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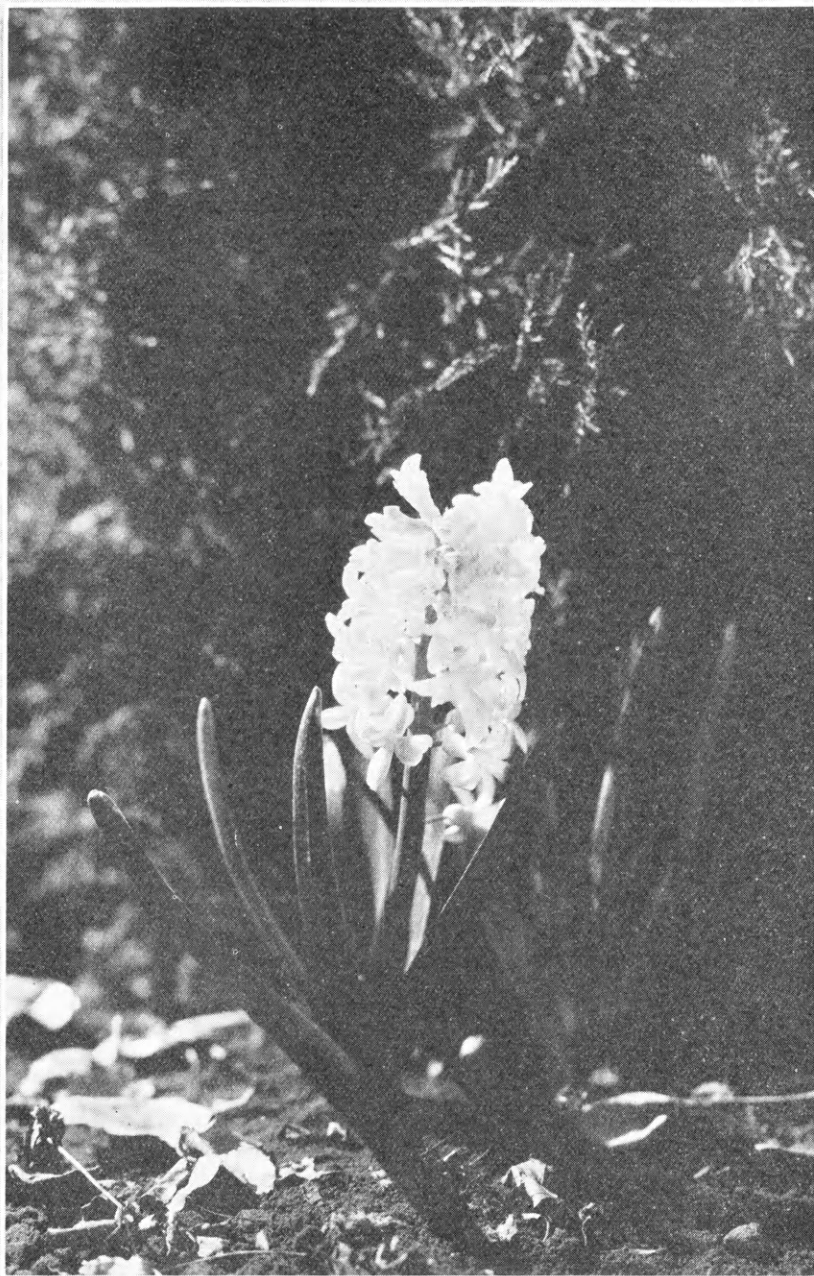
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HYACINTHUS ORIENTALE—ONE OF THE BEAUTIES OF SPRINGTIME

The Kansas Agricultural Student

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No. 4

Ultraviolet Rays—the Important Part of Sunshine for Poultry

J. M. Moore, M. S., '25



In any industry the successful man is the one who always takes advantage of the natural resources of his surroundings. There is one important advantage which the Kansas poultryman has not appreciated in the past. This advantage, as recent investigations in poultry husbandry have shown, lies in the bountiful supply of sunlight. Kansas in 1921 was excelled in the amount of sunshine during the hatching months (February, March, April, and May) only by Florida, South Carolina, and the Rocky Mountain states. According to the weather bureau reports, Old Sol was, during those months, in plain view 74 percent of the time he was above the horizon.

Everyone knows that plants must have sunlight in order to grow. The plant is a manufacturing unit and the motive power is the sun. For many years these facts have been recognized in the plant world, but it has been only during recent years that the importance of sunlight to the poultry industry has been ascertained. During the past two years the work in the Kansas Agricultural Experiment Station has brought home to the poultryman the fact that direct sunshine is an important factor in successful poultry raising.

Practical poultrymen have always known they cannot raise chickens in close confinement. Under such management chickens develop weak legs (rickets) and cannot walk. This is a condition characterized by the failure of bones to develop normally. In the first stages the chickens sit around, but are otherwise healthy. As the disease develops they lose control of their legs altogether. The poultryman has always known that if he could get them outside on the soil they would develop normally. In short he thought that his chickens needed more exercise, fresh air, and contact with Mother Earth. The chickens

needed to be outside, but he was wrong about the manner of their cure. It was not the soil, nor the exercise, nor the fresh air, but it was the direct rays of the sun that made the difference.

In the past the poultryman was unable to distinguish between the light in his well-lighted poultry house and the sunshine out in the yard, but there was a very important difference. It was due to the absence of ultraviolet rays inside the poultry house and to the presence of these life-giving rays in the sunshine outside. If sunshine is allowed to pass through a wedge shaped piece of glass it is separated out in what is known as the rainbow colors ranging from red to violet. These rays of light differ only in their wave length and wave frequency—the longest rays being the red and the shortest the violet. Although they cannot be detected with the human eye there extend beyond the rainbow colors shorter waves. This region has been called the ultraviolet (ultra meaning beyond.) These are the rays which produce the tanning or sunburning effect and are responsible for the normal development of animals. Ordinary window glass screens out a large proportion of these rays, which explains why the sunlight in the brooder house will not prevent leg weakness while the direct sunshine will.

The poultryman is now independent of weather conditions in hatching and rearing his chicks. He no longer needs to wait for the return of the sun in the spring before he sets his incubator. He knows that either ultraviolet rays or cod liver oil carry the anti-rachitic factor and will prevent rickets in his chicks. It all seems very simple when the secret is known. The wonder is, why was it not discovered years ago!

In the late spring and early summer when

the sun is working overtime the chicks are outside a great deal, and the old fashioned methods are best. The chicks in their pursuit of grubs and worms are carried far afield. They absorb the ultraviolet rays in the sunshine and their bones grow husky and strong. But when winter has come the poultryman does not have to quit hatching chickens because he cannot raise them. Thus he does not

and always the results were the same—financial failure.

Sunshine cannot be depended on in the late fall, winter, or early spring to prevent leg weakness for during this period Kansas sunshine contains very little ultraviolet rays. This is due to the angle at which these rays pass through the atmosphere, but if they did contain these rays the baby chicks could not be outdoors because of weather conditions. If for any reason the poultryman desires to grow chicks during this part of the year he can do one of two things. He can provide the ultraviolet rays from an artificial source or he can add to his chicks' ration a food that is rich in vitamin D. Either cod liver oil or a feed that has been treated with ultraviolet light will answer the purpose.

Vitamin D is found in only a few foods in any quantity. Milk contains a sufficient amount to keep rats free from rickets only when the cows from which the milk is obtained are out in the sunlight. So far as known cod liver oil is the only substance which contains vitamin D in sufficient quantities to prevent leg weakness in growing chicks when they receive no direct sunlight. Great importance is attached to its method of preparation and bottling for its potency reduces rapidly if the oil is allowed to oxidize.

Leg weakness is a form of rickets. Rickets is caused by a lack of certain minerals in the body. Calcium and phosphorus are especially important in this relation, and if they are thrown out of balance the lime salts cease to be deposited in the bones. The rest of the body develops too fast for the bones and the result is the chick with weak legs and deformed bones. In older birds the same factors are at work, but in a different way. The lime salts once deposited in the bones are dissolved away faster than they can be replaced, and a porous, easily breakable bone results. The effects are not so easily noticed as in the chicks, but the hens lay thin-shelled eggs which hatch poorly; the attendant has to exercise great care in trapnesting them for fear of breaking their bones; the egg is often retained in the oviduct for three or four days; and the hens even lose control of their legs in extreme cases. Vitamin D aids in maintaining this balance of minerals in the animal

(Continued on page 128)



UVIARC POULTRY TREATER

This lamp has been adapted from the lamp used in human therapy as a result of the work done by the Agricultural Experiment Station of K. S. A. C. on the influence of ultraviolet light on poultry. The burner is the same in both lamps but the rest of the uviarc lamp has been simplified in order to make the cost of it as low as possible for poultrymen.

have to confine his operations to the favorable season and close his incubator the rest of the year.

The type of poultryman who "counts his chickens before they are hatched" has often tried to beat Dame Nature. The fancy price of broilers in January and February was enough to arouse his enthusiasm. He could hatch his chicks but he never got them as far as the broiler stage. He tried all the different methods of housing, lighting, and feeding

Utilization of Sweet Clover in Kansas

H. H. Brown, '27, R. L. Anderes, '25,
and A. C. Hoffman, '26

GROWING SWEET CLOVER

No crop has had a more unique history than sweet clover. From a worthless if not noxious weed it has risen in popular esteem to a widely grown crop of many uses. It is valued for pasture, soil improvement, hay, and for a cash crop where seed is produced. Its cultivation is rapidly increasing as a part of the general cropping system on Kansas farms.

Sweet clover will thrive under more adverse conditions than any other legume. Furthermore it is adapted to a wide variety of soils and climatic conditions. Sweet clover grows best on well-drained soil, not deficient in lime, under average Kansas climatic conditions.

necessary in the eastern regions. On acid soils liming is often necessary to encourage bacterial growth. Inoculation may be secured by the same bacteria and methods as used for alfalfa.

There are many varieties of sweet clover, a few of which can be grown in Kansas. The white biennial sweet clover (*Melilotus alba*) being the most desirable as it grows more vigorously, more upright and larger than the other varieties.

In growing sweet clover difficulty is often experienced in securing a stand. This can be largely overcome by proper farming practices. In the first place good seed should be obtained,



SWEET CLOVER SEED CROP, 1922

The early growth on this field was cut at a height of 12 inches for hay.

However, it is more tolerant of acidity and poor drainage than alfalfa and is not injured by a moderately alkaline soil. Sweet clover has not been thoroughly proved on the uplands of western Kansas but is successful on land with a shallow water table, or on land receiving drainage water from higher ground. However, sweet clover can often be grown on land unsuited for cultivation or on land so depleted in fertility that tillage is unprofitable. Under these conditions, phenomenal returns may not be received but sweet clover is profitable under the principle that any crop is better than no crop, and furthermore the soil will be improved by its growth.

The necessary soil bacteria for sweet clover production are present in the western three-fourths of the state but inoculation may be

and a germination test run, or fresh unscarified seed may germinate as low as 25 percent. The ordinary threshing machine removes but few of the hulls, and such seed will not germinate unless subjected to the weather or some other means which will break the seed coat. Even when the hulls are removed, as with a clover huller, the seed coat prevents the rapid absorption of moisture. In order to secure the best germination the seed coat should be scratched or broken. This can be done by means of a scarifier which throws the seed over rolls covered with sand paper, scratching and weakening the seed coat so that it absorbs moisture readily. Inexpensive home-made machines are being used successfully by a number of Kansas farmers. It is practically necessary to use some type of

scarifier where sweet clover is grown to a large extent.

The preparation of the seedbed and the time and rate of seeding depend upon several factors, the most important being the condition of the seed, the character and condition of the soil, and the purpose for which the crop is intended. Rough, stony, or otherwise untillable ground may be sown in the late fall or early winter using 15 to 25 pounds of unhulled seed per acre. The seed may be sown on the surface permitting the weather not only to cover the seed but also to break down the seed coat. Many times seed which fails to germinate the first year will lay over in the soil and germinate the following season. Hulled but unscarified seed may be sown in February or March but scarified seed should not be sown before March 10 to 15 as the germinating seed may be destroyed by freezing. In either case the seedbed must be firm and compact with just enough loose soil to cover the seed. The lack of a firm seedbed is probably the chief reason causing failure of sweet clover on cultivated fields. If the ground is plowed it should be plowed shallow and plowed early enough to allow the seedbed to settle. Rolling is often beneficial. Sweet clover may follow corn or other intertilled crops providing moisture is present and the seedbed preparation does not make the ground too loose.

In winter seeding, the seed is often sown broadcast on the surface and covered by natural agencies or lightly harrowed. With average seed 12 to 15 pounds per acre is sufficient. Later seeding may be sown broadcast and harrowed, or drilled. Care should be taken that the seed is not covered too deep. It should never be covered with over one-half inch of soil. With high-quality seed and favorable conditions a good stand may be secured by sowing 10 to 12 pounds per acre.

In eastern Kansas where moisture is abundant sweet clover may be sown with a nurse crop such as oats. The dangers of this system are a lack of moisture and the shading of the clover by the nurse crop. The nurse crop should be seeded thinner than usual and harvested high enough to prevent injury to the sweet clover. In western Kansas the use of a nurse crop usually results in failure.

Although sweet clover is justly noted for

its excellent growth under adverse conditions, it responds readily to good care. Consequently the more successful grower will follow proper methods of culture.

SWEET CLOVER FOR HAY

Sweet clover, generally speaking, is not a satisfactory crop for hay. Good-quality hay may often be secured in the fall after seeding in the spring but the second year's growth is too stemmy and too difficult to cure to be generally satisfactory for this purpose.

SWEET CLOVER FOR SOIL IMPROVEMENT

Sweet clover may properly be regarded as one of the best crops for soil improvement. It fits into a rotation of other crops much better than alfalfa and is more widely adapted to soil and climatic conditions than any other legume. Like alfalfa and other legumes it has the ability to secure nitrogen from the air. There is perhaps no other crop that makes so rapid and luxuriant growth as sweet clover and because of that fact it is unsurpassed in its ability to add organic matter to the soil. Its extensive root system loosens the soil and leaves it in excellent condition for the growth of the following crop.

While no extensive experimental data are available general experience in growing the crop on many farms indicates that it will be widely used on the thinner soils of the state for soil improvement and for rotation with other crops.

SWEET CLOVER PASTURE FOR DAIRY COWS

As a Kansas pasture crop for dairy cows sweet clover is unexcelled. It will carry more cows per acre than any other pasture crop, furnish the earliest spring pasture, provide summer pasture when native grass is dry, and can be grazed until frost kills it in the fall; even after frost there is generally some growth of sweet clover that may be grazed. It is relished by the cows and, contrary to common belief, seldom causes bloat under good management. Serious cases of bloat are usually due to pasturing hungry cows on rank wet sweet clover. After the first few days, cows kept continuously on sweet clover pasture are practically safe.

In the summer of 1917, the Kansas Agricultural Experiment Station secured some figures as to the value of sweet clover pasture

for dairy cows. The pasture used had been planted the previous spring with oats as a nurse crop and had been cut for hay in the fall. On May 7, of the following spring, six cows were turned on 3.8 acres of the second-year growth. They were kept on the pasture day and night until June 16, when three cows were taken off. However, the pasture so improved that on August 5 one cow was put back and from this time until October 1 the four cows were on the pasture continuously. This is at the rate of one cow per acre for 5.3 months. In addition to the pasture the cows received daily one pound of grain mixture for each

bur J. Fraser, of the University of Illinois. His work included a study of 81 dairy farms in Illinois as to the value of sweet clover pasture for dairy cows. He found that three-fourths of an acre of sweet clover pasture would carry a cow for six months. This is four times the carrying capacity of blue grass. Cows owned by a number of Illinois farmers, receiving an average of four pounds of grain per head per day while on sweet clover pasture produced more milk than cows receiving good barn rations of silage, alfalfa hay, and mixed grain daily.

Reed and Burnett, of Michigan, pastured



K. S. A. C. DAIRY COWS ON SWEET CLOVER PASTURE

four pounds of milk produced. The grain ration consisted of 4 parts of corn chop, 2 parts bran, and 1 part of oilmeal. Under these conditions production was maintained and at the end of the period the cows had made a slight gain in weight. This experiment confirms common experience that sweet clover usually furnishes from two to four times as much grazing per acre as native grass and has the advantage of supplying green pasture during the hot dry summer months.

Much experimental work has been done at other agricultural experiment stations. Notable among these are the investigations of Wil-

bur J. Fraser, of the University of Illinois. His work included a study of 81 dairy farms in Illinois as to the value of sweet clover pasture for dairy cows. He found that three-fourths of an acre of sweet clover pasture would carry a cow for six months. This is four times the carrying capacity of blue grass. Cows owned by a number of Illinois farmers, receiving an average of four pounds of grain per head per day while on sweet clover pasture produced more milk than cows receiving good barn rations of silage, alfalfa hay, and mixed grain daily.

Reed and Burnett, of Michigan, pastured

Many surprising results have been obtained

under ordinary farm conditions. Mr. Beaty Ray, of Iola, Kan., pastured two acres of second-year growth sweet clover with eighteen cows for seven weeks, six yearlings for twelve weeks, and three sows and their litters all season. By December 1, this pasture had reseeded itself enough for a good stand. Dairy farmers in all parts of Kansas are realizing



K. S. A. C. CATTLE MAKE GOOD USE OF
SWEET CLOVER PASTURE

the value of sweet clover for pasture with the result that its popularity is increasing among dairymen.

SWEET CLOVER PASTURE FOR BEEF CATTLE AND HOGS

Sweet clover is the best of all the legumes as a pasture crop for all classes of livestock, except hogs, in Kansas. Even for hogs sweet clover pasture is a very good substitute for alfalfa pasture and sweet clover can be grown in many sections of the state where it is impossible to grow alfalfa.

An idea of the carrying capacity of sweet clover for beef cattle may be formed from a record kept by the Department of Animal Husbandry in 1922. A second year's growth of sweet clover from a 12-acre plot of very high ground carried 60 head of cattle from May 6 to June 10, and 25 head from then on

to August 1. This plot was not grazed the rest of the summer but made a good growth, reseeded itself for the second time and made considerable pasture in the spring of 1923.

A test conducted in the summer of 1924 gives reliable figures on the comparative values of alfalfa and sweet clover pastures for self-fed hogs. The test was begun June 15



PIGS IN SWEET CLOVER

and continued until September 13. Both the alfalfa and sweet clover plots were the first year's growth. There were 19 pigs in each lot. Both lots were handfed tankage and had access to shelled corn in a self feeder.

The results of the experiment are as follows:

	Lot on alfalfa pasture Pounds	Lot on sweet clover Pounds
Av. initial wt.....	60	61.90
Av. final wt.....	196.84	163.47
Av. daily gain.....	1.52	1.13
Dairy ration per pig:		
Corn	4.64	3.70
Tankage	.20	.19
Feed per 100 lbs. gain:		
Corn	305.30	327.80
Tankage	12.88	16.60

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Beautifying the Farmstead

Harold J. Brodrick, '26

Only a few farmers appreciate the need for beautifying their homes or realize the added value attractive surroundings give to the farmstead. A home and its surroundings must be attractive in order to be most satisfying to the family, visitors, and passers-by. Farmsteads need special attention in order to secure satisfactory conditions because the farm home and the farm business are so closely related that the success of the latter is reflected in the appearance of the former, according to F. L. Mulford, landscape gardener in the United States Department of Agriculture.

It is a common thing to see the buildings of a farm standing in the open without a single tree or bush near them. Passers-by invariably think that they would hate to live in such a place and the farm children rarely become attached to it. This unattractiveness could easily be changed to beauty by the use of a few trees and shrubs properly placed, and the value of the farm would be increased proportionally.

All the buildings with their immediate surroundings must be considered in any improvement work. The roads and walks; the home vegetable, fruit, and flower gardens; the lawns; and the ornamental plantings also are important factors in determining the plan of improvement which should be adopted.

So far no distinctive type of American farm architecture has been developed, although some localities have evolved typical styles. An important thing is to have the buildings on any farm sufficiently similar to appear as belonging together. The barns should all be of the same general style, and the houses should be livable and attractive but not so different in their general features as to seem out of place.

The size of the grounds depends upon the size and style of the house and barn as well as the rest of the farmstead. The larger the buildings the more ground is required to give the proper effect. But too much ground is undesirable because the care required is out of proportion to the needs.

The approach to the farmstead should be direct but as a rule not straight toward any of the buildings. Where buildings are near

the highway a good plan is to have a single road enter the grounds then divide, one branch going directly to the barn and the other past the side of the house near both front and rear entrances, where possible, then rejoin the other road. The approaches should be so curved as to permit plantings to partially hide the barns and service yards thus screening unsightly objects from view.

"The ornamental flower garden, the garden for growing cut flowers for indoor decoration, and the fruit and vegetable gardens as well are part of the farmstead and should be used in its setting," states Mr. Mulford. They will be pleasing in appearance if properly placed, appropriately laid out, well cultivated, and neatly kept. Placing such gardens for the best effect may interfere with using horsepower in their cultivation. This should be avoided if possible because of the increase of labor in upkeep. It is best to put them in a place where some kind of power cultivation can be used. Between the house and barn or on the side of the house opposite the drive are favorite locations.

Lawns are most important for beautifying the farmstead. They are the background or foundation against which all the details are viewed. They should be in as large and unbroken stretches as possible. This gives a pleasing effect and tends to give the impression of greater expanse, as well as makes them easier to maintain. The surface of the lawn should be smooth enough to permit easy mowing, although many of the natural undulations should be retained.

Trees are the first plants to be considered in planting where shade is wanted. Furthermore they are of great importance in giving an attractive appearance to the premises. A common fault is to plant them too close together and too near the house, cutting out the light and air. Neither trees nor shrubs should be spotted around over the lawn but should be massed about the foundation of the house and on the sides or to the rear of the premises.

The plants and trees selected for the ornamentation of the grounds should be hardy in

(Continued on page 122)

Recent Tax Legislation in Kansas

Glen B. Railsback, '25

Three important steps for the revision of the system of taxation in Kansas were taken by the state legislature during its last session. These are: (1) A classification of intangible property; (2) a law providing for a mortgage registration fee in place of other taxes on real estate mortgages; and (3) a gasoline tax for roads. The first two of these laws were made possible by the adoption of the amendment to the state constitution at the regular election last fall.

Under the law providing for classification of intangible property the rate of taxation is lower on intangibles than on tangibles. A tax of 25 cents per annum has been placed on each \$100 of the fair cash value of money and credits which will exempt it from all other taxation. This act does not apply to any national banking association, or the stock thereof, or to money and credits belonging to persons or corporations incorporated under the laws of this state, the taxation of which is otherwise provided for by law.

The mortgage registration law provides for a tax of 25 cents on every \$100 or major fraction thereof of the mortgage. The fee is paid only once and is the same regardless of the duration of the loan. This fee is paid in the county in which the property is located and at the time the mortgage is registered. Money collected from this source is distributed equally between the general county fund and the schools within that county. The payment of the registration fee gives the mortgage a legal standing in court. If the fee is not paid the mortgage will be subjected to the regular tax on intangibles. Thus the nature of the law should make it as nearly self enforcing as any tax law can be.

The gasoline tax provides for a tax of 2 cents a gallon on all gasoline sold, effective May 1, 1925. All money raised by the gasoline tax is to be used for the building and the maintaining of roads. The law provides for a refund of the tax on gasoline burned in tractors or stationary gas engines.

With the government constantly extending its services, the taxpayers have been forced to pay higher taxes. Tangible property has been, and still is, paying the principal propor-

tion of these taxes, and the farmers, who on the average have a higher percent of tangible property than any other class of people in the state, have felt this increase most. Many are now wondering if the recent legislation will lighten the burden on real estate. In an attempt to answer this question it is necessary to study the probable effects of each law separately.

The relief that is to come through the results of a classification of intangible property will depend to a great extent upon the force and vigor with which it is executed. It has possibilities of raising much more revenue from intangibles than did the old method of taxation, which drove most intangibles into hiding or out of the state.

In Minnesota, when a similar classification of intangible property was made, the tax rate dropped from 28 mills per dollar in 1910 to 3 mills per dollar in 1911. The result is outstanding. In 1910, 6,200 people were assessed with a total assessment valuation of \$13,913,806 which yielded a revenue of \$389,586. In 1922, 119,081 persons were taxed with a total assessment valuation of \$400,689,000, which gave a revenue of 1,202,067, three times as much as the revenue under the old law. The justice of this law is further shown by the fact that the increased tax was distributed among 119,081 people as compared to 6,200 people in 1910. Similar data can be obtained from Maryland, Kentucky, and other states. These results show that a lower tax rate will bring many intangibles out of hiding.

Experience elsewhere shows that this law will not only reduce the tax burden on tangible property, if properly enforced, but will also aid in building up Kansas industries by making more capital available at a lower rate of interest for productive enterprises. In the past, Kansas investors have found possibilities in Kansas limited due to the high tax on intangibles. Capital has been driven to states where the tax laws were less severe. Bank deposits should now increase and the rate of discount throughout the state may be expected to average lower.

The mortgage registration fee law will be

(Continued on page 122)

Hog Lot Sanitation

H. L. Church, Vet. Med., '25

Eventually every successful swine raiser will come to the conclusion that his biggest problem is not feeding, but the preservation of the health of his herd. The wise man who said, "An ounce of prevention is worth a pound of cure," might well have had in mind the prevention of diseases common in the hog lot. Experience has clearly shown that the risk of disease increases in direct proportion to the increase in number of animals in a herd, and consequently the importance of sanitation increases in proportion to the size and value of the herd. Sanitation and prevention of disease go hand in hand.

Formerly, too much reliance has been placed upon vaccines for the prevention and treatment of hog diseases, with little or no thought given to sanitary measures. In a great majority of cases insanitary conditions are responsible, directly or indirectly, for the presence of disease in the hog lot. Swine diseases can not be cured, or prevented by tonics, stock-foods, minerals, or the countless patent remedies found on the market. Even the veterinary profession has been able to develop but few vaccines which will prevent disease and fewer still which will cure them. Hog cholera is the only common swine disease which can be prevented by vaccination. On the other hand nearly all of the common ailments of swine can be, to a very large extent, prevented and controlled by observing a few simple sanitary measures.

Long ago, state authorities recognized the value of sanitation, especially in regard to the prevention and spread of disease, and most states have passed laws which require stock yards at shipping points to be regularly and frequently disinfected. When a disease is discovered, pens, yards, loading chutes, stock cars, and other equipment are immediately given a very thorough disinfection.

The methods and details of sanitation on the farm must be worked out according to the facilities at hand. The job is strictly the farmer's job. A competent graduate veterinarian should be consulted in regard to details, and with his advice and suggestions a wonderful improvement in sanitary conditions can be made.

Probably the first thing to be done in formulating a system of sanitation on a farm is to inspect the drainage of the hog lots. Preferably the lots should have a distinct slope so that rain and melting snow will quickly run off without leaving a deep layer of mud in which disease germs will be held. Low places where water stands should be thoroughly drained and filled with dirt. If wallows are desired they should be made of cement so that disinfectants can be used in them. Where a running stream passes through the hog lots it is advisable to fence it off so that hogs can not drink from it, for many diseases are carried from the farms up stream to farms down stream. Hog cholera, especially, is a good example. Such streams are dangerous sources of disease. If one doesn't wish to keep his hogs away from such a stream he should, at least, be very watchful of his neighbors' hogs up stream. If disease breaks out on these farms, those hogs down stream will be almost certain to contract the same disease unless they are immediately shut off from this stream. It is even then often too late to prevent infection, because the water may have been contaminated before the hogs up stream showed any symptoms of disease.

Thus far the sanitary program calls for the drinking water to be furnished from sources other than standing pools or running streams. An automatic, self-filling hog-waterer, so constructed that it will not overflow, and so the hogs can not get their feet in it, is very satisfactory. Under no circumstances should a mud hole be allowed to form around the watering device. Clean drinking water is as essential to the health of hogs as it is to that of any other animal.

The food supply must also be clean. Mouldy and spoiled feed can not be fed to hogs without sooner or later causing bad results in the form of digestive disturbances, loss of appetite, and even fatal forage poisonings. The natural resistance is lowered by such feeding, causing the animal to become more susceptible to disease. Hog feed should be free from filth. A feeding floor of some sort is usually desirable. It can be made of plank, concrete, or any material which can be easily washed

and swept clean. It should be constructed so it will drain away from the hog house.

The type of hog house varies in different sections of the country. In warm climates, shelter should be provided to protect the hogs against rain and extreme heat. If the building is to be a permanent immovable structure it should have plenty of windows to admit sunshine and provide ventilation. Dirt floors are unsatisfactory because they can not be disinfected. Cement or wooden floors are easily cleaned and disinfected. Portable hog houses are satisfactory where climatic conditions are not too changeable, providing they are well ventilated, frequently moved, and kept cleaned.

Rotation of pasture does much to break up the life cycle of most hog parasites. Plowing up a hog lot each year and sowing it to some green crop, such as rye, clover, or alfalfa, is to be recommended. At least three pastures are desirable for a regular pasture rotation plan.

New animals to be added to the herd should be placed in a quarantine pen and kept isolated from the main herd for at least two weeks, during which time they should be carefully watched for symptoms of any disease. The use of a quarantine pen will often prevent the introduction of a serious disease into the main herd.

According to statistics published by the United States Department of Agriculture for the year 1924, 38 percent of all pigs farrowed died before weaning time, and 5 percent died after weaning. The causes given for these losses were: Filth, disease, accident, and pigs born dead. These losses could largely be prevented by proper sanitation and care, especially care in feeding. Sows given a good bath in clean warm water and soap and placed in clean quiet farrowing pens have a much better chance to raise healthy litters of pigs than sows left out in a muddy, filthy lot to farrow, where their pigs will likely become infested with round-worm eggs at their first attempt to nurse.

Every swine breeder is familiar with round-worms of hogs. He also knows that they are responsible for losses of young pigs as well as unthrifty, slowly growing pigs. The McLean county (Ill.) plan of solving the round-worm problem has been widely adopted, not because of its success in the control of this parasite

alone, but because it has prevented many other diseases from entering the herds. Briefly, it consists in washing the pregnant sows just before farrowing, in order to rid them of worm eggs on their skin, then placing them in clean, disinfected farrowing pens. Two weeks after farrowing, the sows and pigs are turned into lots or pastures where no swine have been for at least one year. They are left here until the pigs are weaned. If this plan is followed, not only will the round-worm troubles be largely prevented, but other diseases such as pig typhoid, "bull-nose," filth pneumonia, mange, tuberculosis, and many others will certainly have difficulty in gaining a foothold in such a herd.

If a disease is discovered in a herd, a competent graduate veterinarian should be called at once, and a correct diagnosis made, before it spreads through the whole herd. Such a veterinarian should be able to give detailed directions for special methods of sanitation, as well as treatment, relative to the particular disease present. His directions should be faithfully followed.

By immunizing hogs against cholera, dipping for mange, lice, and other parasites, and maintaining a good sanitation program, very gratifying results are certain to be obtained.

L. R. Allott, '23, is in the employ of Swift & Co., Huntington Park, Cal. His address is 513 Roseberry Ave.

G. L. Kelley, '21, chemist for the Imperial Flour Mills Company of Wichita; Torby G. Fletcher, F. M. E., '21, chemist for the Wichita Mill and Elevator Company, Wichita Falls, Tex.; and Roy K. Durham, '20, chemist for the Rodney Milling Company, Kansas City, Mo., were students in the Short Course for Cereal Chemists given January 13 to 16, 1925.

H. C. Gaden, '14, and Mildred Hollingsworth Gaden, '15, are enjoying farm life near Seiling, Okla. A two-year-old son, Dean Robert, is a third member of the partnership. Wheat raising is Mr. Gaden's major enterprise, growing about 500 acres each year. His farming is diversified, however, by keeping small herds of good milk cows and purebred Duroc Jersey hogs, and a good-sized flock of standardbred White Rock chickens.

Using Silage to Cheapen Gains on Lambs

G. F. Ellis, '25

A sixty-day lamb-feeding experiment recently completed by the Agricultural Experiment Station of K. S. A. C. shows results of unusual interest on the advantages of feeding silage to fattening lambs. Kansas is a state of widely differing agricultural conditions so that the same feeds are not available in all parts of the state. All authorities are agreed that a ration of corn, cottonseed meal, and alfalfa is excellent for fattening lambs. Experiments have shown that other legume hays may be substituted for alfalfa or that the grain sorghums may be used to replace corn. However, silage is the cheapest roughage produced in Kansas. Its use, if found desirable and practical, should cheapen the gains made by fattening lambs.

The lambs were a uniform lot of western feeder lambs averaging 63 pounds each at the beginning of the experiment. They were divided into six lots, 24 in each lot. One lot was fed alfalfa as a roughage from the beginning and received no silage. Another lot received only silage as a roughage during the trial. A third got silage and alfalfa during the entire period. Of the other lots, all of which started on silage, one received alfalfa with the silage after the first 20 days, another alfalfa with the silage after the first 30 days, and the last, alfalfa with the silage after the first 40 days. All lots received corn and cottonseed meal. Less meal was fed when alfalfa formed part of the ration.

After the lambs had been on feed for a time, about 30 days, those getting silage alone began to show evidences of poor appetites. When alfalfa hay was added to the ration of any lot, those lambs immediately made large gains for the next ten days and showed greatly improved appetites. It was only with the greatest of difficulty that the lot receiving only silage for the entire period was kept on feed until the end of the trial.

With the exception of the lambs in the lot getting alfalfa after the first 30 days the daily gains decreased in proportion to the amount of silage in the ration. This lot made

phenomenally large gains which can be explained only by individual differences that may have existed in the lambs. Because of these large gains this lot made the cheapest gains. Otherwise the lot receiving both silage and alfalfa for the entire period made the cheapest gains, with the "alfalfa lot" next, followed by the other lots in order of the length of time they received alfalfa. The lot that got only silage made very poor gains and showed such poor finish at marketing that they returned the least profit, having also made the most expensive gains due to the gains being small.

The selling prices of the various lots varied according to the amount of alfalfa received. The highest price was received for the "alfalfa lot" with no difference between the next three, and with the one getting alfalfa only the last 20 days bringing the low price except for the silage lot.

The lot getting alfalfa the last half of the period returned the greatest profit because of its large and consequently cheap gains. The alfalfa lot was next because of its high selling price. The other lots ranked according to the amount of silage fed, those getting the most silage returning the least profit.

This feeding experiment supports the following statements: Silage cannot be successfully used as the only roughage for fattening lambs. However, silage can be used up to a certain point and will materially cheapen the gains made in such cases. Lambs make most efficient use of their feed during the first part of the feeding period. If cheap feed is used then very cheap gains may be secured. It is therefore best to use silage in the early part of the feeding period and to add alfalfa later when it is needed to keep the lambs on feed. The appetite of the lambs should be the guiding factor in the use of silage, and alfalfa should be added to the ration as soon as the lambs begin to go off feed. The use of alfalfa should not be delayed until the lambs are off feed as such a state means poor gains which are consequently expensive.

Making Ice Cream on the Farm

H. L. Summers, '25

Ice cream is no longer considered a luxury. It is a food, a nourishing food, equal in every way to good butter and cheese. Some people like home-made ice cream better than that commercially manufactured. Ice cream is easily made in the home and is inexpensive.

There has been a lot of discussion about the amount of fat that ice cream should contain. Too rich ice cream may cause indigestion, and not so much of it will be consumed. On the other hand, ice cream too low in fat content detracts from the flavor and the product tastes more like an ice milk than a cream. It is also likely to be coarse or grainy and contain ice crystals.

On the farm, as elsewhere, a good article is desired, one with a good flavor, and one which has a smooth texture and a firm but mellow body. For this purpose a 20 percent cream should be used. However, that is more or less of an individual matter and if a richer product is desired a 25 or 30 percent cream may be used. It is necessary to use a good, sweet cream. Sour cream is used for frozen delicacies, but its preparation demands great care. Cream too high in acidity is likely to curdle, especially if fruit ice cream is made, because fruit also contains acid. However, for the average home any cream which is not over 72 hours old and has a sweet clean taste can be used with perfect safety and ought to produce an ideal ice cream.

It would be a good idea to age the cream in a cold place for 24 to 48 hours, as a smoother ice cream with a better body and texture will result. Sugar should be added to the cream 10 or 15 minutes before freezing in order to give it a chance to dissolve. Sugar added in the proportion of one-sixth to one-seventh the weight of the cream will produce the desired sweetness in the final product.

Some people prefer the use of gelatin while others do not. A good quality of gelatin is valuable as a food, and when used judiciously will not only produce a better texture ice cream but will give the product a greater resistance to melting without injuring the flavor. Therefore it is a good plan to use a little gelatin, say about one ounce to the gallon. It should first be dissolved in a little hot

water or milk until all lumps have disappeared, then strained into the cream.

As a rule the direction for the use of vanilla for flavoring are given on the bottle and should be followed. Ordinarily, about one ounce to a gallon of cream will give a flavor that is about right. If this proves a little too strong when the product is finished, vary the amount to suit the taste. It is easy, after a little experience with any particular brand of extract, to produce the desired flavor in the ice cream.

The following suggestions and directions regarding the preparation of a batch of ice cream may be useful:

Cream, 20 percent.....	1	gallon
Sugar	1.4	pounds
Gelatin	1	ounce
Vanilla extract	1	ounce

Mix thoroughly and pour into the freezer before it has had a chance to become warm. This mix should provide nearly two gallons of ice cream.

After packing the ice and salt in the freezer the turning should be begun. The quicker the ice melts the quicker the mix freezes. As a rule, the time required for proper freezing is 12 to 15 minutes, depending largely on the condition of both the salt and the ice. Fine salt causes the ice to melt too rapidly, the water leaves the ice quickly and the small cold portions of ice stick or freeze together and form bridges which prevent the ice from settling down close to the freezer where it can take up heat from the cream. Fine salt is also unsatisfactory because it is too expensive. Too coarse salt causes the ice to melt too slowly and the cream to take too long to freeze. This causes the ice cream to be buttery or greasy because of the churning action of the dasher. Ice cream salt about the size of a small pea can be purchased from almost any grocery store and is very satisfactory. It shakes through the freezer and rattles over all portions of the ice.

The ice should be broken in small pieces also though not so small as the salt. Ice broken in pieces averaging approximately one-fourth to one-half of an inch in diameter is usually satisfactory. When using such ice, with the

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Treatment of Fence Posts on the Farm

Walter D. Hemker, Agr. Engrg., '25

A fence post in itself does not cost much, but when a farmer undertakes to fence a 160- or 320-acre farm he generally gives serious consideration to the selection of posts. A 320-acre farm fenced into 160-acre fields, with posts on all four sides, spaced one rod apart would require about 1,120 posts. Assuming the average cost of a post as 40 cents, the cost would amount to \$448. The life of untreated posts cannot be assumed to be over 10 or 15 years. In cases of soft woods, such as box elder, cottonwood, and ash, the life is from three to six years. In either instance the replacement cost is quite high.

When the state of Kansas is considered, which requires about 10,000,000 posts annually for replacement and new fence, the amount of money these posts represent is an expense that should receive careful thought. The yearly cost for posts in Kansas amounts to nearly \$2,500,000, which is large because wooden posts are almost wholly used. Numerous tests extending over many years indicate this heavy expense may be greatly reduced by preservative treatments which will lengthen the life of wooden posts from 3 to 25 years.

One of the best indications of the economic value of wood preservation is found in the attitude the railroads of the United States are taking toward this work. Practically all of the railroads are using cross ties treated by one of the several processes for timber treatment, and a number of large companies have installed elaborate treating plants for doing their own work. Immense sums of money are saved annually by increasing the durability of ties.

The same principles of durability and economy apply to farm posts. If the farmer can reduce his fence post charges by one-half or more, the saving effected is well worth his consideration. Preservative treatments not only lengthen the service of the wooden fence posts now commonly used, but they also make possible the use of many common soft woods which heretofore have been considered worthless. Many of these inferior soft woods actually have an advantage over the harder woods for preservative treatment, since they absorb preservatives more readily and it is a well

known fact that the quality and amount of preservative in a piece of wood, and not the wood itself, determines largely the length of life of treated timbers.

In recent years the supply of post timbers of the more durable species, such as mulberry, white oak, osage orange, and others, has been nearing the point of exhaustion in the wood lots. This has increased the use of several less durable species for posts, principally red or black oak, elm, and even such timbers as cottonwood, willow, ash, and maple. All of these species are short lived when placed in the ground and it does not pay to set them unless first treated with preservatives. It is also probable that sapling or second growth oak will not last in the ground much over eight years, hence it pays to treat such posts as well as those of the less durable species.

Decay, or rot, in fence posts is caused by fungi and bacteria, both of which destroy the wood structure. Fungus development requires the presence of moisture, heat, and air, besides food which is supplied by the wood itself. A successful preservative assists in preventing decay, both by poisoning the wood against fungus attacks and, to a certain extent, by excluding air and moisture.

Of the preservatives used for wooden fence posts, coal tar creosote is by far the most important. This product is the base for a number of patented preservatives on the market. It is a complex mixture with great chemical variation, heavier than water, obtained by distillation of tar and tar-like substances.

A home-made treating plant can be made by constructing a brick or stone firebox and then placing on this a sheet metal drum about four feet high and at least three feet in diameter. A damper should be provided for the firebox as it is desirable to control the fire very closely. As regards the location and arrangement of the treating plant it should not be set close to buildings because of the fire hazard. A hillside location can be utilized to good advantage in placing the posts in the tank.

The posts should be placed in the creosote to such a depth that the butt ends will be

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THE HIGH SCHOOL SENIORS AND K.S.A.C.

What per cent of high school seniors have chosen their vocation?

Many of our high school students come from rural high schools where most of them are sons and daughters of farmers. Others in the city high schools are predominantly sons and daughters of the merchants and professional men of the city. Each is influenced by his home life to a great extent and often, due to parental advice or to his own liking to some particular vocation, has decided upon the college curriculum he expects to study.

However, as many as 50 per cent of high school seniors planning on a college education are frequently undecided as to their future career. A large percent are still weighing the question of which college they will enter. To all prospective college students interested in any college curriculum offered by K. S. A. C. the opportunities of K. S. A. C. present a challenge.

To be sure Kansas State Agricultural College offers the only college curriculum in agriculture in the state. It is first class, the equal of any in the country and should make a strong appeal especially to all farm-reared high school seniors. Other curricula in K. S. A. C., however, offer wonderful opportunities for many kinds of technical training. The curricula in engineering are known nationally for their excellence. First-class cur-

ricula in veterinary medicine, domestic science, industrial journalism, rural commerce, music, architecture, and general science are available for those interested in any of these fields.

The especial attention of students interested in agriculture is called to the real value of a scientific training in this field. Courses in agronomy, animal husbandry, agricultural economics, dairy husbandry, poultry husbandry, and horticulture provide ample scientific training in all phases of agriculture of economic importance in Kansas. Openings for trained men in any one of these departments are always available to college graduates. A thorough training in agriculture is of inestimable value. College training in agriculture is becoming more and more a recognized asset, even a prerequisite, to highly successful farming and to those industries closely related to farming. The demand for the college-trained farmer will increase rapidly during the years of the immediate future.

OUR COVER PAGE

The picture presented on our cover page by the courtesy of F. E. Colburn, college photographer, is that of Edith Elsie Hanna, 3½ years of age, daughter of Mr. and Mrs. Floyd J. Hanna. The Easter lilies add a further touch emphasizing the wonder, brightness, and beauty of young life.

Soil Survey in Kansas

Raymond H. Davis, '27

Agriculture is our basic industry and to maintain its permanency and provide for future development it is necessary to increase and conserve the fertility of our lands.

The soil survey provides a complete inventory of our soils, and it should bear the same relation to our soil resources as the geological survey bears to our mineral resources. Both are fundamental to the future development of the country.

Such a survey is valuable to the individual farmer because it classifies the agricultural and nonagricultural lands. It divides the soils which are adapted to general farming or grazing from those which are suited to various specialized crops, and it gives an idea of their relative value. The soil survey also classifies lands suitable for forestry purposes. It indicates swamp lands suitable for reclamation, dry lands suitable for dry farming, and arid soils which may be profitably irrigated.

The survey is of value to the land seeker. City folks wanting to buy farms find the survey maps and accompanying reports to be what they need first to consult. Real estate dealers, land appraisers, and bankers making farm loans can use the soil survey in determining land values. County agricultural agents and schools giving instruction in agriculture use soil surveys in dealing with soil and crop problems.

Soil surveys are of two kinds. One is called a general preliminary or reconnaissance survey, the other a detail survey. In making a general survey the soil men go over the country at one-, two-, or three-mile intervals and get a broad general idea of the large and most important soil areas. They make a preliminary investigation and the general soil map is made on a small scale, usually three or six miles to an inch, and it shows only the large tracts of sand, clay, marsh, etc., but does not attempt to show minor variations.

Detail maps are made on a standard scale of one inch to a mile and show not only the different soils but locate accurately all important features such as roads, railroads, streams, towns, schools, churches, and farmsteads. Such maps usually cover a county and all soil types are designated by distinct colors.

A report accompanying each soil map describes properties of the soil and subsoil, topography, water supply and drainage conditions, crop adaptations, general soil fertility, systems of farming, and methods of soil management. There is also included a general discussion of the agricultural development of the county, farm improvements, important products produced, markets, transportation facilities, and the general condition of the community.

Up to the present time soil survey work that has been done in Kansas includes a detail survey of Jewell, Reno, Shawnee, Leavenworth, Cowley, Cherokee, Montgomery, and Greenwood counties. A reconnaissance soil survey of western Kansas was made in 1910. Ten thousand dollars has now been appropriated by the state legislature to continue with this type of work for the next two years.

To insure continuous adherence to the idea of uniformity in classifying soils throughout the United States and at the same time to provide for proper consideration of local conditions, it has been found desirable that federal and state agencies should work together in making soil surveys in any particular state, with the former acting as the coordinating agency.

Both state and nation should take a deeper interest in expediting the making of soil surveys by providing funds to carry the work to completion more rapidly. When once completed the soil survey will be of permanent value and not until it is completed can the soil resources of the country be definitely known or utilized to the fullest advantage. Each state may well consider carefully the importance of making soil surveys and the desirability of cooperating with the Federal Government in making an inventory of its most valuable resource—the soil.

C. C. Button, '23, is buttermaker for the Blue Valley Creamery Company, Kansas City, Mo.

C. F. Trace, '20, is foreman of the Swift fertilizer plant located at Houston, Tex.

College Notes

AGRICULTURAL SEMINAR

I. THE TAX SITUATION IN KANSAS

At the February meeting of the Agricultural Seminar, Prof. Eric Englund, of the Department of Agricultural Economics, spoke on the "Tax Situation in Kansas." He pointed out that the need for new economic legislation comes out of changes in economic life. During the last 50 years, the number of people working for salaries and wages has multiplied many times. There has been a great increase in intangible property, such as notes, bonds, stocks, mortgages, copyrights, etc. But no practical way has been devised of taxing such income and that kind of property in Kansas. The difference between intangible property and real estate is that intangible property is often hidden and can easily evade taxation while on the other hand farm real estate is relatively immovable and can easily and always be seen.

The speaker outlined what the legislature would be able to do under the tax amendment adopted at the last election, and what the legislature would have the power to do outside that amendment. [Since the speaker confined his discussion largely to bills before the Kansas legislature which have since been enacted into law and since an article on "Recent Tax Legislation in Kansas" is found in this issue, no outline or discussion of this excellent seminar address is presented.—Editor.]

II. KANSAS FORESTRY

At the March meeting of the Agricultural Seminar, Prof. Albert Dickens, head of the Department of Horticulture, spoke on Kansas Forestry. The following excerpts are taken from his address:

Kansas has 3 to 4 percent of its total acreage in timber. This would total an area of one million acres. The eastern counties have much the larger area devoted to woodlands as compared to the western counties. One cause of the treelessness of the prairies may be attributed to the ability of the native grasses to adapt themselves more readily to the soil and climatic conditions of these regions.

The walnut, one of the original species

grown in Kansas, has been found to grow widely throughout the state. It is considered by some people that the Indians planted this tree as a source of food. During the war the walnut was used in large quantities in the manufacture of gun stocks and aeroplane propellers. Seven hundred car loads of walnut logs were shipped from Kansas during the season of 1924-25.

From Hutchinson west, most of the timber was cleared by settlers in building their homes. Since 1880 a large part of this area has been replanted to cottonwood. Kansas now manufactures practically all of her egg cases from the cottonwood. The cottonwood grows rapidly and is well adapted to Kansas conditions.

Other trees of lesser importance are the red cedar, elm, oak, box elder, and mulberry. More trees should be planted on Kansas farms as they aid in furnishing shade and wind-breaks, and also add to the beauty of the farmstead.

ANNUAL SPRING JUDGING CONTESTS

During the spring semester of each college year the departmental clubs of the Departments of Agronomy, Dairy Husbandry, and Animal Husbandry conduct student judging contests. Any student of the college is eligible to enter one of these contests unless he has won in a previous student contest or represented the department in an intercollegiate judging contest.

The seventh annual Students' Grain Judging Contest, sponsored by the Klod and Kernel Klub, was held Saturday, April 18, 1925. It consisted of identification of grain and forage samples and judging and grading corn, kafir, small grains, and alfalfa. Advanced students competed in one division and others in another. Equal awards were given in the two divisions and special prizes provided for freshmen.

The twenty-third annual Students' Stock Judging Contest was held Monday, April 20, 1925, under the auspices of the Block and Bridle Club and in direct charge of the senior stock-judging team. The contest was divided

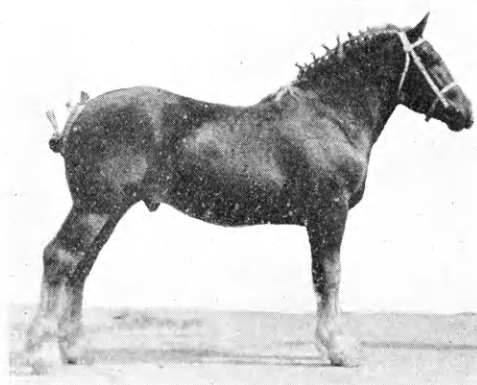
into the usual two divisions, the contestants being classified according to their training in judging beef cattle, horses, sheep, and swine. Eight classes of livestock were judged, one each of draft horses, Belgian fillies, fat steers, Shorthorn cows, fat barrows, Poland China gilts, fat wethers, and Hampshire ewes. Appropriate medals, cash prizes, and other prizes were awarded the high-ranking contestants in each division.

The eighteenth annual Dairy Judging Contest, sponsored by the Dairy Club and in charge of the dairy judging team, was held Saturday afternoon, April 25, 1925. For the first time in the history of this contest the contestants were divided into two sections. Those having had advanced dairy judging constituted the advanced section and all others the second section. Suitable prizes were awarded first, second, and third placings in each section and a special prize in each section to the high individual on each breed.

An entrance fee of 50 cents is charged for participation in each of these contests. Faculty members chosen from the department act as judges. These contests are always carefully planned and conducted and are marked by keen interest and strenuous competition. They are important events in the experience of students of the Division of Agriculture. The contests this year were especially successful. A report of each contest giving names of all winners will be printed in Vol. V, No. 1 of the Ag Student to be issued October, 1925.

CHAMBER OF COMMERCE ENTERTAINS JUDGING TEAMS

The annual banquet given K. S. A. C. inter-collegiate judging teams and their coaches by the Manhattan Chamber of Commerce was held Wednesday evening, March 25, 1925. Formerly the coaches of each team have addressed those present. This year, however, a new plan was followed and one member of each team talked. Those who spoke were: E. C. Smith for the stock judging team; G. M. Reed for the grain judging team; F. A. Hagans for the dairy judging team; and H. A. Stewart for the poultry judging team. The occasion was helpful to all concerned and an excellent booster for well trained intercollegiate judging teams in the future.



COLGODINE—A PROMISING BELGIAN COLT

March 20, 1923, is a date that will be remembered for some time by the personnel of the Department of Animal Husbandry of K. S. A. C. On that date a period of anxious waiting and watching terminated with the foaling of the Belgian mare, Bernadine, 28 days overdue. The period of pregnancy, 368 days, is one of the longest, if not the longest, on record, and the robust stallion foal weighing 204 pounds is thought to have a record birth weight for a foal.

The type of mating which produced this foal is of considerable interest as the dam is a mare that won grand champion honors at the Kansas Free Fair and Kansas State Fair in 1919 and weighs 2,300 pounds in good breeding condition. The sire, Colgo 11942, was bred and raised by the college and also won the coveted purple at both Kansas fairs in 1921. Colgodine, as the colt was named, showed unusual promise from the first, being a very active, rugged, and growthy individual. Before he was a year old, and during a period when stallion sales were slow, the college received several good offers for this colt but it was decided to retain him as a herd sire. When just one year old, and only in good growing condition, Colgodine weighed 1,420 pounds and showed even greater promise of developing into a real breeding stallion than ever before. On his second birthday, March 20, 1925, he weighed 1,850 and carried no superfluous fat.

At the Kansas Free Fair, Topeka, September, 1924, Colgodine stood second in class, being defeated by one of the outstanding yearlings of the season shown by the prominent Belgian breeders, Hazard and Stout. A week later, however, at the Kansas State Fair, Hutchinson, Colgodine headed his class, deposing the winner of the previous week. Thus, as was expected, Colgodine, whose parents had won grand champion honors, was placed in the coveted champion class.

Reports have been received recently from four of the members of the Class of '23 engaged in general farming as follows: B. D. Hixson, Wakeeney; Fred Paulsen, Stafford; Fred Banks, Madison; and C. G. Russell, La-Crosse.

SPRING ELECTION TO ALPHA ZETA

Spring initiation for Alpha Zeta was held May 4, 1925. Nine new initiates were taken into the local chapter. This makes a total of seventeen new Alpha Zeta men at K. S. A. C. since the school year began last September. Eight of these were initiated at the close of the first semester.

Alpha Zeta is purely a national honorary fraternity which limits its membership to the upper two-fifths of the class. Before one is eligible for pledging he must have completed at least three semesters of his collegiate work, he must be enrolled in agriculture or closely related science, and possess qualities of leadership which make him outstanding in his class. This is an honor which all students in agriculture should strive to attain, and when one is elected to membership in this fraternity he should feel honored because of the high standards and qualifications which the fraternity represents.

The following students were elected to membership this May:

C. W. Thole, H. H. Brown, L. B. Harden, R. H. Davis, Russell Reitz, Stephen Raleigh, A. I. Balzer, Fred P. Eshbaugh, T. M. Kleinenberg.

AGRONOMY FIELD DAY

Farmers of the community will be the guests of the Department of Agronomy on Agronomy Field Day which is planned for Saturday, June 13.

Residents of Riley county have in the past been less familiar with the Agronomy Farm and the work carried on there than visitors from other parts of the state or other states. The Agronomy Farm, which was purchased by the state in 1909, occupies a half section of land and is considered to be one of the best managed and most useful farms in the United States.

The field day will give local farmers an opportunity to get acquainted with the farm and the agronomy workers.

POULTRY CONVENTION

The American Association of Instructors and Investigators in Poultry Husbandry will hold its seventeenth annual convention at

the Kansas State Agricultural college, August 12 to 15. L. F. Payne, head of the department of poultry husbandry at the college, and secretary-treasurer of the association, has charge of preliminary arrangements.

President F. D. Farrell has appointed 12 committees representative of all departments of the college engaged in research work with poultry to take care of the local arrangements. General E. L. King, commandant at Fort Riley, is assisting in the preparation of the entertainment features, which will include a trip to Fort Riley, tours of the college, and trips to points of interest in and about Manhattan.

The program this year will differ somewhat from those of previous years, in that exhibits of investigational and research work will be featured. Among the exhibits will be displays depicting the experiments conducted with the ultraviolet ray at K. S. A. C. Manufacturers' exhibits of scientific and educational equipment will also be on display.

Preceding the convention will be a two-day conference of delegates from all states and from the United States department of agriculture to discuss standardization, accrediting, certification, and registration of poultry. Dr. M. A. Jull, chief poultryman of the department of agriculture, will preside at this conference.

SPRING ELECTION TO PHI KAPPA PHI

Glenn McKinley Reed and George Montgomery, Jr., were elected from the Division of Agriculture at the spring election to the honorary fraternity, Phi Kappa Phi. The initiation and banquet were held on Friday, May 8. The Phi Kappa Phi speaker on this occasion was Dr. Jay William Hudson, professor of philosophy at Missouri university.

Doctor Hudson has won a national reputation through his lectures on public issues and movements. During the last few years he has lectured in nearly every state in the Union before universities and colleges, state teachers' associations, summer schools, chambers of commerce, bankers' associations, and popular audiences.

Bacteria and the Ice Cream Industry

Glenn Wood, '25

Bacteria are not essential in the production of ice cream, but do play an important part in determining the quality of the finished product. No satisfactory bacterial standard has ever been determined, but a finished product which has a bacterial count running well up into the millions may rightly be considered undesirable from a sanitary point of view.

It is a common fallacy for people to believe that the extremely low temperature at which ice cream is stored is sufficient to kill all pathogenic organisms. Hammer of Iowa found that ice cream which had been artificially inoculated with tubercular organisms was still infective for guinea pigs after one month of storage. Therefore some other means must be used in the producing of a finished product which is safe for human consumption.

Pasteurization is the manufacturers' first guaranty of a safe product to the consumer. If properly done, pasteurization kills approximately 99 per cent of all the organisms present. All pathogenic organisms are destroyed. The 1 per cent which remains is composed almost entirely of streptococci, an acid-producing group which in no way impairs the quality of the product. However, if every precaution is not exercised in the cleaning and sterilizing of the freezer, homogenizer, and other utensils, contamination will result.

In the washing and sterilizing of the equipment, Professors Fay and Olson of K. S. A. C. recommend that the utensil first be rinsed with cold water followed by a thorough washing with warm water and some good washing powder, then sterilized with live steam. The steaming should be continued until the utensil has been heated to at least 200° F.

Even though the bacterial count of the finished product is somewhat higher than the count immediately after pasteurization it should not be taken as evidence that contamination has taken place. When samples are taken at various stages in the operation the count is found to be increased considerably after both homogenization and freezing. This

increase is due to the breaking up of clumps of organisms caused by the agitation, and is an apparent increase rather than an actual one. There is no noticeable change in bacterial numbers during the process of aging before freezing.

Hammer and Goss made a careful study of ice cream in storage and came to the conclusion that there is no increase in the number of organisms, and that there may be a decrease. The behavior in storage depends, to a large extent, upon the bacterial flora of the ice cream.

Fay and Olson, working in cooperation with a number of plants in Kansas, found that ice cream with a bacterial count of less than 100,000 may be produced successfully in a large commercial plant. They observed that in every case where the bacterial count was exceedingly high, it could be traced back to carelessness on the part of the operator during one or more stages of the operation.

DOCTOR OF AGRICULTURE DEGREE TO F. D. FARRELL

The degree of doctor of agriculture was conferred upon F. D. Farrell, acting president of the Kansas State Agricultural College, by the University of Nebraska on Wednesday, April 15.

The degree was conferred at the commencement exercises of the Nebraska school of agriculture where President Farrell delivered the principal address on "Law in Agriculture."

JAPANESE STUDIES FARM EXTENSION ACTIVITIES HERE

Yeicho Mitsui of Korea, representative of the department of agriculture of the Japanese imperial government, who has been spending the past year investigating the agricultural situation in Europe and America, was in Manhattan two days recently investigating the Kansas State Agricultural college in its relation to the farmer, and its methods of assisting him.

Wheat Growing in Brazil

I. F. Correia

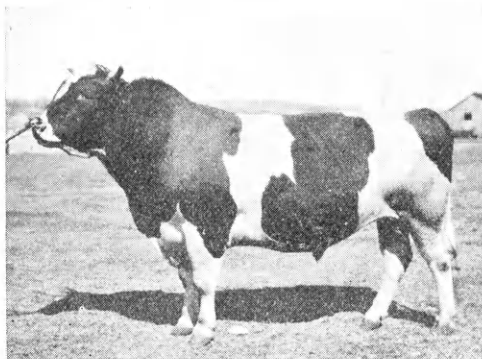
The amount of wheat grown in Brazil is small compared with that grown in United States. In 1920 the area devoted to wheat was 394,000 acres yielding 10 million bushels or less than one-tenth the amount produced in Kansas. The principal reason for this small production is the climate. Brazil, lying between 5 degrees north latitude and 32 degrees south latitude, does not offer favorable climatic conditions for the best growth of wheat. In the vicinity of the equator, rice is the only cereal that can be successfully grown. However, the southern part of Brazil, south of 20 degrees south latitude and the mountain region of Minas Geraes, is in the zone where cereals may be successfully grown.

Besides an adverse climate, black stem rust and other diseases are responsible for the low production of wheat in Brazil. In 1813, before these plant diseases were introduced from European countries, more wheat was grown than at the present time. Since that time, other crops such as corn, oats, barley, rye, beans, and flax have been grown more advantageously than wheat to such an extent that today with a rural population five times larger than in 1813, the total annual production of wheat is less than it was in 1813. It is also true that wheat grown in Argentine can be imported and sold in Brazil for less than the cost of producing wheat in Brazil. However, since the one-crop system has been the cause of many men's ruin, particularly in the state of Sao Paulo, the tendency of the people engaged in agriculture in Brazil is to follow a more rational system in which cereals play an important role.

The Brazilian government realizes that such an important food crop as wheat should be raised in its own country. It was once satisfactorily produced, now it is more than an agricultural problem; the problem is economic as well. Modern agriculture knows no obstacles. If a disease is preventing the successful production of a certain crop, methods of plant breeding furnish many possibilities of control or even complete extinction. It has been shown that in regions of mild winters, control of black stem rust by the eradication

of its alternate host, the barberry, is of little or no value since the fungus can over winter on the wheat stubble in the red stage. For this reason hybridization and acclimatization followed by careful selection are the means which promise success in overcoming the difficulties of wheat culture in Brazil.

The Brazilian Department of Agriculture has made distributions several times of foreign varieties of wheat among farmers who are able to carry out experiments and report their results. Thus far the only variety that has shown some aptitude to thrive under Brazilian conditions is the Argentine wheat known in that country as "trigo barleta." In years of exceptionally mild winters even this variety gets badly rusted. Agricultural experiment stations of Brazil are trying to develop by hybridization a variety which is rust-resistant and at the same time has as good milling and baking qualities as can be produced under their climatic conditions. Are hardness and disease resistance linked characteristics is a question which the science of genetics has not yet solved, and for the present the problem is unanswered.



CANARY PAUL VALE WALKER

The sire of Canary Paul Vale Walker was Canary Paul Fobes Homestead 6th, whose first ten tested daughters averaged 409 pounds of butterfat. His dam was Lady Vale Walker, one of the outstanding Holsteins of the college herd. As a five-year-old she produced 20,582.1 pounds of milk and 706.92 pounds of butterfat. At nine months of age Canary Paul Vale Walker was sold to the Kansas State Penitentiary. His daughters, however, showed such excellent type that the Department of Dairy Husbandry made an exchange whereby he was returned to the college herd.

The Thirteen-Lined Ground Squirrel

Earl H. Herrick, '26

The thirteen-lined ground squirrel (*Citellus tridecemlineatus*) is a common resident of Kansas. It is easily recognized, even at a distance, by the striking color pattern of its coat. The seven dark brown stripes dotted with lighter spots, alternating with the six light-colored stripes running the full length of the back, keep this little rodent from being confused with any of its relatives. A variety of names are given to this ground squirrel. It is sometimes called the striped gopher which cannot be said to be correct for it is not a gopher. Some of the more nearly correct names by which it is called are, Leopard Spermophile, Striped Ground Squirrel, *Citellus*, and Striped Spermophile.

The distribution of this species is over a large extent of territory including, in general, the central states and to the northwest into Canada. They are not found east of Ohio, southeast of Kansas or west of the Rocky Mountains. The open prairie in black or clay soil is the favorite home of this ground squirrel but it may be found in the lower well-drained land and even in thinly wooded places. There are at least eight varieties of this species found in the above named territory. These varieties are always of the same color pattern, the difference being only in size and intensity of color. Each variety occupies a certain section of country although there is some overlapping of sections.

The ground squirrel has the teeth and other characteristics of a herbivorous animal. To a great extent it eats grains of various kinds, grass, herbs, and berries, but will eat almost anything it can find. It is especially fond of grasshoppers, cutworms, and many other insects. Many of the insects which are eaten are harmful to plants, but a few are beneficial. Some authorities say that many mice are killed and eaten by this animal. A large number of stomachs have been examined and the contents found to be almost half animal matter, most of which was made up of the bodies of harmful pests. The ground squirrel is very fond of young and sprouting corn as well as other crops. It delights in digging up and eating the starchy swollen grains and in this way does much damage, so if the number of

ground squirrels is large they undoubtedly do more damage than they do good. If this is the case measures must be taken to control their numbers.

In digging out their runs large stores of grain have been found. Great care is exercised in storing their grain so that it usually keeps very well without spoiling. As much as three pints of grain has been found stored in one burrow and by one animal. Much more grain is always damaged than stored so it can readily be seen that the loss incurred is large where grain is raised, if there are many of these little animals present.

Some people maintain that the ground squirrel does not drink. It has been observed in the laboratory that they will drink at times, but it is very well agreed among observers that they do not have to drink if they can get the things to eat which they ordinarily like.

The burrows are about two inches in diameter and from a few inches to a rod or more in length. They may have several openings to the surface and usually have several blind alleys and nest chambers. A burrow is usually only a few inches deep, although in rare cases some have been found two and three feet deep. One animal may have more than one burrow which may be used for storage of grain, as hiding places, or as sleeping quarters. The nest is made of dry grass and built in an enlarged part of the burrow.

The ground squirrel is one of a few of our mammals that hibernates during the cold weather. In this part of Kansas the ground squirrel usually disappears for the winter's sleep in October or November depending upon the weather. During hibernation the temperature of the animal goes down to almost that of the surroundings. The rate of heart beat and rate of respiration is retarded to only a small fraction of the normal rate. The animal is stiff and feels cold when touched with the hand and has all appearances of being dead. Usually in the month of April the ground squirrel is again seen as happy and lively as ever, the only difference being in the loss of fat used during hibernation.

The mating season of the ground squirrel

(Continued on page 124)

Alumni Notes

DIRECTORY, CLASS OF 1914, DIVISION OF AGRICULTURE

FARMING

Name	Address	Further information
*W. C. Acton.....	Lewistown, Mont.....	Ranchman
L. N. Arnold.....	Morgantown, N. C.....	In charge of dairy herd, State School for Deaf and Dumb
E. J. Bird.....	Great Bend.....	General farming
H. C. Bird.....	Albert.....	Farmer and stockman
B. E. Blair.....	Sawyer.....	General farming
W. D. Brigham.....	East Kansas City, Mo., R. 1.....	General farming
W. G. Davis.....	Clay Center, R. 5.....	General farming
F. R. Dunlap.....	Eureka.....	General farming
H. C. Gaden.....	Seiling, Okla.....	General farming
W. S. Gates.....	Goff.....	General farming
W. I. Gray.....	Concordia.....	General farming
C. W. Haines.....	Havensville.....	General farming
A. L. Hodgson.....	Harveyville.....	General farming
*R. B. Hood.....	Fort Myer, Va.....	?
*F. R. Howe.....	Hicksville, L. I., N. Y.....	?
A. F. Kiser.....	Geneseo.....	General farming
C. O. Levine.....	Waterville.....	General farming
*W. C. Meldrum.....	Cedar Vale.....	Livestock farming (?)
G. D. Miller.....	Horton, R. 3.....	General farming
*A. E. Pearson.....	Clinton, Okla., 321 S. 5th St.....	?
*R. M. Phillips.....	Stockdale.....	General farming
M. I. Shields.....	Lincolntonville.....	General farming
H. C. Stockwell.....	Havensville.....	General farming
Oliver S. Taylor.....	Wann, Okla., R. 1.....	General farming
V. T. Worstell.....	Corning, Iowa.....	Fruit grower

PUBLIC SCHOOL TEACHING

*W. D. Cusic.....	Montclair, N. J.....	?
*F. L. Fleming.....	Reading.....	?
H. S. Gish.....	Soldier.....	Teaching agriculture in Soldier Rural H. S.
*C. A. McIntosh.....	Greybull, Wyo.....	?
S. L. Potter.....	Westmoreland.....	Prin., Westmoreland Rural H. S.
*E. G. Shaad.....	Deer River, Minn.....	Teaching vocational agriculture
T. G. Spring.....	Holcomb.....	Prin., Holcomb Consolidated H. S.
P. L. Mize.....	Bonner Springs.....	Director of vocational agriculture

COMMERCIAL WORK

C. H. Arbuthnot.....	Oklahoma City, Okla. 1110 W. 26th St.....	Wireman (inside), Oklahoma Gas and Electric Co.
*J. O. Barnes.....	U. S. S. Utah, care Postmaster N. Y. Box Sig.....	Turret Captain, U. S. Navy
F. T. Boise.....	Salt Lake City, Utah Care Univ. Club.....	Salesman, employ of J. O. Hoyle & Co., Investment securities
Arthur Doryland.....	Kansas City, Mo.....	Manager, Missouri Dairy Company
*V. O. Farnsworth.....	North Topeka, 118 Holman St.....	Coal dealer
C. S. Goldsmith.....	Parsons, 109 S. 27th St.....	Creameryman
George M. D. Jones.....	Kansas City, Mo., 4430 Madison St.....	Salesman, Columbian Electrical Company
Frank Kramer.....	Jefferson City, Mo., 801 Clark Ave.....	Laboratory assistant, testing road material, Mo. State Highway Commission.
Homer C. McNamara.....	Greenville, Tex., Box 611.....	U. S. Cotton Breeding Station
*J. D. McCallum.....	Flint, Mich.....	City Planning Commissioner
R. H. Musser.....	Twin Falls, Idaho.....	District Manager, Oregon Life Insurance Company
C. E. Neerman.....	Tulsa, Okla., 314 N. Santa Fe St.....	Manager, job printing plant
C. A. Patterson.....	Kansas City, Kan., 1830 Walker St.....	Investment securities
W. L. Sweet.....	Oakland, Cal., 1933 Broadway.....	Proprietor and manager of The Ballroom Beautiful
R. H. VanSeoik.....	Utica, N. Y., 3 Kenyon Court.....	Representative, Dairymen's League Coop. Assoc.
Horace T. Wilkie.....	Topeka.....	Jobber and retailer

HIGHER EDUCATION OR RESEARCH

A. E. Anderson.....	Lincoln, Nebr., 3500 R St.....	Agricultural statistician
F. A. Coffman.....	Washington, D. C.....	Associate agronomist, Office of Cereal Investigations, U. S. D. A.
W. R. Curry.....	Siloam, Ark.....	Head, Dept. of Agricultural Practice John E. Brown College
A. P. Davidson.....	Manhattan.....	Associate professor of vocational education, K.S.A.C.
V. H. Florell.....	University Farm, Davis, Cal.....	Associate agronomist, Office of Cereal Investigations
David Gray.....	Raleigh, N. C.....	Asst. Professor of Animal Husbandry, North Carolina State College
R. S. Hawkins.....	Tucson, Ariz.....	Professor of Agronomy, College of Agriculture, Univ. of Ariz.

E. H. Hostetler.....	Raleigh, N. C.....	In charge of swine investigations, Agr. Expt. Sta.
R. E. Karper.....	Lubbock, Tex.....	Supt., Texas Agr. Expt. Sta.
R. W. Kiser.....	Manhattan.....	Professor of Animal Husbandry, Exten. Div., K.S.A.C.
P. E. McNall.....	Madison, Wis.....	Assoc. Professor of Agricultural Economics, Univ. of Wis.
F. R. Root.....	Manhattan.....	Asst. Coach in athletics, K. S. A. C.
H. H. Sherrard.....	Sonora, Cal.....	Horticultural Commissioner and Deputy State Sealer of Weights and Measures for Tuolumne County
L. P. Wehrle.....	Ithaca, N. Y., Renwick Heights.....	Investigator in Entomology

COUNTY AGRICULTURAL AGENTS

Name	Address	County
A. L. Clapp.....	Manhattan.....	County Agent Leader, Exten. Div., K. S. A. C.
G. L. Cleland.....	Goodland.....	Sherman
A. I. Gilkinson.....	Lyons.....	Rice
R. E. Gwin.....	Iola.....	Allen
H. L. Hildwein.....	Kingman.....	Kingman
C. R. Jaccard.....	Clay Center.....	Clay
Karl Knaus.....	Menominee, Mich.....	Menominee
D. F. Laubmann.....	Fort Sumner, New Mex.....	De Baca
R. W. Schafer.....	Fort Collins, Colo.....	Asst. County Agent Leader Colorado Agricultural College
H. F. Tagge.....	Holton.....	Jackson
Earl J. Willis.....	Camden, Ark., care Chamber of Commerce.....	Ouachita

ALL OTHERS

**Whereabouts and occupation unknown: L. W. Anderson, Lloyd Gearhart, C. P. Lillard, H. M. Zeigler, and E. M. Parrish

Deceased: E. H. Clark, Ernest Doryland, B. R. Ellis, and S. F. Hacker

*From latest available information which is not up to date.

**Information regarding any of this group will be very much appreciated.

DIRECTORY, CLASS OF 1919, DIVISION OF AGRICULTURE

FARMING

Name	Address	Further information
J. B. Angle.....	Courtland.....	General farming
Clara E. (Higgins) Claphan, Lane.....		Housewife, general farming
J. A. Clarke.....	Winfield, R. 2.....	General farming
O. W. Hinshaw.....	Eureka.....	Nurseryman
F. W. Howard.....	Oakley.....	General farming
W. C. Janssen.....	Lyons.....	General farming
J. L. MacNair.....	Jetmore.....	General farming
H. W. Phillips.....	Hutchinson, R. 3.....	General farming
F. M. Pickrell.....	Leon.....	Dairy farming

PUBLIC SCHOOL TEACHING

W. W. Bell.....	Portis.....	Supt., Portis Public Schools
Shirley Blanche French.....	Guthrie Center, Iowa.....	Teaching biology
E. M. Hiestand.....	White Cloud, Box 41.....	Teaching high school agriculture
L. N. Jewett.....	Altamont.....	Teaching vocational agriculture
R. M. Kilbourn.....	Lingayen, Pangasinan, P. I.....	Teaching in Government School
C. L. Quear.....	Kansas City, Mo., 228 Library Bldg.....	Director of Horticulture in Kansas City Public Schools
E. F. Whedon.....	Los Angeles, Cal., 1118 Spencer St.....	Teaching in Gardena H. S.

COMMERCIAL WORK

Turner Barger.....	Des Moines, Iowa, 2815 High St.....	Adv. Mgr., The Dairy Farmer
H. A. Lindsley.....	Cambridge, Mass., 18 Lee St.....	Real Estate Salesman
C. W. McCampbell.....	New York City, 18 E. 41st St.....	Adv. Dept., Standard Gas Equipment Corp.
C. V. Maloney.....	Fort Scott.....	Numer and Maloney Sales Co.
E. J. Price.....	Pawnee, Okla.....	Employ of Pawnee Ice Cream Co.
L. V. Ritter.....	Marked Tree, Ark.....	Pres., E. Ritter & Co., Inc.
R. S. Wescott.....	Beulah, Mich.....	Creamery Operator
C. E. Wettig.....	Valley Falls.....	Wettig Clothing Company
F. C. Wilson.....	Indianapolis, Ind., Room 152, State House.....	In charge Milk Laboratory, Food and Drug Dept., State Board of Health

HIGHER EDUCATION OR RESEARCH

G. Y. Blair.....	San Antonio, Tex.....	Horticulturist, U. S. Expt. Farm
Fred Griffiee.....	St. Paul, Minn.....	Associate in Plant Breeding, Univ. of Minn.
Edgar Martin.....	Fayetteville, Ark.....	Assoc. Prof. of Animal Husbandry, Univ. of Ark.
A. F. Swanson.....	Hays.....	Asst. Agronomist, U. S. D. A., Fort Hays Branch Expt. Sta.

COUNTY AGRICULTURAL AGENT

L. H. Rockford.....	Center, Colo.....	Saguache County
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TAX LEGISLATION

(Continued from page 106)

of special benefit to the farmers. In the first place, it favors long-time loans. Secondly, it will nearly eliminate double taxation of mortgaged real estate. Previous to this act, the owner of real estate not only had to pay taxes on the land, but also a high enough interest rate on the mortgage to allow the lender the usual rate of interest above the mortgage tax. The land owner was indirectly paying a double tax. Formerly the tax was paid where the holder of the mortgage resided. Mortgages held outside of the state were not taxable in Kansas. All the mortgages that were held within the state were by no means turned into the assessor. Under the new law the registration fee is paid in the county where the property is located and, with the large increase in the number of mortgages bearing a

tax, the amount of revenue raised under this law ought to be greater than under the old law. Furthermore these taxes will be distributed more widely and more uniformly among mortgages held against Kansas real estate.

The gasoline tax gives a new source of revenue and, based upon the amount of gasoline sold in 1922 and 1923, should yield a revenue of about \$3,500,000 annually at the present rate of consumption. This revenue will be used on roads within the state and should materially reduce the appropriations for such roads as well as result in better ones. This tax is made more desirable because the people paying the tax pay in proportion to the amount of driving on public roads. The cost of collecting this tax is about one-half of 1 percent of the revenue it will yield, according to the experience of other states.

In conclusion, it can be said that the work of the state legislature last winter in tax revision was progressive and sound. The March issue of the Bulletin of the National Tax Association calls the work of this legislature "the most striking tax legislation of recent years." The work done is a mark of important progress in bringing about gradual changes which will require several years for completion. This, however, is much more desirable than a complete change in a short time. When the change is gradual, industries have time to adjust themselves to new conditions. They are not thrown off their balance. Slow and careful adjustment of tax laws insures greater stability of industries.

ONE POUND BETTER THAN THREE

Due to the ability to provide desired conditions economically American industries each year are replacing many pounds of unsuitable supplies with a comparatively few pounds of effective material.

As sanitation is of basic importance in handling milk food products the Dairy Industry has long since realized the extravagance of using unsuitable and ineffective cleaning materials.

Dairymen the world over in steadily increasing numbers are standardizing the use of



because it economically cleans clean, freely and quickly rinses, and leaves all washed surfaces sweet smelling and odorless.

Wyandotte Cleans Clean

The J. B. Ford Company, Sole Mfrs.
Offices in principal cities

BEAUTIFYING THE FARMSTEAD

(Continued from page 105)

the region, should be fairly free from pests and should have a reasonable quantity of foliage that is not liable to drop because of slightly adverse conditions. They should be of proper size, habit, and texture for the location. Where a tall upright shrub or tree is needed a spreading one should not be used.

H. C. Colglazier, '20, is county agricultural agent of Douglas county, Lawrence.

Earl Teagarden, '20, is teacher of vocational agriculture in the Reno Community High School, Nickerson, Kan.

The CASE Engineering Code



Applies to All Case Machines

THE Case Engineering Code takes definite, accurate information obtained from special, dependable sources, analyzes it month by month, charts it, and applies its findings to the continuous improvement and development of all Case machines.

There is a scientific reason, based upon accurate knowledge, for every detail of Case machine construction. The steel frame of the thresher; the fact that every rotating bearing on the thresher is self aligning; the extensive use of special alloy steels and protected bearings in the tractor; the remarkable economy records made by Case steam engines—all had their origin in the Case Engineering Code.

The results of the operation of the Code are apparent in the better work done by Case machines, their greater dependability and durability and their economy as demonstrated in low cost per year or per job. This is the only system of development ever devised that insures steady progress toward perfection, and it is applied to every part throughout all Case machines.

J.I. Case Threshing Machine Co.

(Established 1842)

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Case Farm Tractors, Steel threshers,
Silo fillers, Baling presses, Steam engines,
Road machinery, Grand Detour
Plows and Disc Harrows

NOTE—Our plows and harrows are NOT
the Case plows and harrows made by the
J. I. Case Plow Works Company

100

90

80

70

60

50

40

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20

10

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THE GROUND SQUIRREL

(Continued from page 119)

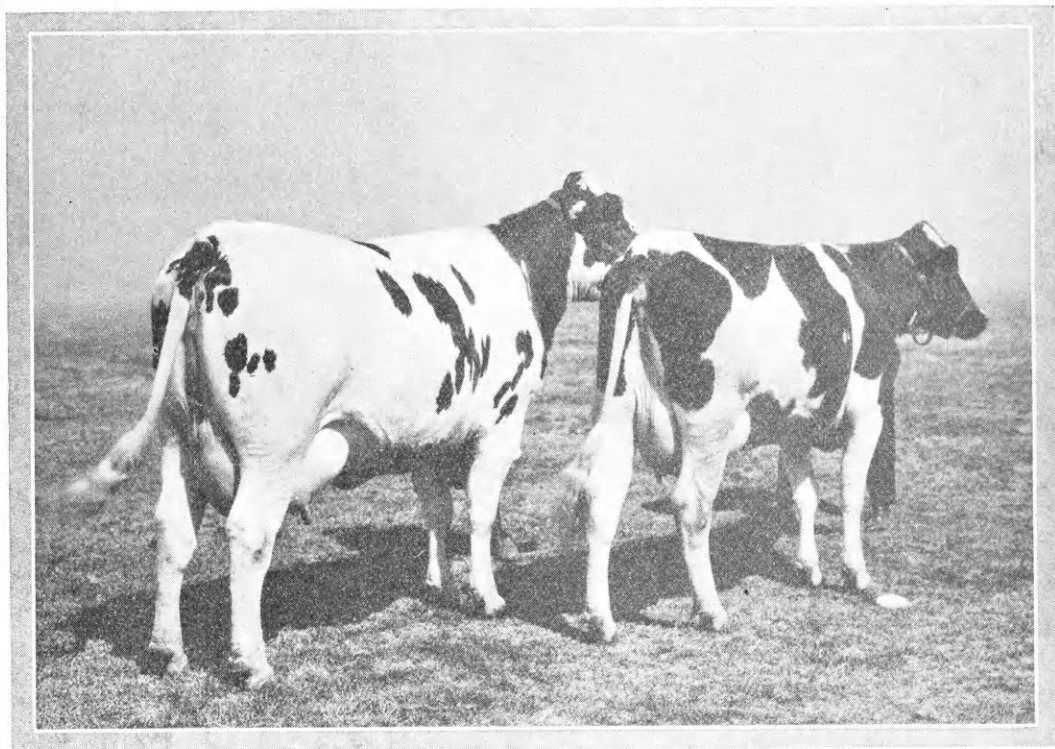
opens immediately upon its appearance in the spring. The young are born about the first of June. The average number in one litter is eight or nine with as many as thirteen or fourteen in rare cases. The young are very small and hairless when born, so they stay in the nest longer than most rodents which are more developed when born. In the latter part of August the young leave the nest. From then on the family feeling is broken for when they once leave the nest they usually live alone.

The common enemies of the ground squirrel are hawks, snakes, and the carnivorous animals that live in the same locality. This little rodent is very prolific but its enemies, if not

exterminated by man, keep its numbers in about the same ratio from year to year.

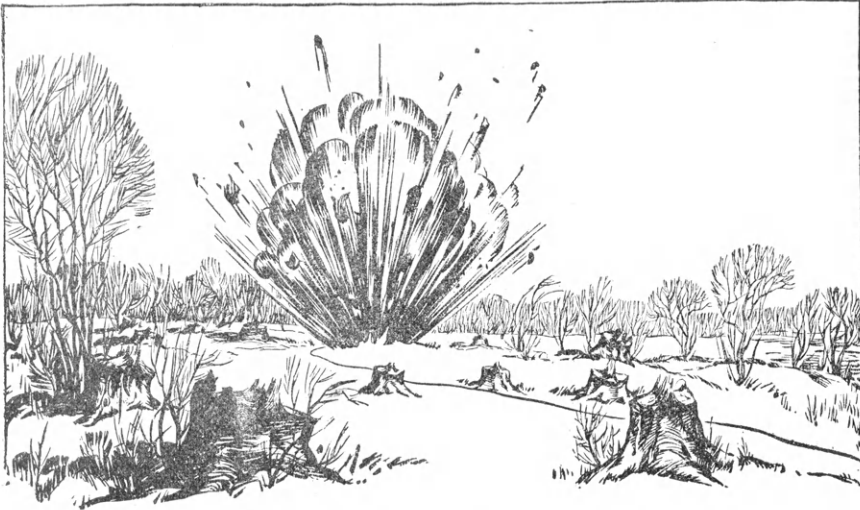
If the farmer decides that the ground squirrel is doing too much damage to be tolerated, it is usually only a matter of using poisoned grain to stop the menace. Carbon disulphide and cyanide flakes have proved to be effective when put into the burrow to form a gas. In most cases, however, the ground squirrel does not do enough damage to warrant a campaign against him.

Dr. F. D. Farrell, since March 2 acting president of the Kansas State Agricultural College, was made president, the appointment becoming effective immediately, at the meeting of the state board of administration on May 5.



K. S. A. C. KORNDYKE INA AND K. S. A. C. KORNDYKE INKA

These interesting purebred Holstein twins, born August 1, 1922, were shown with their mother, Inka Hijlaard Walker, on the cover page of Vol. II, No. 2 of the Kansas Agricultural Student. A picture of the twins at nine months of age was again presented on page 104 of Vol. III, No. 4, of the Student. They are here shown as two-year-olds and are making creditable two-year-old records. Their mother is considered the most valuable cow in the college dairy herd. Her picture was shown and her last record discussed on page 76 of the last issue of the Student.



What happens to loafers on the farm?

OUT they go—surely!

Well, that's what every farmer needs to do with the stumps and boulders on his land. These "loafers" occupy space that should be replaced by growing crops. They are the cause of accidents to the farmer and breakage to harness and implements. They are breeding places for crop-destroying vermin as well as weeds and briars.

Getting stumps and boulders out of the way enables the farmer to cultivate *all* his land and make his *whole* farm work for him.

Du Pont dynamite is the explosive to use for land clearing work. It's dependable—always the same—sure to do a good job. The oval trade-mark on stick and case identifies du Pont dynamite.

Write today for the free 110-page "Farmers' Handbook of Explosives" giving full information about the use of explosives on the farm. This book is really a text book. You will find it interesting and instructive, and particularly useful during college years as a reference source.

E. I. DU PONT DE NEMOURS & CO., Inc.

Arcade Bldg., St. Louis, Mo., Joplin, Mo.



SWEET CLOVER

(Continued from page 104)

From the table it is at once seen that the pigs on alfalfa made the greatest gain. They consumed more corn and tankage but made more economical gains, requiring 22.22 pounds less corn and 3.72 pounds less tankage to make 100 pounds gain than the pigs on the sweet clover pasture. However, the poor appetites of the pigs on the sweet clover for the first month accounts in some degree for the difference in the average daily gain. The alfalfa was the more palatable and apparently stimulated the appetites of the pigs for corn. While these results indicate that alfalfa is a better hog pasture than sweet clover, yet they show large possibilities in using sweet clover as a substitute if alfalfa can not be produced.

PASTURE MANAGEMENT

To insure good pasture for the longest possible time each season, sweet clover should be handled in two plots, since it is a biennial crop and the late second year's growth is too coarse to be grazed well. The system of pasture management advised is as follows: One of the plots should be seeded early in the spring. After a growth of about eight inches which is made by about June 1, livestock may be turned on it. Pasturing may continue until late in the fall. The following spring a second plot should be seeded. The second year's growth of the first plot may be used for early spring pasture. Later in the summer, as this plot becomes coarse and woody, the cattle may be grazed on the first year's growth of the second plot until late in the fall. The first plot may be left to reseed itself or turned under and reseeded the following spring. In this way, a continuous pasture of tender clover is available from early spring until frost.

SUMMARY

1. Sweet clover is a deep-rooted plant and should be allowed to become well established before pasturing.

2. However, sweet clover will provide early spring and late fall pasture and stands pasturing well.

3. Pasturing should be used to prevent the growth of large stems and make easier the harvesting of a seed crop.

4. Sweet clover does not cause bloat so

frequently as alfalfa and if properly handled the danger from this source is negligible.

5. Animals may at first refuse to eat sweet clover if it is coarse and stemmy but if started while the crop is tender they will graze it readily.

6. Sweet clover is an exceptionally satisfactory pasture crop for dairy cows and is excellent for summer maintenance and growth of beef cattle.

7. Careful management of sweet clover pasture will provide in a most economical way, regular pasture each season from early spring till frost.

ICE CREAM ON THE FARM

(Continued from page 110)

proper proportion of salt, the crank turns smoothly and the ice melts quickly bringing the freezing process to a finish in a short period. A good freezing mixture is one part of salt to three or four parts of ice, depending on the size of freezer and the size of the particles of salt and ice. Coarser ice may be used in a larger freezer. These directions are for the ordinary two-gallon freezer.

The freezer must not be turned too fast, as this will give too much swell in the early part of the freezing which will later fall down, leaving a poor, soggy body. On the other hand, if the freezer is turned too slowly a nice velvety body of cream will not be secured. The dasher should be removed as soon as the cream is frozen so as to avoid difficulty in dishing the cream out of the freezer. The cream should then be packed until it becomes solid.

PROFESSOR WALKER CHAIRMAN OF RECLAMATION COMMITTEE

H. B. Walker, head of the Department of Agricultural Engineering of Kansas State Agricultural College, has been made chairman of the reclamation committee of the American Engineering Council. It is the function of this committee to make a careful and impartial study of the whole field of reclamation in the United States to include not only irrigation, but also drainage and land clearing.

The American Engineering council expects to correlate all reclamation agencies of a fed-



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GENERAL ELECTRIC

eral nature, and lend its assistance in bringing about such national legislation as is necessary for a comprehensive federal policy.

Professor Walker has had wide experience in the reclamation field. He was drainage and irrigation engineer for the Kansas State Agricultural College for seven years and formerly state irrigation engineer. In 1912 he acted as a special consulting engineer for the United States reclamation service and is now engineer for and member of the Kansas water commission.

ULTRAVIOLET RAYS

(Continued from page 100)

body thus causing a normal development of bone and other body tissue.

The character and amount of the minerals in the diet play a very important part in the development of leg weakness. If the feed contains an insufficient quantity of mineral, or if the minerals are not present in the proper proportion, the chicks will develop leg weakness in a few weeks unless they are out in the sunshine or are provided with plenty of vitamin D. If, however, minerals are present in sufficient quantity and proper proportion it is possible to keep the chicks away from direct sunlight for 6 or 8 weeks without any development of weak legs.

Since the work of the Kansas Agricultural Experiment Station has shown the importance of ultraviolet light in the normal development of chickens there has been developed a special ultraviolet lamp for the use of poultrymen. This lamp is an adaptation of an ultraviolet lamp which has been used for a number of years in human therapy. The lamp has been developed by the Cooper-Hewitt Company of Hoboken, N. J., in cooperation with Dr. J. S. Hughes who has been directing the experimental work with ultraviolet light at this station. It is called the "Uviarc Poultry Treater." This lamp can be used either for the direct method of treating chicks or for treating the feed which they consume. While the method of treating feed has been shown by Steenbock of Wisconsin to have been successful in preventing rickets in rats, it must be remembered that the chicken requires far more of the antirachitic factor than the rat. It has been demonstrated, however, by two years' experimental work in this and other stations,

that the direct treatment of chicks with ultraviolet light will prevent rickets and the indications are that experiments now under way will show that the activated feed, i. e., feed treated with ultraviolet light, will have the same effect.

The same condition which prevents the development of leg weakness in growing chicks will enable hens to remain in a normal healthy condition and lay eggs with sound shells and high hatchability. Of course the other essential factors in the ration must be present. This gives an explanation of the fact that the birds kept in any open-front house, so that they receive all the ultraviolet rays that are in the sunshine make higher records than those that are confined in a dark house or behind glass.

The conclusion which, it seems, may properly be drawn from experimental data so far compiled, is that in the abundant supply of Kansas sunshine, the Kansas poultryman has one of his greatest assets. Sunshine is free. Let's use it. Our slogan should be "Let a lot of sunshine in."

TREATMENT OF FENCE POSTS

(Continued from page 111)

treated to a point at least six inches above the future ground line. They should be left in the hot creosote for from 2 to 5 hours, during which time the air and moisture in the post are heated, expanded, and partly driven off. The posts are then allowed either to remain in the preservative as it cools (single tank method) or are changed quickly to a cool tank of the same preservative (double tank method). In either case the cooling process causes a contraction of the remaining air and moisture in the wood structure and, as a result, additional preservative is drawn into the wood. For the fairly durable woods, such as oak, catalpa, and cedar, the tops of the posts should be given a brush treatment; but with the nondurable woods, such as sap, second-growth pine, second-growth cypress, red oak, mixed oaks, gum, sycamore, cottonwood, willow, poplar, maple, beech, and the western pines, treatment should include the whole post.

In quantities it costs about 4 cents a post for a two-hour treatment, and 8 cents for a five-hour treatment.

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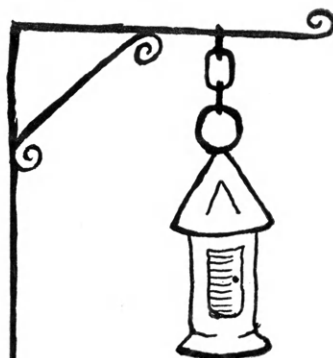
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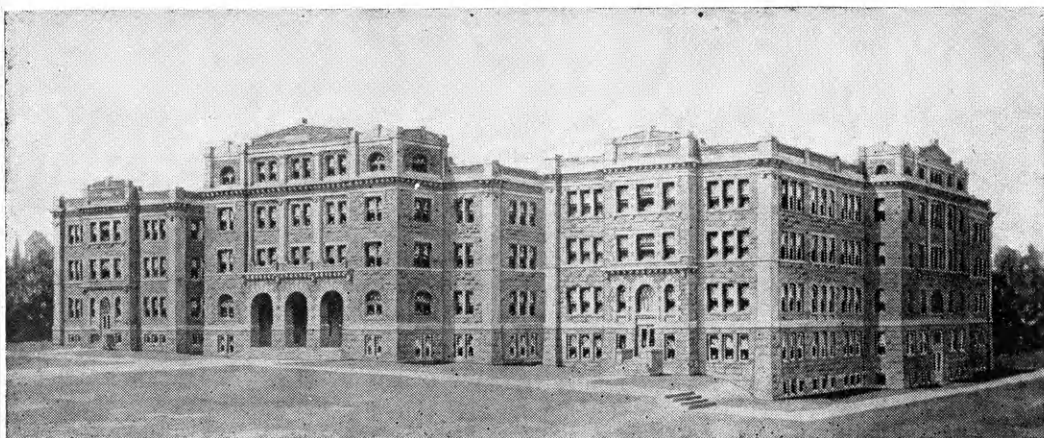
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