

REG. 12
a-12
ep 1

THE KANSAS AGRICULTURAL STUDENT



VOL. III, No. 1

OCTOBER, 1923

MANHATTAN, KANSAS



Walter E. Moore

AUTHORIZED AGENT

LINCOLN

FORD

FORDSON

FOR

Up-to-Date News

VISIT THE

Traction News Store

116 South Fourth St.

Men's Furnishings

Fashion Park and Sincerity
Clothing, Cheney Cravats,
Ralston and Tilt Shoes

Givin Clothing Co.

Aggieville

COLONIAL FOOD SHOPPE

The Little Shop of Great Service

Home-made Cake, Pies, Cookies, Bread,
Salads, Meats, Baked Beans, Etc.

*We will make your favorite Cake or
Pie, etc., to order. Just phone us*

Catering Service Picnic Lunches to Order
Phone 1579 523 Poyntz Ave.

**Martin-Moore Hardware
and Electric Co.**

*Electric Supplies
Hardware*

Headquarters for Mazda Lamps

Phone 553

1124 Moro St.

M A R S H A L L

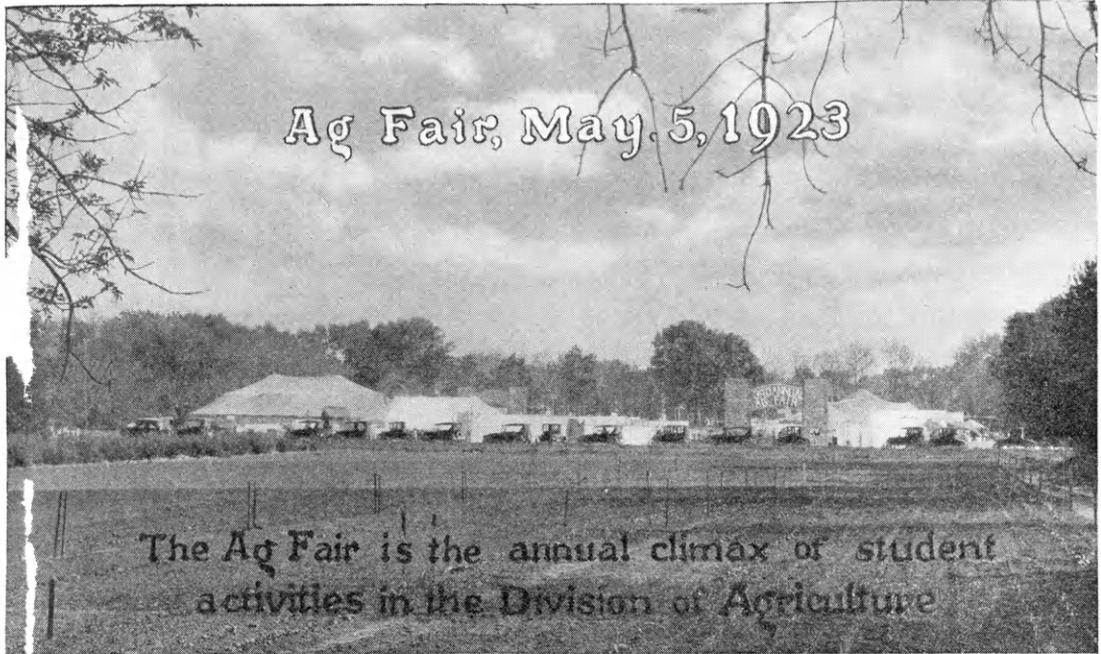
The Aristocrat of Theatres

*If It's at the
MARSHALL*

It's Usually the Best

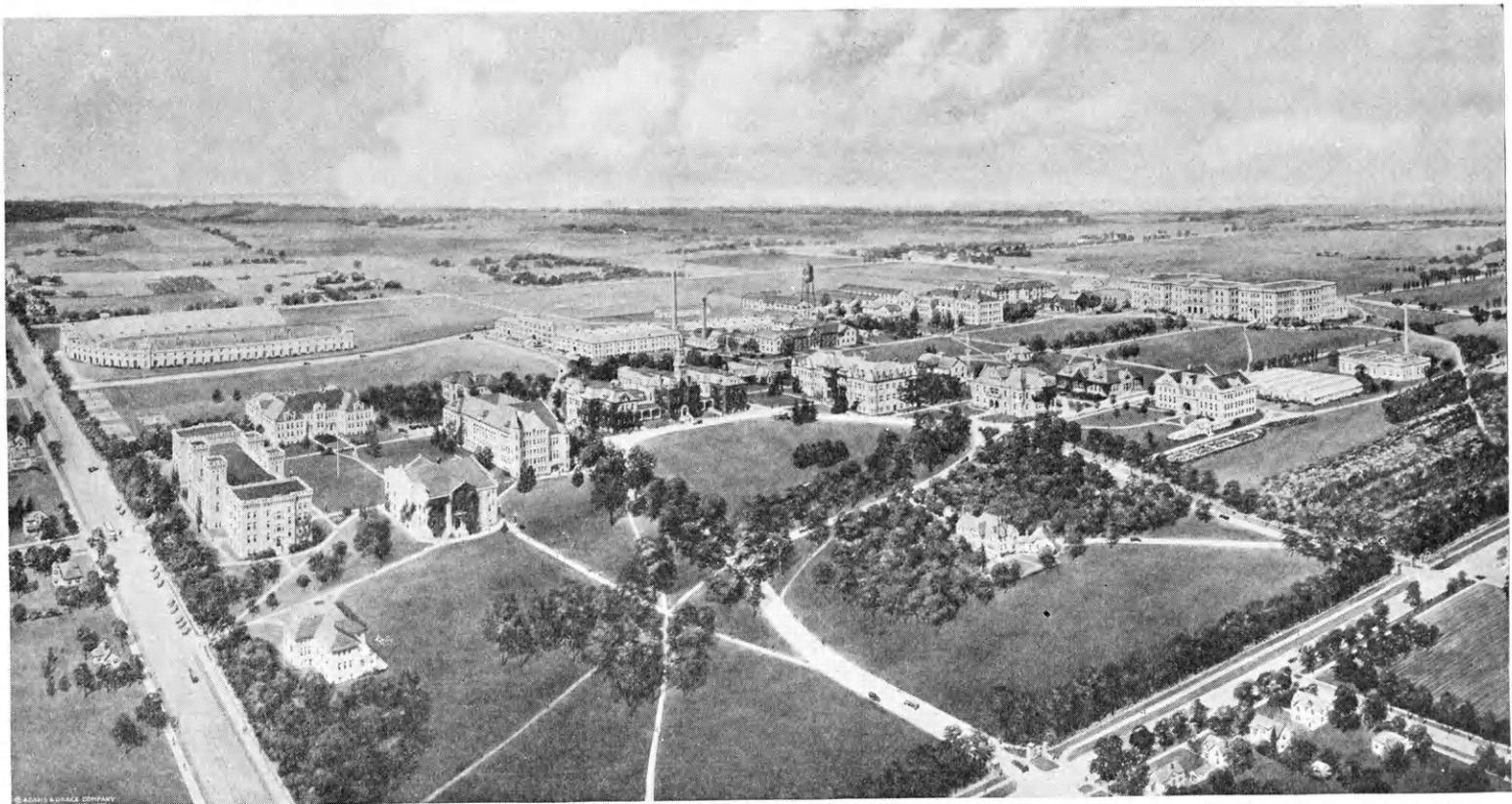
**ROBERT C.
Smith**
JEWELER

GIFTS THAT LAST



CONTENTS

A Unique Class Project in the Production of Baby Beef..... 3 Louis Vinke, '21	College Notes16
The Alfalfa Situation in Kansas..... 6 F. M. Alexander, '24	The Third Annual State High School Judging Contest
Vocational Agriculture Trains Useful Citizens 7 Walter E. Crabtree, '20	The Third Annual Ag Fair College Dairy Judging Team Places High in Intercollegiate Contests Farrand Wins at Kansas Free Fair First Intercollegiate Grain Judging Contest
The Outlook on the Wheat Situation..... 8 C. D. Tolle, '24	The Care of Pullets During the Fall.....20 Harriet H. Myers, '26
Kansas Apple Crop for 1923..... 9 E. M. Litwiller, '24	Why the Dairy Industry Continues to Grow21 W. J. Daly, '25
Traumatic Disorders in Cattle10 G. R. DOWD, '25	A Seventeenth Century Ag.....22
Feeding Cottonseed Cake Economically in the Fattening of Baby Beef.....11 Marvel L. Baker, '24	A Few Rermaks About Kansas23 I. D. Graham
More Room for Agriculture.....13 P. R. Woodbury, '24	Alumni Notes.....24
Editorial14 To Our New Readers Knowing a Thing Is Not Enough To the College Student from the Farm The Country Church in Rural Life	The Agriculture of West Virginia.....25 Karl S. Quisenberry, '21
	Pruning Fruit Trees.....30 S. W. Decker, '24



Copyright 1923, Adams & Grace, N. Y.

AIRPLANE VIEW OF KANSAS STATE AGRICULTURAL COLLEGE

Reproduced from a 15 X 25 photogravure etching which has been prepared for distribution to Kansas high schools. For further information write DEPARTMENT OF ILLUSTRATIONS, KANSAS STATE AGRICULTURAL COLLEGE

The Kansas Agricultural Student

VOL. III

Manhattan, Kansas, October, 1923

NO. 1

A Unique Class Project in the Production of Baby Beef

Louis Vinke, '21

A carload of steers was purchased and fed out by the Department of Vocational Agriculture of Wakefield Rural High School the past winter in order to supply the need for a more thorough and practical course in livestock production. Home projects coupled with practical instruction in the classroom and field trips had been successful, but the boys could not handle as large a project as they would have to carry when engaged in farming, nor could the supervision be close enough. Therefore, the problem of selecting a class project that would be suitable was brought up in the class room and after due consideration and consultation with parents and the school board it was decided to feed a carload of steers.

After careful consideration of the method of handling the project an agreement was reached whereby the school board was to purchase the steers, the instructor provide the feed, and the students of the class do the work. Profits were to be divided fifty fifty. The school board was to get 50 percent to be used in equipment for vocational agriculture and the boys 50 percent for their work. In case of loss the school board was to stand it.

A good feedlot was secured just outside the city limits with a good barn and shed so that the feed could be kept under shelter and the cattle amply protected. The lot was flat but was improved somewhat by the boys' hauling in 15 loads of clay. Fences were repaired, a water system provided, and everything made ready for the steers. As a remuneration for the use of the feedlot the boys agreed to haul the manure on the farm of the owner, Mrs. George Gaston.

Fifty Highland Hereford and fifteen na-

tive steer calves were purchased at auction at the American Royal Livestock Show at Kansas City. These calves had not been shown but had considerable quality. Their average weight was 302 pounds and they cost \$6.35 per hundredweight. When the steers arrived at Wakefield two days later they averaged 280 pounds per head. They were immediately put in the feedlot.

The first week the steers lost weight and did not receive grain because of a severe outbreak of shipping fever. They were vaccinated with mixed infection bacterin and the sick ones given Epsom's salts in a drench. In two weeks they were pretty well straightened out and were started on grain. One steer, however, had succumbed to the disease and another was stricken with an infection in the feet and had to be killed later. A third developed a severe case of pneumonia and was kept in a pen by himself the entire feeding period as he could not be forced to eat shelled corn. He fattened fairly well on chop.

Some of the boys brought in pigs to follow the steers. They were given one-third of the gain, two-thirds going to the department. Several farmers donated pigs to the school in which case the pigs were given a value and accounts kept as if purchased. In all 15 pigs followed the steers. They received very little extra grain except waste which was cleaned up after hauling feed. Most of the pigs were wormy when they arrived and the boys treated each one separately with castor oil and oil of worm seed.

The feeding of these steers was done before and after school hours, the boys working in groups of three. Three boys would

feed for a week, one would hold over for a second week and two would be relieved by two other boys. In this way there was always an experienced boy on duty. The steers were fed promptly at 7:30 a. m. and 4:30 p. m., the time not varying 15 minutes during the entire feeding period. The instructor supervised the work at feeding time during the entire period.

The boys hauled most of the feed to the feedlot. Those that could not furnish teams on certain days helped in loading. At one time 1,400 bushels of corn was purchased and binned. This was hauled six miles, the boys and their teams taking the corn away from a sheller. The remaining corn was

market. One of the boys accompanied the shipment with the instructor as a reward for being the best feeder of the group. This boy was Don Workman, who has never lived on a farm.

The work was closely correlated with classroom instruction. Every morning in class a "Feeders' Report" was given to the class by the boys on duty and usually a lively discussion followed. This brought out all of the problems and the boys solved them without undue effort on the part of the instructor. The community became interested, the large number of visitors making it necessary to place "Keep Out" signs on the fence to



CLASS PROJECT CALVES AT FEEDING TIME

The average weight per calf when this picture was taken was 540 pounds. The instructor and the three boys on duty are at the left.

purchased later at the same place. Hay was purchased wherever available. Boys were detailed to find hay of suitable quality for sale at the most reasonable prices.

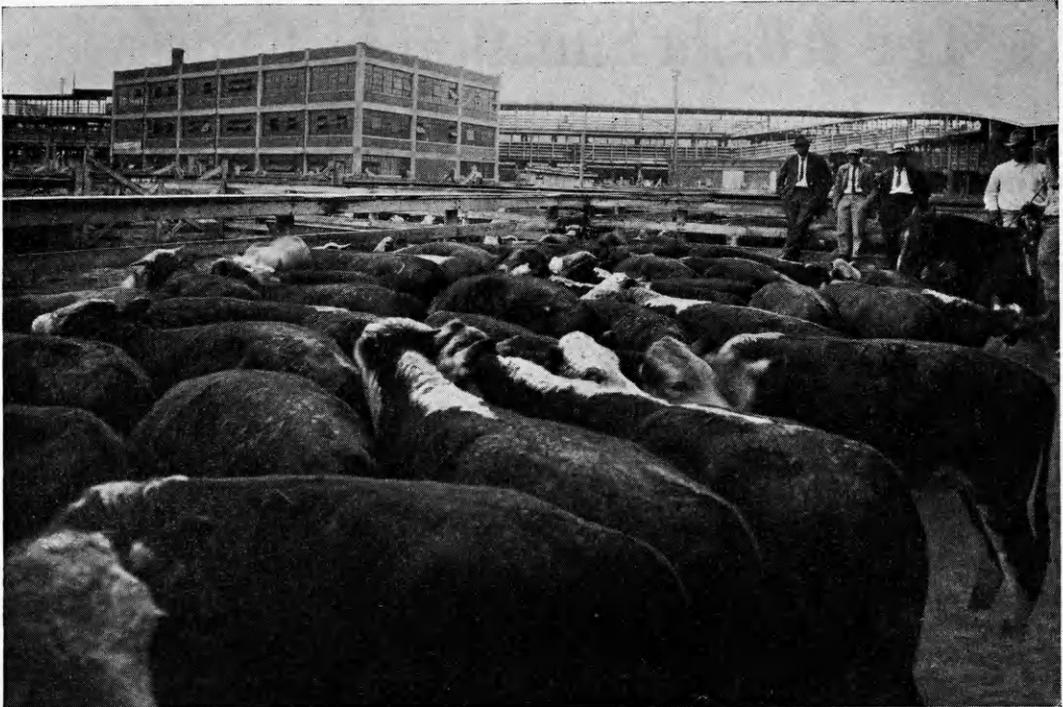
The last week in the feedlot was disastrous because of a sudden heat wave, accompanied by the worst siege of flies in the history of the community. A shrink of 30 to 40 pounds per steer resulted just before shipping.

On June 27 the steers were marketed in Kansas City. They brought the highest price paid for steers in that class that day, bringing \$9.50 per hundredweight on a very dull

keep the steers quiet.

Among the things learned by the students in this project may be enumerated: (1) Feeding practices. (2) Beef cattle management. (3) Judging beef cattle. (4) Disease control. (5) Cooperation. Such a project as this would be impossible without the hearty cooperation of both the boys and their parents.

The story of this high school project in the production of baby beef may be tabulated as follows:



CLASS PROJECT STEERS AS THEY APPEARED IN THE KANSAS CITY STOCK YARDS. AVERAGE WEIGHT PER STEER, 718 POUNDS

Av. initial weight per steer.....	280	lbs.
Av. final weight per steer.....	718	lbs.
Av. total gain per steer.....	438	lbs.
Length of feeding period.....	203	days
Av. daily gain.....	2.15	lbs.
Av. daily ration per steer:		
Shelled corn.....	10	lbs.
Alfalfa hay.....	5	lbs.
Cottonseed meal (last half of feeding period).....	1	lb.
Cost of steers in K. C.....	\$1,321.11	
Freight.....	39.15	
Marketing charges.....	182.35	
Interest.....	46.23	
Corn (2,075 bus.).....	1,392.45	
Cottonseed meal, (6,500 lbs.).....	165.50	
Alfalfa hay (3½ tons).....	425.25	
Prairie hay (3 tons).....	15.00	
Salt (155 lbs.).....	4.25	
Total expenses.....	\$3,591.29	
Sale of steers.....	\$4,323.45	
Profit on steers.....	732.16	
Profit on hogs.....	124.16	
Total profit.....	856.31	

J. A. Vohringer, '13, Superintendent of Shellbanks Farm, Hampton, Va., in remitting for The Kansas Agricultural Student for the next three years comments as follows:

"It is with a great deal of pleasure that I send in two bucks to take advantage of your generous offer for three years' subscription for that amount. If you had asked that amount for one year's subscription, I would have cheerfully shelled out. It is one great little magazine and I enjoy it very much."

C. A. Herrick, '21, M. S., '23, has been granted a fellowship in medical zoology in John Hopkins University. His address is 310 West Monument Street, Baltimore, Md. Mr. Herrick was research assistant in parasitology in K. S. A. C. 1921 to 1923.

Among the faculty of the Virginia Polytechnic Institute, Blacksburg, Va., are: Ralph E. Hunt, '11, head of the Department of Animal Husbandry, and Edmund C. Magill, '12, professor of vocational education.

G. C. Gibbons, '18, is Extension Agronomist of the Oklahoma A. & M. College, Stillwater.

R. E. Karper, '14, has for the past eight years been Superintendent of the Texas Agricultural Experiment Substation at Lubbock. The primary project of this station is the investigation of grain sorghums in which it has done outstanding work and made some recent valuable contributions to the literature in that field.

The Alfalfa Situation in Kansas

F. M. Alexander, '24

Although Kansas still leads all other states in the acreage of alfalfa, of late years this acreage has been decreased and in some sections of the state this decrease is quite marked. From 1915 until 1920 there was a decrease of 128,158 acres. In western counties a marked reduction has been made in spite of a real need for a protein feed crop.

In the greater part of western Kansas the sorghums can be depended upon to produce a heavy tonnage of feed high in carbohydrates, but this carbonaceous crop requires a protein supplement. Legumes, other than alfalfa, have been found of little value or their use is still in the experimental stage. Sweet clover, especially biennial white, has shown its adaptability to bottom lands and to those bottoms too sandy for alfalfa. On the uplands the crop is uncertain and a stand is obtained only with difficulty. Repeated plantings on the same ground for three or four years are sometimes necessary before a satisfactory growth is made. Chiefly on account of dry weather and rabbits, annual legumes such as soy beans and cowpeas have not been successfully grown and their future value is doubtful.

Past experience has shown that alfalfa can be raised on the bottoms and the better uplands of the western part of the state. In seeding a field to alfalfa the best results have been obtained by spring sowing on a firm, well-prepared seedbed. Unless there is a plentiful supply of moisture in the soil, it is desirable to fallow preceding the year of sowing. To a limited extent, seeding in rows has been practiced on uplands. Experiments conducted at the Fort Hays Experiment Station for the past several years, have shown that this method is not of practical value and has no advantages over close drilled or broadcasted seedings. Yields of hay and seed are not increased and the expense of growing the crop is increased because of the cultivation necessary to kill weeds.

After a stand is obtained, management will largely determine its longevity. From the standpoint of both the plant and its feeding value, cutting from one-tenth to full-

bloom state is best. Much care should be exercised in pasturing. Probably horses and hogs are the most satisfactory animals to pasture on alfalfa, many farmers pasturing horses on it practically all winter. When horses are pastured during fly season there is danger of areas being beaten out by the horses fighting flies. To insure plenty of soil moisture to aid growth the following year, heavy pasturing should not be practiced, as it leaves the ground clean so rain and snow will not be held. Where grasshoppers are damaging fields, the use of poison bran mash has given good results and is a profitable operation.

While Kansas still leads in alfalfa, the acreage should be increased as it is the only protein feed crop well adapted to the state in general. Good seedbed preparation and proper management of stands, together with a greater appreciation of farmers for the crop, will do much to put alfalfa on many acres where it rightfully belongs.

Friday, November 2, 1923, has been designated as Dairy Day at the Kansas State Agricultural College. This is to celebrate the opening of new quarters for the Department of Dairy Husbandry. Many invitations are being issued to persons known to be interested in dairying to inspect the dairy equipment and dairy cattle at the college on that day. Prominent men in the dairy industry will address those assembled. November 2 should be an unusually opportune time for a visit to the college since it is the day before the annual homecoming football game.

B. B. Bayles, '22, Office of General Investigations, U. S. D. A., recently stationed at Hays, has been transferred to the Dry-Farm Branch Station, Moro, Ore.

Harry V. Harlan, '04, M. S., '09, of the Bureau of Plant Industry, United States Department of Agriculture, is spending a year studying barley production in the chief barley producing countries of the Eastern Hemisphere.

Vocational Agriculture Trains Useful Citizens

Warren E. Crabtree, '20

The other day a sophomore made the statement, "I can get \$5 a day as carpenter's helper, so will not come to school this fall." Thus industry today is making a great appeal to the boy and even beckons him to its side at too early a stage. The vocational teacher who doesn't take this situation seriously will miss his greatest opportunity and fail to do his full duty. "Every boy must be considered as a teaching unit, segregated in thought, purpose, and activity from every other boy, an individual in spirit, mind, and body." By this ideal only can teachers get down to the concrete and teach individually instead of in groups.

Many boys entering high school have only the thought of finishing as quickly as possible, going on a farm as a laborer, or entering industrial work as a means of livelihood; others tolerate school until past the school age and then enter the industrial field. For many such students vocational agriculture has functioned as vocational guidance, lending interest to school work and keeping them in school when otherwise they would have dropped out. Most boys pursuing the vocational curriculum will farm as a vocation. It is common for vocational students, who enter with little thought of their future vocation, to determine within the first two years on specific farming activities.

Perhaps the hardest job of the teacher is to get the boy placed in the work for which he has a natural liking and where he belongs. Why limit to "book studies" a boy whose entire makeup is calling for the outlet of his ability and energy through the use of his hands? This selective grouping can be done successfully with full cooperation between teachers and school administrators. The weeding out of misfits is a relatively easy matter, although one must handle cautiously the problem of teachers of classical subjects who tend to shift their weak or failing students into the vocational departments just to get rid of them. Principals, too, are not exempt from such practices. What is

needed in our educational system is a broader training of all teachers to the end that the best interests of the child are always placed first. Each child has his special talents and will be successful if properly guided and encouraged.

The teacher should seek out the lines of special interest and ability in the boy and give him every opportunity to pursue training along these lines. Every progressive step should be encouraged and the student helped to the highest degree of training possible to



VOCATIONAL AGRICULTURE STUDENTS AND THEIR PROBLEMS

(1) Filing the home pruning saw in the school shop. (2) A student making summer repairs. (3) Practice in stairway construction. (4) A study in portable swine house construction. (5) A study in the hibernation of orchard insects. (6) An overall ('haul) job. (7) Forge and anvil work in the farm shop.

him. Many easily discouraged students will through sympathetic vocational guidance determine to pursue some definite training and later will make a success in their work. It is

(Continued on page 27)

The Outlook on the Wheat Situation

C. D. Tolle, '24

"Shall we put in wheat as usual, a decreased acreage, or none at all? Shall we continue storage or sell at the present price?" These questions are being debated by Kansas farmers. How are they to know? It has been said that farmers have had more advice than anything else in the last few years. Unfortunately this is true, and, at the same time, to a large extent the farmer must work out his own salvation. He can do this only by constant study of the economic situation. The following are a few facts on the situation which have been gathered during the past few months by the Department of Agricultural Economics of K. S. A. C.

In regard to wheat in storage the prospects are not very encouraging. This is due to a number of things, some of which cannot be expected to change much before another crop of wheat is ready for market. The payments now being made to the United States by Great Britain under the debt refunding plan, reduce her ability to purchase wheat from the United States. Another factor in the probable European demand is the fact that Europe is producing more of her food-stuffs now than she was a year ago. This will reduce the amount of wheat required to supply her demands. As for consumption in the United States, it is not likely that any increase will take place. Any condition which would create unemployment would result in reduced consumption and, no doubt, a similar reduction in the price of wheat.

Crop conditions throughout the world are constantly changing and any unusual circumstances in the Southern Hemisphere which might reduce the crop to a large extent, might tend to boost the price. Or perhaps if the area seeded in the Northern Hemisphere should be reduced a large percent, it also would tend to stimulate the price. However, it would require a large decrease in the area seeded to bring it back to the pre-war level as most all of the countries have greatly increased their wheat acreage during and since the war. Canada, before

the war grew an acreage of less than 10 million acres. In 1923 the acreage in Canada was over 22 million acres. Argentina, Australia, and India have all increased their acreage. The United States has increased her wheat area from 47 million acres before the war to 58,253,000 acres in 1923. These five countries are the principal exporting countries of the world.

Russia before the war was also an exporting country and present conditions indicate that she may be back in the market within the next year. If Russia returns, she will increase competition, which is so great now that it gives discomfort to the American wheat producer.

During the five-year period, 1909 to 1913, the average area in wheat in the United Kingdom, Italy, Germany, France and the Netherlands, was a little less than 35 million acres. During the war these countries reduced their acreage. In 1917 their combined acreage was less than 27 million acres. In 1923 their combined acreage was about 31 million acres. It is very evident that these countries will try to produce as much of their wheat at home as possible since they are at a disadvantage as purchasers in the world market.

It appears that little reduction in acreage can be expected in countries outside of the United States. Canada, Australia, and Argentina have an abundance of cheap land upon which they can produce wheat and on which they probably will continue to produce it. The latest official estimate of the Canadian crop is 471 million bushels, an increase of 89 million bushels over the estimate a month ago, 71 million bushels more than the 1922 harvest, and 215 million bushels more than the average production for the last four years. Of the 471 million bushels, 350 million bushels will be available for export trade. This is a bearish factor when most importing countries are not only trying to economize, but have crops of their own somewhat above the average. In addition, other surplus produc-

(Continued on page 28)

Kansas Apple Crop for 1923

E. M. Litwiller, '24



YOUNG APPLE ORCHARD OF THE DEPARTMENT OF HORTICULTURE

According to the Federal government estimate for September of this year the Kansas commercial apple crop will amount to 286,000 bushels. The report for December, 1922, gave the production for last year as 546,000 bushels. The United States as a whole will produce more apples this year than last, but because of spring frosts Kansas suffers a decrease in yield for this year. However, the improved quality of this season's crop together with the promise of fair prices compensate somewhat for the decrease in yield. As is the case the country over, the farm orchards this year will produce less fruit than last. Whatever increase in yields there are must come from commercial plantings.

It is in the northeastern portion of the state, especially in Doniphan County, where the growth of the fruit has been most nearly normal and where weather conditions have been most favorable for the development of size and color. Timely rains have brought about good size, while cool nights are assisting the fruit to color well so that it will not be necessary to leave the apples on the trees

so long that their keeping quality will be impaired.

In general all the leading varieties such as Ben Davis, Gano, Winesap, and Arkansas promise well in the northeastern portion of the state, but the Jonathan yield will be relatively light.

This year the fruit shows improvement over last year in that there is very little codling moth injury, and there are few blotched or scabby apples. A part of this freedom from disease the growers are attributing to the increased use of Bordeaux mixture. This spray material during the present season has shown exceptionally favorable results in the control of scab and blotch.

The Arkansas Valley suffered considerable from hail and flood. In some instances water standing about the trees has caused them to die. However, in the Valley the size of the fruit is good; the color prospects are fair; and the quality promises to be fair to good with an improvement over last year. The total decrease in production for the Valley over last year is not much greater than that for the entire state.

Traumatic Disorders in Cattle

G. R. Dowd, '25

Yes, it is the seemingly little things that count. Woodshed roofs at \$3,000 are high. This bit of philosophy was forcefully driven home to a Riley County cattle breeder recently, when his purebred bull valued at \$3,000 became suddenly sick and died. Post-mortem examination revealed a dozen shingle nails penetrating the heart and stomach. The owner of the bull had shingled his woodshed a short time before, and the scattering of nails around the yard led directly to the death of the animal.



This hair ball was taken from the stomach of a deceased cow. Scores of nails, staples, pieces of baling wire, and other foreign bodies are bound together in the compact ball.

Foreign body ingestion divides itself into two classes: First, traumatic pericarditis, where the ingested foreign body penetrates the wall of the rumen, or first stomach, and enters the heart; second, traumatic gastritis and enteritis, where the foreign body penetrates the stomach walls.

All cattle are subject to internal disorders resulting from the ingestion of foreign materials. The disease is more prevalent than is usually believed and dry lot conditions increase the cattleman's liabilities in this respect. Dairy herds are most frequently subjected to these disorders, being confined to the feedlot and fed on baled hay and concen-

trates the greater portion of the year.

Cattle seem to have a natural inclination to pick up foreign bodies. Commercial feeds and grain shipped in bulk in cars that have been used for other transportation purposes often contain nails and other sharp objects which are readily swallowed in the feed. Short ends of baling wire often drop into the hay if care is not used in cutting and disposing of the wires when feeding baled hay.

The clinic report of the Division of Veterinary Medicine of K. S. A. C. shows 15 fatalities due to traumatic origin last year in the neighborhood of Manhattan.

The commonest symptoms of traumatic injuries where the heart is affected are: (1) Swellings in the neck, brisket, and chest, great pain being evidenced upon pressure over the heart region, the animal flinching and grunting. (2) Stiffness and a disinclination to move in the early stages, the animal remaining down most of the time. (3) Difficult breathing, shortness of breath being evidenced when the animal is forced to exercise, the abdominal type of respiration predominating. (4) Loss of appetite, the animal becoming thin, anemic, and weaker day by day.

In traumatic gastritis only the stomach is involved. The usual symptoms are evidenced accompanied by intestinal disorders such as bloating and diarrhea.

Sometimes a foreign body penetrates the heart so rapidly that the first symptom appears when the animal falls dead.

Treatment of these cases is almost entirely hopeless. However, frequently in the early stages of a case the animal can be slaughtered and the carcass salvaged.

A large percent of these traumatic disorders can be prevented and the annual toll due to this disease practically obliterated. The herd owner should spend no little time and money to make feeding conditions as favorable as possible. With the present-day tendency and need that the farmer depend more on his livestock and at the same time that range feeding be replaced by dry lot feeding, the importance of taking every precaution to prevent traumatic disorders is evident.

Feeding Cottonseed Cake Economically in the Fattening of Baby Beef

Marvel L. Baker, '24

Feeding tests by the Department of Animal Husbandry of the Kansas Agricultural Experiment Station in 1922-23 indicate that one pound of cottonseed cake per head per day is the most profitable amount to add to a ration of shelled corn, cane silage, and alfalfa hay in the production of baby beef. Fifty steer calves were used in the experiment. Ten heifer calves were also used to secure data regarding the production of baby beef from heifers. The calves were all high-grade Herefords produced at the Fort Hays branch of the Agricultural Experiment Station, and were shipped to Manhattan, October 22, 1922. They were fed until November 3 on alfalfa and cane silage. At that time the steers were divided as carefully as possible with regard to size, type, and quality into five lots of ten each. The ten heifers, which were similar to the average of the steers, constituted the sixth lot.

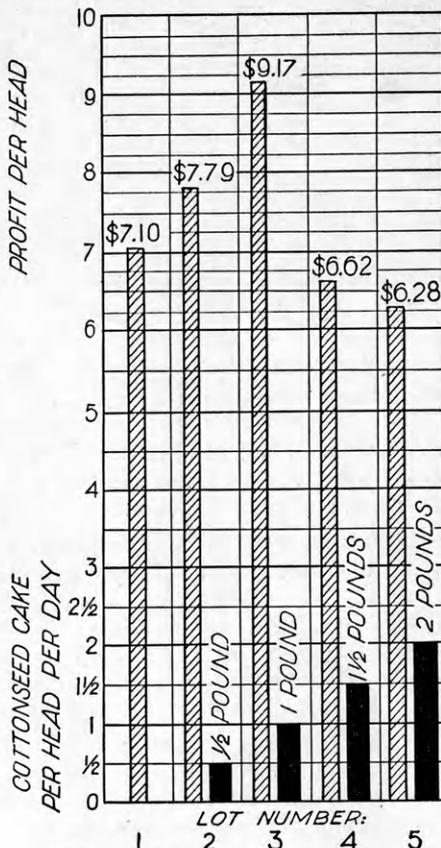
Each lot was fed in a feedlot approximately 50 by 40 feet in size, including an open shed across the north end. All were fed for a period of 231 days and had free access to salt and water at all times. All lots were full fed a basal ration of cane silage and shelled corn plus two pounds alfalfa hay per head per day. In addition they received cottonseed cake in the following amounts per head per day:

- Lot 1.....None
- Lot 2.....½ pound
- Lot 3.....1 pound
- Lot 4.....1½ pounds
- Lot 5.....2 pounds
- Lot 6 (heifers).....2 pounds

When marketed, the steers in lot 2 had gained 0.14 of a pound per head per day more than those in lot 1 and because of higher finish outsold lot 1 by 10 cents per hundredweight, netting 69 cents per head more profit. The steers in lot 3 had made 0.22 of a pound greater average daily gains per head than those in lot 1 and 0.08 of a pound greater than those in lot 2. Because of higher finish they outsold the steers in lot 1

by 45 cents per hundredweight and those in lot 2 by 35 cents per hundredweight yielding a net profit per head \$2.07 greater than lot 1 and \$1.38 greater than lot 2.

The addition of 1½ pounds of cottonseed cake in lot 4 and of two pounds in lot 5 in-



Graphs showing the average profit per head on the steers in each lot, also the amount of cottonseed cake per head fed daily.

creased both gains and selling price so slightly over the gains and selling price of lots 1, 2, and 3 that the profits in both cases were less. Profits in lot four were 48 cents per head less than in lot 1; \$1.17 less than in lot 2; \$2.55 less than in lot 3, and 34 cents greater than in lot 5. Profits in lot 5 were



STEERS IN LOT 3 READY FOR MARKET

These steers received one pound of cottonseed cake per head per day during the 231 days of the feeding period. They made an average daily gain of 2.06 pounds per steer, averaged 819 pounds per head on the Kansas City market, and made a greater profit per head than any other lot in the feeding experiment.

82 cents per head less than in lot 1; \$1.51 less than in lot 2; \$2.89 less than in lot 3; and 34 cents less than in lot 4.

The heifers fattened more rapidly than the steers fed the same ration and were fatter at the close of the experiment. Their total gains were less than those made by the steers and they sold for \$1.59 per hundred-weight less although they were fatter, dressed as high, and looked as well on the hooks. The steers returned a profit of \$14.57 per head more than the heifers.

These results indicate that cottonseed cake up to one pound per head per day can profitably be added to a ration of shelled corn, cane silage, and alfalfa hay in producing baby beef, but that more than one pound should not be added as long as feed values and cattle prices maintain practically the same ratio as in 1922-23.

Heifer calves will gain almost as rapidly as steers and will be fatter at the end of a given feeding period. At the present time, however, a sharp discrimination exists in American markets against heifer beef. Feeders

must therefore buy heifers cheaper than steers if feeding them is to be equally profitable.

It is not always the cattle making the most rapid gains nor the ration which is least costly that is the most profitable. Consequently, a knowledge of how to combine feeds to secure the greatest gains and the highest finish as cheaply as possible is of primary importance to the beef producer.

Fred Griffie, '19, is doing outstanding work in plant breeding in University of Minnesota and will be a candidate for his doctor's degree in the near future. He is ably supporting the well-known work of Dr. H. K. Hayes.

A. F. Swanson, '19, on leave of absence from Office of General Investigations, U. S. D. A., received his master's degree from University of Minnesota at the close of last college year, majoring in plant breeding, and has returned again to take charge of cereal investigations at the Fort Hays Branch Experiment Station, Hays, Kan.

More Room for Agriculture

E. R. Woodbury, '24

The opening of school this fall found the West Wing of Waters Hall practically completed and ready to accommodate the increasing number of students interested in dairying, poultrying, and the economics of agriculture. The new building is a modern four-story, fire-proof structure for which the Kansas Legislature, in 1921, made an appropriation of \$275,000. It is, in external appearance, practically an exact counterpart of the East Wing.

The Department of Dairy Husbandry, under the leadership of Prof. J. B. Fitch, occupies the basement and first floor of the new building. The offices of the department, both college and extension, are on the front of the first floor while the rear of the first floor and the entire basement are devoted to lecture rooms, classrooms, dairy laboratories, and a complete dairy manufacturing plant. All equipment in the creamery is up-to-date in design and operated by individual motors. Sanitary pipes and fittings for conveying the milk and cream are connected in such a way as to give the maximum of efficiency in operation. The store rooms for cheese, butter, and milk, and a zero degree hardening room for ice cream and butter are supplied with refrigeration by two 6½ by 6½ York ammonia compressors. These compressors are operated by the direct expansion system which is the latest in refrigeration equipment. A small ice plant will furnish ice for the department. The complete modern equipment of the ice cream room is capable of turning out 50 gallons of ice cream an hour. The entire plant emphasizes the importance and necessity of sanitation and cleanliness as well as efficiency.

The Department of Poultry Husbandry, under the direction of Prof. L. F. Payne, occupies the entire second floor. Offices, classrooms, lecture rooms, and laboratories extend from the front to the rear on both sides of the hall. One of the laboratories is devoted to incubation; another to market poultry and eggs; another to research; and another to poultry judging and management. In fact, with the exception of field and inspection trips, all the laboratory work of the Department of Poultry Husbandry hereafter

will be conducted in the laboratories on this floor.

The third floor of the building is occupied by the Department of Agricultural Economics of which Prof. W. E. Grimes is head. The large lecture room on this floor is furnished with 256 tablet-arm opera chairs. The large laboratory for the classes in Farm Organization and Farm Cost Accounting is provided with 96 private lock drawers so that each student in these subjects may have a safe place to keep his supplies. Three splendid recitation rooms, a seminar room for agricultural economics, and two rooms for the use of student organizations occupy the remainder of the floor.

The completion of the West Wing of Waters Hall marks an epoch in the development of agriculture in K. S. A. C. The graduates from the Division of Agriculture have proved to the state and the nation the importance of applying science to this great basic industry. The years of the immediate future will bring larger enrollments in agriculture and it is by means of well-equipped buildings and an efficient faculty that the needs of these students and the country can be met. The East Wing of Waters Hall was completed in 1912; the West Wing in 1923; normal progress and a reasonable degree of prosperity will certainly demand the fine central section of the structure before another decade rolls around. The completed building will be one of the finest on the campus, a magnificent and appropriate home for Kansas agriculture.

James W. Linn, '15, was elected president of the Ayrshire Breeders' Association at their forty-eighth annual convention, Saratoga Springs, N. Y., June 13, 1923. For several years Mr. Linn has been recognized as one of the leading dairymen of Kansas and is at the present time president of the Kansas Dairymen's Association. He is a member of the firm of John Linn and Sons, owners and managers of the Linndale Farm near Manhattan. Their Ayrshire herd is one of the leading herds of the country.

THE KANSAS AGRICULTURAL STUDENT

KANSAS STATE AGRICULTURAL COLLEGE
MANHATTAN, KANSAS

VOL. III

OCTOBER, 1923

NO. 1

Published quarterly by the students of the Division of Agriculture. Subscription rate, one dollar a year; single copies, twenty-five cents; advertising rates on application. Address all communications to The Kansas Agricultural Student, Manhattan.

STAFF

KENNEY L. FORD.....Editor in Chief
GLADWIN A. READ.....Assoc. Editor
M. E. ROWE.....Alumni Editor
R. W. SHERMAN.....Editor of College Notes
M. M. WILLIAMSON.....Business Manager
H. WAYNE ROGLER..Asst. Business Manager
M. L. BAKER.....Member of Pub. Bd.
HUGH DURHAM.....Advisory Editor

Departmental Editors

H. H. CARNAHAN.....Animal Husbandry
MAX M. HOOVER.....Agronomy
EDWARD WATSON.....Dairy Husbandry
C. D. TOLLE.....Agricultural Economics
E. M. LITWILLER.....Horticulture
HARRIET H. MYERS.....Poultry Husbandry

TO OUR NEW READERS

This number marks the beginning of the third year for The Kansas Agricultural Student as the official organ of the Division of Agriculture and, we believe, one of the best publications of its kind in the field. "Everyday and in everyway it is growing bigger and better" is the motto we strive to follow. It is the policy of the editorial staff to give at least a brief resume of the more important experiments, projects, and happenings included in the agricultural investigations and activities of K. S. A. C. In every way we desire to promote the interests of the division we represent. Our departmental editors are constantly on the lookout for the latest developments in their particular fields in order that each student and reader may not only obtain information of value but may become better acquainted with the agricultural problems and accomplishments of K. S. A. C. Inasmuch as this is essentially a student publication the greater number of the topics will be handled by students. In all cases, however, the veracity of each article is assured by the division. We hope those who are enjoying the contents of this magazine for the first time will become enthusiastic readers and loyal boosters for the publication.

KNOWING A THING IS NOT ENOUGH

It is of little consequence to the world at large how much or how little we learn in college; but it is of dynamic importance to the public whether or not we contribute to them the facts obtained by college training. To render this service best the cultural side

of man must be cultivated as well as the practical and scientific.

Perhaps the finest recognition of this need was shown during the last year in the training of the K. S. A. C. stock judging teams. Debate coach, Prof. H. E. Rosson of the Department of English, voluntarily gave his services in assisting Prof. F. W. Bell of the Department of Animal Husbandry in developing the 1922-23 teams. Professor Bell taught the candidates for the teams the fundamentals of livestock judging while Professor Rosson coached the men in giving their reasons or in telling why they considered one individual superior to another. This type of coaching resulted in well-balanced winning teams.

Professor Rosson resigned recently from his position at K. S. A. C. to accept a professorship in the Oregon Agricultural College. He carries with him the best wishes of the Division of Agriculture.

TO THE COLLEGE STUDENT FROM THE FARM

Mr. W. L. Willhoite, '16, livestock farmer of Drexel, Mo., makes the following suggestions to college students and especially to those who have been reared on the farm:

A college curriculum should not be considered lightly by high school graduates. The decision to attend college involves four years of time and at least four thousand dollars in cold cash. Further it involves sacrifices, often severe sacrifices, by those left at home. Too often a student enrolls in college unmindful of time and expense involved and without well-defined or commendable purpose. At the best such a student faces failure or unjustifiable waste of resources for a

time. Practically every college annually "quittates" a share of such college students who have wasted one or two years in so-called college "experience." The undergraduate students of any college should bear these facts in mind, but I desire especially to call them to the attention of students in the Division of Agriculture, a large percent of whom come from the farm.

The student coming from the farm has many advantages over the one who has always lived in the city and is unfamiliar with farm practices. By spending his boyhood on the farm, the farm boy has served an apprenticeship that is invaluable if properly used. In many trades and professions several years of apprenticeship are required before a young man may attain a place of responsibility or be allowed to serve the public. The farm-reared college student has completed this apprenticeship. He has an experience that may be a resource to him and may be capitalized in large fields of human endeavor. This fact is often overlooked when a farm boy decides to leave the field of agriculture and enter some other supposedly more profitable field.

Every profession or vocation has its advantages and disadvantages either of which may be overemphasized. During the past three or four years farming has been about an even break for those who got in on the high spot. However, any business has its good years and poor ones. Farming is now due for a long pull up "prosperity" hill. The average farmer is poorly paid. But more and more as the individual farmer of the future applies sound principles of good management will he place his farm above the average and make his income commensurate with his efforts.

A college graduate who returns to the farm has many obstacles to overcome. Every move he makes is jealously watched and mistakes do not go unnoticed. However, when he succeeds the neighborhood will follow his example and the farmer's opportunities for a long and useful life are unsurpassed in most vocations.

W. E. Grimes, '13, head of the Department of Agricultural Economics, received his doctor's degree from the University of Wisconsin at the close of summer school.

THE COUNTRY CHURCH IN RURAL LIFE

From the landing of our Pilgrim Fathers down to very recent times the country church has always been deemed essential in the social life of our rural communities. However, since the war many country churches have been abandoned and in most cases no form of organized social activity remains for the young people of those communities.

That there is still a great need for the country church is amply proved by visiting a community where the church is still the center of rural social activities. Such a community may be found in Nemaha County in a progressive neighborhood, six and one-half miles from Seneca, the nearest town. That this church, which is neatly painted and well kept, has played a very important part in the general welfare of that community is conceded by all. There is scarcely a family in this community whose children are not given a high school education. Many of the younger people have graduated from or are attending our leading colleges and universities. Miss Gladys Ford, '20, is superintendent of the Sunday School. The young people enjoy frequent social activities such as picnics, parties, and in addition to these at least one good play is staged annually. The peculiar thing about the social activities in this community is that all the people are "young." They all turn out.

However, the economic benefits are more apparent than the social. The true cooperative spirit which has unconsciously developed through their social activities is yielding profitable dividends in the form of community-owned threshing machines, good roads, many modern homes, a Standard school, boys' and girls' clubs, culling and canning demonstrations, in fact every worthwhile improvement whether it be from the Kansas State Agricultural College, the Farm Bureau, or from a private source, is given a fair and intelligent trial.

A permanent and prosperous agriculture must have its basis in the worthy character and noble ideals of its citizens. No other institution promotes these fundamentals of life as does the church. Life, vitality, and enthusiasm in the country church mean a sound rural life which in turn means a safe, permanent, and progressive agriculture.



HIGH SCHOOL JUDGING TEAMS AND THEIR COACHES AT K. S.
Each spring two days are devoted to this contest.

College Notes

THE THIRD ANNUAL STATE HIGH SCHOOL JUDGING CONTEST

The third annual State High School Judging Contest was held at the college on Thursday and Friday, May 3 and 4, 1923. Forty-nine high schools of the state sent teams of three men each to represent them in this contest. One additional school sent a single representative.

The individuals entered in the contest were ranked on a basis of their proficiency in judging all four of the following groups of farm products: (1) Beef cattle, horses, hogs, and sheep; (2) dairy cattle; (3) grain, including wheat, oats, alfalfa, and kafir; and (4) poultry. They were also ranked from the standpoint of their proficiency in judging each of the groups separately. The four groups were in charge of the Departments of Animal Husbandry, Dairy Husbandry, Agronomy, and Poultry Husbandry, respectively, of the Division of Agriculture of the college.

Classes of fat steers, Shorthorn cows, fat barrows, Poland China sows, fat wethers, Shropshire ewes, Percheron mares, and Bel-

gian mares were offered in the animal husbandry group. In the dairy judging group the contestants were required to place one class of four animals of each of the four leading dairy breeds. The grain judging group offered classes in the identification of crop samples, and the judging of wheat, ear corn, and alfalfa seed. In poultry a class of four hens of the same age was judged in each of the following breeds: Single Comb White Leghorn, Barred Plymouth Rock, White Plymouth Rock, and Single Comb Rhode Island Red. These fowls were placed on the basis of their production records.

Prizes were awarded as follows: The W. M. Jardine parchment certificate for the team making the highest general average on all classes was won by the Frankfort High School team. The F. D. Farrell parchment certificate for the individual making the highest general average on all classes was awarded to Eugene Cleaves of the Wichita High School. The heads of each of the four departments of the college represented in the contest offered parchment certificates to the teams making the highest general aver-



S. A. C. FOR STATE HIGH SCHOOL JUDGING CONTESTS, MAY, 1923
contest in the judging of livestock, crops, and poultry

age in their respective sections. The C. W. McCampbell parchment certificate awarded in the animal husbandry section was won by the Frankfort High School. In the dairy section the J. B. Fitch parchment certificate was won by the Partridge Rural High School. The L. E. Call parchment certificate awarded in the agronomy section was won by the Wakefield Rural High School. In the poultry judging section the W. A. Lippincott parchment certificate was awarded to the Wakefield Rural High School.

Medals were presented to the individuals making the highest general average in each of the four groups by the departmental student clubs in each department conducting a section of the contest. In the animal husbandry section the Block and Bridle Club medal was won by Benjamin Hook of Silver Lake. In the dairy husbandry section, the Dairy Club medal was awarded to Myron Gale of Wichita. In the agronomy section the Klod and Kernel Club medal was won by Clifford Eustace of Wakefield. In the poultry division the Poultry Club medal was awarded to William S. Kalb of Melvern.

Wakefield Rural High School placed second in the entire contest and Wichita High School third. Raymond Johnson and Minor Arnold of Frankfort placed second and third, respectively, in the entire contest. The high placing of the winning contestants naturally

reflects much credit upon their coaches who were: Frankfort—O. R. Peterson; Wichita—M. T. Hargiss; Wakefield Rural—Louis Vinke; Partridge Rural—A. C. Ramsey.

The contest was favored by ideal weather conditions so that all of the teams arrived in time to participate in the entire contest. The judging contest immediately preceded the Ag Fair which was held on Saturday, May 5. The trip therefore combined a high educational value with a chance to participate in the annual frolic of the students of the Division of Agriculture of K. S. A. C.

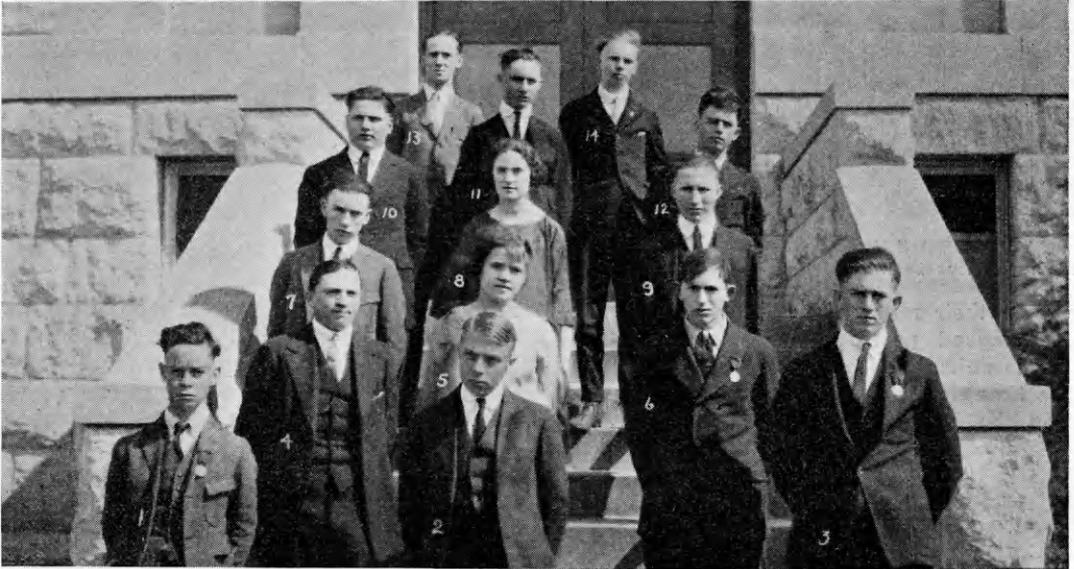
The members of the class of 1923 engaged in farming include the following: Warner Adams, Maple Hill; Howard H. Ames, Downs; F. A. Bangs, Madison; E. E. Bates, Perry; C. C. Button, Topeka; R. S. Circle, Kiowa; T. D. Cole, Sheboygan Falls, Wis.; Thomas Cross, Belle Plaine; Paul Evans, Williams-town; J. W. Farmer, Humboldt; R. L. Fleming, Ipswich, Mass.; W. Clarence Fulton, Harper; C. R. George, Fond Du Lac, Wis.; F. W. Houston, Twin Falls, Idaho; F. W. Kerns, Baldwin; J. F. T. Mostert, Balfour, Transvaal, South Africa; Dwight Patton, Crisfield; F. H. Paulsen, Stafford; W. P. Raleigh, Clyde; H. E. Ratcliff, Gaylord; G. D. Stockwell, Larned; and D. M. Woodworth, Sedan.

THE THIRD ANNUAL AG FAIR

"Big fun for little money" proved a popular drawing card at the Third Annual Ag Fair held on the east campus of the college on the afternoon and evening of May 5, 1923. The fair was favored by ideal weather conditions, so that a large attendance was encouraged.

Publicity for the big event began a week in advance of fair day, when an advertising

The fair, which is the principal annual undertaking of the Agricultural Association, carried many new and elaborate attractions that were not seen in either of the previous fairs. The management laid particular emphasis upon the educational value of the fair, and each department of the Division of Agriculture was represented by carefully prepared exhibits of various phases of its work. These exhibits were housed in a



WINNERS IN THE THIRD ANNUAL STATE HIGH SCHOOL JUDGING CONTEST HELD AT K. S. A. C., THURSDAY AND FRIDAY, MAY 3 AND 4, 1923—(2) Eugene Cleaves of Wichita High School, high man in the entire contest. (4) Minor Arnold, (7) Albert Mills, and (10) Raymond Johnson, high team of the entire contest representing Frankfort High School. The Frankfort team also won the division of the contest which included the judging of beef cattle, horses, hogs, and sheep. (5) Minna Koestel, (8) Edith Markham, and (11) Alfred Miller, Partridge Rural High School team winning the dairy judging division of the contest. (6) Clifford Eustace, (9) Warren Schaulis, and (12) Francis Carpenter, Wakefield Rural High School team winning the grain and poultry judging sections of the contest. High individuals of each of the four sections of the contest were as follows: In the judging of beef cattle, horses, hogs, and sheep, Benjamin Hook, Jr. (1) of Silver Lake; in the judging of dairy cattle, Myron Gale (3) of Wichita; in grain judging, Clifford Eustace (6) of Wakefield; and in poultry judging, William S. Kalb (14) of Melvern. John Tyson (13) of Merriam tied for high man in poultry judging. In a special poultry judging contest William S. Kalb (14) won the place and the medal.

campaign was instituted in Manhattan for the purpose of arousing enthusiasm for the occasion. Previously the students in agricultural journalism had written their local papers inviting the home folks to visit Manhattan and join in the festivities.

Preceding the opening of the main pike at 3 o'clock, a parade composed of departmental floats toured the city. This feature brought out some ingenious and beautiful displays. At this time the official fair books, which described the intricate details of the fair, were placed on sale,

large tent, which added to the attractiveness of their arrangement.

Several new amusements in addition to the 40 side shows were introduced. Outstanding among these were the Aggie rodeo and the scenic railroad—the latter staging its initial performance after an unsuccessful debut in the spring of 1922. "Farmhand Follies" and "Spanish Fandango" were housed in large tents and played to capacity audiences.

The members of the Ag Fair Board, who

(Continued on page 31)

COLLEGE DAIRY JUDGING TEAM PLACES HIGH IN INTERCOLLEGIATE CON- TESTS

The college dairy judging team of 1923 made a fine record in the two recent intercollegiate dairy judging contests. In the contest held in connection with the Dairy Cattle Congress at Waterloo, Iowa, Monday, September 24, ten teams competed. Kansas placed first on Holsteins and third in the entire contest. Iowa (Ames) placed first and Indiana (Purdue) second.

In the National Dairy Show contest held at Syracuse, N. Y., Saturday, October 6, twenty-nine teams competed. Kansas placed second, winning the Wyandotte trophy. Minnesota placed first. Kansas placed second on Holsteins and Guernseys. Stover was high man on Guernseys, winning the gold medal given by the American Guernsey Cattle Club. Stover also tied for first place on Holsteins, winning a 400-dollar scholarship offered by the American Holstein Friesian Association. He further won one of the fine canes given by the Dairy Farmer to the three highest individuals in the contest.

The team is composed of Raymond L. Stover, Manhattan; F. E. Charles, Republic; Edward Watson, Osage City; and E. L. Raines, Louisburg. Prof. H. W. Cave is coach and accompanied the team on the trip.

FARRAND WINS AT KANSAS FREE FAIR

The livestock judging contest held in connection with the Kansas Free Fair at Topeka, September 10, 1923, in charge of Prof. F. W. Bell of K. S. A. C. was a very successful event, judging from the high scores made by the contestants as a whole, and especially by the eight prize winners.

This contest is an annual event at the fair and the contestants are, for the most part, students in the Department of Animal Husbandry of K. S. A. C. This year there were 22 entrants and all, with the exception of Harold Tomson of Wakarusa, were K. S. A. C. students majoring in the Department of Animal Husbandry. The contest offers the senior who expects to try out for the senior livestock judging team which goes to the American Royal Livestock Show at Kansas City and the International Livestock Show at Chicago, a chance to make a start

toward winning a place on the team.

The contest consisted of placing seven classes of livestock and giving oral reasons on three of them. With 50 as a perfect score for placings and for reasons this made a possible score of 500. The classes used in the contest consisted of one of sheep (fat lambs); two of hogs, both breeding classes; two of cattle, both breeding classes; and two of horses, both breeding classes.

The winners in the contest, scores received, and prizes awarded were as follows:

Rank	Contestant	Score	Prize
1	J. L. Farrand	469	\$25
2	A. C. Magee	467	20
3	Edwin Hedstrom	449	15
4	A. P. Atkins	448	10
5	M. L. Baker	446	8
6	G. R. Warthen	445	7
7	Ellis Babbit	443)	
) tie	5
7	Harold Tomson	443)	

FIRST INTERCOLLEGIATE GRAIN JUDG- ING CONTEST

As a new feature of the International Grain and Hay Show to be held in Chicago, December 1 to 8, the First Intercollegiate Grain Judging Contest will be held. Junior and Senior students from any Agricultural College in the United States may compete in this contest, December 6.

Prof. J. W. Zahnley who has charge of the grain grading and judging work in the Department of Agronomy will coach the team from K. S. A. C. Since this contest is similar to the annual student grain judging contests held here for the past three years there is not a small amount of speculation as to what the Aggie team will do in their first intercollegiate contest at Chicago.

The International Grain and Hay Show is being sponsored by the Chicago Board of Trade. The sum of \$12,000 is being offered as premiums for the 5,000 or more exhibits entered. These exhibits will represent every state in the Union and it is from this wealth of material that the judging samples will be taken.

This Intercollegiate Grain Judging Contest probably will become an annual event. It is hoped that the Agronomy enthusiasts will start a winning record for K. S. A. C.

The Care of Pullets During the Fall

Harriet H. Myers, '26

The pullet crop demands special attention in the fall. It is of great importance that the pullets that are to lay winter eggs receive the proper care just before and immediately after production starts. Fright or sudden changes in feed and surroundings often cause considerable delay in egg production.

If there is to be a change from the chick quarters to the laying house it should be accomplished with as little disturbance as possible and finished before the middle of October. The change from the growing ration to the laying ration should be made before the birds are moved. The change must be made slowly in order to avoid digestional disturbances.

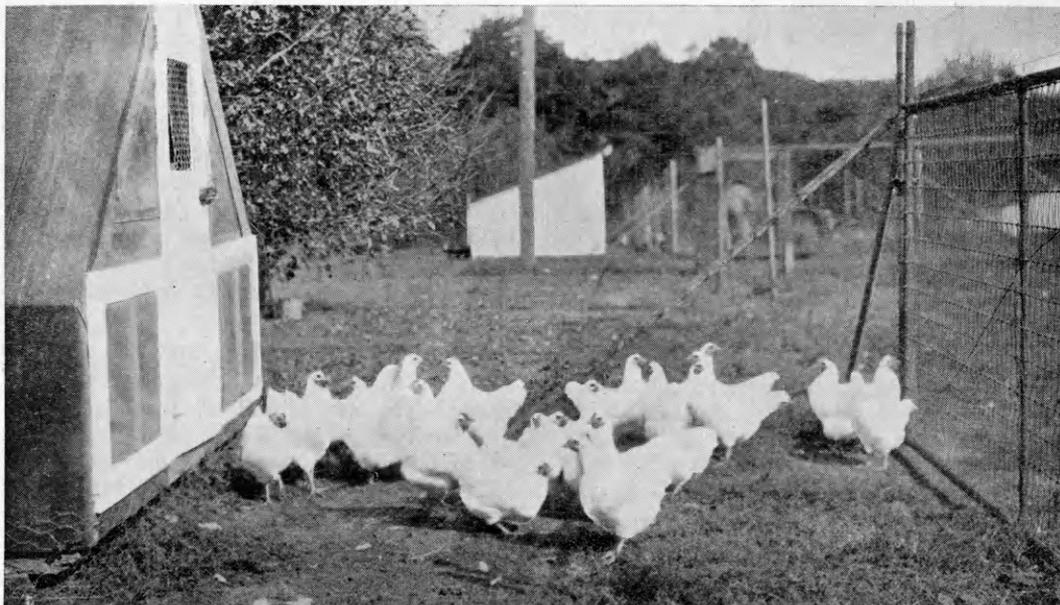
A good ration for heavy winter egg production may consist of:

GRAIN	
Corn (cracked)	50 pounds
Wheat	50 pounds
	<hr/>
	100 pounds

DRY MASH	
Ground oats and corn	40 pounds
Bran	20 pounds
Shorts	20 pounds
Tankage (high-grade)	20 pounds
	<hr/>
	100 pounds

A light grain feed, about five pounds per hundred birds, is generally given in the litter early in the morning, and a heavier feed, about seven pounds per hundred birds, in the evening. Fresh water, oyster shell, and the dry mash are kept before the birds at all times. Some form of succulence or green feed is necessary and may be supplied in the form of sprouted oats, beets, or wheat pasture. Perhaps the amount of feed given is as important as any one point in feeding. Birds that are being forced for winter production, especially those under lights, demand a large amount of food and if stinted almost immediately reduce production or lose vigor.

Culling and grading are also important
(Continued on page 28)



A PEN OF WHITE PLYMOUTH ROCK PULLETS ON THE COLLEGE POULTRY FARM

Why the Dairy Industry Continues To Grow

W. J. Daly, '25

The dairy cow is proving her value among all classes of livestock in any system of diversified agriculture. She is naturally fitted to work into such a system having a wonderful ability to consume roughage and other by-products in the production of some of the most nutritious and digestible of our foods. The following table will serve to show the comparative efficiency with which she does this:

HUMAN FOOD PRODUCED BY FARM ANIMALS FROM 100 POUNDS OF DIGESTIBLE MATTER CONSUMED¹

Animal	Marketable product	
	Pounds	solids Pounds
Cow (milk)	139.0	18.0
Pig (dressed)	25.0	15.6
Cow (cheese)	14.8	9.4
Calf (dressed)	36.5	8.1
Cow (butter)	6.4	5.4
Poultry (eggs)	19.6	5.1
Poultry (dressed)	15.6	4.2
Lamb (dressed)	9.6	3.2
Steer (dressed)	8.3	2.8
Sheep (dressed)	7.0	2.6

This table clearly proves the superiority of the dairy cow over other farm animals in the economical production of human food. The hog is her only near rival and his product is not in so available or digestible forms. In the future as population and demand for food increase, production per unit of area must also increase.

A mature dairy cow will in one year produce over two times as much nutrients as are found in the carcass of a two-year-old steer.

In any system of permanent agriculture the fertility of the soil must receive due consideration. If the manure is properly handled and returned to the soil, very little fertility will be removed in dairy products. The following table gives the value of fertilizer removed from the soil by various farm products:

VALUE OF FERTILIZER REMOVED FROM THE FARM IN 1000 POUNDS OF VARIOUS FARM PRODUCTS²

Product	Lbs. N	Lbs. P	Lbs. K	Total Value
	Corn	16.2	6.9	
Wheat	19.8	8.6	5.3	4.93
Alfalfa hay	23.8	5.4	22.3	6.70
Fat ox	23.3	15.5	1.8	5.87
Fat pig	17.7	6.5	1.4	4.09
Milk	5.8	1.9	1.7	1.41
Butter	1.2	0.4	0.4	.28

NOTE: N, nitrogen; P, phosphoric acid; and K, potassium.

From these figures note the very small amount and value of fertilizer removed from the farm in dairy products. Nearly all dairy farmers purchase some protein rich in concentrates which have a high manurial value. The fertility arising from the feeding of these purchased concentrates will more than offset the small amount removed in dairy products thus making it possible for the dairy farmer to actually build up his soil where manuring is accompanied by the proper care of the land and the logical use of crop rotations.

If there is any danger of overproduction of dairy products in this country, the removal of unprofitable cows from American herds will do away with any possibility of this for many years. In the United States there are 26 scrubs and grades for every purebred dairy animal. A few of these scrubs are high-producing and profitable animals, but a large number do not pay for their keep. Furthermore these scrubs are useless for breeding purposes for it is impossible to predict what their offspring will be.

The experience of the past, a scientific study of efficiency in food production, and the application of safe and progressive farming methods today, indicate that dairying is sound in principle and safe in practice. There is room for improvements, but any one with a reasonable knowledge of modern dairy methods, anxious to learn better methods, and willing to work hard, will find dairying profitable. Therefore, the dairy industry will continue to grow.

Clarence R. George, '23, began work on the Corium Farm, Inc., Fond Du Lac, Wis., October 1. This farm is known by all Guernsey cattle breeders, taking large winnings at the big dairy shows and owning at the present time two of the highest-priced Guernseys ever sold in this country.

1. Henry and Morrison's "Feeds and Feeding," Eighteenth edition, unabridged. Page 92.
2. Henry and Morrison's "Feeds and Feeding," Eighteenth edition, unabridged. Page 276.

A Seventeenth Century Ag

If Abraham Cowley had been a student at K. S. A. C. he doubtless would have been cheer leader for the Agricultural Association. Unfortunately he missed this opportunity, having died in the year 1667, or about 200 years before K. S. A. C. was started.

But he expressed his sentiments and showed his enthusiasm for agriculture in speaking of coats of arms for the nobility of his native England. "We may talk what we please," he said, "of lilies, and lions rampant, and spread-eagles, in fields d'or or d'argent; but, if heraldry were guided by reason, a plough in a field arable would be the most noble and antient arms."

Abraham Cowley's ideas on dancing would scarcely have agreed with those of his fellow students at K. S. A. C. had he been here; but he would have found strong support for his belief that one should be trained for a career in agriculture. "A man would think," he declared, "when he's in serious humor, that it were but a vain, irrational, and ridiculous thing for a great company of men and women to run up and down in a room together, in a hundred several postures and figures, to no purpose, and with no design; and therefore dancing was invented first, and only practiced antiently, in the ceremonies of the heathen religion, which consisted all in mummerly and madness; the latter being the chief glory of the worship, and accounted divine inspiration: this, I say, a severe man would think; though I dare not determine so far against so customary a part, now, of good-breeding. And yet, who is there among our gentry, that does not entertain a dancing-master for his children, as soon as they are able to walk? But did ever any father provide a tutor for his son, to instruct him betimes in the nature and improvements of that land which he intended to leave him?"

Cowley seems to have been one of the early ones to suggest the establishment of agricultural colleges. His suggestions on this point are rather interesting, even though his views as to what should be included in the field of home economics may impress us as being just a little bit odd. He was about 200 years ahead of Senator Morrill who secured

the passage of the Land-Grant College act in the United States Congress in 1862, and about 225 years ahead of the Hatch Act which provided for the establishment of Agricultural Experiment Stations to provide "solid and experimental knowledge" of the things to be taught to agricultural students:

". . . I could wish (but cannot in these times much hope to see it) that one college in each university were erected, and appropriated to this study, as well as there are to medicine and the civil law: there would be no need of making a body of scholars and fellows with certain endowments, as in other colleges; it would suffice, if, after the manner of halls in Oxford, there were only four professors constituted (for it would be too much work for only one master, or principal, as they call him there) to teach these four parts of it: First, Aration, and all things relating to it. Secondly, Pasturage. Thirdly, Gardens, Orchards, Vineyards, and Woods. Fourthly, all parts of Rural Oeconomy, which would contain the government of Bees, Swine, Poultry, Decoys, Ponds, etc. . . . together with the sports of the field (which ought to be looked upon not only as pleasures, but as parts of house-keeping) and the domestical conservation and uses of all that is brought in by industry abroad. The business of these professors should not be, as is commonly practised in other arts, only to read pompous and superficial lectures, out of Virgil's Georgicks, Pliny, Varro, or Columella; but to instruct their pupils in the whole method and course of this study, which might be run through perhaps, with diligence, in a year or two: and the continual succession of scholars, upon a moderate taxation for their diet, lodging, and learning, would be sufficient constant revenue for maintenance of the house and the professors, who should be men not chosen for the ostentation of critical literature, but for solid and experimental knowledge of the things they teach."

J. W. Crumbaker, '16, is Superintendent of the Experimental Swine Farm of Indiana Agricultural Experiment Station, Route K, Lafayette, Ind.

A Few Remarks About Kansas

I. D. Graham

Assistant Secretary, Kansas State Board of Agriculture

Kansas occupies the whole of North America except that used by Canada, Mexico, and some other states. It derives its name from Kansas river, which is the dustiest stream on earth and the only one navigable for pedestrians.

Kansas is a large body of land entirely surrounded by the United States. It was the first state to maintain a bone-dry law, and if it were freed from its entanglements with other states it would float on the vast sea of fresh water which underlies it.

The state is so long that out in Coolidge they consider Wyandotte county as a part of the effete East and dub its inhabitants Yankees. The chief pursuit of the people of Kansas is making of crop records and their chief occupation is to keep from making all the money in the world.

If Kansas were removed from its place the United States would look like a peanut with the kernel gone.

With more acres under cultivation than any other land except Texas, which has not yet been divided into states, and more wheat than any other political unit in the world, Kansas had to expand sidewise, and is now bounded by the lakes of oil on the under side and the Milky Way on top.

Each year the Kansas hen produces more than half the value of the output of all the gold mines in the United States and more than three times the first cost of Alaska, without counting the large number of her yellow-legged sons which enter the ministry.

Though in some places the hog is ranked among "The short and simple 'animals' of the poor," the Kansas hog makes both ends meet. As a mortgage lifter the Kansas pig is a self-starter that always works "on high" with more miles of prosperity to the gallon of skim milk than any other "make", while the sow is the embodiment of Kansas on the rind. If all Kansas hogs were combined into one animal he could solve the "Great Lakes to the Sea" problem in about two roots.

Kansas alfalfa, all in one stack, would make Pike's Peak look like a golf tee, while her "cribbed and confined" corn crop would

extend the Woolworth building clear to Boston Back Bay.

A combination of all Kansas cattle into one animal would make a cow whose milk would replace the Great Lakes; whose body would extend from the Gulf to the Arctic, and while she browsed on the greenery of the tropics her tail would brush the mist from the Aurora Borealis.

Kansans are but a modest folk. They admit that there are other states of minor importance and other civilizations yet in the making. They would not claim the earth if they could because they already have the best part of it and have little need for the rest.

M. L. Robinson, McPherson; C. E. Agnew, Garnett; D. B. Ibach, La Crosse; and L. M. Knight, Cimarron, are the members of the class of 1923 employed as county agricultural agents.

Jay L. Lush, '16, M. S., '18, is geneticist in animal breeding of the Texas Agricultural Experiment Station, located at College Station, Tex. He received his doctor's degree from the University of Wisconsin in 1921 and is beginning his third year in Texas station. Doctor Lush recently spent a few days visiting relatives and friends in K. S. A. C.

Clinton H. Morgan, '22 (also M. S., '22), is beginning his second year as head of the Department of Agriculture in the Alaska Agricultural College and School of Mines located at Fairbanks. Last spring he took an 80-acre homestead in that territory and spent three months this summer largely clearing and beginning the development of it. He spent time enough on a public domain 15 miles up the river from Fairbanks to cut down and roll into the river 200 fine logs. These were floated to the sawmill in Fairbanks and sawed for use in the construction of a house on his homestead. The accompanying kodak pictures are illustrative of the scenery and activities common to him during the summer. He will contribute an article on "Alaskan Agriculture" to an early issue of the Student.

Alumni Notes

A. E. McClymonds, '15, is superintendent of the United States Experiment Farm at Aberdeen, Idaho. This farm is conducted in cooperation with the Idaho Agricultural Experiment Station. It is located in the famous irrigated section of southern Idaho.

R. E. Kellogg, '22, has been appointed milling chemist of the Acme-Evans Milling Company of Indianapolis, Ind.

Ray D. Laflin, '12, is one of the most successful county agricultural agents in Iowa. He is located at Union, Hardin County.

Joe H. Lill, '09, is agriculturist in sugar-plant investigations, U. S. Bureau of Plant Industry. At the present time he is stationed at Rocky Ford, Colo.

Harry E. Reed, University of Missouri, '14, formerly a member of the faculty of the University of Arkansas, has been appointed to succeed Prof. A. M. Paterson in the Department of Animal Husbandry. From the standpoint of experience as well as from the standpoint of training, Professor Reed is a man well qualified for his new position. He was reared on a livestock farm and after receiving his degree in agriculture in 1914 was for five years manager of the Wardmere Farms at Macon, Mo. As manager of these farms he was exceptionally successful in raising, fitting, showing, and selling pure-bred cattle, hogs, sheep, and saddle horses. He also fed from five to six carloads of baby beef and from three to four carloads of hogs each year. When Wardmere Farms were sold, Professor Reed decided to enter college work. His first college job was with the Division of College Extension of K. S. A. C. as livestock specialist. He resigned this position to accept one in the Department of Animal Husbandry of the University of Arkansas where for two years he had charge of most of the practical work of the department and coached the stock-judging teams.

H. F. Tagge, '14, is now County Agent of Jackson County with offices at Holton, Kan. He was transferred from Atchison County on January 1. The transfer is in the nature of an advancement.

Members of the class of 1923 are located as teachers of vocational agriculture in high schools as follows:

Name	Post Office
Jasper D. Adams	Cleburne
C. M. Barringer	South Haven
A. L. Bridenstine	Satanta
W. E. Brown	Nash, Okla.
S. U. Case	Vinland
H. L. Collins	Linwood
H. D. Finch	Fruita, Colo.
L. F. Hall	Burlington
W. F. Hearst	Alma
E. A. Hepler	Byers
G. F. Humphrey	Mankato
L. V. Hunt	Lincoln
R. C. Lind	Paxico
A. R. Paden	Argonia
W. E. Stone	Ford
F. A. Swanson	Kingman
F. C. Stockebrand	Auburn
Iro N. Vowel	Sharon Springs
R. L. Welton	Cherokee

Karl B. Musser, '12, M. S., '14, University of Missouri, was made secretary-treasurer of the American Guernsey Cattle Club in May, 1923. His headquarters are Peterboro, N. H. Mr. Musser has been with the American Guernsey Cattle Club since 1920. During the six years previous to 1920 he was dairy extension specialist, four years in Connecticut and two in Washington.

Thomas R. Baumgartner, '21, is running a truck and small fruit farm near Thayer, Neosho County, Kan. He raises a few acres each of melons, sweet potatoes, and sweet corn, together with large quantities of other truck crops.

Warren E. Crabtree, '20, is beginning his second year as head of the Department of Agriculture, McLoughlin Union High School, Milton, Ore. In the training of teachers of agriculture this high school is affiliated with Oregon Agricultural College, Corvallis.

H. L. Baker, '22, is principal of the Wellington high school.

The Agriculture of West Virginia

Karl S. Quisenberry, '21

The average Kansan thinks that West Virginia is a mean, dirty, little state, located somewhere in the eastern part of the United States. It is also thought that all the West Virginian does is to make moonshine, take part in miners' wars, and cause trouble in general. It is doubtful if the average Kansan thinks that there is any farming done in that part of the country called West Virginia. At least that was the opinion of the writer until two years ago.

West Virginia is not one of the leading agricultural states of the country and never will be. The state is small, being a little less than one-third the size of Kansas, but there was so much land to be included within her boundaries that it was necessary to pile up the soil in some places. As a result the land is very rough and rolling and much of it unfit for agriculture; in fact, only one-third of the area of the state is classed as improved land.

The mineral resources are so great that many people can make a better living by mining than by farming. In the western part, along the Ohio river, the land is fairly level, but as one travels eastward through the state the land becomes more rolling and rough, until the top of the Allegheny mountains is reached. In this mountainous section most of the land is too rough for farming, although there are some high plateaus that have fairly fertile land. East of the mountains a small "panhandle" extends along the Potomac river to the Blue Ridge mountains. This land is very level and is probably the best farming section of the state. The altitude of West Virginia varies from 240 feet to nearly 5,000 feet above sea level. The annual rainfall varies from 35 to 50 inches. The agriculture of the state could, in general, be compared with the agriculture of the eastern part of Kansas. West Virginia agriculture at least has many things in common with the agriculture of eastern Kansas and a few of these will be pointed out.

West Virginia raises some of all of the crops that Kansas raises, and a few additional ones. Among the crops grown are corn,

wheat, oats, rye, buckwheat, soybeans, cowpeas, alfalfa, clover, timothy, tobacco, and potatoes. In no case does West Virginia lead in the production of any farm crop, the nearest being a rank of fourth in the production of buckwheat, and buckwheat is not of great importance in the state. Corn is the leading grain crop, with an average yearly production of twenty million bushels, or about one-fifth as much as Kansas raises. Kansas has twenty times as much area in crops as West Virginia, but the average value of all farm crops in Kansas is only four times as great as the value of the crops of West Virginia.

Soil fertility is the greatest crop production problem in West Virginia. It is impossible to get a good crop unless the ground is heavily fertilized. The annual fertilizer bill of West Virginia is about twice as large as that of Kansas. The average West Virginia farm is two-fifths as large as the average Kansas farm. There is very little up-to-date farm machinery in West Virginia for the handling of farm crops and it is possible in some of the hilly sections to see farmers harvesting their buckwheat with cradles. Much of the small grain is broadcasted rather than drilled, and many acres of corn are planted by hand or with one-row planters. These conditions can be expected when the farming is on such a small scale and the land is so rough. There are, however, some farmers on the better land who are just as up-to-date as any in the Middle West.

The livestock industry of West Virginia is more important than crop production. Much of the land, although very rolling, makes excellent pasture, and the state now boasts more blue-grass acreage than Kentucky. With the exception of sheep, West Virginia does not have so much livestock as Kansas. Dairying in the state is very well developed in the east, as would be expected where the denser population provides good markets within a short distance. What is said to be the best Guernsey herd in the United States is found in this state, as is one of the four best Hereford herds.

The poultry industry is coming to the front at a very rapid rate. In 1919 poultry and eggs brought the state over twelve million dollars. This was greater than the proceeds from the dairy products. The high value of the poultry products is due to the great demand in the larger cities, and as West Virginia can have her produce in Philadelphia, Baltimore, or New York City before it becomes stale, she can supply these cities with eggs and chickens at fancy prices. During the winter months farmers get as much as 75 cents a dozen for their eggs and seldom do they get less than 25 cents. There are several poultry associations in the state shipping "Mountain State" brand eggs direct to New York City.

In the production of fruit West Virginia need take her hat off to no state, and least of all to Kansas. West Virginia raises more than three times as many apples and peaches as does Kansas. In the eastern panhandle one may ride through miles and miles of orchards, just as one may ride for mile upon mile through the wheat fields of Kansas. A West Virginia girl traveling through Kansas said she saw so much wheat that it made her sick at her stomach; a Kansas girl in West Virginia would see so many apples that the sight would probably affect her in the same way. While West Virginia is behind in methods of crop production she is far to the front in methods of orcharding. In the apple growing sections the best of methods and machinery are used. The Agricultural Experiment Station keeps specialists in this section at all times, and the farmers are glad for their help and advice.

In traveling through West Virginia one is impressed with the substantial type of farm homes. Large brick or stone houses and barns nestle among the hills, making ideal places of abode. In the sections along the Virginia or Kentucky line reminders of slave days may be seen in the slave quarters at the back of the houses. The farmers are usually carefree and happy and take life fairly easy. They insist that they are not southern, saying that West Virginia is the most northern of the southern states, the most southern of the northern states, the most eastern of the western states and the most western of the eastern states. It is the state to which the great John Brown of Kansas had to come to enact one of the incidents which made him nationally famous.

From this rather brief summary it is seen that, as was stated before, the agriculture of West Virginia resembles in many respects that of the eastern part of Kansas. Almost all types of farm crops are raised in the state and livestock plays a big part on all of the farms. Because of the close proximity to large cities poultry products, vegetables, and fruit are a paying proposition. This gives the state a very well-balanced type of agriculture.

As in parts of eastern Kansas, soil fertility is the limiting factor in crop production. Rainfall is ample, there being too much at times. Kansas need never worry that West Virginia will ever displace her as a leading agricultural state, but it would be well for all Kansans to remember that West Virginia raises something besides peanuts, cotton, and trouble, as is now believed by many people in the Middle West.



SUMMER SCENES IN ALASKA

Spruce logs, 12 to 24 feet in length, cut by Clinton H. Morgan (left); going up stream in a poling boat (right).

VOCATIONAL AGRICULTURE

(Continued from page 7)

not uncommon to find students who have failed miserably in academic lines, making high averages and doing outstanding work in every way in certain vocational lines.

Two typical cases are cited. One, at first a failure in all high school subjects, in a period of a year became interested through his vocational work and not only moved from the bottom of his class to the top but began making grades in all subjects to the astonishment of his teachers and parents. The other was a student who was finally urged to quit school by teachers and administrators when his actions could no longer be tolerated. He secured a job to assist in supporting a mother and brothers and sisters, but was persuaded that he had made a mistake, that without more definite training he could not make the best of his abilities. Returning to school with a real purpose this boy soon astonished all who had known him and only recently has been graduated from high school. His problem was met by giving him what he was fitted for and in the amount suitable to his

capabilities. By arousing in him a new interest and giving him an aim in life he has been started on a path which will make him a valuable member of his community.

The opportunities of the teacher of vocational agriculture are limited only by his vision and ability. His calling is one of the most spiritually lucrative and presents real opportunities for service in the proper directing and training of young lives for future citizenship.

DR. C. H. FAUBION
DENTIST

Gillett HotelBlock

Burger Ideas

Build Distinctive Year Books

A college annual designed, planned and engraved by the Burger Engraving Co. always results in a successful publication

College Annual Staffs have discovered that our close cooperation combined with original ideas, the highest quality of engraving and service results in a financial statement showing a profit to the Staff

May we talk over our proposition with you?

BURGER ENGRAVING CO.

Boston Building

Kansas City

THE WHEAT SITUATION

(Continued from page 8)

ing countries have large amounts of wheat which will be placed on the market.

The United States and Canada together have about 550 million bushels of surplus wheat. This is generally estimated as enough for the import requirements of Europe. In addition to this about 350 million bushels will be available from other sources if normal crops are produced in the Southern Hemisphere.

These factors enter into the determination of the immediate price of wheat and also are of importance in determining the long-time trend of wheat prices. After considering the problem from all angles, one is forced to conclude that the American wheat grower must produce his wheat at costs that will permit of its profitable sale at approximately present prices. If he is unable to do this, he should resort to other crops for a few years.

There is one factor which favors the holding of stored grain. Europe, owing to her condition, is buying wheat on the basis of day to day needs. As a result, American wheat for European trade must be held within the United States until it is needed for European consumption. Holding wheat on the farm helps to keep the wheat from reaching Europe before it is wanted.

It is hard to say what effect storage on the farm will have on price. Professor W. E. Grimes, head of the Department of Agricultural Economics, says: "Were I a farmer, free of debt and with a wheat crop stored in bins which I owned, I should hold the wheat for a later market, expecting to get interest on the investment and pay for storage and shrinkage. In doing this I should be fully aware that I was taking the chance of securing either a greater price which would be sufficient to pay this interest and storage, or a price which might not be sufficient to pay this or even might be less than the present market price. This is a chance which everyone must take who holds products for a future market."

I. K. Landon, '20, has been appointed Assistant Professor of Agronomy. He will have direct charge of the recently established outlying experimental fields in southeastern Kansas.

CARE OF PULLETS

(Continued from page 20)

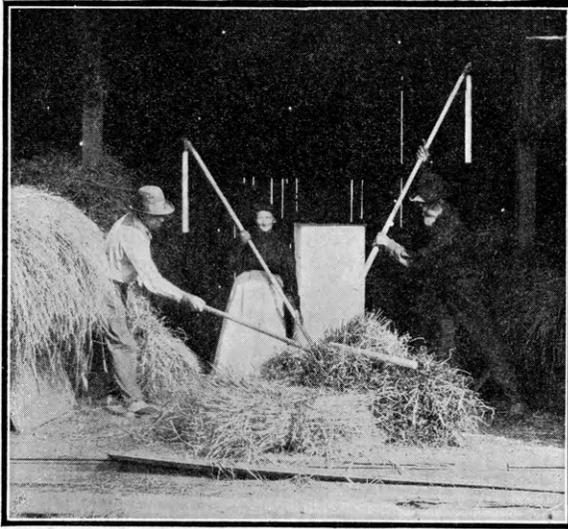
points in getting pullets ready for their winter work. Culling, of course, starts at hatching time and continues as long as the birds are kept but it is generally a very convenient time to handle birds individually when they are placed in the laying pens. This is also a good time to dust them thoroughly with a good louse powder. No bird that is diseased, lacking in vigor, or that shows any serious physical defect should be placed in the laying pen. Careful grading simplifies feeding and general care by putting all those birds of the same age and general characteristics in the same pen, which makes it more nearly possible to suit each hen's needs.

The housing problem likewise needs careful consideration in the fall. To do their best work pullets must have plenty of the right kind of house-room, that is, a clean, dry, sunny house with good ventilation and convenient fixtures. For the heavier breeds, four square feet of floor space should be allowed for each bird while the lighter breeds do very well with three or three and one-half square feet each. The floor of the house should be so constructed as to be dry and easily cleaned. Three to six inches of wheat straw on the floor makes a good litter in which to feed grain. The fixtures should be simple, convenient, and contain as few cracks where mites may lodge as possible. After the first of November, the birds will probably do better work if confined to the house all of the time.

There are no hard and fast rules concerning the care of pullets for winter egg production, but if the foregoing principles are kept in mind and the birds watched with an eye appreciative of their comfort, very few serious mistakes will be made.

J. F. T. Mostert, '23, and Lucy (Stallings) Mostert, f. s., sailed for Balfour, Transvaal, South Africa, August 25. The issues of *The Kansas Agricultural Student* will follow them regularly in the long journey to their home. Mr. Mostert has been a contributor to the *Student* and its readers will look forward with pleasure to other articles from him.

Percy Sims, '23, manager of the Third Annual Ag Fair (1923), is teaching in his home high school, Little River, Kan.



What Farm Machinery Has Done

BEFORE farm machinery came into use, the labor of over 90% of the people was required to furnish the necessary food and clothing, and even then famine was always close at hand. Under such conditions there was little time for invention or production of the many devices which make life so comfortable and so well worth living today.

But with the coming of farm machinery in the early years of the nineteenth century, assuring an adequate supply of food and clothing and freeing millions of men for other occupations, the whole status of living was revolutionized. New inventions multiplied. Science and civilization advanced by leaps and bounds. The world progressed faster and farther than in all the ages before.

The J. I. Case Threshing Machine Company had an active hand in this development. Since 1842, our undivided efforts have been given to the production of the most efficient power farming machinery it was possible to build.



J. I. Case Threshing Machine Co.

[Established 1842]

Dept. L 63 Racine Wisconsin

Case Farm Tractors, Steel Threshers, Silo Fillers,
Baling Presses, Steam Engines, Road Machinery,
Grand Detour Plows and Disk Harrows.

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

Pruning Fruit Trees

S. W. Decker, '24

Prof. R. J. Barnett, Horticulturist of the Agricultural Experiment Station, has recently prepared for publication a manuscript on "Pruning Fruit Plants." Because of the limited material available and the importance of the subject, the following excerpts from this valuable manuscript are offered the readers of the "Student."

Good spraying, careful soil management, and skillful pruning constitute the only sound foundation for successful fruit production. It may be taken as a general rule that lack of care regarding any of these operations will greatly reduce the value of the orchard and the crop. The operations go hand in hand and need the grower's constant attention, each in its proper season.

Pruning may be defined as the removal of a part of a plant for the purpose of increasing the economic value of the remainder. The increase in value may be: Greater probability of the plant's living; tree building; or an aid to other orchard operations. Without exception, however, the grower does better pruning when he understands the particular purpose toward which his efforts are directed and the physiological effects which are likely to follow whatever cutting he does.

A clear understanding of the fact that both varieties and trees within the variety have individuality and each requires special treatment is of great use to the pruner. The worker must constantly keep in mind the necessity of adapting his system to the peculiarities of varieties and even of individual trees.

There are three principal operations connected with pruning: Heading back, thinning out, and the removal of large branches. Heading back consists of cutting off a portion of a twig or branch. Thinning out refers to the removal of twigs or small branches which are growing too close together. Branches are removed when they become broken, diseased, or are crowding, and in rejuvenation pruning.

Fruit growers have suffered heavy losses

due to improper pruning. Heavy pruning upsets the balance between top and root and results in various ill effects such as delaying establishment of fruit production, dwarfing the tree, and early decline and death. Neglect of pruning and too light pruning are no less injurious.

A supply of pruning tools for each workman should include one swivel-back saw and a number of spare blades, one pair of hand pruning shears, one pruning knife, a ladder, and a disinfecting kit.

PRUNING THE APPLE TREE

Apple trees are vigorous-growing plants, under proper environments, and require moderate annual pruning. This work is usually done between the time the leaves fall and the spring flow of sap.

In order to prune a tree properly the worker should know its method of bearing fruit. The apple tree bears its fruit upon spurs. The spurs are produced laterally on branches two years old or older, bear the fruit from terminal buds, and, if not starved or over-shaded, will continue to bear for 10 to 12 years. The individual spurs are biennial in fruit bearing and if they all bloom the same season the tree is likely to assume the alternate habit. Pruning should aim to prolong the productive life of the fruit spurs which should never be pruned off so long as they remain fruitful.

In tree building the trunk should be about 24 inches long and the frame work branches should be distributed over a distance of about 12 inches above the trunk and should consist of from three to five branches. If possible, branches should be chosen which form a wide angle with the trunk and properly distributed around the trunk.

In tree maintenance moderate annual pruning is required, such as will admit sunlight to the center of the tree, prevent the tree's growing to great height, sustain vigor of tree, and tend to promote abundant fruit production.

PRUNING THE SOUR CHERRY TREE

The sour cherry, when grown upon Mahaleb stocks, requires little pruning. The tree-building requirement is practically the same as for the apple tree, except that the trunk may not be over 18 inches long and may have as many as seven branches in the framework. Pruning throughout the life of the tree will consist of thinning out clusters of twigs which develop near the tips of the preceding year's growth and the removal of crossing, rubbing, and parallel branches and all water sprouts and suckers.

The sour cherry bears fruit on spurs and also in the axils of the leaves on one-year-old wood. The distribution of fruit bearing between these two types of organs is a characteristic of varieties and should be given study by the grower. If fruit is borne on the twigs any heading back of branches is a thinning process.

L. C. Aicher, '10, is Superintendent of the Fort Hays Branch Experiment Station at Hays, Kan. The Hays station is a branch of

the Agricultural Experiment Station of K. S. A. C.

R. K. Bonnett, '13, M. S., University of Wisconsin, '16, is head of the Department of Agronomy, University of Idaho, Moscow.

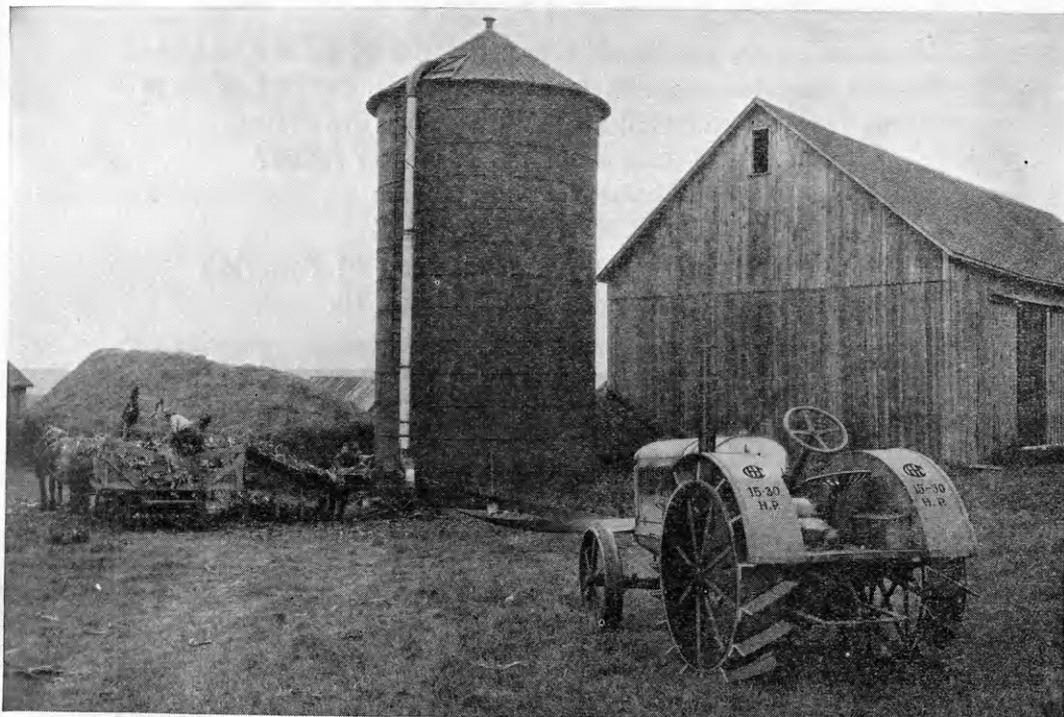
F. A. Coffman, '14, M. S., '22, assistant agronomist, Office of Cereal Investigations, is located at the Akron (Colo.) Field Station. He is carrying on a large number of detailed genetic experiments with small grains and corn at the Akron station.

Clyde McKee, '10, is head of the Department of Agronomy in the Montana State College of Agriculture and Mechanic Arts, Bozeman.

THIRD ANNUAL AG FAIR

(Continued from page 18)

were responsible for the excellent organization and marked success of this, the big spring event of the Division of Agriculture, consisted of Percy Sims, manager; Burton E. Colburn, assistant manager; Ray D. Hahn, treasurer; and E. J. McWilliams, fourth member of the Board.



FILLING THE SILO

Sorghum is a sure crop and sorghum silage has an important place in the ration of dairy cattle or feeding stock.

Net Profit!



Every man who milks cows for a living knows that net profit-- income over labor and feed costs--determines the value of a dairy herd.

Holstein Herds Assure Net Profit —

through large, economical production of milk and butter-fat, regular crop of healthy calves, greater salvage value from animals when milking days are ended.

HOLSTEINS WILL INCREASE YOUR NET PROFIT

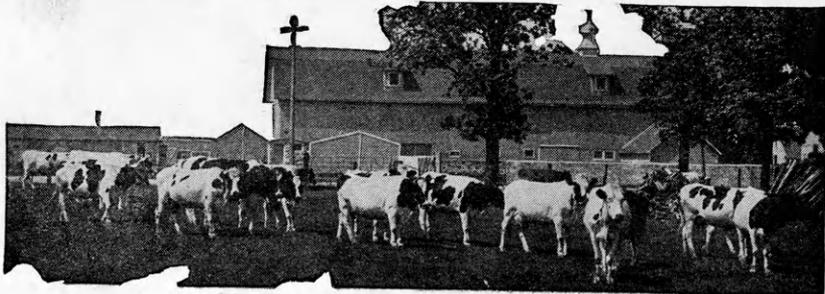
Let Us Tell You About Holsteins

EXTENSION SERVICE

The Holstein-Friesian Association of America

230 East Ohio Street, Chicago, Ill.

HOLSTEINS



SAM ALMGREN

Shoe Repair and Shine Parlor

*All work neatly done by
the Goodyear System*

Phone 496

110 S. Fourth

THE ABERNATHY MARKET

Quality groceries and meats
Fresh fruits and vegetables

Open Sunday, 8 to 9 A. M.

722 North Manhattan

Phone 91

EAT

B & B BAKING CO.'S

*Home Maid
Bread and Pastries*

313 Poyntz

*Greeting Cards
of
Every Variety*

The Bungalow Shop

619 N. Manhattan

Aggieville

DUCKWALL'S

5c—10c Variety Store

Candy and Stationery
Our Specialty

Two Stores

1123 Moro

322 Poyntz

Mont J. Green

C. H. Nash

Manhattan Sheet Metal Co.

Plumbing and Heating of all kinds

Phone 427

212 Poyntz Ave.

**Dyeing Pressing
Cleaning Repairing**

**ELITE CLEANING AND
DYEING WORKS**

We do all kinds of pleating

Phone 299

1110 Moro

P. C. HOSTRUP

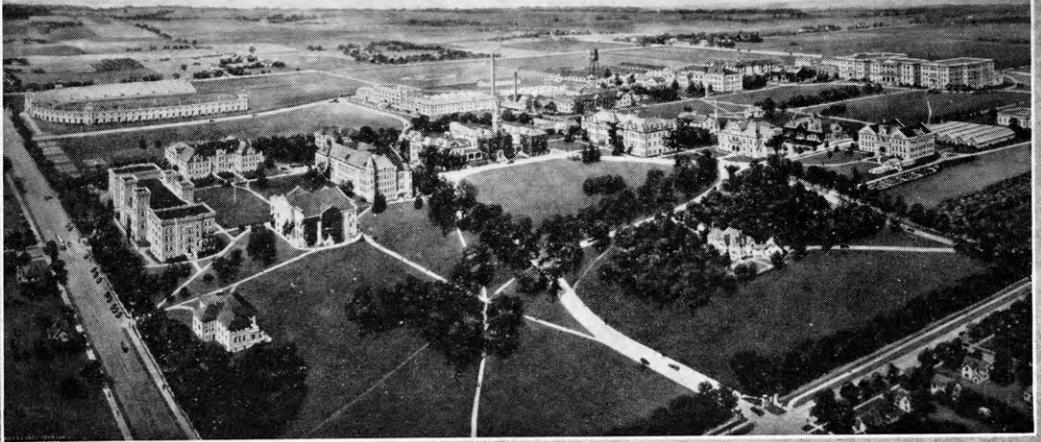
Insurance—All kinds

Real Estate for sale and exchange

Over First Nat'l Bank

Phones—Office 468

Residence 199



AIRPLANE VIEW OF KANSAS STATE AGRICULTURAL COLLEGE

DO YOU KNOW—

THAT the fine layout and beautiful campus of Kansas State Agricultural College is commented on by every visitor?

THAT the genuine democracy and moral tone of the student body is unsurpassed?

THAT for a well-balanced college education in agriculture, engineering, home economics, industrial journalism, veterinary medicine, general science, rural commerce, or music, K. S. A. C. offers exceptional opportunities?

THAT of course K. S. A. C. is especially prepared to teach scientific agriculture? Its faculty and equipment are among the very best.

For further information write to

Kansas State Agricultural College

Manhattan, Kansas

"The College That Serves a State"