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MANHATTAN, KANSAS  
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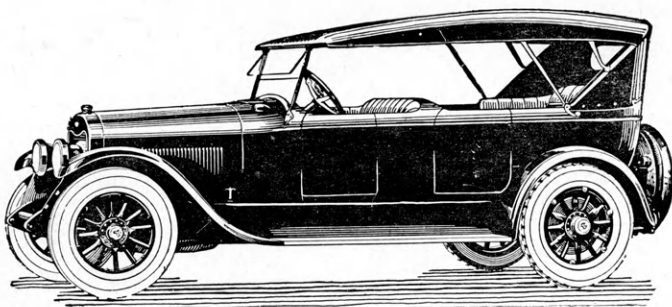
# THE KANSAS AGRICULTURAL STUDENT



VOL. III, No. 2

DECEMBER, 1923

MANHATTAN, KANSAS



Walter E. Moore

AUTHORIZED AGENT

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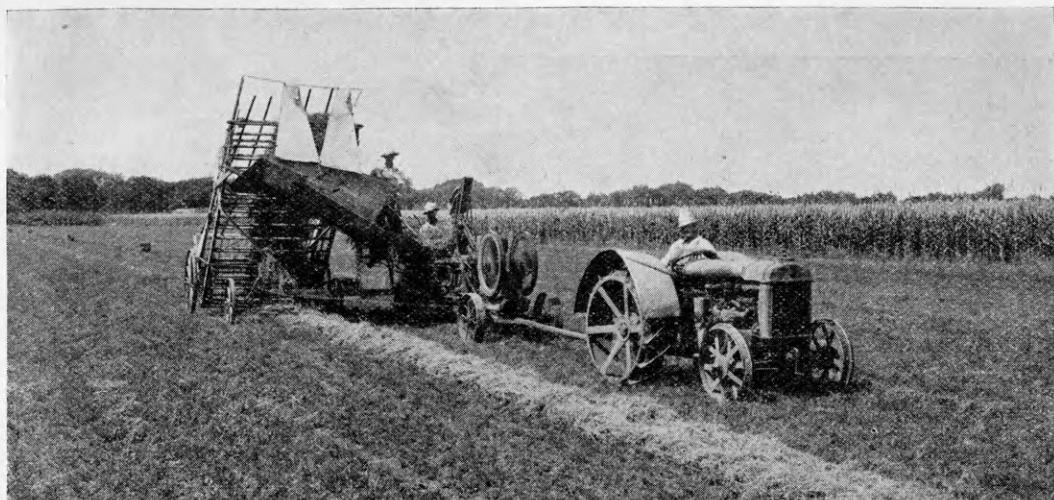
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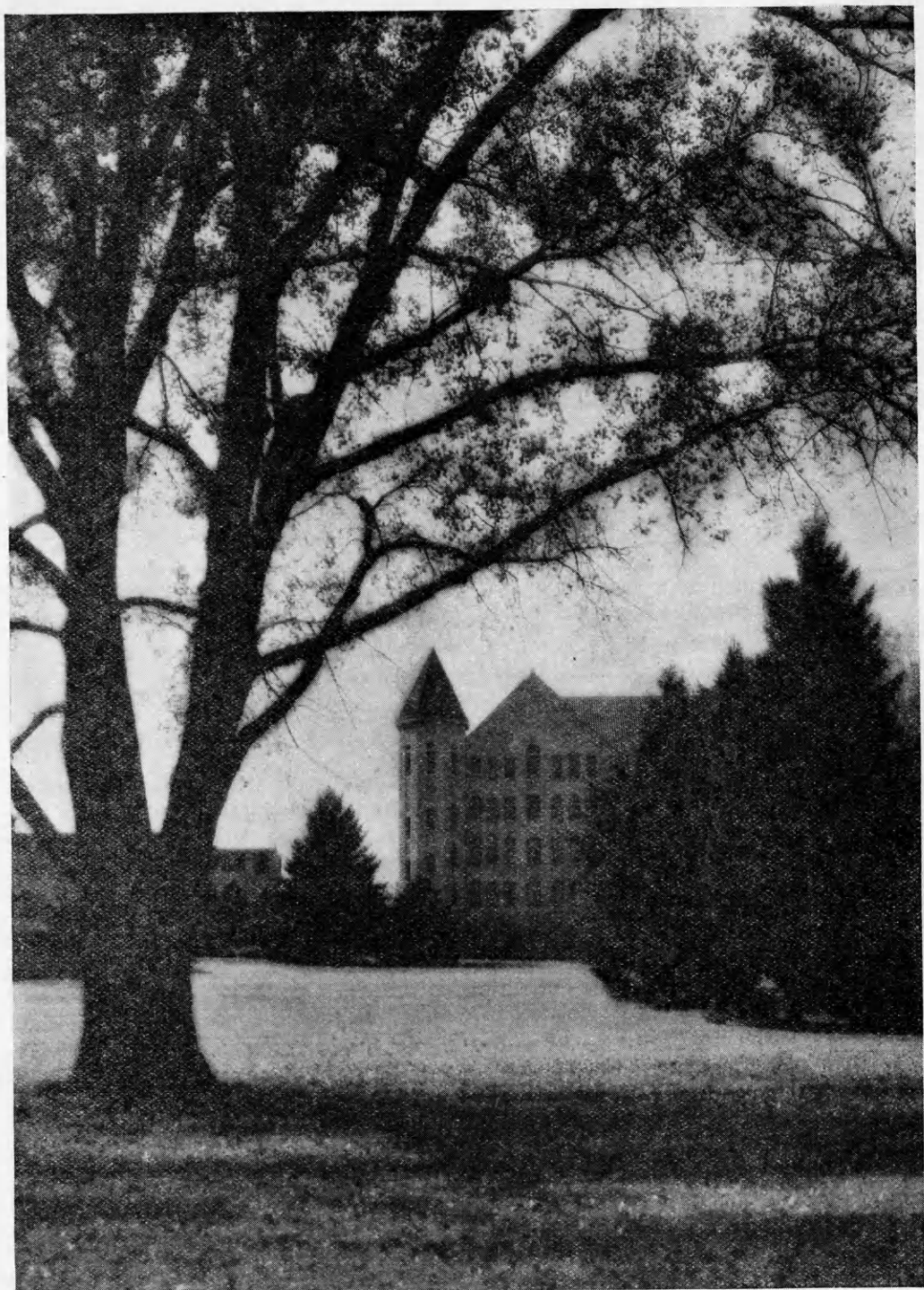


PUTTING UP ALFALFA ON THE LINN FARM NEAR MANHATTAN

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A FAMILIAR CAMPUS SCENE



# The Kansas Agricultural Student

VOL. III

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NO. 2

## Vitamin D or Sunlight Will Prevent Weak Legs in Chickens

B. H. Fleenor, '19

Young chicks may be successfully reared without developing "Weak Legs," or rickets, under one of the following conditions: (1) Direct sunlight, (2) Vitamin D in addition to the standard poultry ration, (3) ultra-violet light treatment. The use of electric light in the ordinary room will not prevent the appearance of rickets. These important conclusions have been reached recently in an experiment conducted by Dr. J. S. Hughes, of the Kansas Agricultural Experiment Station.

Three lots of day-old chicks were placed in pens with varying intensity of light. The pens were about ten feet square and were provided with hot water brooders. All lots received the same ration, which was the standard ration used by the Department of Poultry Husbandry. In addition to the scratch grain and mash, each lot was given all the fresh buttermilk and sprouted oats the birds would consume.

Lot I was located before a large east window, and received the direct morning sunlight filtered through ordinary window glass. Lot II was adjacent to Lot I but received only the diffused light reflected from the wall of the room and, in addition, the light from a 100-watt electric bulb, placed under a bright reflector, hung four feet from the floor of the pen. Lot III was kept in a pen so dark that one could not see distinctly on first entering the pen. This pen was ventilated by means of an electric fan, as it had to be closed to exclude the light.

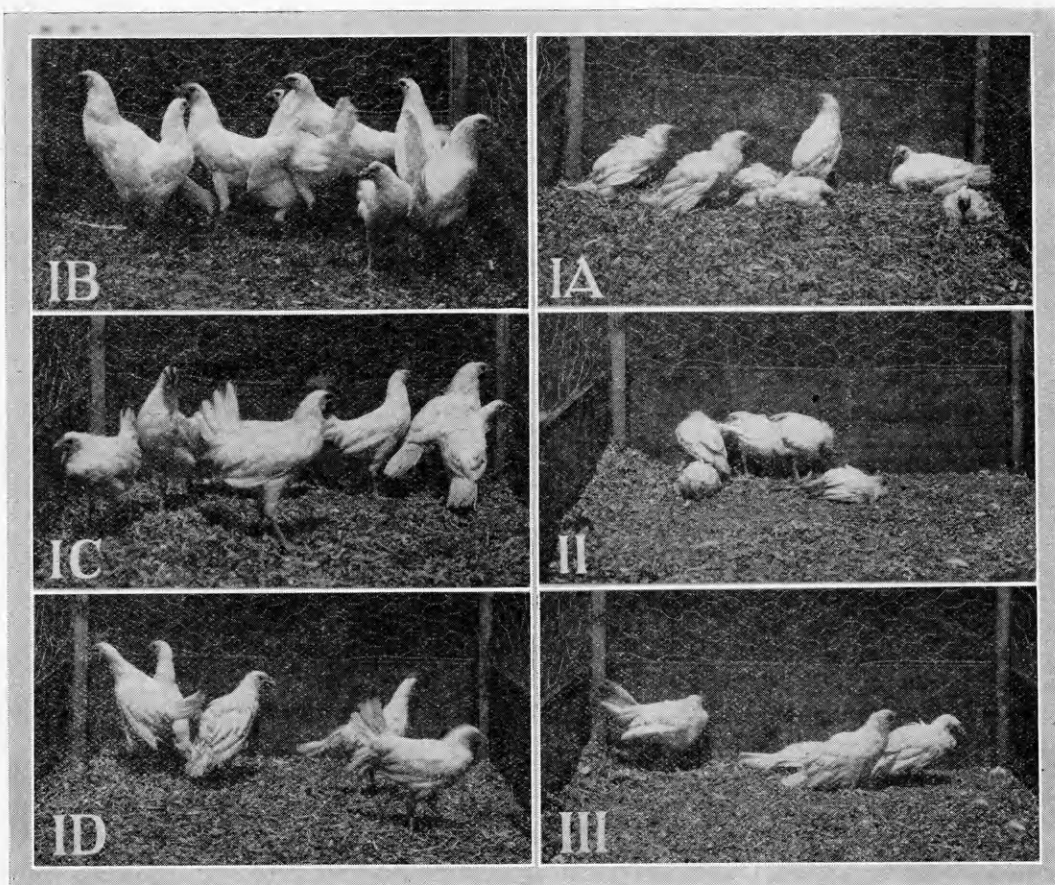
It was planned to keep one lot in direct sunlight; but as there was no means at hand in March when the experiment was started for keeping such a pen warm out in the sun,

the chickens intended for this lot were put in Lot I. At the end of four weeks, when the weather had warmed up somewhat, this group was put in a small wire cage, and placed out in the sun about six hours each day. The chicks receiving this treatment are designated as Lot I, B.

At the end of seven weeks, another group of seven chicks were removed from Lot I to another pen having the same amount of light, and were given 10 per cent of cod-liver oil in their mash. This group is designated as Lot I, C.

After eight weeks five chicks were selected from Lot I, and were given two ten-minute treatments a day of the ultra-violet light produced by the Hereus mercury arc lamp. This group is designated as Lot I, D. The chicks in Lot I that received no special treatment, are designated as Lot I, A. The experiment was discontinued at the end of fourteen weeks.

The results obtained are shown in the accompanying illustrations which show the condition of the chicks in each lot when the experiment was concluded. The effect of direct sunlight on the plumage is easily noticeable. (Lot I, B.) An early condition of rickets was clearly evident in Lot I at the end of the first four weeks of the experiment; but when Lot I, B, was placed in the direct sunlight, the beneficial effect was so marked as to leave no doubt as to the influence of sunlight. One of the most striking results, however, was in the development of the secondary sexual characters. At the time the cockerels receiving the sunlight had well developed combs, and were beginning to crow, it was



THE SIX PENS OF CHICKENS AS THEY APPEARED AT THE CLOSE OF THE EXPERIMENT

impossible to distinguish the sex of the chickens in Lot I, A, Lot II, and Lot III with any degree of certainty.

The beneficial results obtained with cod-liver oil (Lot I, C) and ultra-violet light (Lot I, D) were almost as outstanding as with direct sunlight. In each case there was a prompt recovery of the normal use of the legs and a normal development of secondary sexual characters.

Lot II, which received the light from a 100-watt electric bulb, in addition to the diffused light, showed about the same results as Lot I, A, which received only morning light filtered through the east window. The light produced by the ordinary electric bulb is very poor in the shorter wave lengths which have the beneficial action in preventing and curing rickets.

Lot III, which was kept in the dark pen, did just about as well as Lot II, which was kept in a well-lighted pen with the added electric light. This indicates that the longer wave lengths of light of the visible spectrum have very little beneficial action.

Sunlight is much poorer in the short wave lengths, which are the beneficial ones, during the winter months than during the summer months. The morning and evening light is much poorer in the short wave lengths than the noon day light. For this reason, chicks will do much better before a south window than before an east or west window.

The outstanding abnormality outside of the failure of sex development in rickets, is the failure to calcify the bones, particularly the flat bones. This is shown not only in the lack of development of the breast bone, but also in

the bony structure inside the beak and toe nail. In several of the chicks the bone of the upper beak was so soft as to allow it to hang down over the under beak, causing the condition known as scissor beak. The lack of calcification of the bones in the toe nails permits the nail to curl up, which is one of the early symptoms of rickets in chickens.

This experiment not only points the way to the proper methods of rearing early-hatched chicks but also indicates the importance of Vitamin D in a feeding ration where normal bone development is expected. Where young chicks are placed in the sunlight it is essential that they receive the direct light during the middle of the day rather than the sunlight of early morning or late afternoon.

The farmer and the practical poultry raiser may well profit by the results of the experiment by seeing to it that chicks grown in late winter and early spring have plenty of direct sunlight or are given a ration containing some substance, such as cod-liver oil, rich in Vitamin D.

WEEKS	LOT I				LOT II	LOT III
	A	B	C	D		
1					Diffused	Kept in
2	In east window—morning				light	a dark
3	sunlight filtered through				reflected	room
4	glass				from	
5		In direct			walls of	
6	Continued	sunlight			room	
7	in east	six hours			and	
8	window,	in middle	Cod liver		electric	
9	morning	of each	oil added	Ultra-violet	light in	
10	sunlight	day,	to standard	light treat-	addition	
11	filtered	otherwise	ration,	ment added		
12	through	light same	light same	to same		
13	glass	as Lot I A	as Lot I A	light as		
14				Lot I A		
	▲	■	■	■	▲	▲

▲ Rickets developed    ■ No rickets  
A CONCISE REPRESENTATION OF THE  
EXPERIMENT AND ITS RESULTS

## The K. S. A. C. Herdsmen

Edwin Hedstrom, '24

As the average person looks at the scores of ribbons won by the Department of Animal Husbandry and the numbers of high-record cows that have been produced by the Department of Dairy Husbandry, he is apt to think all that is necessary for such honors is the purchase of good animals. He seldom stops to think of the hours of patient watching the animal requires while young, the skillful feeding necessary during the growing period, and the careful manner in which the animals must be handled to achieve this success. Behind these awards is a group of highly skilled men working with the animals. Although the herdsmen at the college do not have the cultural training of the professors, they are trained by years of experience and very careful study which make them know livestock.

There has never been a man in charge of the college beef show herd with such a wonderful show record as Albert Allen. He was born in Runcorn, Cheshire, England. Before coming to America, he showed cattle at

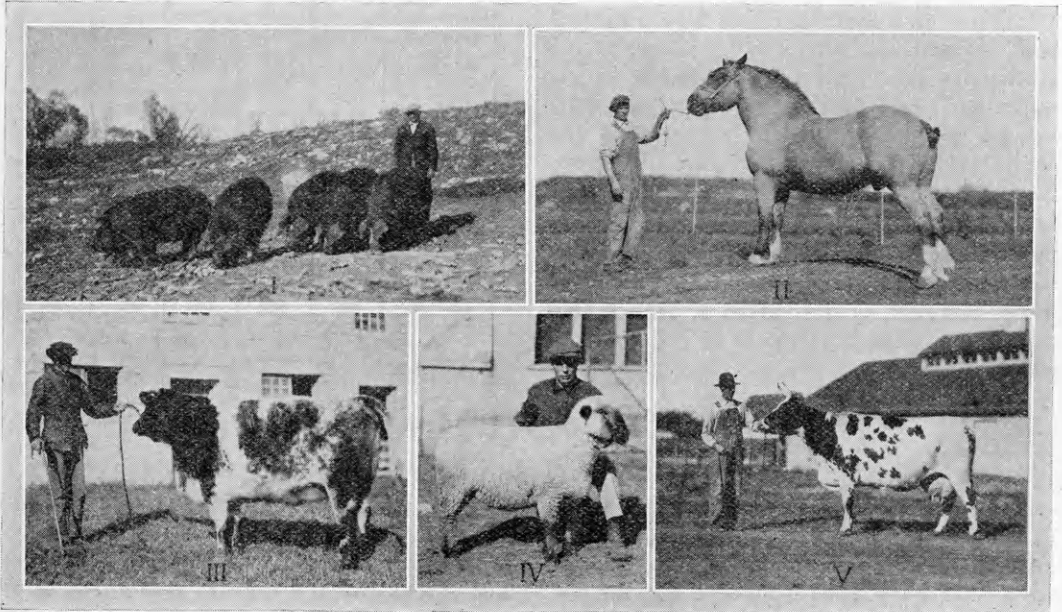
the Smithfield show and at the Royal Agricultural Society show of England. His father raised cattle for the Smithfield market and it was Albert's duty to feed them. Ever since that time he has been fitting prize-winning cattle. In 1906 he showed Gloster King, the junior champion at Lincoln (Nebr.), the first two-year-old bull, and the first aged bull of the show. At the first Shorthorn Congress he showed the junior and grand champion bull for Hopley Stock Farms of Iowa, in 1918 the first champion bull of the beef breeds at Lincoln, owned by S. A. Nelson and Son. The undefeated Cumberland's choice and the grand champion Shorthorn female, Clara 71's, owned by W. Preston Donald, was fitted by Mr. Allen. It is a well-known fact that the greatest agricultural demonstration in America is the Sni-a-Bar farm experiment. Mr. Allen purchased for this establishment some of the foundation cows, as well as many of the bulls now in use, while he was in charge of the herd. Last year when the Mendenhall



herd was shown at Sedalia, Mo., it didn't receive much consideration, but after the skillful care and feeding which Mr. Allen gave it, his bull was given second at the American Royal and his steer was first on all of the mid-western circuit. Mr. Allen fitted and showed nine individuals for the college at the 1923 American Royal Livestock show. He made a very creditable showing, winning one first, two seconds, five fifths, two sixths, and two sevenths. Mr. Allen undoubtedly

gian stallion "Farsar" (II) and the Grand Champion Belgian female "Farzelle" were grown, fitted, and shown by "Tom."

The best way to make an enemy of Mr. Greer is to excite, injure, or in any way annoy the horses, and the quickest way to win his friendship is to handle the horses gently and carefully whether in the judging pavilion or on the farm. "Tom" always keeps the horses in excellent condition for class work, which requires a great deal of time spent in



#### K. S. A. C. HERDSMEN AT HOME

I. W. W. Bales, the hogman, and a few specimens of the hog herd. II. Thomas W. Greer, the horse groom, and Farsar, one of his favorites. III. Albert Allen and Narcissus Gem 6th, a purebred Shorthorn of exceptionally fine type. IV. Thomas Dean, the college shepherd, and one of his pets. V. C. O. Bigford, superintendent of the Dairy Farm, and Melrose Canary Bell 2d, a famous purebred Ayrshire.

will bring home many ribbons to K. S. A. C. in the future.

Everyone who has been around the show barn is greeted by "Howdy," or some other cheerful word upon entering the barn. These words come from a man who cares for the horses in the same manner in which he speaks to you. He is Thomas W. Greer, better known as "Tom" in animal husbandry circles. Mr. Greer started to care for the college stud in 1917. In the past five years he has fitted and shown 23 champions and 82 firsts for the Department of Animal Husbandry. The 1922 American Royal Grand Champion Bel-

grooming. In early spring from February to April, which is the foaling season, nights of watchful attention and careful management are given the mares to insure good colts. It is the mature animals that are seen in the show yard or heard of in the papers, but nobody but "Tom" knows how many hours of work were required, and how his patient eye watched the colts as they developed, hoping each day that they might grow better.

The institution has no better and more willing man to help with class work than its

(Continued on page 62)

# Forage Poisoning

E. W. Young, '25

The term "botulinus" (botulus, a sausage) was coined by the physicians of southern Germany in the beginning of the nineteenth century, to apply to a peculiar type of food poisoning which was caused by the ingestion of spoiled sausages.

The *Bacillus botulinus* has been proved to be the causative factor in the production of the disease, botulism or food poisoning. The organism was first isolated in 1896 by van Ermengen, a German bacteriologist. Since that time it has been isolated a number of times from various sources, not only from spoiled meat but from spoiled vegetables, spoiled hay, ensilage, and other feedstuffs.

The organism itself cannot grow in the body of an animal, but it produces a toxin or poison which is excreted in the spoiled meat, vegetables, and other decomposing material. This toxin is very poisonous, 0.00005 of a gram being sufficient to cause the death of a guinea pig. Hence suspected food should not be tasted, as it may be deadly poisonous. In one case it is known that one-third of an olive caused the death of an individual.

The symptoms of poisoning by the toxin *Bacillus botulinus* are about the same in man as in animals. They usually appear in from eight to one hundred twenty hours after the poisonous food has been eaten. The disease is usually characterized by nausea, dizziness, incoordination of muscular movements, and impairment of the vision. It is one form of "blind staggers." Mortality varies from 50 to 100 percent.

The causes of botulism in humans are usually the ingestion of improperly canned foodstuffs that are contaminated with the botulinus organism. The disease can be prevented in most cases by the observation of sanitary methods and careful procedure in canning foodstuffs. All food that is tainted should be destroyed. Spoiled food should never be fed to the chickens or hogs as it may prove fatal.

Forage poisoning of horses and cattle is usually caused by the *Bacillus botulinus*. In horses the disease is commonly known as

blind staggers, pasture disease, horse plague, and forage poisoning. In cattle it is known as silage poisoning or corn stalk disease. In the control of this disease one must constantly be on the lookout for evidence of spoiled or molded forage. Molded forage is, as the name implies, caused by a mold, but it is possible that the botulinus organism may also be present. Anything that looks suspicious should be handled with care and in case a large amount of feed is involved it might be well to test out the feed on an animal that is not too highly valued. If the test animal shows no ill effects from the feed after a week or ten days feeding, it may be reasonably safe to assume that the feed is not harmful.

In chickens this disease is commonly known as limberneck. The head and neck are limber or pendulant resting upon the floor or ground. The respirations are shallow and rapid in character. The disease can be prevented by not allowing the fowls to gain access to any form of spoiled organic material, such as spoiled canned feed or bodies of dead animals.

Antitoxins have been developed for the treatment of botulinus poisoning. Due to the fact that three types of the organism have been demonstrated and that any one of the three can produce disease, it is necessary to use the polyvalent antitoxin, which is composed of at least two of the types. Botulinus antitoxin, bovine, equine, and ovine origin may be prepared and should have preference in the treatment of cattle, horses, and sheep, respectively.

It is well to remember that botulism is a non-contagious, fatal, toxemic disease occurring sporadically in horses, mules, sheep, swine, cattle, poultry, and man. The causative agent is a specific bacterial poison. Forage poisoning may be prevented in animals by feeding only wholesome food. An immediate change of feed and pasture and the administration of polyvalent botulinus antitoxin is recommended to check the disease in infected herds.

# The Relation of Farm Granary Space to Early Marketing

R. M. Green

Many people believe that the so-called "dumping" of large quantities of wheat on to the market immediately after threshing constitutes a "disorder" in the marketing system. Hence, the present interest in orderly marketing—a process that will cure this disorder.

It was at one time the practice in attempting to cure physical disorders to bleed the patient, whatever the particular disorder might be. Farmers now and then think that even yet this out-of-date practice is used on them at times in attempting to cure their marketing disorders.

Modern medical science attempts to diagnose physical disorders first, and then prescribe treatment. Attempts to better the farmer's position in the markets—to prescribe treatment for certain of his economic disorders—are just as likely to cause further disorder and complications as they are to cure, unless action is taken after careful consideration of facts. Perhaps on no other single point have so many farmer movements gone astray as on the matter of acting first without full information. Today, more than ever, a certain business man's advice to "get the facts or they will get you" holds good.

It was with the idea of getting the facts in the case that the Kansas Agricultural Experiment Station began in the fall of 1920, an economic study to determine just to what extent a shortage of storage space for wheat on Kansas farms was a force back of this dumping of wheat early in the crop year.

Those who believe that a more evenly distributed delivery of wheat throughout the year would help prevent seasonal sags in prices, have held that two things in particular contribute to the present heavy deliveries immediately after harvest; namely, (1) shortage of farm storage space, (2) inability to secure bank credit. This article deals only with a study of the first of the

foregoing causes.

It is a simple proposition that if shortage of farm storage is a cause of disorderly marketing, the remedy lies in more farm storage space. In fact such a remedy was suggested in farmers' meetings in Kansas during the fall of 1920 when wheat prices were falling so rapidly. The extent to which a "cure" will be effected by the use of this remedy, however, depends upon the extent to which shortage of storage space contributed to the disorder in marketing, if indeed the chief causes back of early wheat movement prove it to be a disorder.

This leads to seeking an answer to the very practical questions: (1) How short are we of farm storage space for wheat in Kansas, (2) Where in the state is the shortage? (3) How much above an average crop can different sections of the state stand before a shortage of farm storage space develops? (4) How much of the wheat crop is this shortage forcing on the market? To what extent then will more farm storage space help solve the problem of a peak-load delivery of wheat from farms immediately after threshing?

## HOW SHORT IS KANSAS ON FARM STORAGE SPACE FOR WHEAT?

The first study made to answer this question was undertaken in the fall of 1920. Results from 743 farms scattered over 29 Kansas counties showed that only about 20 per cent of this number of farms was short of farm storage space. The combined results from all farms showed 144 bushels of bin room for every 100 bushels of wheat crop.

The same study was repeated in 1922 on 152 farms in 56 different counties, with the intention of further checking up results obtained in 1920. This time, as before, it was found that approximately 20 per cent of this relatively small group of farms was short of farm storage space. Combined re-



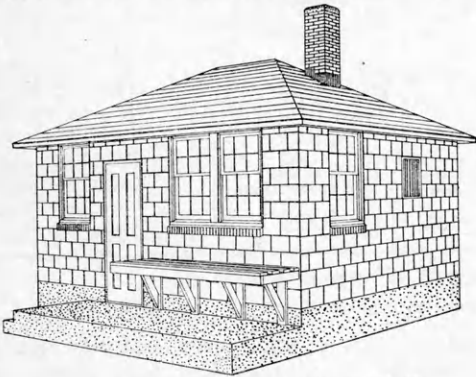


# Farm Buildings

C. O. Nelson, '24

Farm buildings should be designed to meet individual farm needs. No one type of building is suitable for all types of farming and proper location and planning require more forethought than they ordinarily receive. A satisfactory building is the result of many hours of thought and planning on the part of the owner, as well as consultation with those experienced in the erection of good buildings.

Arranging the buildings, fences, and roads on a new place is an easy matter comparatively, but rearranging an old farmstead is often difficult as well as expensive. Hence it is desirable to put adequate thought and effort



A PRACTICAL MILK HOUSE

into the first plan. An approximate calculation of the accommodations required must be based on the present and prospective size of farm, the number and kind of livestock to be kept, and the number of acres in each crop. The high cost of materials makes overbuilding extremely unprofitable, therefore, one must utilize all the room, but provisions for probable future expansion should also be taken into consideration. Briefly stated, the farm building situation today demands that more attention be given to such factors as fitness, convenience, permanency, upkeep costs, sanitation, and appearance than ever before.

The arrangement of farm buildings in a fairly compact plan or system is generally conceived to be the most practical. However, the outbuildings should not be so close to the house as to appear a part of it, nor so far distant as to be inconvenient. The house

should be sufficiently distant from the other buildings so that odors, flies, and noises will not be objectionable and danger from fire will not be serious. The workshop has often been spoken of as "the hub of all farm activities," hence placing the machine shed, with shop included, and the horse barn in a group will save innumerable steps.

The poultry house should be placed nearest to the dwelling as the care of the farm flock falls partially upon the housewife. It is desirable that the grain storage houses be placed close to the feedlots and feed boxes, and that they be constructed of such materials as to reduce to a minimum the immense losses due to the depredations of rats and mice. It is estimated that more than two hundred million dollars are lost annually by feeding rodents from the granaries of the country.

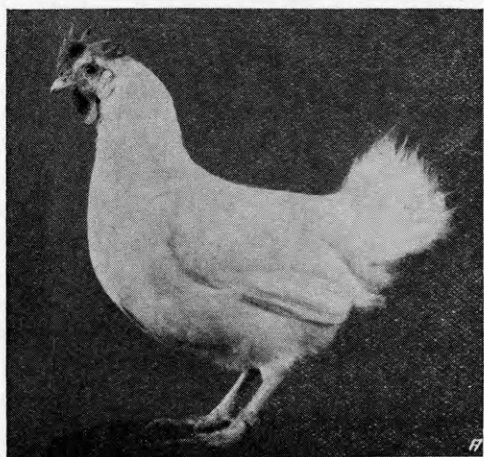
Farmers are generally recognizing more and more the fact that it actually pays to house the less bulky forage crops such as legumes, tame and native hays, and some of the sorghums. Nearly all farm feeds are salable and any surplus feeds can be disposed of at a better figure if kept under roof and the spoilage incidental to outside storage is almost entirely eliminated. A combined hay and livestock barn enables a three-fold saving to be made: A saving in labor of feeding; a saving in feed required; and a saving of feed resulting from less spoilage and waste. During the winter months, modern housing of the dairy cows will mean an increased milk production of several pounds per day from each cow.

Undoubtedly a large part of the enormous farrowing season losses could be averted by adequate hog houses. In fact there are losses in almost every type of farm building that could be prevented by good, well-planned, sanitary structures. In fact it is not uncommon to find that these losses are greater than the cost of suitable buildings. It thus appears that farmers frequently pay for good buildings whether they have them or not.

# Three Hundred Egg Hens

D. C. Warren

The world's official record for number of eggs produced in 365 days is 339. This record was made in Australia by a Black Orpington hen in 1920. The highest official record in the United States is 335 eggs and was made by a White Leghorn hen at Puyallup, Wash., in 1922. Three hundred egg hens are very rare and to the writer's knowledge only two have been reported for the past year



COLLEGE RECORD HEN

White Leghorn hen No. 4546. This hen holds the college record, laying 299 eggs in 365 days.

in all of the territory east of the Rocky Mountains.

The performance of some of the hens at the Kansas State Agricultural College poultry plant was followed with considerable interest during the past year. It was believed for a while that the much sought three hundred mark would be reached by one or more hens. A single Comb White Leghorn hen, although surpassing by considerable any previous Kansas record, presented us with the disappointing record of 299 eggs. This record exceeded by 20 eggs any previous record made at the College plant and it should be mentioned that it was made in a large laying house under conditions recommended to the practical poultryman. Such conditions are not com-

parable to those under which the highest records have usually been made.

Each year the highest producing hens are placed in the production breeding pens from which future breeders are obtained. The average production of the hens used in the White Leghorn breeding pens for the past few years gives some idea of the progress made. In 1920 thirty-three hens were used in the production pens and their average was 200 eggs in a year; in 1921 eighteen hens with an average production of 216 eggs; in 1922, thirty-six hens with an average production of 215 eggs; in 1923, thirty-seven hens with an average production of 231 eggs; and in 1924, thirty-nine hens are to be used and their average production is 264 eggs. Very little new blood has been introduced into the stock for the past five years and the increased production has been brought about by rigid selection and careful management.

The production breeders for 1924 have been divided into three lots. In the first pen the hens used are not only high producers, but come from matings which gave a high per cent of superior progeny. In the second pen the hens were selected because of their high individual records. In selecting hens for a third pen emphasis was placed primarily upon superior production over a period of two or more years. The average production for the nine hens in the first pen is 274 eggs; for the ten hens in the second pen, 276 eggs; for the eight hens in the third pen, 249 eggs. From these matings it is hoped to obtain offspring that will continue to raise the standard of production in the future.

---

W. H. Brookover, '18, is farming near Eureka. His duties also include those of the manager of the Cooperative Livestock Association of his community.

J. D. Montague, '20, is farming near Anthony. In the fall of 1919 he was a member of the intercollegiate stock judging team.



# Control of Fire Blight in the K. S. A. C. Apple Orchard

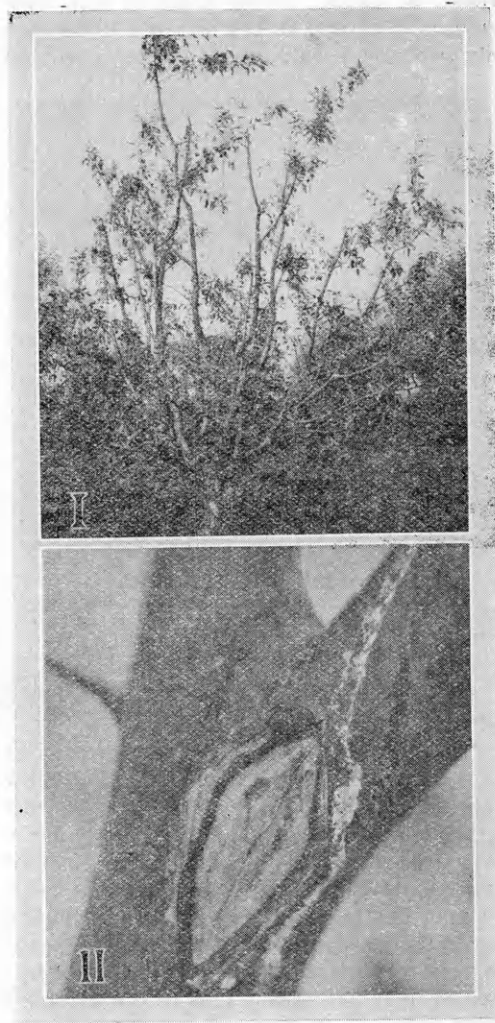
C. O. Dirks, '24

The first fire blight epidemic in the young K. S. A. C. apple orchard occurred during the summer of 1923. The Jonathan, Chenango, and Maxwell varieties proved to be the most susceptible to the disease although at least traces could be found in all parts of the orchard. In combating the blight, the whole orchard was gone over six times and the more seriously infected trees received additional treatments.

Although a few twig and spur blights were observed early in June, it was not until two weeks later that the disease became widespread in the orchard. A vigorous control campaign was started as soon as indications pointed to a serious epidemic. Cutting out the blighted parts and careful disinfection of wounds and pruning tools were the methods of attack. All water-sprouts and short spurs on the trunk and main branches were also removed. By August 6, the hot, dry weather had slowed up tree growth to the extent that the trees were able to resist the bacterium and the cutting of blight was no longer necessary. Only a small number of Jonathan trees, a few Maxwells, and a Chenango suffered seriously. The Jonathans which blighted the most were large, vigorous, 10-year-old trees. Practically all of the 235 trees of this variety showed some blight during the summer.

Fire blight is a bacterial disease and attacks the plant in the cambium layer underneath the bark. The bacteria most frequently gain entrance to the cambium near the ends of rapidly growing twigs and spurs. The first indication of the disease is the turning brown of the leaves. As the blight progresses the leaves die, then change in color from brown to nearly black. The most serious damage is done if the disease reaches a large branch. In such cases it may follow the cambium down and around the limb until it is killed. During bad epidemics the number of blighted twigs may be so numerous

as to make a tree look as though it had been scorched by a fire. Certain varieties of pears are especially susceptible to fire blight and



A TREE AND A LARGE BRANCH AFTER TREATMENT FOR SEVERE FIRE BLIGHT INFECTION

large limbs are often killed which later leads to death of the tree.

The removal of all diseased parts as soon as they appear is the best known method of blight control. Affected twigs and spurs should be cut off well below the lowest point at which browning of the bark shows. If bacteria have spread down into the cambium of a limb a cut through the bark following the outline of the lesion should be made. This plate of bark should then be removed, the wound and tool disinfected and a second cut made parallel with the first and about one inch outside of it. This ring of healthy bark should then be removed, the wound carefully disinfected, and soon after painted with water glass.

In work of this kind it is absolutely necessary to keep the pruning tools sterile at all times. After each twig or lesion cut the pruning implement should be swabbed off with a disinfectant. All large wounds should also be sterilized and when dry painted with water glass.

The disinfectant used during the summer

in this orchard consisted of bichloride of mercury, 1 ounce, mercuric cyanide, 1 ounce, and water, 4 gallons. This disinfectant works equally well for sterilizing the tree wounds or the pruning tools. As no metal should come in contact with the solution, it is best to carry it in a wide mouthed glass bottle. It is applied by means of a rag swab.

Holdover cankers from the previous summer's blight serve as the most fruitful source of fire blight spread. If these cankers are not removed insects carry the bacteria from them to other trees. Early in the spring the disease is carried to the nectaries of the blossoms or to rapidly growing tips by aphids and other insects and as a result new infections occur.

The growing of resistant varieties, the inhibiting of rapid succulent growth, and the spraying for aphid control, together with surgery, are the means of controlling fire blight.

## The Pocket Gopher, the Rodent Pest of the Alfalfa Grower

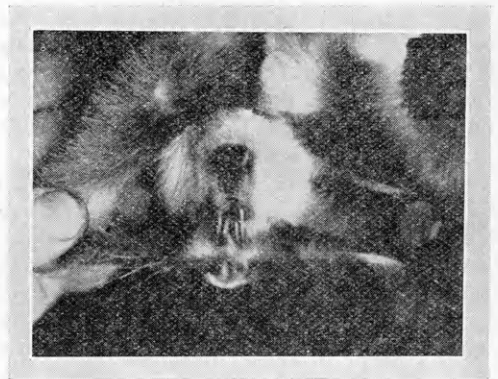
Frederick E. Emery, '23

Although pocket gophers are very common in most parts of Kansas they are not familiar animals to most people. Pocket gophers are numerous in Nebraska, Kansas, Oklahoma, and westward. Early settlers tell us the gophers are natives of this country and were trapped by the Indians for food purposes.

Pocket gophers are seldom seen above ground and for this reason they are not well known. Sometimes the striped ground squirrels or the chipmunks have been called gophers. The writer has been called upon to poison gophers but on arrival found the trouble was due to moles. One man asked if the gopher was not a ground hog. In some parts of the country people speak of pocket gophers as salamanders.

Three species of the pocket gophers are found in Kansas. The one in the vicinity of Manhattan is *Geomys bursarius*. The pocket gopher is a heavy, short-legged fellow, with a short, almost hairless, tail and stout muscular forelegs. The incisor teeth are long and the upper ones grooved. On the forefeet are long, strong claws. The head and

shoulders are heavy, and on either side of the mouth is a hair-lined pocket extending back to the shoulders. These pockets are used for carrying food. In color the gopher resembles the native rat, but the gopher is



POCKET GOPHER SHOWING POCKETS

more heavily built and is much less active. The eyes of the gopher are small and kept partly closed when the animal is at rest, but

when frightened or angry the eyes protrude and are very conspicuous in their flashing brilliancy.

The home of the pocket gopher is a system of underground runways varying in size and length. Sometimes a tunnel six inches in diameter is made. More often, however, a three- to four-inch tunnel is dug about ten inches under the ground. The tunnels of the gopher are often very long sometimes totaling one hundred yards in length.

The gopher uses his strong fore claws and teeth in digging. The dirt is cut loose and thrown under the animal. At frequent intervals he turns around and with his breast



POCKET GOPHER PUSHING DIRT FROM A SIDE TUNNEL

and paws pushes the dirt to the surface. As the runway advances in length side tunnels six to ten feet apart are cut. These side tunnels are slanting from the runway to the surface and it is through these that the dirt is pushed out forming a mound.

The mounds are usually crescent shape and show a circular area near the concave side. This area is really a plug where the tunnel has been closed after the dirt was pushed out. The dirt is pushed out so rapidly that the gopher is only exposed for an instant and even then rarely more than the head and shoulders are visible. Between the mounds the surface of the ground is not disturbed. This fact alone would distinguish the work of the pocket gopher from that of a mole. Though more active early in the morning or in the evening the gopher

may be seen at work any time of the day.

In general the food of pocket gophers consists of roots, green plants, and grains. Roots are eaten almost exclusively in winter. The roots are cut up in pieces two or three inches in length and stored near the nest. This store house is filled in October and November. For this reason these months present a very opportune time for poisoning. Gophers wander out at night in search of grain and may go a half mile or more in order to get their pockets full of oats or corn.

During the summer alfalfa tops are eaten. These may be taken into the runway either by digging a tunnel under the plants and pulling them into the runway, or by coming out on top of the ground and cutting them off.

Gophers have increased steadily with the increase in alfalfa growing and have become the most injurious rodents to the alfalfa crop. It has been estimated the damage done to the alfalfa alone in Kansas is two and one-half million dollars annually. This fact should be sufficient to interest the Kansas farmer in cleaning his land of these pests.

Full information concerning trapping and poisoning pocket gophers can be obtained by writing to the Department of Zoology of K. S. A. C. Information concerning the extermination of the pests will also be presented in succeeding issues of The Kansas Agricultural Student.

Over 100 students of the Division of Agriculture attended the first annual Aggie Day at the American Royal Livestock Show at Kansas City, on Wednesday, November 21, 1923. Through the cooperation of the Department of Animal Husbandry of the college and the officials of the American Royal, the students were admitted as guests of the association.

Willard Welsh, '21, is farm editor of the Hutchinson News. He is handling a real department according to reliable reports. Willard says he has married and settled down.

H. E. Ratcliff, '23, is planning to return to K. S. A. C. next semester and take up graduate work in agricultural economics.



# Why the Acreage of Soy Beans on Eastern Kansas Farms Is Increasing

O. M. Williamson, '24

The soybean, an annual legume, is one of the most valuable crops for the eastern Kansas farmer. It furnishes him with a legume which is a soil improver and also permits him to grow a legume hay without having to keep his land in the crop for a number of years as is the case with alfalfa and the clovers. To both the landlord and the tenant the soybean should be a great help. The tenant wants a legume hay and the landlord wants legumes grown, but with alfalfa it takes a year to get it started and the tenant does not want to plant alfalfa and then move. With the soybean, however, the tenant can plant and harvest a crop in one year thus getting his hay. The crop is a high yielder, the best seed varieties in Kansas yielding 18 to 20 bushels per acre and the better hay varieties yielding from 2 to 3 tons of hay per acre.

As is the case with most legumes the principal incentive for growing soybeans is their value as a soil improver. However, unless the crop were valuable for other purposes also it would seldom be grown. In eastern Kansas, especially southeastern Kansas, there is much land which will not grow corn, wheat, and legumes, such as the sweet clovers and alfalfa, profitably, owing to the acid condition of the soil. It has been found that soybeans will grow on these soils. Of course the best yields of soybeans cannot be secured from an acid soil but they will grow and improve the conditions of these soils. One of the causes of an acid condition in the soil is the lack of aeration and the soybeans greatly assist in this function. Soybeans being taprooted penetrate the soil deeply and with rather large roots aid in aeration. The roots of the plants decay and leave air passages in the soil. The root habit of soybeans also seems to leave the surface soil in an extremely fine condition for the following crop. The lateness of cultivation leaves the field free from weeds and this with the well pulverized condition of the soil after the crop is har-

vested leaves an ideal seedbed for fall planting of alfalfa or a fall crop.

As stated before the soybean is more resistant to the effects of an acid soil than almost any of the other legumes and will produce good yields of both hay and seed on an acid soil. However, experiments have shown conclusively that the yield of the crop is greatly increased by a light application of lime. A heavy application of lime is not profitable but an application of from one to two thousand pounds per acre gives profitable returns. The lime increases the percent of protein in the plant and seed. The number of nodules formed by the nitrogen fixing bacteria found on the roots is also greatly increased by the addition of lime, in some cases the number being more than doubled. It is these nodules which give the plant one of its greatest values, that of adding nitrogen to the soil.

With many Kansas soils, especially the acid ones, it will be found that inoculation of the seed or of the field itself before planting is necessary. Material with which to inoculate the seed can be secured from most wholesale seed houses, if the commercial culture is used. The method which can be most readily used to inoculate the field itself is to scatter top soil from a field on which soybeans have been previously grown over the field on which the beans are to be planted.

The great difficulty to be encountered in soybean culture is that of getting a stand. Care and skill must be exercised by the farmer if he is to secure best results or any satisfactory results at all. The plant is very sensitive to a poorly prepared seedbed. One reason for this is that the soybean does not seem able to push itself to the surface if planted too deep, therefore, to plant shallow enough and still cover the seed the soil must be well worked. Also the bean cannot push through a crust caused by hard rains, but if planted only an inch or a little more in depth it has a much better chance of getting through. Probably

(Continued on page 64)

# THE KANSAS AGRICULTURAL STUDENT

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## OUR COVER PAGE

Lovers of good cattle and our readers in general will be interested to know that the three yearling Shorthorns shown on our cover page are all Kansas products. The bull, Royal Crown, is the result of years of successful breeding by Tomson Brothers of Topeka and Wakarusa. The college purchased this bull as a calf and expects to head the college Shorthorn herd with him. The heifer in the center of the group is Marauder's Emily, whose maternal ancestors for the past five generations have been bred on the college farm. The other heifer, Narcissus Gem 6th, an exceptional individual in width and depth of body, is also a product of the college farm.

These three individuals will be shown individually and as a yearling Shorthorn herd at the Kansas National Livestock show, Wichita, January 26 to February 2, 1924.

## SCHOLARSHIP COUNTS

We are glad in this issue of The Kansas Agricultural Student to give some recognition to a few of the students of the Division of Agriculture who have made outstanding scholarship records. The four young men whose pictures are shown on page 53 have done their freshman, sophomore, and junior work in K. S. A. C. They have won the distinction of having the highest scholarship average of the

seniors of the division who have made all their college credits in K. S. A. C.

There are two other members of the class of 1924 of the Division of Agriculture whose scholarship average places them well up in this group of leaders. However, both of these students entered this institution with advanced standing and have not earned sufficient college credits in K. S. A. C. to make them eligible to election to Phi Kappa Phi the first semester of the college year.

Freshman honors in the Division of Agriculture for the college year 1922-23 were won by A. G. Jensen of Neodesha. Sophomore students in the Division of Agriculture may be elected to Alpha Zeta and the society is to be commended highly for the stimulus it gives to scholarship from the first day the student becomes a college freshman.

The "Honor Roll, 1922-23" as given in "College Notes" is worthy of notice and comment. The three standards that must be met to attain the distinction are worthy of the best in any students. The second standard makes it necessary that a student's paramount job be his college assignment. It is to be regretted that this standard automatically eliminates a few worthy self-supporting students who are otherwise worthy of the commendation. The number thus eliminated, however, is not large. The first standard requires college work that is regularly and consistently satisfactory. More students were eliminated

by this first standard than by the third standard which requires, not an exceptional but a reasonably high scholarship average. A great majority of college students can meet these worthwhile standards. It is hoped that the percent of those commended may be much higher this year than last.

After all, **Scholarship Counts.** All else in a college career will fall flat and not be worth the effort and the expenditure of time and money unless the student attains and maintains a reasonably high degree of scholarship. There are many beautiful and helpful things in four years of college life, many more indeed than are usually crowded in any other four years of human life, but without scholarship—that which is the only sound and acceptable core of a college education—all the frills and the “activities” become as “sounding brass and a clanging cymbal.”

#### WHAT ABOUT THE FARM HOME?

Many Kansas farmsteads once well painted and attractive have become blackened by wind and weather until it seems that farmers have lost all appreciation of the value of a good appearance. The farmer with his back to the wall has been forced to postpone repainting the farm buildings and beautifying of home surroundings until he works out his financial enigma.

However, there is a latent danger in doing without a thing which we really need. By so doing the need becomes less apparent until we scarcely realize that the need actually exists. Will the farmer when normal prosperity returns use his surplus means to the attractiveness, and permanency of his business and home, or will his ideals and standards have changed until added wealth means only added cylinders and a longer wheel base than the flivver.

Well kept and neatly painted farm buildings surrounded by shrubs, trees, and natural beauty are an advertisement and farm asset which cannot be disregarded. They bespeak good farm management and carefulness in all farm operations. Permanency, stability, and economy are self evident. A home signifies more than a mere house to live in. It embodies comfort, convenience, economy, and beauty. Give the farmer a modern attractive home and he has by far

the most wholesome home life of any class of people. The social and financial power in any rural community always has been and we hope always will be measured by the number of beautiful, modern, and practical farm homes which its progressive citizens have erected.

May the new year bring to American agriculture its due portion of prosperity. A reasonable share of this prosperity should be used in beautifying and modernizing the farm home. The value of beauty and comfort cannot be measured. By abstaining from a few present-day luxuries the home may be provided with every worth-while convenience. Surely the farm family well deserves the best of home surroundings. May we soon see the farm home rejuvenated and restored to its rightful position in the sun, that of the most beautiful spot under the canopy of heaven.

#### AGRICULTURE CHALLENGES THE PROSPECTIVE COLLEGE STUDENT

Relatively few prospective college students investigate carefully all of the “ins and outs” of various curricula of study that are offered by the higher educational institutions. Regardless of the fact that the selection of the college curriculum is the most important step toward the student's life work, the choice is often made with little forethought, in a hit-and-miss fashion. Perhaps that is the reason why so many graduates later find themselves on the wrong road, or discover that they are misfits in their particular line of endeavor.

Many students make erroneous choices because they judge the future too exclusively by the present. Only when the future has become a reality do they see how incompetently they have judged the entire situation. Undoubtedly the relatively low price of farm products during the last few years presents a case in point. For no other reason than the present depressed situation in several phases of agriculture, many students have forsaken their fathers' farms, their early training, and sometimes their real inclinations, and have begun to prepare themselves for other occupations. They have made the grave mistake of allowing the price curve to choose their life work for them. One's career should be chosen with a for-

ward look and not on the basis of momentary expediency. The student's inclinations and aptitudes should be considered carefully and he should not lose sight of the long-time prospects of various pursuits and professions which he might enter. Rather than basing his choice on the price curve, the student should consider the wisdom of these words of Emerson: "A man is relieved and gay when he has put his heart into his work and does his best; whatsoever he has said or done otherwise shall give him no peace." A man should seek to enter that pursuit in which he will be able to put his whole self into his work.

Perhaps no other field of activity has received more comment of late than that of agriculture, and in none has more skepticism been voiced. This pessimism, to a great extent, may be attributed to the lack of appreciation of certain relevant facts. Although the agricultural depression of the last few years has been discouraging, the student who is thinking in terms of the future should not lose sight of the fact that this depression is necessarily temporary.

Agriculture is a fundamental industry. In fact it is the one around which all others revolve and upon which all others depend for their stimulus and very existence. Upon first thought this seems like an overvaluation, but we must consider that modern industry has been developed primarily because agriculture and other extractive industries have been able to produce enough food and raw materials for the entire country. Civilization began with agriculture—the care of animals and cultivation of the soil. It is only reasonable to expect that civilization cannot continue without agriculture. Thus it is quite impossible to conceive of a profession, as essential to the well being of humanity as agriculture, failing to retain its place as one of the most important and attractive of all pursuits. In all probability by the time a student now entering college will have graduated, the agricultural outlook will have undergone extensive changes for the better.

One of the first points the student wishes to ascertain in selecting a course is the amount he can reasonably expect to receive as a reward for his training. In other words, how will the returns compare with his expenditure of time, effort, and talent? While

no one can deny that farming and related occupations generally offer small returns at the outset, they are by no means the only occupations that do so. Many men in the professions—law, medicine, and theology—are required to go through a comparable "starvation period." It is merely the acid test that tries the metal of the beginner. The beginner in farming, as a rule, has a comparatively small income available for spending. This may be attributed to the fact that the greater part of the income must necessarily be returned to the farm in the form of equipment and improvements. However, the beginner's fear of a period of low spendable income should be given but small consideration. The question of greatest concern is, what will be the state of affairs of the farmer who is industrious, thrifty, and a good manager, at the end of a period of 10, 15, or even 20 years? Will he be more nearly financially independent than his city brother, and if so why?

In the first place the partial isolation of the farm life encourages thrift. The tendency toward extravagant and useless social activities is noticeably lacking, and the unconscious competition in conspicuous consumption of non-essentials is removed. Thus all returns from the farm above actual living expenses are put into land, livestock, equipment, and a home. So while the farmer is going to bed early and paying for his farm, his city brother may be struggling for supremacy on the waxed floor and barely making his books balance. In this case it will be quite apparent, when old age comes and the earning power of each begins to decline, who has held the winning hand in the game of life. The farmer invests his surplus in one of the most secure of all investments—land. He plans for the future of himself and his family, while many of his city contemporaries, though they may be living well at the start, are fundamentally living under hand-to-mouth conditions.

After all where may conditions be made more nearly ideal or more as Nature intended them to be? Where may one find a better place to express his individualism than in the environment in which he was created to live? Amid surroundings which breed contentment, man's efficiency is increased and



by reason of this increase he is of greater service to himself and society. John Stuart Mill said, "Solitude in the presence of natural beauty and grandeur is the cradle for thoughts which are not only good for the soul but which society could ill do without." While these considerations do not necessarily affect one's earning power, they are the points that go to make life worth while.

Before the prospective college student decides to disregard the ancient and time honored profession of agriculture and elect one apparently more remunerative, he should recognize such important considerations as have been advanced herein. The intelligent selection of one's life work is a problem that calls for much forethought and meditation. Agriculture challenges the high school student who is considering a college course.

## The Relative Values of Corn Silage and Corn Stover Silage

Austin W. Stover, '24

Experiments were carried on by the Department of Dairy Husbandry of the Kansas Agricultural Experiment Station during the years 1914-15, 1920-21, and 1921-22 to determine whether corn silage was more valuable than corn stover silage for feeding dairy cattle.

In these experiments the single reversal system was used. The experiments were divided into three periods of 40 days each, the first 10 days of each period being a preliminary feeding period in order to be assured of no fluctuations due to sudden changes of feed. If corn silage was fed in the first and third periods it would be replaced by corn stover silage in the second period, or if corn stover silage was fed in the first and third periods it would be replaced by corn silage in the second period. In all of the experiments the grain supplement remained constant for the three periods.

Experimental evidence has proved that if the feeds in such experiments are equal in value, the average of the first and third periods will be equal to the second. So in these experiments any variation between the average total of the first and third periods, and the total of the second period was due to a difference in the feeding values of the two kinds of silage.

The results obtained from the three years work are given in the following table:

	PRODUCTION FOR 30-DAY PERIOD		AV. BODY WEIGHT
	POUNDS MILK	POUNDS BUTTERFAT	POUNDS
<b>1914-15</b>			
Corn silage.....	1,302.95	53.34	1,863.90
Stover silage.....	1,232.90	48.82	1,869.60
Difference in favor of corn silage ....	70.05	4.52	-5.70
<b>1920-21</b>			
Corn silage.....	2,694.60	99.79	4,473.00
Stover silage.....	2,734.80	100.63	4,505.00
Difference in fav. of corn stover silage	40.20	.84	32.00
<b>1921-22</b>			
Corn silage.....	2,706.10	115.10	7,123.40
Stover silage.....	2,581.10	112.30	7,066.00
Difference in favor of corn silage ....	125.00	2.80	57.00

The results of the experiments show that the corn stover is not as valuable for feed as is the corn silage since the milk and fat produced were greater during the periods when corn silage was fed. The cows also showed slightly more tendency to gain when fed corn silage than when fed stover silage.

M. M. Justin, '07, M. S., '17, is Field Statistician in the Livestock Bureau, United States Department of Agriculture. His address is 432 State Capitol Building, Salt Lake City.

# College Notes

## KANSAS SECOND IN LIVESTOCK JUDGING CONTEST AT THE AMERICAN ROYAL

M. L. Baker of Syracuse, senior in animal husbandry, won highest individual honors and the Kansas State Agricultural College's livestock judging team placed second in the students' judging contest held on Saturday, November 17, 1923, in connection with the American Royal Livestock Show at Kansas City. A. C. Magee of Canadian, Tex., placed fourth in individual competition. The Kansas team placed high on swine judging, thus winning a trophy from the National Duroc-Jersey Association. The team also placed high on sheep, third on cattle, and fifth on horses.

There were ten teams competing in the contest. North Dakota's team won first with a total score of 2,872 points, followed by K. S. A. C. with a score of 2,801 points.

The first five individual rankings with the scores made from a possible 650 points were as follows.

Rank	Contestant	Score
1	M. L. Baker, Kansas.....	617
2	H. C. Anderson, North Dakota.....	604
3	J. H. Turner, Iowa.....	587
4	A. C. Magee, Kansas.....	582
5	Oscar L. Hansen, North Dakota.....	577

The scores made by the first five teams were as follows:

Rank	Contestant	Score
1	North Dakota .....	2,872
2	Kansas ..	2,801
3	Iowa ..	2,778
4	Oklahoma ..	2,716
5	Nebraska ..	2,696

Other members of the team besides Baker and Magee were: Edwin Hedstrom, Manhattan; J. L. Farrand, Hunter; G. R. Warthen, Webb City, Mo.; and H. F. Moxley, Osage City. Prof. F. W. Bell, livestock judging coach, accompanied the team.

In the various classes of livestock judged, Farrand placed second and Moxley third on swine; Magee, second, Baker, fourth, and Warthen, fifth on cattle; and Baker, second on horses.

## KANSAS GRAIN JUDGING TEAM PLACES FOURTH IN THE INTERNATIONAL CONTEST

The college grain judging team placed fourth in the first annual Intercollegiate Grain Judging Contest held in Chicago, December 6, 1923, in connection with the In-

ternational Livestock Exposition.

Seven teams were represented making records as follows:

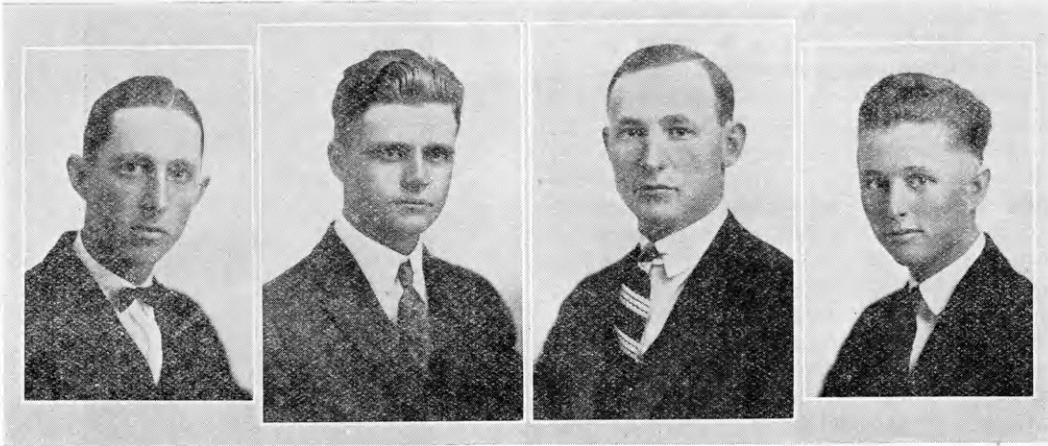
Teams	Score
North Carolina .....	3,897
Iowa ..	3,826
Michigan ..	3,802
Kansas ..	3,671
Oklahoma ..	3,645
Montana ..	3,616
Pennsylvania ..	3,478

The contest though only in its infancy shows great promise for the future as nearly twice this number of states have pledged to have their institutions represented by a team another year. Though handicapped somewhat this year by not having sufficient space, the contest is quite sure to grow into a permanent part of the annual International Livestock Exposition.

Much credit is due Prof. J. W. Zahnley for his work as coach in producing a team that made such a creditable showing. The team was composed of the following seniors in the Division of Agriculture: M. M. Hoover, Burlingame, W. H. von Trebra, Oswego; Edward Watson, Osage City; and B. R. Churchill, alternate, Fiatt, Ill.

## ALPHA ZETA ALUMNI ORGANIZE

At a recent meeting of Alpha Zeta, honorary agricultural student fraternity, the resident alumni members of the local chapter organized the Kansas State Association of Alpha Zeta Alumni. After the adoption of a constitution, an executive committee of three resident members of the college staff and three alumni from the state at large were elected. Prof. J. H. Parker, Prof. R. J. Barnett, and Prof. W. E. Grimes were selected as resident members of the committee. Mr. M. L. Otto, '21, farmer, of Riley; H. A. Pennington, '09, farmer, of Hutchinson; and John J. Inskeep, Purdue, '21, county agricultural agent of Sumner County (Wellington), were chosen to represent the alumni members from the state as a whole. Tentative activities for the alumni association include holding of an annual reunion, seeing that the organization is represented at the biennial conclave, and lending encouragement in every possible way to the Kansas Chapter of Alpha Zeta.



#### HONORS STUDENTS IN THE DIVISION OF AGRICULTURE

The national honorary scholastic society, Phi Kappa Phi, elects to its membership during the first semester of each college year the 5 percent of the members of the senior class who rank highest in scholarship and who also have completed their first three years of college work in K. S. A. C. The Ags whose pictures are shown above having won the distinction for this college year were recently elected to Phi Kappa Phi. From left to right they are: R. W. Sherman, Burlington, N. J., majoring in animal husbandry; M. L. Baker, of Syracuse, majoring in animal husbandry; E. M. Litwiller of Salem, Ore., majoring in horticulture; R. L. Stover of Manhattan, majoring in dairy husbandry. Average scholarship 1.59, 1.84, 1.58, and 1.5, respectively.

#### KANSAS WINS FIRST AT INTERNATIONAL

Kansas won first place in the intercollegiate livestock judging contest held December 1, 1923, in connection with the International Livestock Exposition at Chicago, scoring a total of 4,319 points out of a possible 5,000. The team scored 200 points more than any former winning team and placed more classes of livestock correctly. The same team placed second in the contest at the American Royal in Kansas City, November 17. The following seniors in animal husbandry composed the team: A. C. Magee, Canadian, Tex.; M. L. Baker, Syracuse; J. L. Farrand, Hunter; G. R. Warthen, Webb City, Mo.; H. F. Moxley, Osage City; Edwin Hedstrom (alternate), Manhattan.

There were 19 teams competing in the International making a total of 95 contestants. G. R. Peterson of the Ontario Agricultural College placed first with a total score of 908 points out of a possible 1,000. R. F. McSwain of Texas placed second with a score of 893. Warthen placed third making 892 points, and Farrand fourth making 891 points for individual honors.

The contesting teams placed in the following order: Kansas, Ontario, Ohio, Iowa, Texas, Missouri, Oklahoma, Nebraska, Illinois, Minnesota, Wisconsin, West Virginia,

Wyoming, Colorado, Manitoba, Pennsylvania,, Purdue, Michigan, and North Dakota.

It is a matter of pride to note that Prof. F. W. Bell coached this Kansas team which made such an enviable and unusual record against strong competition in two great livestock judging contests.

#### UNION PACIFIC BETTER FARMING SPECIAL

Five heads of departments of the Division of Agriculture represented the college on the first Union Pacific Better Farming Special which toured the western Kansas territory of the Union Pacific Railroad during the second week in November. It is estimated that over 10,000 western Kansas farmers were reached by the better farming program. They were all reported as having been receptive to any information concerning feed crops and the kind of livestock most profitable in a system of farming giving greater diversity than at present commonly practiced in the Union Pacific territory of western Kansas.

Prof. L. E. Call, head of the Department of Agronomy, outlined a plan for the prevention of a recurrence of Hessian fly infestation such as the western Kansas farmers experienced this fall. Prof. L. F. Payne, head of the

Department of Poultry Husbandry, stressed March and April hatching in order to secure increased egg production. The feeding of meat and milk as supplements to other grain rations and the providing of draft-free houses were also emphasized. Prof. W. E. Grimes, head of the Department of Agricultural Economics, explained the increased farming efficiency which could be obtained from a more balanced system of farming in the wheat belt. Dr. C. W. McCampbell, head of the Department of Animal Husbandry, centered his talk around the hog as an important source of farm income. Plans for profitable raising, feeding, and marketing pigs were outlined. "The dairy business dovetails perfectly with wheat production," explained Prof. J. B. Fitch, head of the Department of Dairy Husbandry. A method of building up a valuable herd of cows was recommended, and the possibilities of the dairy business as part of a diversified type of farming were discussed.

Eighteen stops were made by the special, three meetings each day with three hours at each stop comprising the itinerary.

#### HONOR ROLL, 1922-23

Letters of special commendation for outstanding achievements in scholarship during the last college year, 1922-23, have recently been sent by Dean Farrell to 40 students of the Division of Agriculture. The standards met by these students that entitled each to this special mark of distinction were three in number: (1) Keep their year's record free from deficiencies. (2) Carry not less than a normal assignment. (3) Make at least 50 points under the K. S. A. C. point system.\*

The students enrolled in the division at the present time who met these standards in their work last year are:

#### SOPHOMORES

B. C. Bogue	Manhattan
J. J. Dlabal	Wilson
Guy Faulconer	Eldorado
A. G. Jensen	Neodesha
Earl M. Kaepf	Frankfort
M. E. Osborne	Partridge
John H. Shirkey	Madison

#### JUNIORS

Glenn Aikins	Valley Falls
A. M. Carkuff	Miltonvale
Walter J. Daly	Tucson, Arizona
G. E. Hendrix	Lane
Martin Henrichs	Humboldt
D. C. McMillin	Carlton, Colorado
G. W. Montgomery, Jr.	Sabetha
H. A. Noyce	Manhattan
Glen Railsback	Langdon
G. M. Reed	Galesburg



WINNER OF FRESHMAN HONORS IN THE DIVISION OF AGRICULTURE

The honorary student agricultural society, the Kansas Chapter of the Fraternity of Alpha Zeta, offers a medal each year to the highest ranking freshman in the Division of Agriculture. A. G. Jensen was the winner for the college year 1922-23. During the two semesters of the college year he earned 38 college credits making an average in scholarship of 1.5 or 93 percent.

Hugh T. Willis  
Glenn Wood

Eureka  
Milan

#### SENIORS

F. M. Alexander	Wellington
M. L. Baker	Syracuse
D. M. Braum	Denison
H. H. Carnahan	Garrison
J. H. Coolidge	Greensburg
Walter Crotchett	Louisburg
S. W. Decker	Birmingham
C. O. Dirks	Augusta
G. A. Fillingier	Cuba
K. L. Ford	Seneca
M. M. Hoover	Burlingame
L. D. Keller	LeRoy
R. G. Lewis	Emporia
E. M. Litwiller	Salem, Ore.
R. T. Patterson	Ellsworth
R. W. Sherman	Burlington, N. J.
M. B. Spear	Bushong
T. B. Stinson	Manhattan
R. L. Stover	Manhattan
C. D. Tolle	Rose
G. R. Warthen	Webb City, Mo.

\*Passing grades given at K. S. A. C. are, from lowest to highest, P, M, G, and E. Each credit hour with a grade of "M" gives the student one point. Each credit hour with a grade of "G" gives two points and each hour of "E" three points. No student will be graduated unless his total number of points earned at least equals the total number of credit hours required in his curriculum.



Measured by these standards, 22 members of the Class of 1923 from the Division of Agriculture made this honor roll. The most outstanding record of the year was made by Marvel L. Baker who carried 42 credit hours of work during the regular school year making a total of 121 points, or 5 less than the greatest number possible.

#### SENIORS OF THREE DEPARTMENTS HAVE DISTINCTIVE REGALIA

Big hats, portfolios, and canes have made their appearances on the campus recently in larger numbers and varieties than usual. These testify to the fact that the seniors of three of the departments in the Division of Agriculture have adopted regalia to separate them from their lesser colleagues in the division, or at least to distinguish them from the yearlings.

The seniors of the Department of Animal Husbandry (see representative in the illustration) have adopted as the emblems of their stockmanship large 3X beaver Stetsons, with 3½-inch brims and 6-inch crowns. These are similar to the official hats worn by the seniors in this department for the last four years.

Seniors in the Department of Dairy Husbandry decided this year to uphold their dignity with a distinctive symbol. Consequently, as illustrated, they are gracing the campus with black genuine velour hats of slightly more generous proportions than those worn by the senior stockmen.

The agricultural economist seniors, as has been their custom in the past, are carrying portfolios as a mark of their profession, thus combining practicability with their naturally studious natures. Two representative specimens were caught entering the west wing of the agricultural building and are presented in the illustration.

The all-Ag cane adds the finishing touch to all seniors in the division. The canes are symbolical of the superiority of the holders, and are otherwise conceded to be valuable in ordering about innocent hogs in stock-judging classes.

H. H. Frizzell, '16, farmer of Cherokee, Okla., was on hand for Homecoming. His community is one of the many going too strong on wheat.



REPRESENTATIVE SENIORS MAJORING  
IN DAIRY HUSBANDRY, ANIMAL  
HUSBANDRY, OR AGRICULTURAL  
ECONOMICS

## Alumni Notes

N. E. Dale, '18, formerly assistant professor of agronomy, is chief agriculturist for the Indian River Products Company, Vero, Fla.

G. C. Gibbons, '18, Extension Agronomist, Oklahoma A. and M. College, attended the National Hay and Grain Show, Chicago. On his return he visited K. S. A. C. He is planning to complete work for a master's degree in the near future.

W. C. Hall, '20, of Coffeyville, is a breeder of Shorthorn cattle and Poland China hogs. For the past three years he has been president of the Montgomery County Farm Bureau.

Carl F. Trace, '20, formerly with the Royster Guano Company, Toledo, Ohio, is now in partnership with his father in the retail mercantile business, Commerce, Okla.

S. D. Capper, '21, is county agricultural agent in Lincoln County.

C. O. Granfield, '17, is county agricultural agent in Bourbon County. (Fort Scott.)

E. H. Ptacek, '18, is teaching agriculture in the Maple Hill High School.

C. A. Wood, '11, is county agricultural agent in Johnson County, Olathe, Kan.

Walter A. Hepler, f. s., member of the stock judging team in 1913, is farming near Manhattan (rural route No. 4). Mr. Hepler showed the champion carlot of lambs at the recent American Royal Livestock Show held in Kansas City.

H. G. Roots, '11, is teaching and coaching athletics in the Wamego High School.

O. M. Norby, '12, visited K. S. A. C. and friends in Manhattan recently. He is farming in Pratt County near Cullison.

Arthur D. Weber, '22, until recently manager of the Cameston Farm near Kansas City, is now instructor in the Department of Animal Husbandry. Mr. Weber will be a valuable man in the department. He has always been a lover of livestock and made a large portion of his college expenses by working in the Department of Animal Husbandry. In judging contests both in K.

S. A. C. and in state and national contests he has placed first or second a larger number of times than any other student in the history of the college. His record as an outstanding student and unexcelled livestock judge promises much for the future.

F. D. Rupert, State College of Washington, '23, is graduate assistant in farm crops, Department of Agronomy. He is specializing in crop improvement. As a student in Washington he was a member of the stock judging team.

Dr. Don C. Warren, University of Indiana, '14, who contributes an interesting article in this issue, is now associate professor of poultry husbandry. Doctor Warren received his doctor's degree from Columbia University specializing in zoology with special reference to heredity. At Columbia he was a student of Doctor Morgan, recognized as the world's leading authority on heredity.

H. L. Kent, '13, M. S. '20, formerly for several years a member of the faculty of K. S. A. C., now president of the New Mexico State College of Agriculture and Mechanic Arts (P. O., State College), made a business trip to Manhattan and K. S. A. C. recently.

F. E. Emery, D. V. M., '23, is assistant mammalogist of the Agricultural Experiment Station.

B. H. Fleenor, '19, recently instructor in the Manhattan High School, is now assistant professor of education.

Frank M. Linscott, D. V. M., '91, is farming near Farmington. He has a son, S. K. Linscott, who is now a freshman in college.

J. M. Ryan, '07, is a member of the Kansas State Tax Commission. His home address is Holton.

George E. Starkey, '22, is manager of Doctor Grossheart's dairy farm near Alsuma, Okla.

Earl Means, '22, Editor of Volume I of The Kansas Agricultural Student, is farming at Everest. He is also secretary-treasurer of the Atchison County Farm Bureau.

# The Champion Club Girl

Sam Pickard, '23

Kansas has the material for a modern Joan of Arc. The prairie heroine is Kathryn Nickel, pretty and sixteen. Kate, as the folks in McPherson County call her, is Kansas' champion club girl.

This "Maid of Kansas" has displayed the spirit, character, and courage to lift a siege should the exigency exist. Her list of achievements consummated at the end of an assiduous year of club work is probably unequaled. She is one of a large Mennonite family living out in the country 15 miles from McPherson.

It was April, 1922, that Kathryn joined the Willing Workers Club under the local leadership of Mrs. A. H. Wendt. At that time the rural girls were centering their attention on poultry work. Kathryn put her heart, soul, and strength into the project. She hatched 863 baby chicks. But first came the floods and then all the crows in the neighborhood seemed to center their attention on the Nickel ranch, swooping down and carrying off the baby chicks from morning 'till night. But Kathryn didn't quit. Her total feed bill, the result of carefully kept daily records, amounted to \$74.88. Fowls and eggs sold amounted to \$212.65, leaving a profit of \$137.73. Besides her chicks Kathryn raised 85 turkeys and 18 ducks. She says her luck would have been better last spring had she just specialized on ducks.

Until she joined the Willing Workers Club, Kate had never sewed a stitch. Her record books shows 200 hours of needle work to her credit since January, 1923, with dresses, aprons, middies, overalls, and boys' shirts as products. In between times Kathryn managed to fix up the house a bit. A dressing table, nine chairs, a bed, a baby's crib, library table and a kitchen table were either painted or refinished. The floors of six rooms were refinished. In her own room she plastered up the holes and papered. With her own money she bought a piano.

Another phase of club work taught by the leaders which interested Kathryn was beautifying the home surroundings. Flowers and shrubs adapted to western Kansas con-

ditions were planted with careful attention to landscaping ideas.



KATHRYN NICKEL

The club work accomplishments of Kathryn and her half dozen girl friends gained the limelight during the fair season when their demonstrations outranked all competitors at the state fairs. Garments made by Kathryn were awarded one second and two fourth prizes. The \$200 earned in prize money is being used by the girls for the purpose of bringing educators into the community during the winter months.

Last spring her club was given a trip to the Annual Boys' and Girls' Round-up at the Kansas State Agricultural College for the purpose of presenting their club play. It was at this time that the attention of Prof. Ira Pratt, head of the Department of Music, was directed to Kathryn. Her voice possessed qualities which the music director felt should not be neglected. He told her that with proper training she could become a great singer. Soon after Kathryn bought her piano. Now it is her ambition to know all the fun-

damentals of music by the time she is ready for college.

Yes, she expects to go to college and is saving money for that purpose now. And the future holds no locked treasuries for Kathryn. Her pleasant personality, charming manner, indefatigable perseverance, and capability have functioned as a magic key. On every turn she has met opposition with intrepidity. Kathryn displayed her unselfishness and generous nature last fall when she surrendered her almost certain chance to win the coveted trip to Chicago for meritorious club work. When she learned that it

meant a keen disappointment to her closest competitor she asked Miss Eleanor Howe, state girl club leader, to please take her off the team. "It will be impossible for me to go, anyway, and besides the other girls have worked just as much as I have and it will be almost as great a pleasure to see one of them win." This fall when the achievements of thousands of Kansas club girls were summarized it was found that Kathryn's record unquestionably gave her the coveted prize trip to the Boys' and Girls' Club Congress at Chicago for which club girls in many counties had worked enthusiastically all year.

## Supplying Vitamin A in the Ration of Brood Sows

Marvel L. Baker, '24

Investigations in animal nutrition now being carried on by the Department of Animal Husbandry of the Agricultural Experiment Station with the Departments of Chemistry and Pathology cooperating, show the importance of Vitamin A in the growth and reproduction of swine. Eighteen purebred Poland China gilts of spring farrow were placed on feed July 25, 1922. These were divided into four lots, lot 1 containing six gilts and each of the others, four. The effect of the basal ration, which was to be the feed of lot 1, had been demonstrated in previous experiments and the two gilts were added for purposes of clinical study.

The gilts are kept on a concrete floor and all have equal access to sunlight and exercise. The basal ration consists of ground white corn 87 per cent, tankage 10 per cent, and bone ash 3 per cent. Lot 2 has 5 percent of this ration replaced by an equal quantity of butterfat. Lot 3 receives one-fourth pound sprouted oats per head per day in addition to the basal ration and lot 4 has 10 per cent ground alfalfa added to the basal ration.

None of the gilts from lots 2 and 4 have been lost from nutritional disturbances. Two gilts from lot 2 and one from lot 4 were lost early in the experiment because of foot rot. None of the gilts showed evidence of nutritional disturbances until January 21, 1923. Since that time five from lot 1 and

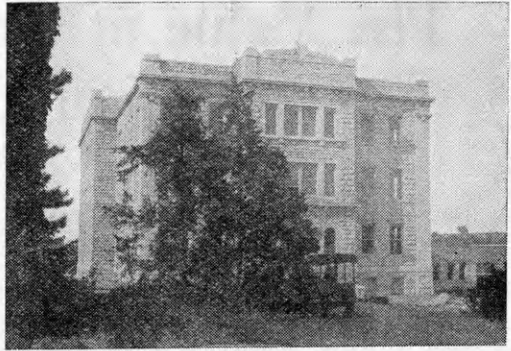
three from lot 3 have developed the following symptoms in order: Loss of appetite, carrying head to one side, partial or total blindness, staggering gait, paralysis of the hindquarters, and paralysis of the entire body. Two gilts from lot 1 and one from lot 3 either died or were killed. Post mortem examination showed it was impossible to remove the brain of the affected animals entire, the tissue being soft. The same condition prevailed in the spinal cord and it appears that a degeneration of nervous tissue results from feeding a ration deficient in Vitamin A. One gilt in lot 1 and one in lot 3 never developed the symptoms enumerated above. The gilt from lot 1 has, however, made but little development and is in very poor physical condition. The remaining gilts in these two lots have been given one ounce of cod-liver oil daily since breaking down, and with the exception of one gilt in lot 3 have recovered wholly or partially, and it appears evident that swine can be recovered from the malnutritional effects of a deficiency of Vitamin A by the addition of cod-liver oil to their ration, if such addition is made soon enough. Although the gilts of lot 2 have not broken down it has been difficult to keep them on feed. They have been very stiff much of the time. The gilts in lot 3 have developed more uniformly than those of lot 2, despite the fact that three of them have broken down. Those



of lot 1 are decidedly the poorest in the experiment and until cod-liver oil was added to their ration made but little development. The gilts of lot 4 have shown a decided advantage over the remaining gilts and have developed quite uniformly. It cannot be said, however, that they have a perfect ration and the deficiency is ascribed to a lack of Vitamin C or D.

It was desired to continue the experiment through succeeding generations and with this in view, the gilts were bred to a normal boar for fall farrow in 1923. Although all of the gilts of lot 1 had been in heat almost continuously for some time prior to the opening of the breeding season, only one of them came in heat afterwards. Work at other stations indicates that animals receiving a ration deficient in Vitamin A ovulate continuously until the functional power of the ovaries has been destroyed and this is probably the explanation in this case. All of the remaining gilts were bred and have all produced litters with the exception of one gilt in lot 4 which failed to settle. The pigs were in general weak. The sow from lot 1 which farrowed had received cod-liver oil during the entire period of pregnancy, and her pigs although undersized were not particularly lacking vigor as compared to the others. None of the pigs from lot 2 have been saved. In lot 3, all of the pigs from one sow, which had broken down some time prior to farrowing, were blind and died soon after birth. The pigs from lot 4 were at the time of farrowing the largest, most uniform, and most vigorous of any in the experiment. It is, however, too early to draw definite conclusions from the pigs.

From the results of these investigations to date, it appears that Vitamin A which is found in yellow corn, alfalfa hay, cod-liver oil, butterfat, and green feeds is essential to the proper development of swine; that valuable breeding animals may often be saved after breaking down, by the prompt addition of cod-liver oil to their feed; and that from a production standpoint, the practice followed by many successful swine growers of adding alfalfa hay to their swine rations during the winter is basically sound and one that may well be followed more generally.



WEST WING OF WATERS HALL

This new fireproof structure has since September 1, 1923, been the home of the Departments of Dairy Husbandry, Poultry Husbandry, and Agricultural Economics.

Albert Wertman, '23, is in the employ of the Blue Valley Creamery company of Detroit, Mich.

George J. Raleigh, '21, is teaching in the Department of Horticulture of the Massachusetts Agricultural College, Amherst.

Robert H. Lush, '21, a member of the dairy judging team of 1920, is now an instructor in the Department of Dairy Husbandry.

George M. Drumm, '21, is in charge of the dairy herd at the University of California at Davis.

G. C. Anderson, '21, is teaching in the Department of Dairy Husbandry of the University of Idaho, Moscow.

Raymond Campbell, '20, is running a purebred Ayrshire farm near Parsons.

Edward E. Gottman, '20, is manager of a commercial dairy farm near Kansas City, Kan.

W. L. Martin, '22, is teaching agriculture in the Mulberry High School, Crawford County.

L. R. Allott, '23, is having some valuable experience in the employ of a Minnesota packing company. His address is 1101 North Kenwood Avenue, Austin, Minn.

G. C. Wheeler, '95, is associate specialist in marketing in the hay, feed, and seed division of the Bureau of Agricultural Economics, United States Department of Agriculture.

# The Value of Ground Cane Seed in a Ration for Dairy Cows

F. E. Charles, '24

The old idea, so long prevalent among dairy farmers, that feeding cane seed to dairy cows would dry them up has been exploded completely by the results of a series of experiments completed recently by the Department of Dairy Husbandry of the Kansas Agricultural Experiment Station. The experiments were made to determine the relative efficiency of ground cane seed as compared with corn chop in the dairy cow's ration. The outcome of the tests indicate that ground cane seed can be fed in a ration to dairy cows with results practically as good as when corn chop is fed.

For the Kansas dairyman the data gained from these experiments should be of exceptional value for in many sections of the state corn raised for grain is an uncertain crop because of low annual rainfall and drouth, while in some sections no attempt is made to grow corn for any purpose.

As a silage crop the grain sorghums have had increasing popularity each year and the acreage harvested for grain is growing larger. The seed of the nonsaccharin varieties is generally considered a good feed for livestock, including dairy cattle, but the seed of the saccharin varieties has been used very little for this purpose. In fact the old superstition that cane would dry up milk cows has created a decided feeling against the practice of feeding cane seed.

The digestible nutrients in cane seed are practically the same as in corn. If the dairy cow could utilize these nutrients in ground cane seed it would be practicable for the farmer to remove the heads from the cane before putting it in the silo. The heads when removed and dried could be threshed and the ground seed fed in grain mixtures to take the place of corn chop or other carbohydrate grain.

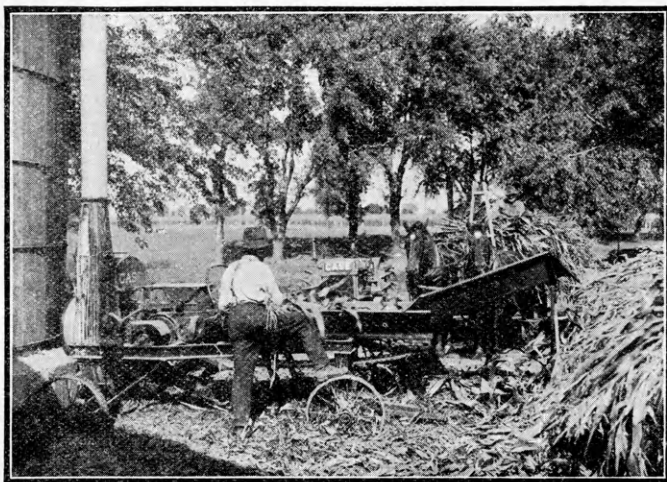
In making the tests to determine the efficiency of ground cane as compared with corn chop in the dairy cow's ration a feeding trial was conducted in 1920, repeated in 1921,

and again in 1922.

The general plan of the test as conducted was as follows: The cows were balanced as nearly as possible as to the period of lactation and length of time bred. They were milked twice daily standing in ordinary stanchions and turned in a dry lot whenever the weather permitted. Salt was provided at all times. Sufficient feeds of uniform quality were provided at the beginning of each test to last throughout the trial. All feeds were weighed to the animal and any uneaten portions were weighed back. The cows were fed by the double reversal method through three thirty-day periods, each period consisting of a ten-day preliminary period followed by a twenty-day experimental feeding period, from which the data on the test were compiled. The grain mixture consisted of four parts of the grain to be compared, two parts of wheat bran, and one part of linseed oilmeal. In two of the trials corn was used in the grain mixture during periods one and three, and was replaced by ground cane seed during period two. In the other trial cane seed was fed in the mixture during periods one and three and corn during period two. The roughages were fed according to body weight while the grain was regulated according to milk production.

Twelve animals were included in the tests on which there was a loss of nine pounds live weight while on the cane seed ration as compared with the corn chop ration. This is less than 1 per cent and is therefore negligible. Only 20.4 pounds more milk was produced while the cows were on the grain mixture containing corn than while they were on the mixture containing ground cane seed. This is only 0.4 of 1 per cent. The total butterfat production was in favor of the cane seed. The twelve cows, while on cane seed, produced 8.77 pounds or 4.8 per cent more butterfat than the same cows produced while on the corn ration. The difference in per

(Continued on page 64)



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**THE K. S. A. C. HERDSMEN**

(Continued from page 38)

shepherd, Thomas Dean. He is always anxious to give the best kind of sheep for instructional work. He spends several days in blocking and getting the sheep ready for the class-room before college starts in the fall. Mr. Dean is a native of Lestershire, England. While in England he showed cattle, sheep, horses, and hogs in the leading shows of the country. He came to America in 1911 and worked for Woods Brothers of Lincoln, Nebr., where he showed their stud. In 1914 he cared for the Ronselle stud and continued until in 1917, when he enlisted in the United States army. Upon leaving the army, he showed W. S. Corsa's herd. Here he showed the champion stallion and the champion mare at Springfield, as well as the junior champion and the champion American bred stallion. Wolfington, the undefeated Percheron in his class, sired by Carnot, was grown under "Tommy's" care.

In 1920 the college sheep were put in Mr. Dean's care. Since that time the flock has won 111 championships and 406 firsts. This is a record which should make every loyal Aggie proud of the man who is showing our flock. But with this show record the work connected with it must be considered. During the lambing season 24-hour days are necessary to save the lamb crop, and every day proper and careful attention must be given the sheep, because one day off may mean the losing of ribbons.

More quiet and a few years older than the other herdsman is Mr. Wilford W. Bales, the hogman. He was reared on a farm where he became interested in purebred livestock, and has spent most of his time in farming, specializing in raising purebred hogs. For some years he farmed in Norton county, just across the river from the pastures of the famous Gudgeon and Simpson Hereford herd. Mr. Bales has worked for the college for the past five years and has made a commendable record, showing five champions and twenty firsts at the leading livestock expositions of the country. The junior champion Poland China sow of the Topeka Free Fair in 1919 and the junior champion Duroc Jersey sow of the 1920 Kansas State Fair were the result of Mr.

Bales' ability as a hog showman. In addition to handling the commercial and show swine herds, a large portion of feeding the experimental swine is done by him. During the farrowing time and in the cold, wet weather of early spring, Mr. Bales works hard and spends many sleepless nights in order that the herd may be kept in proper condition.

Every one of the herdsman previously mentioned cares for his particular class of livestock, but in addition to looking after the dairy herd, Mr. C. O. Bigford is superintendent of the dairy farm. He was given the management of the farm and herd in 1911. Since that time he has put 82 cows in the advanced register, including a number of state record cows and the first cow in Kansas to produce more than a thousand pounds of butter in a year. The Grand Champion Guernsey bull at the Topeka Free Fair of 1923, and the first three-year-old Holstein at the Kansas State Fair were shown by the college. The record that Mr. Bigford has made in the last five years as superintendent of the dairy farm is a commendable one and should be appreciated by every student.

The K. S. A. C. herdsman perform a very important part of the class and institutional work, by keeping representatives of the various types of each of the important breeds of livestock and by providing animals for show. Certainly students can profitably and easily learn the methods of showing, by making the acquaintance of these men. Students specializing in livestock are anxious to become acquainted with others interested in the same fields, but because of the confining work of the herdsman they are able to meet only those students who visit and make a real study of the college farms. The college is very fortunate in having these faithful herdsman, and students interested in livestock are missing an opportunity if they fail to become acquainted with the herdsman.

---

F. W. Howard, '19, is farming near Oakley.

G. L. Kelley, '21, is chemist for the Imperial Flour Mills of Wichita.



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**SOYBEANS IN EASTERN KANSAS**

(Continued from page 47)

the greatest difficulty in soybean culture is that the soybean cannot compete with weeds, and unless the ground has been thoroughly worked weeds have not been sufficiently checked to give the delicate young plant a chance. The soybean starts slowly and unless it is given every chance the weeds will get the start of it and choke it out.

This last factor is one that largely explains why the soybean does best when planted in rows and cultivated. When broadcasted or drilled there is no opportunity for cultivation and weeds usually make up a good portion of the crop. When planted in rows and cultivated a more luxuriant growth is usually secured and as a result greater yields of both hay and seed are secured. Another advantage of planting in rows is that less seed is required.

Another reason for the soybean being so well adapted to the eastern part of Kansas is that it is not only drouth-resistant, but moisture-resistant, being injured by moisture only when water stands on the plant for some length of time. The plant is probably more drouth-resistant than moisture-resistant and has produced some good yields of both hay and seed in very dry years. In dry years when the drouth comes at the time seed is just forming, seed of poor quality and of low germination is produced. However, the feeding value of the seed produced under such conditions is slightly greater because of the higher protein content.

Until this year the price of soybean seed has been so high because of the large demand for the beans as seed and the relatively small production, that feeding of the seed to livestock was unprofitable. This past year, however, the production was great enough that seed is selling for around a dollar a bushel in some places. At such a relatively low price feeding the seed to livestock is practical. The place of the soybean in the ration is not that of the main fattening feed such as corn or kafir. It should be used more as a protein supplement to these feeds. The seed contains about 17 percent protein and from 20 to 30 percent oil. The Iowa Agricultural Experiment Station found ground soybeans fed to dairy cows, in comparison with linseed oil-

meal, to be one-third more valuable than the oilmeal. When fed to fattening cattle the ground soybeans had about the same value as linseed oilmeal. As a substitute for tankage in feeding swine the ground soybeans were worth only about 60 percent of the value of tankage. These experiments indicate that as a protein supplement soybeans are one of the most valuable livestock feeds.

To summarize it may be said that by careful management soybeans will produce well in eastern Kansas. They are a leguminous crop and an exceptionally good soil improver. Being both drouth-resistant and moisture-resistant soybeans are a fairly safe crop for eastern Kansas. Soybean hay is a valuable roughage and in the livestock ration the seed compare favorably with other protein supplements. The eastern Kansas farmer could well afford to increase his acreage of this crop.

**VALUE OF GROUND CANE SEED  
IN A RATION**

(Continued from page 60)

cent of fat contained in the milk was 0.21 of 1 per cent in favor of the cane seed.

Judging by the tests there is no particular difference in the ability of corn chop and cane seed to maintain the body weight of cows in milk while on a liberal ration of alfalfa hay, grain, and silage. There was no appreciable difference in total milk production nor any apparent difference in the palatability of the grain mixture when cane was substituted for corn chop. On the whole the only significant difference was the fact that the cane seed in the grain mixture produced 4.8 per cent more butterfat than did corn chop.

L. H. Griswold, '22, is buttermaker in the Hollywood Creamery, Colorado Springs, Colo.

B. D. Hixon, '23, is feeding out a bunch of cattle on the home ranch near Wakeeney this winter.

C. F. Laude, '21, is special agent for the Insurance Company of North America. His address is 1505 Waldheim Building, Kansas City, Mo.

F. W. Milner, '15, is field superintendent of the Fairmount Creamery Company with headquarters at Salina.

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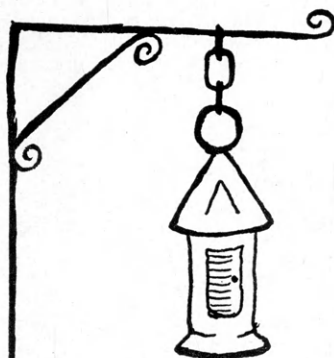
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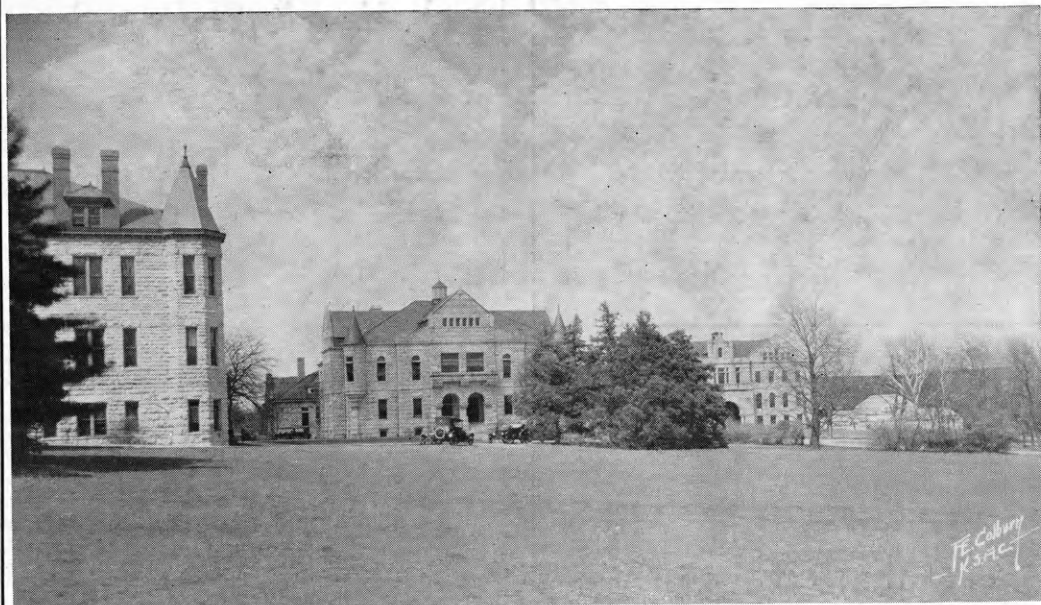
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