture Le Duc extended a strong and friendly hand to the sorghum-sugar industry during his term of office. His successor, Commissioner Loring, had the work continued by Professor Wiley, but was himself entirely faithless as to results. The present commissioner, Hon. Norman J. Colman, had been an advocate of sorghum for many years before his accession to office, and had probably written and published more on the subject than any other man in the United States. Every friend of the struggling industry was gratified at his appointment. He has extended all the aid at his command, and may justly feel proud of the attainment of the present success under his administration of the department of agriculture.

The experiments in making sugar from sorgum, which as above shown, have been in progress for several years at the expense of private capital and the United States department of agriculture, have this year reached so favorable results as to place the manufacture of sorghum sugar on the basis of profitable business, as will be seen by the report to his company of Hon. W. L. Parkinson, manager of the Fort Scott works.

To the Board of Directors Parkinson Sugar Company:

GENTLEMEN: I respectfully submit for your consideration the following report of the operations of the works of your company for the season just closing:

It is provided in our contract with the United States department of agriculture that certain experiments in sugar making shall be made by the department, with certain machinery of its own and at its own expense, using the company's plant and machinery. Many of those experiments have been so closely allied to and dovetailed into the regular work of the factory, that it is very difficult, if not wholly impossible, to clearly separate the cost of the experimental work from that of the general operation of the factory during the season. At the same time, it is highly important that you know as precisely as possible the cost of working, and the profit or loss on each ton of cane handled.

As you are aware, the crop of cane contracted last spring was very much less than the capacity of our works to consume. It was considered prudent to limit our danger from loss, by reason of the experimental nature of the work, and at the same time to have sufficient cane to determine thoroughly the value of the work on a practical manufacturing basis. This has been done, though it is now apparent that had the crop been twice as large, the expenses for working it would have been relatively much less. Indeed, a crop double the size of the one just finished could have been worked in about the same time, and at a comparatively trifling additional expense. The plans, methods and processes which have made the work of the season successful beyond our most sanguine expectations, were adopted early in the season, so that the risks incident to experiments taken into account when contracting for a crop were reduced to the minimum. The fact that at least a portion of these highly successful processes were not tried and adopted last season, was no fault of your company, nor of any one connected with this season's work.

To arrive at the cost per ton of cane worked, let us take the working of a single average day, when in full operation, and apart from the cost of experiments referred to.

The capacity of our factory, aside from deficient centrifugals, is limited to the capacity of the diffusion battery. Working twenty-two hours per day, this battery can comfortably handle 135 tons of chips, or cleaned cane. This represents a capacity of field cane, or cane with seed tops and blades of about 170 tons. To handle this, aside from curing and handling seed, cost us per day of twenty-two hours, when running regularly, as follows:

1 weighmaster, @ $2 00	$ 2 00
1 team, pulling cane into storage racks, @ $2 50	2 50
5 men, unloading and getting cane to cutters, 22 hours, @ 12½ cents	13 75
1 man, cutting machine, @ 15 cents	3 30
1 man, cleaning machine, @ 12½c	2 75
1 man, grinder, etc., @ 15c	3 30
1 man, ciler, @ 15c	3 30
3 men, diffusion battery, 1 at car and 2 above, @ 12½c	8 25
1 man, diffusion battery, director of battery, @ 20c	4 40
2 men, defecating, @ 15c	6 60
2 men, double effects, @ 15c	6 60
1 man, strike-pan, @ $5	5 00
1 man, hot room, @ 12½c	2 75
1 man barreler, @ 12½c	2 75
2 men, centrifugals, @ 15c	6 60
1 man, machinest, @ $3	3 00
2 men, engineers, @ 20c	4 40
5 men, firemen, @ 15c	16 50
2 men, roustabouts, @ 12½c	3 50
1 man, water boy,	2 00
1 man, night watch	1 50
2 men, foremen, @ $2 50	5 00
Total cost of labor	$111 75
Total cost of labor	$111 75
Oil, etc	2 50
Coal, 22 tons slack, @ 90c	20 70
Total	$134 75

This makes the cost of working a ton of cleaned cane, with a factory of the capacity of ours, about one dollar per ton for labor and fuel, or ninety cents per ton of field cane. The cost per ton for salaries, insurance, wear and tear, etc., must depend, of course, not only upon the size of the salaries and other general expenses, but the number of tons worked. This plant, rated as above, is capable, in seventy days, of working 9,450 tons of chips, or 11,900 tons of field cane. There is necessarily considerable expense in preparing for the season's work, and again in closing up. Allowing liberally for this and for the proper management and control of the works, we may still bring our total expenses, outside the cost of labor and fuel, at one dollar per ton upon the above basis. Add to this the cost of labor and fuel, and we have two dollars per ton as the total cost per ton of working cleaned cane. These figures are fully verified by our pay rolls, coal bills and other expenses while working to our capacity during the season, separated from expenditures in the completion and changing of machinery directly connected with experiments made. And to work a factory with a capacity at least one-half greater than this one, would require very little additional expense except in the matter of fuel, and that would be relatively less. It seems to me a very conservative basis, with a factory of the capacity of ours, to place the actual cost of manufacture at $2 per ton of cane; and with such a factory as I have indicated, and with a season of, say seventy days, it is safe to place the cost of manufacture at considerably less than that sum. It requires but little figuring upon this basis, and with the cost of cane at $2 per ton, and the yield of cane and product secured this year, to show that we have here developed a business of great interest and profit to our state and nation.

To run a factory at the maximum profit it must be operated constantly during the working season. The loss this season by reason of the irregular operation of the factory for want of sufficient cane, was very considerable. During the whole season the factory was operated but three whole days of twenty-two hours each. Some idea of the loss from this source may be gathered from the fact that not less than two tons of chips were lost at each break in the operation of the diffusion battery. Sixty-five such breaks or stoppages were made while running for sugar. With a larger crop of cane and better arrangements for delivery upon the part of the larger contractors, but little or no difficulty from this source need be apprehended in the future.

Total number tons of cane bought	3,840
Total number tons of seed tops bought	437
Total number tons of field cane	4,277

This represents the crop, less about 30 tons of seed tops yet to come in, from about 450 acres of land. There were something over 500 acres planted. Some of it failed to come at all, some "fell upon the rocky places, where they had not much earth, and when the sun was risen they were scorched;" so that, as nearly as we can estimate, about 450 acres of cane were actually harvested and delivered at the works. This would make the average yield of cane 9½ tons per acre, or $19 per acre in dollars and cents. I beg to observe, in this connection, that the present was the lightest in tonnage of the five successive crops I have handled. It was probably also the poorest in crystallizable sugar, covering the same period of time, in the state. It may not be amiss to observe, too, in this connection, that a very commonly accepted theory, that "the dryer the weather the sweeter the cane," is not verified by my experience.

Of the total cane worked, 162 tons were consumed in experiments with our cutters and cleaning machinery befor the cane was ripe enough for use for either syrup or sugar. No product whatever, not even seed, was saved from this, nor from ten tons additional, brought in since the factory closed down. About 300 tons of mostly down and inferior cane was worked in the early part of the season on the crushers and without diffusion. The only product from this was molasses, and of that but a small quantity. About 375 tons were also worked for molasses only on the diffusion battery. This, with the exception of fifty tons at the close of the season, and which came in too irregularly to be worked for sugar, was worked before the sugar season began, and comprised such down patches and poorer quality of cane as could be gathered, mainly on the lands belonging to the company. It was an open question whether very poor cane could be worked successfully, even for syrups, on a diffusion battery. Nothing in this direction had hitherto been attempted. The total yield of molasses from this source, and from which no sugar has been taken, is 4,157 gallons. From this are sold 3,157 gallons, for $726.71 net. The remaining 1,000 gallons are still on hand, and is worth 25 cents per gallon.

Deducting from total tonnage, less seed	3 840 tons
Amount not worked for sugar (897)	897 "
We have total cane and leaves for sugar	2,943 "

The total number of diffusion cells worked for sugar is 2,643. The weight of a cell of

"For Sale,"
advertisem
cents per w
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1,975 pounds. With this as a basis

was worked by diffusion for sugar
from tons of clean cane, as it entered the
ones. Deducting this from 2,943 tons of
cane, with leaves and blades, and we have
33 tons of leaves and blades. The latter are
to us a dead loss. A small portion has been hauled away by farmers for feed, but the bulk of this large tonnage is now fit only for manure. The waste was considerably increased by the failure of our separating machines, especially in the early part of the season, to properly discharge their duties. This whole subject was new; machines had to be devised, and their adjustment, which is not yet perfect, caused considerable loss of cane. The weight of blades and leaves will not be far from 10 per cent. of field cane. For either feed or fuel, especially where the latter is much of an object, the blades can be utilized so as to at least cover their own cost. At present we figure the loss from this source to seed account.

SEED.

There have been delivered of seed tops 437 tons. As nearly as we can estimate, there are yet to be delivered 30 tons, making in all 467 tons. From the best calculations we can make, and judging from our experience in former years, seed yields about 70 per cent. of the weight of heads, as bought in over the scales, in cleaned seed. Putting it at 60 per cent. and with 56 pounds to the bushel, we shall have 10,000 bushels of cleaned seed. A portion of this, estimated at 1,000 bushels, has at considerable additional expense, been picked over by hand, head by head, tied into small bundles, and hung up in the dry. This has been done to provide ourselves with pure seed of the different varieties for planting, and to supply a probable want in the same direction from others. For this hand-picked seed we expect to get not less than two dollars per bushel. The cost of handling the seed has not been kept separate from the cost of running the factory. The total cost of curing, stacking and hand-picking will not be far from $700, fully $200 of which has been expended in securing pure and perfectly cured seed for ourselves, and others willing to pay the extra price. To thresh and prepare for market the seed will cost about six cents per bushel additional. I estimate that we shall get for our seed crop $7,000 net. There will be left of seed tops, after threshing, fully 100 tons. These are good for feed or fuel.

SYRUPS.

The bulk of our syrups are stored in the large cistern or cellar under the warehouse. The amount on hand we estimate at 50,000 gallons. This includes the whole crop, except the 3,157 gallons sold in early part of season. Of this we have sold, to be delivered within thirty days, and one car load of which has already gone, 250 barrels, or about 12,500 gallons, at a price that will net us here 20 cents. This sale includes the bulk of our poorest syrups. I think we can safely estimate our syrup product, exclusive of packages, at $10,000. Considering the condition of our factory, for work in cold weather, and the limited capacity of our centrifugal machinery, I recommend their sale, without boiling, for seconds.

SUGAR.

Of our sugar product, the state inspector, Prof. E. B. Cowgill, has weighed and certified for state bounty 206,326 pounds. We have now in addition and ready for inspection, 22,500 pounds. The centrifugals are still running. We estimate that we shall still have, exclusive of seconds, from 7,000 to 10,000 pounds, or in all, 235,826 pounds. This, at 5¾ cents, present price to jobbers, will produce us $13,559.98. To this add the state bounty of 2 cents per pound, and we have for our total sugar product $17,276.50.

TOTAL PRODUCT OF THE SEASON.

*Sugar, 235,826 lbs, at 5¾c....	$13,559 98	
" State bounty, at 2c....	4,716 52	
		$17,276 50
Syrups, 51,000 gallons (estimated) at 20c.....		10,200 00
Seed, (estimated,).....		7,000 00
Value for total product.....		$34,476 50

TOTAL COST.

Cane, 3,840 tons, at $2.....	$7,689	
Seed, 967 tons at $2.....	1,934	
		$9,934 00
Labor bill from August 15 to October 15, including labor for department experiments.....		5,737 16
Coal, including all experiments...		1,395 77
Salaries, etc.....		3,500 00
Insurance, sundries etc.....		1,500 00
Total.....		$21,746 93
Total value.....		$34,476 50
Total cost.....		21,246 93
Net.....		$329 57
Of the above labor bill there has been paid—		
By the Department.....		$2,575 21
By the Company.....		3,161 79
Of the above coal bill there has been paid—		
By the Department.....		$ 324 00
By the Company.....		1,071 77
Of the above cane account, there has been paid—		
By the Department.....		$ 324 00
By the Company.....		9,200 00

Or, of the above expenditures the department has paid $3,234.75. Bills are now pending for $3,300, making in all $6,534.75, reducing our total cost from $21,746.93 to $15,212.18, and leaving a profit from the season's work of $19,764.32. It will thus be seen that in the working of the crop, including cane for experimental purposes, the department of agriculture has paid or been charged with $6,534.75. This includes the labor for the various experiments, the changing and erection of new machinery, for the trial of the same, and the salaries and wages of most of the high-priced help, and which, in the practical operation of a factory, will not be required,

Respectfully submitted,
W. L. PARKINSON, Manager.

Fort Scott, Kansas, October 28, 1887.

*The amount of sugar branded was 234,607 pounds. The number of cells full of cane from which the juice was boiled for sugar was 2,501, according to the record of the sugar boiler.—E. B. C.

As now developed, the processes for making sugar from sorghum are as follows:

First. The topped cane is delivered at the factory by the farmers who can grow it.

Second. The cane is cut by a machine into pieces about one and a quarter inches long.

Third. The leaves and sheaths are separated from the cut cane by fanning mills.

Fourth. The cleaned cane is cut into fine bits called chips.

Fifth. The chips are placed in iron tanks and the sugar "diffused"—soaked out with hot water.

Sixth. The juice obtained by diffusion has its acids nearly or quite neutralized with milk of lime, and is heated and skimmed.

Seventh. The defecated or clarified juice is boiled to a semi-syrup in vacuum pans.

Eighth. The semi-syrup is boiled "to grain" in a high vacuum in the "strike-pan."

Ninth. The mixture of sugar and molasses from the strike pan is passed through a mixing machine into centrifugal machines which throw out the molasses and retain the sugar.

An account of the process of sugar-making ought doubtless to begin with the planting, and cultivation, growth and ripening of the cane, for it is here that the sugar is made. No known processes of science or art, save those of plant growth, produce the peculiar combination of carbon with the elements of water which we call sugar. Not only is this true, but the chemest utterly fails in every attempt to so modify existing similar combinations of these elements as to produce cane sugar. It will be interesting here to note three substances of nearly the same composition, viz.: Starch, sucrose or cane sugar, and glucose or grape sugar. These compositions are much alike, and may be stated as follows:

Starch—12 carbon, 10 water.
Cane sugar—12 carbon, 11 water.
Grape sugar—12 carbon, 12 water.

The chemist produces glucose, or grape sugar, from either starch or sugar, by treatment with acid, but all attempts have failed to produce cane sugar from either starch or grape sugar.

The farmer then, or perhaps more accurately the power which impels the plant to select and combine in proper form and proportion the three elements, carbon, hydrogen and oxygen, is the real sugar-maker. All after processes are merely devices for separating the sugar from other substances with which it grows.

Cane sugar, called also sucrose or crystallizable sugar, when in dilute solution is changed very readily into grape sugar or glucose, a substance which is much more difficult than cane sugar to crystallize. This change, called inversion, takes place in over-ripe canes; it sets in very soon after cutting in any cane during warm weather; it occurs in cane which has been injured by blowing down, or by insects, or by frost, and it probably occurs in cane which takes a second growth after nearly or quite reaching maturity.

It is apparent from what has already been said, that to insure a successful outcome from the operations of the factory the cane must be so planted, cultivated and matured as to make the sugar in its juice; that it must be delivered to the factory very soon after cutting, and that it must be taken care of before the season of heavy frosts.

The first cutting at the factory is accomplished in the ensilage or feed cutter. This cutter is provided with three knives fastened to the three spokes of a cast-iron wheel which makes 250 revolutions perminute, carrying the knives with a shearing motion past a dead knife. By a forced feed the cane is so fed as to be cut into pieces about one and a quarter inches long. This cutting frees the leaves and nearly the entire sheaths from the pieces of cane. By a suitable elevator, the pieces of cane, leaves and sheaths are carried to the second floor.

The elevator empties into a hopper below which a series of four or five fans is arranged one below the other. By passing down through these fans the cane is separated from the lighter leaves much as grain is separated from chaff. The leaves are blown away, and finally taken from the building by an exhaust fan. This separation of the leaves and other refuse is essential to the success of the sugar-making, for in them the largest part of the coloring and other deleterious matters are contained. If carried into the diffusion battery, these matters are extracted (see reports of Chemical Division U. S. Department of Agriculture), and go into the juice with the sugar. As already stated, the process of manufacturing sugar is essentially one of separation. The mechanical elimination of these deleterious substances at the outset at once obviates the necessity of separating them later and by more difficult methods, and relieves the juice of their harmful influences. From the fans the pieces of cane are delivered by a screw carrier to an elevator which discharges into the final cutting machine on the third floor. This machine consists of an eight-inch cast-iron cylinder, with knives like those of a planing machine. It is really three cylinders placed end to end in the same shaft, making the entire length eighteen inches. The knives are inserted in slots and held in place with set-screws. The cylinder revolves at the rate of about twelve hundred per minute, carrying the knives past an iron dead knife, which is set so close that no cane can pass without being cut into fine chips. From this cutter the chips of cane are taken by an elevator and a conveyor to cells of the diffusion battery. The conveyor passes above and at one side of the battery, and is provided with an opening and a spout opposite each cell of the battery. The openings are closed at pleasure by a slide. A movable spout completes the the connection with any cell which it is desired to fill with chips.

The condition in which the sugars and other soluble substances exist in the cane is that of solution in water. This sweetish liquid is contained, like the juices of plants generally, in cells. The walls of these cells are porous. It has long been known that if a solution of sugar in water be placed in a porous or membranous sack and the sack placed on water, an action called osmosis, whereby the water from the outside and the sugar solution from the inside of the sack each pass through, until the liquids on the two side of the membrane are equally sweet. Other substances soluble in water behave similarly, but sugar, and other readily crystallizable substances pass through much more readily than uncrystallizable or difficulty crystallizable. To apply this properly to the extraction of sugar, the cane is first cut into fine chips, as already described, and put into the diffusion cells where water is applied and the sugar is displaced. The diffusion battery, as used at the Parkinson factory, consists of twelve iron tanks. They are arranged in a line. Each has a capacity of seventy-five cubic feet, and by a little packing holds a ton of cane chips. The cells are supported by brackets near the middle, which rest on iron joists. Each cell is provided with a heater, through which the liquid is passed in the operation of the battery. The cells are so connected by pipes and valves that the liquid can be passed into the cells, and from cell to cell, at the pleasure of the operator. The bottom of each cell consists of a door, which closes on an annular rubber hose placed in a groove, and filled with water, under a pressure greater than that ever given to the liquids in the cell. This makes a water-tight joint whenever the trap-door bottom is drawn up firmly against it. The upper part is of cast-iron and is jug-shaped, and is covered with a lid which is held with a screw on rubber packing. In the jug neck and near the bottom, the sides are double, the inner plates being perforated with small holes to let water in and out. The bottoms are double, the inner plates being perforated like the neighboring sides, and for the same purpose. The cells are connected with a water pipe, a juice pipe, a compressed-air pipe, and the heaters, by suitable valves. The heaters are connected with a steam pipe. The water pipe is fed from an elevated tank, which gives a pressure of twelve pounds per square inch. The valve connections enables the operator to pass water into the cells at either the top or the bottom; to pass the liquid from any cell to the next, or to the juice pipe through the heater; to separate any cell from any or all others, and to turn in compressed air.

The cutters are started, and cell 1 is filled with chips. This done, the chips from the cutters are turned into cell 2; cell 1 is closed, and cut off from the others, and water is turned into it by opening until it is filled with water among the chips. When 2 is full of chips, its valve (a) is raised to allow the liquid to pass down into the juice pipe. Valve of 3 is also raised. Now the juice pipe fills, and when it is full the liquid flows through valve of 3, and into the heater between 2 and 3, and into the bottom of 2, until 2 is full of water among the chips. Valve of 2 is now screwed down; (c) is down and (b) is opened. It will be readily seen by attention to the diagram that this changes the course of the flow so that it will no longer enter at the bottom but at the top of 2, as shown by the arrows at cell 2.

When 2 is emptied, 3 takes the first place in the series and so on. When 12 has been filled it takes the thirteenth place. (The juice pipe returns from the termination of the series, and connects with 1, making the circuit complete.) The process is continuous, and the best and most economical results are obtained if there are no intermissions.

One cell should be filled and another emptied every eight minutes, so that in twenty-four hours the number of cells diffused should be 180.

WHAT HAS TAKEN PLACE IN THE DIFFUSION CELLS.

For the purpose of illustration, let us assume that when it has been filled with chips just as much water is passed into the cell as there was juice in the chips. The process of osmosis or diffusion sets in, and in a few minutes there is as much sugar in the liquid outside of the cane cells as in the juice in these cane cells; i. e., the water and the juice have divided the sugar between them, each taking half. Again, assume that as much liquid can be drawn from 1 as there is water added. It is plain that if the osmosic action is complete, the liquid drawn off will be half as sweet as cane juice. It has now reached fresh chips in 2, and again equalization takes place. Half of the sugar from 1 is brought into 2, so that it now contains one and a half portions of sugar, dissolved into two portions of liquid, or the liquid has risen to three-quarters of the strength of cane juice. This liquid having three-fourths strength passes to 3, and we have in 3 one and three-fourths portions of liquid, or after the action has taken place the liquid in 3 is seven-eighths strength. One portion of this liquid passes to 4, and we have one and seven-eighths portions of sugar in two portions of liquid, or the liquid becomes fifteen-sixteenths strength. One portion of this liquid passes to 5, and we have in 5 one and fifteen-sixteenths portions of sugar in two portions of liquid, or the liquid is 31-32 strength. It is now called juice. From this time forward a cell is emptied for every one filled.

Throughout the operation, the temperature is kept as near the boiling point as can be done conveniently without danger of filling some of the cells with steam. Diffusion takes place more rapidly at high than low temperature, and the danger of fermentation, with the consequent loss of sugar, is avoided.

INVERSION OF SUGAR IN THE DIFFUSION CELLS.

In the experiments at Fort Scott in 1886, much difficulty was experienced on account of inversion of the sugar in the diffusion battery. The report shows that this resulted from the use of soured cane and from delays in the operation of the battery on account of the imperfect working of the cutting machinery, much of which was there experimental. Under the circumstances, however, it became a matter of the gravest importance to find a method of preventing this inversion without in any manner intertering with the other processes. On the suggestion of Professor Swenson, a portion of freshly precipitated carbonate of lime was placed with the chips in each cell. In the case of soured cane, this took up the acid which otherwise produced inversion. In case no harmful acids were present, this chalk was entirely inactive. Soured canes are not desirable to work under any circumstances, and should be rejected by the chemist, and not allowed to enter the factory. So, also, delays, on account of imperfect machinery are disastrous to profitable manufacturing, and must be avoided. But for those who desire to experiment with deteriorated canes and untried cutting machines, the addition of the calcimine carbonate provides against disastrous results which would otherwise be inevitable.

Immediately after it is drawn from the diffusion battery the juice is taken from the measuring tanks into the defecating tanks or pans. These are large, deep vessels, provided with copper steam-coils in the bottom for the purpose of heating the juice. Sufficient milk of lime is added here to nearly or quite neutralize the acids in the juice, the test being made with litmus paper. The juice is brought to the boiling point, and as much of the scum is removed as can be taken quickly. The scum is returned to the diffusion cells, and the juice is sent by a pump to the top of the building, where it is boiled and thoroughly skimmed. These skimmings are also returned to the diffusion cells.

This method of disposing of the skimmings was suggested by Mr. Parkinson. It is better than the old plan of throwing them away to decompose and create a stench about the factory. Probably a better method would be to pass these skimmings through some sort of filter, or perhaps better still, to filter the juice and avoid all skimming. After this last skimming the juice is ready to be boiled down to a thin syrup, in the double-effect evaporators.

These consist of two large closed pans provided within with steam pipes of copper, whereby the liquid is heated. They are also connected with each other and with pumps in such a way as to reduce the pressure in the first to about three fifths and in the second to about one-fifth the normal atmospheric pressure.

The juice boils rapidly in the first at somewhat below the temperature of boiling water, and in the second at a still lower temperature. The exhaust steam from the engines is used for heating the first pan, and the vapor from the boiling juice in the first pan is hot enough to do all the boiling in the second, and is taken into the copper pipes of the second for this purpose. In this way the evaporation is effected without so great expenditure of fuel as is necessary in open pans, or in single-effect vacuum pans, and the deleterious influence of long-continued high temperature on the crystallizing powers of the sugar are avoided.

From the double effects the syrup is stored in tanks ready to be taken into the strike-pan, where the sugar is crystallized.

At this point the juice has just reached a condition in which it will keep. From the moment the cane is cut in the fields until now, every delay is liable to entail loss of sugar by inversion. After the water is put into the cells of the battery with the chips, the temperature is carefully kept above that at which fermentation takes place most readily, and the danger of inversion is thereby reduced. But with all the precautions known to science up to this point the utmost celerity is necessary to secure the best results. There is here, however, a natural division in the process of sugar-making,

which will be further considered under the heading of "Auxiliary Factories." Any part of the process heretofore described may be learned in a few days by workmen of intelligence and observation, who will give careful attention to their respective duties.

BOILING THE SYRUP TO GRAIN THE SUGAR.

This operation is the next in course, and is performed in what is known at the sugar factory as the strike-pan, a large air-tight iron vessel from which the air and vapor are almost exhausted by means of a suitable pump and condensing apparatus. As is the case with the saccharine juices of other plants, the sugar from sorghum crystallizes most readily at medium temperature. There are two ways of accomplishing this. The simplest is to boil the syrup in the vacuum pan until it has reached about the density at which crystallization begins, then draw it off into suitable vessels and set it away in a hot room (about 110 to 120 deg. F.) to crystallize slowly. The proper density is usually judged by the boiler, by observing the length to which a sample of the hot liquid can be drawn. This is called the "string" proof test. A far better method is to "boil to grain" in the pan. This is better because it gives the operator control of the size of the grain within certain limits, because it gives a better appearing sugar, and more important still, because with proper skill it gives a better yield. Several descriptions of this delicate operation have been published. After reading some of the best of these, the writer found, on attempting to boil to grain, that more definite instruction was necessary; and after obtaining the instruction it became apparent that while almost anyone can learn to "boil to grain," yet to obtain the best yield requires personal skill and powers of observation and comparison which will be obtained in widely different degrees by different persons. To become a good sugar boiler, one must be an enthusiastic specialist. The Parkinson Sugar company were fortunate in securing for this important work the services of Mr. Frederick Hinze, a native of Hanover, Germany, and a graduate of the "Sugar Industry School" at Braunschweich. Though a young man, Mr. Hinze has had a large experience, having assisted his brother in the erection and operation of sugar factories in Germany, and since coming to America having worked in the best sugar factory at Alvarado, Cal., and in cane sugar factories in Louisiana and in Cuba. Since the close of the working season at Fort Scott, Mr. Hinze has again gone to Louisiana and taken charge of a strike-pan at the sugar house of ex-Governor Warmouth, where he worked last season.

The process of boiling to grain may be described as follows: A portion of the syrup is taken into the pan, and boiled rapidly *in vacuo* to the crystallizing density. If in a syrup the molecules of sugar are brought sufficiently near to each other through concentration—the removal of the dissolving liquid—these molecules attract each other so strongly as to overcome the separating power of the solvent, and they unite to form crystals. Sugar is much more soluble at high than at low temperatures, the heat acting in this as in almost all cases, as a repulsive force among the molecules. It is therefore necessary to maintain a high vacuum in order to boil at a low temperature, in boiling to grain. When the proper density is reached, the crystals sometimes fail to appear, and a fresh portion of cold syrup is allowed to enter the pan. This must not be sufficient in amount to reduce the density of the contents of the pan below that at which crystallization may take place. This cold syrup causes a sudden though slight reduction of temperature, which may so reduce the repulsive forces as to allow the attraction among the molecules to prevail, resulting in the inception of crystallization. To discover this requires the keenest observation. When beginning to form, the crystals are too minute to show either form or size, even when viewed through a strong magnifying glass. There is to be seen simply a very delicate cloud. The inexperienced observer would entirely overlook this cloud, his attention probably being directed to some curious globular and annular objects, which I have nowhere seen explained. Very soon after the sample from the pan is placed upon glass for observation, the surface becomes cooled and somewhat hardened. As the cooling proceeds below the surface, contraction ensues, and consequently a wrinkling of the surface, causing a shimmer of the light in a very attractive manner. This, too, is likely to attract more attention than the delicate, thin cloud of crystals, and may be even confounded with the reflection and refraction of light, by which alone the minute crystals are determined. The practical operator learns to disregard all other attractions, and to look for the cloud and its peculiarities. When the contents of the pan have again reached the proper density, another portion of syrup is added. The sugar which this contains is attracted to the crystals already formed, and goes to enlarge these rather than to form new crystals, provided the first are sufficiently numerous to receive the sugar as rapidly as it can crystallize.

The contents of the pan are repeatedly brought to the proper density, and fresh syrup added as above described until the desired size of grain is obtained or until the pan is full. Good management should bring about these two conditions at the same time. If a sufficient number of crystals has not been started at the beginning of the operation to receive the sugar from the syrup added, a fresh crop of crystals will be started at such time as the crystallization becomes too rapid to be accommodated on the surface of the grain already formed. The older and larger crystals grow more rapidly, by reason of their greater attractive force, and the newer and smaller ones on succeeding additions of syrup, so that the disparity in size will increase as the work psoceeds. This condition is by all means to be avoided, since it entails serious difficulties on the process of separating the sugar from the molasses. In case this second crop of crystals, called "false grain" or "mush sugar," has appeared, the sugar boiler must act upon his judgment, guided by his experience as to what is to be done. He may take enough thin syrup into the pan to dissolve all of the crystals and begin again, or, if very skillful, he may so force the growth of the false grain as to bring it up to a size that can be worked.

The completion of the work in the strike-pan leaves the sugar mixed with molasses. The mixture is called melada or masscuite. It may be drawn off into iron sugar wagons and set in the hot room above mentioned, in which case still more of the sugar which remains in the uncrystallized state generally joins the crystals, somewhat increasing the yield of "first sugars." At the proper time these sugar wagons are emptied into a mixing machine, where the mass is brought to a uniform consistency. If the sugar wagons are not used, the strike-pan is emptied directly into the mixer.

From the mixer the melada is drawn into the centrifugal machines. These consist, first, of an iron case resembling in form the husk of mill-stones. A spout at the bottom of the husk connects with a molasses tank. Within this tank is placed a metallic vessel with perforated sides. This vessel is either mounted or hung on a vertical axis, and is lined with wire-cloth. Having take an proper portion of the melada into the centrifugal, the operator starts it to revolving, and by means of a friction clutch makes such connection with the engine as gives it about 1,500 revolutions per minute. The centrifugal force developed drives the liquid molasses through the meshes of the wire cloth, and out against the husk, from which it flows off into a tank. The sugar, being solid, is retained by the wire cloth. If there is in the melada the "false grain" already mentioned, it passes into the meshes of the wire cloth, and prevents the passage of the molasses. After the molasses has been nearly all thrown out, a small quantity of water is sprayed over the sugar while the centrifugal is in motion. This is forced through the sugar, and carries with it much of the molasses which would otherwise adhere to the sugar, and discolor it. If the sugar is to be refined, this washing with water is omitted. When the sugar has been sufficiently dried, the machine is stopped, the sugar taken out, and put into barrels for market.

Simple as the operation of the centrifugals is, the direction of the sugar boiler as io the special treatment of each strike is necessary, since he, better than any one else, knows what difficulties are to be expected on account of the condition in which the melada left the strike-pan.

CAPACITY OF THE SUGAR FACTORY.

It has already been shown that the operation of the diffusion battery should be continuous. The experience so far had in diffusing sorghum indicates eight minutes as the proper time for filling a cell; or one cell should be filled and another emptied every eight minutes. This, with a twelve-cell battery, nine of which are under pressure, gives seventy-two minutes as the time during which the chips are subject to the action of the water. If the chips are cut sufficiently fine, the time may be reduced to seven or even to six minutes to the cell without probable loss from poor extraction. The time may be extended to ten minutes per cell without danger of damage, when working sound canes.

Taking eight minutes as the mean, we shall have 180 as the number of cells diffused in a day. To secure the best results, all other parts of the factory must be adjusted to work as rapidly as the diffusion battery, so that the capacity of the battery will determine the capacity of the factory.

A plant having a battery like that at Fort Scott, in which the cells are each capable of containing a ton of cane chips, should then have a capacity of 180 tons of cleaned cane, or 200 tons of cane with leaves, or 240 tons of cane as it grows in the field, per day of twenty-four hours. Those who have given most attention to the subject think that a battery composed of one-and-a-half ton cells may be operated quite as successfully as a battery of one-ton cells. Such a battery would have a capacity of 360 tons of field cane per day.

The diffusion battery as used at the Parkinson factory is an intricate and expensive apparatus, and yet it is simple as compared with those first used in Germany and France. The Germans have, however, within a few years constructed batteries even simpler than that at Fort Scott. An apparatus has even been constructed composed of a single vessel through which the water passes in one direction while the chips are moved slowly in the other by a screw conveyor. The batteries which will be used in this country, however, will doubtless be constructed on the ground plan, that used at Fort Scott, with such modifications as will cheapen the construction and reduce the labor of operating.

The cutting and cleaning apparatus consists of modifications of appliances which have long been used. Simple as it is, and presenting only mechanical problems, the cutting, cleaning and evaporating apparatus is likely to be the source of more delays and perplexities in the operation of the sugar factory than any other part.

The diffusion battery in good hands works perfectly; the clarification of the juice causes no delays; the concentration to the condition of semi-syrup may be readily, rapidly, and surely effected in apparatus which has been brought to great perfection by long experience, and in many forms; the work at the strike-pan requires only to be placed in the hands of an expert; the mixer never fails to do its duty; there are various kinds of centrifugal machines on the market, some of which are nearly perfect. If then, the mechanical work of delivering, cutting, cleaning, and elevating the cane can be accomplished with regularity and rapidity, the operation of the well-adjusted sugar factory should proceed without interruption or delay from Monday morning to Saturday night.

The machines used at Fort Srott for these purposes have not been described in detail. They are, however, simply modifications of appliances which have long been used for other purposes. They need only to be made stronger and simpler. Their general plan is not far from that which is likely to be in general use in the near future.

It has already been shown that it is only on reaching maturity that sorghum is a profitable sugar plant. To determine when most farm products are ripe is a simple matter of inspection. But it is astonishing to note how greatly different will be the views of say a dozen practical farmers as to when a given field of wheat is ripe. Experience in judging of the ripeness of sorghum is far less extended than in the case of wheat. Indeed, the varying conditions of the weather so greatly effect the appearance of ripeness, i. e., the hardness of the seed, the condition of the leaves, etc., that the manufacturer, who must know before he uses cane whether it is ripe or green, is left no other than the test of chemical analysis. This determines the one point of interest to him, namely, whether the cane has reached such a degree of maturity as to have made its sugar.

Again, although the cane may have reached full maturity, if it shall have been cut and exposed to the atmospheric influences of the earlier part of the season for any considerable time, the sugar may have changed to glucose. In moist weather this change may take place without any accompanying change in the appearance of the cane.

In the early part of the season, while the weather is warm, all cane cut in the forenoon should be worked the same day, and that cut in the afternoon should be worked by noon the next day. During the cooler weather of the latter part of the season it is not necessary to be quite so prompt. The delays which will be admissible can be determined by analysis of the cane.

Not only is it necessary to know that the cane enters the factory with its sugar intact, but it is important to see that it does not suffer inversion during the process of manufacture. To prevent this, all delays must be avoided. The cane must go promptly and regularly through the cutters and cleaners as rapidly as it can be thoroughly diffused. In a pile of cane chips inversion of the sugar very soon begins, and is soon followed if not accompanied by acetic fermentation. If acetic or other active acid be present in the diffusion cells, it causes rapid inversion of the sugar under the high temperature of the battery. After leaving the battery, the treatment of the juice must be prompt, to guard against inversion. Indeed, as has been remarked above, every part of the factory in which the work is done until the juice has been reduced to syrup, should be of such capacity that it can surely do its work at all times as rapidly as the battery can be operated. It is a matter of great importance to the manufacturer to know whether, at any stage of the process, inversion is taking place. To determine this, the analysis of average samples of freshly-cut chips may be compared with the analysis of the product at other stages. A closer average extraction than 95 per cent. is scarcely to be expected, and an extraction of less than 90 per cent. should be considered inadmissible. Poor extraction may result from overhurrying the battery; from allowing the temperature to run too low, from raising the temperature too highly, thereby filling the upper parts of the cells with steam instead of water, or from improper manipulation of the valves. The perfection of the extraction may be determined by analysis of the enhausted chips from the battery, and if not found satisfactory, the cause is of course to be sought out and remedied.

It is desirable for the manufacturer to know how much sugar he is leaving in the molasses, and also how much molasses he is leaving in the sugar; i. e., the purity of the sugar. These points are readily determined by analysis.

It is doubtless desirable, though not essential, that the superintendent of a sugar factory be also a chemist. The analyses indicated in the above pages are not intricate. To make them all, however, will require considerable time, and whether the superintendent be capable or incapable of making them, he will scarcely be able to spare the time which ought to be devoted to them.

Any of the graduates of our agricultural or other colleges who have taken a good course of chemistry, with laboratory practice, can by a few month's special training in sugar chemistry and practice in sugar analysis, become entirely competent to do the work required in the ordinary operation of a factory, under the direction of the superintendent.

In tables of analyses the percentages given are usually computed on the weight of the juice contained in the cane. Those who are familiar with the habit of the plant will readily see that the cane may be considered in three parts, viz.: 1st, the tops, including the seed and twelve to eighteen inches of the upper part of the stalk; 2d, the leaves, including the leaf sheaths; 3d, the body of the cane after the leaves and tops have been removed. The body of the cane contains nearly all of the juice and practically all of the sugar.

A ton of sorghum as it grows is composed of these three parts in about the following average proportions:

Topped and cleaned cane, pounds	1,500
Tops	300
Leaves and sheathes	200
Total	2,000

The grape-sugar content of sorghum is very large. When freed from each of the "not sugar" products as have an unpleasant taste this constitutes an elegant syrup constituent. It is composed chiefly of two sugars, called respectively dextrose and levulose. The last is sweeter than cane sugar. This grape sugar is that to which most sweet fruits owe their sweetness. The large amount of it—over 53 pounds to the ton of cane—is likely to be recognized in the near future as one of the most valuable contents of sorghum cane.

The sorghum sugar industry now seems to have an assured future. The quantities of sugar and molasses, and other valuable products, now obtained from each ton of the cane and from each acre of land, well remunerate the farmer for his crop and the manufacturer for his investment, and the labor and skill required to operate the factory.

An acre of land cultivated in sorghum yields a greater tonnage of valuable products than in any other crop, with the possible exception of hay. Under ordinary methods of cultivation, ten tons of cleaned cane per acre is somewhat above the average, but under the best cultivation the larger varieties often exceed twelve, while the small Early Amber sometimes goes below eight tons per acre. Let seven and a half tons of cleaned cane be assumed for the illustration. This corresponds to a gross yield of ten tons for the farmer, and at $2 per ton, gives him $20 per acre for his crop. These seven and a half tons of clean cane will yield—

750 pounds of sugar.
1,000 pounds of molasses.
900 pounds of seed.
1,500 pounds of fodder (green leaves).
1,500 pounds of exhausted chips (dried).

A total of 5,650 pounds.

The first three items which are as likely to be transported as wheat or corn, aggregate 2,650 pounds per acre.

Sorghum will yield seven and a half tons of cleaned cane per acre more surely than corn will yield thirty bushels, or wheat fifteen bushels per acre.

The season for harvesting sorghum is limited to the month during which it may be worked. At present this dates in our southern counties from about the last of July to the middle or last of October if a proper selection of varieties of cane has been made. Without doubt this season may, and will be lengthened. On this point I can do no better than to quote from my report to the department in 1884:

As shown by the reports of the sugar factories of Kansas for the last two years, the working season is confined almost exclusively to the months of September and October. When the great cost of sugar works, the expense of keeping them in repair, and the salaries of the specialists, are considered, the importance of lengthening the working season becomes painfully apparent. That a $100,000 factory should be idle ten months every year, implies that it must be run at an enormous profit during the two months or fail to pay interest on the investment.

Several plans have been proposed for extending the time during which the works may run. One of these is the development of earlier varieties of cane by systematic selection of seed, cultivation and breeding. The researches of modern physiological botanists give reason to hope for good results in this direction.

Another plan is proposed to reduce the juice to a semi-syrup in small auxiliary factories, store the semi-syrup and make it to sugar during the winter months. This is much to commend it, but there are some practical obstacles to be overcome before it can be put into use.

Experiments have been made repeatedly in keeping canes in sheds, but with indifferent success. A good deal has been done in the line of preserving green forage crops in pits, and expensive silos have been made and used. Sorghum has been laid away and kept in these with fair success.

A practical plan for keeping cane by simply covering it with a few inches of soil has been used in three experiments now on record. The first of these was made at Tilsonburg, Ontario, in 1881-2, by Mr. Frank Stroback, now of Sterling, Kansas.

Keeping Kansas canes in Silo, on October 15, 1884, I placed one ton of Link's Hybrid and one ton of Early Orange in winrows between rows of stubble, and placed thereon a covering or about two inches of sandy soil.

Analyses were made on the day on which they were buried, and subsequently, as shown, it was fully established that some varieties of sorghum cane can be preserved in an inexpensive way without impairment of the sugar until the last of January. It is desirable that the experiment be extended to other of the late varieties, notably the Honduras, which yields 15 tons to 30 tons per acre, but does not perfect its sugar during the regular fall working season.

The complete sugar factory is an expensive establishment, and while most of the work of operating it can be performed by laboring men of ordinary intelligence, there will be required in each of such factories, whether large or small, at least two men whose attainments will command liberal compensation. These are the chemist, or the superintendent with a cheaper chemist for an assistant, and the sugar boiler. Good business management is of course also necessary to success. The chemist and the sugar-boiler can preside over a large, as well as over a small factory. Moreover, many of the labors of the factory can be performed with no fewer men in a small than in a large factory. It will therefore be cheaper to work a given amount of cane, and to turn out a given amount of product, in large than in small factories. The limit, however, beyond which experience so far does not warrant manufacturers to go, is believed to be at a capacity of about 270 tons of cleaned cane per day.

In order to use to the best advantage the services of the specialists of the business, it has been proposed to establish at convenient places, auxiliary factories which shall carry the processes so far as to prepare syrup for the strike-pan. This syrup will be stored in suitable tanks or cisterns, and worked for sugar after the close of the season for handling cane. In this way the working season for the central factory may be prolonged to occupy almost the entire year. The auxiliary factories will cost about half or two-thirds as much as the complete factory; capable of taking care of the same amount of cane. As thus arranged, the central factory will, in addition to its own regular season's work, take care of the syrup from two or three of these syrup factories.

It will doubtless be found economical to provide the central factory with sugar apparatus of two or three times the capacity required to take care of its own syrup, thereby increasing the number of auxilaries which may be made dependent upon it. It must not be inferred from what is here said that the sugar factory can make sugar from ordinary sorghum molasses. The auxilaries will necessarily be under the supervision of the central factory, and the value of its syrups will depend upon the proper execution of the processes in its manufacture. The syrups from the auxilaries may be transported to the central factory in tank cars or by pipe lines.

The price paid for cane delivered at the sugar factory has heretofore been $2 per ton. It needs only to be stated that long hauls by wagon would cost too much to leave any profit to the farmer at this price. It is doubtful whether the farmer who lives more than three miles from the factory can afford to raise cane unless he can transport it most of the way by rail. Again, the factory will easily obtain all it can work from farmers whose distance does not exceed two miles, and will prefer to patronize these on account of the greater regularity with which they can deliver their crops, as well as the greater facility with which the supervision of the factory may be extended. Farmers living on a line of railroad may be able to ship their cane on such favorable terms as to avail themselves of the market at the factory. In Cuba, and in some parts of Louisiana, light railroads are constructed where the distance is too great for hauling on ordinary roads. On these a team hauls about thirteen tons at a load.

Mr. H. A. Hughes, of Rio Grande, N. J., has been experimenting with a small diffusion battery, and has this season worked eighty acres of sorghum with a battery whose capacity is twenty-five tons per day. I have not received Mr. Hughes' official report, but the results claimed are fully as favorable as those obtained at Fort Scott. His report will be looked for with interest.

We regard it as an established fact that syrup at 30 B, can be evaporated on large surfaces by air to any density required, and also that the color and flavor of the syrup are better than when exposed longer to the high heat of the finishing pan. By allowing the syrup to remain for some time in this apparatus, the syrup was evaporated or dried by the current of air to such density that it was impossible to draw the syrup from the tank through a two inch outlet, until it had been diluted. All the syrup made this season from 700 acres of cane was cooled ready to barrel, and was finished from densities varying from 30 B, to 36 B. by air evaporation in this apparatus. We next built an apparatus on the same plan as the above described apparatus, except that it had no fan to cause a current of air; the current of air was caused by heating the air in a furnace, as done in hot air fruit evaporators. Hot air evaporates water much more rapidly than cold air, and in operating on thin or dilute sweet liquids it is necessary to heat the air above the fermenting ponit—above the point where air has chemical action on the liquid. This is shown by drying fruit in the air at summer temperature; the product is the inferior sun-dried fruit, because the air has acted chemically on the saccharine liquid in the fruit; but when fruit is dried by hot air, as in the modern fruit evaporators, the product is perfect, because hot air has no chemical action on the sweet liquid in the fruit. This hot-air apparatus had 273 square feet of surface covered with semi-syrup in thin films, and exposed to a current of hot air which absorbed and carried off the water of the syrup. In this apparatus, cane juice which had been boiled until the schum was white and free from green color, was evaporated to heavy syrup by hot air. The cane juice was boiled to a density of from 20 to 25 degrees Baume, according to the quality of the juice, and as w as necessary to clarify the juice, and only boiled as long as it was necessary to skim the boiling juice. It was then dried or evaporated by hot air, at a temperature of 130 to 140 degrees, until it became dense syrup. It is probable that it would have been better to have had a temperature of 140 to 180 degrees, which is the best temperature for evaporating fruit by hot air, and which is the usual temperature in vacuum-pan boiling. In the cold-air apparatus, it was necessary to boil the juice until it had such density that air at summer temperature would not act chemically upon the syrum or ferment it, and then finish the evaporation by air at ordinary temperature.

In the hot-air apparatus, it was necessary to boil the juice only long enough to clarify it, and then finish the evaporation by air heated above the point of chemical action or fermentation. To illustrate this point: Ordinary syrup may be exposed to air at summer temperature without change or fermentation, while a dilute sweet liquid exposed to air at summer temperature would be chemically changed; but a dilute sweet liquid exposed to air heated to 150 degrees, which is the scalding point, would not ferment—it would evaporate to syrup.

The hot-air apparatus has 273 square feet of surface, inclosed in a box three feet by two feet, and six feet high. At a temperature of 140 degrees it evaporated one pound of water per hour at 140 degrees. A gallon of cane juice weighs 8.8 pounds. Reducing seven gallons of cane juice or 61.6 pounds of juice, to one gallon of heavy syrup at sugar density, weighing 13 pounds to the gallon, requires the evaporation of 48.6 pounds of water to each gallon of syrup. Where the evaporation from cane juice to heavy syrup is entirely performed by hot air the hot-air apparatus gives 5½ gallons of syrup, weighing 13 pounds to the gallon, per hour, as the product of the evaporation from 273 square feet of surface in a current of air at 140 degrees. When cane juice is boiled to a density of 20 to 25 degrees Baume in order to clarify it, and the hot-air apparatus is only required to finish the evaporation, it produces from 10 to 15 gallons of heavy syrup per hour, for the greater part of the evaporation has been performed by boiling.

The hot-air apparatus above described is of a size and capacity suited to a two-horse cane mill. It would finish the semi-syrup produced by such a mill to heavy syrup, using a temperature of 140 degrees instead of 240 degrees, which is required in finishing heavy syrup by boiling.

The principle of the air evaporating apparatus is, that evaporation is as rapid from large surfaces exposed to air at comparatively low temperature as from small surfaces intensely heated, and that in evaporating dilute sweet liquids it is necessary to heat the air above the point of chemical action upon the liquid. Solid substances have large quantities of water removed from them by exposing large surfaces to the evaporating action of the air. A bushel of apples weighing fifty pounds is reduced by hot air to six pound of perfect product. The same can be done with liquids under similar conditions. As a result of these experiments, we intend to build hot-air apparatus large enough to reduce all our semi-syrup to syrup by hot air next season.

If the question be asked: "Can the farmer profitably make his own sugar?" i. e., make sugar for his own use in a small way, I apprehend that the answer should be much the same as would be given to the question, "Can the farmer profitably make his own woolen goods, or his own flour?" If, indeed, I have succeeded in the preceding pages in conveying an adequate idea of what sugar-making is, I apprehend that my readers will omit to ask the questions about manufacturing in a very small way.

The farmer who is so fortunate as to be near a sugar factory can do much better than to erect, and try to operate, sugar machinery on a small scale. An acre of good sorghum delivered at the factory will pay for a barrel of nice, nearly white sugar. The farmer who is not so fortunately situated will probably try to induce some company to erect a factory near him, or will join with his neighbors in forming a company for the purpose of building a factory as soon as the skilled labor necessary for its operation can be secured, thereby providing not only his own sugar from his own soil, but at the same time a sure and steady market for the most certain and profitable crop he can raise.

The sugar produced by the process herein described is light, but not white in color. Its sweeting power is not surpassed by any raw sugar, and its taste is very agreeable. The demand of the age is, however, for the best possible goods, and sorgum sugar must be refined to the purest whiteness, and made into the various conditions demanded by the market.

To do this requires the work of the sugar refinery. The largest of the central factories soon to be erected will doubtless be provided with refining factories, and when located at convienient shipping centers will be developed into large refineries as rapidly as the raw sugar can be obtained to give them work.

There seems to be no doubt but that there is here developed an industry of vast importance to our state and nation. For the year ending June 30, 1886, there was consumed in the United States foreign-grown and manufactured sugar amounting to 2,689,881,765 pounds. If one thousand new sugar factories were at once erected, and each should produce an annual product of 2,000,000 pounds of sugar they would supply the place of the sugar now imported.

The annual consumption of sugar per capita, in the United States, is about fifty-six pounds. The population of Kansas may be taken at 1,500,000. These people consume each year 56x1,500,000—84,000,000 pounds of sugar. It will be safe to say that the annual average product of the factories will not exceed 1,500,000 pounds, so that fifty-six factories will be required to supply the sugar consumed by the present population of Kansas, and for which they pay over $5,000,000 annually.

Processes whereby sugar can be made at a profit from sorghum, have been worked out. These are far rrom perfection, but present developments give promise of others in the near future, and will enable us to produce our own sugar on our own soil, with the labor of our people. Those who invest in the new industry will be cautious about experimenting with unknown conditions. Kansas is therefore likely to lead in the development and become the first northern sugar state.

Great Corporations.

Machinery is now recognized as essential to cheap production. Nobody can produce effectively and economically without it, and what was formerly known as domestic manufacture is now almost obsolete. But machinery is one of the most expensive of all products, and its extensive purchase and use require an amount of capital far beyond the capacity of the ordinary individual to furnish. There are very few men in the world possessed of an amount of wealth sufficient to individually construct and own an extensive line of railway or telegraph, a first-class steamship, or a great factory. It is also to be remembered that for carrying on production by the most modern and effective methods large capital is needed not only for machinery but also for the purchasing and carrying of extensive stocks of crude material and finished products. Sugar can now be, and generally is, refined at a profit of an eighth of a cent a pound, and sometimes as low as a sixteenth; or, in other words, from eight to sixteen pounds of raw sugar must now be treated in refining in order to make a cent, from 800 to 1,600 pounds to make a dollar, from 80,000 to 160,000 pounds to make $100, and so on. The mere capital requisite for providing and carrying the raw material necessary for the successful prosecution of this business, apart from all other conditions, places it, therefore, of necessity beyond the reach of any ordinary capitalist or producer.

It has been before stated that, in the manufacture of jewelry by machinery, one boy can make up 9,000 sleeve-buttons per day; fours girls, also, working by modern methods, can put together in the same time 8,000 collar-buttons. But to run an establishment with such facilities the manufacturer must keep constantly in stock $30,000 worth of cut ornamental stones, and a stock of cuff-buttons that represents 9,000 different designs and patterns. Hence from such conditions have grown up great corporations or stock companies, which are only forms of associated capital organized for effective use and protection. They are regarded to some extent as evils; but they are necessary, as there is apparently no other way in which the work of production and distribution, in accordance with the requirements of the age, can be prosecuted. The rapidity, however, with which such combinations of capital are organizing for the purpose of promoting industrial and commercial undertakings on a scale heretofore wholly unprecedented, and the tendency they have to crystalize into something far more complex than what has been familiar to the public as corporations, with the impressive names of syndicates, trusts, etc., also constitute one of the remarkable features of modern business methods.—*David A. Wells, in Popular Science Monthly.*

Cement for Mending Boots, Shoes, and Carriage Tops.

A cement which answers well for the above purposes may be made by dissolving pure gutta-percha in chloroform until the solution is about as thick as honey. Take a three-ounce phial to the druggist and have two ounces of chloroform put in it. To this add a half ounce of pure gutta-percha, cut in small pieces, and cork tight. Shake occasionally, and when dissolved, if too thin, add a little more gutta-percha, but if too thick, slightly reduce by adding chloroform. When brought to the consistency of honey, prepare the patch to be put on the boot by paring the edges neatly, making them very thin; scrape all dirt and grease from the under surface of the patch and also from the surface of the boot. Apply the cement thoroughly—but not too thick—to both surfaces; heat both so as to soften the cement, and when soft apply the patch, pressing it firmly to the boot a few minutes until the cement is set. Patches put on in this way are generally quite as durable and much more tidy than those sewed on by an expert cobbler Old carriage tops can be meaded in this manner by the aid of a hot iron to soften the cement.—*American Cultivator.*

In south and west Florida there are hundreds of "sink-holes." Some are partially filled with water, many are of fathomless depth, and others have the tallest trees growing in their depths, the tops just coming to the level of the surrounding ground. Oscar Shogrene a few years ago built a kitchen, bathroom, cistern and cellar over an old sink-hole which adjoined his dwelling. One evening, recently, as the family were getting supper, a strange noise was heard, resembling the rolling of earth down a hole. Shogrene's eldest daughter and an old colored women ran out into the kitchen, and just as they crossed the threshold the entire rear of the building plunged down with a sullen roar and crash, high above which was heard the shrieks of the unfortunate women. It was found that the entire bottom had dropped out and that the sink was half full of turbid water, still frothy and disturbed. The side next to the house had gone, taking with it tons of earth and three big pine trees. Not a sign of the bodies nor of the boards of the house, or the trees or rubbish could be seen. Weights were tied to 200 feet of clothes-line, but no bottom could be found.

Take forethought of shelter for cattle, says a correspondent of the New York *Tribune.* The saving in food between those exposed to the cold and those in warm stables is one-half. The difference in the temperature between the inside of my stable and the outside in cold weather is about 20 deg. The food required to keep cattle alive in the cold will make profitable gain when they are kept in a warm place. Cattle kept from getting chilled will live on half the food required to keep them in the same condition of flesh when kept out in the cold. Prof. Sanborn got one pound of growth on steers fed on hay alone in barns, and outdoor no gain fed in the same way. Prof. Shelton made a difference of gain on pigs of fifty pounds sheltered, above those unhoused. Prof. Morrow had 164 pounds difference in gain per calf between housing and exposure.

The great Dalrymple wheat farm in Dakota is thus described by one of the owners: "We now own 60,000 acres of tillable land; this year our crop of wheat spread over an area of 27,000 acres. To cultivate that much land we employ 600 men, work 800 head of horses and mules, run 120 self-binding harvesters and have a good time. Soon as the wheat-cutting is completed we commence with fifteen steam threshing machines to shell it out, and this year's crop averaged seventeen bushels to the acre, or a total of 459,000 bushels. The number of plows used is 135. The farm is divided into 2,000 acre sections, and for each of these sections a foreman or superintendent is appointed. He is supplied with everything—a boarding house for his men, stables, sheds, and everything necessary for the complete equipment of such a farm. They have fifty miles of telephone, connecting the headquarters' office with the superintendent's office of each district, and from them Mr. Dalrymple receives every evening a report of the day's doings. They also have elevators enough on the farm to hold all the wheat. Generally it is shipped to an agent at Duluth, when they are ready to sell, but if the market is better further east, they ship direct to the best market. We have about 200,000 bushels in the elevators now, waiting for the price to reach 90 cents next spring."