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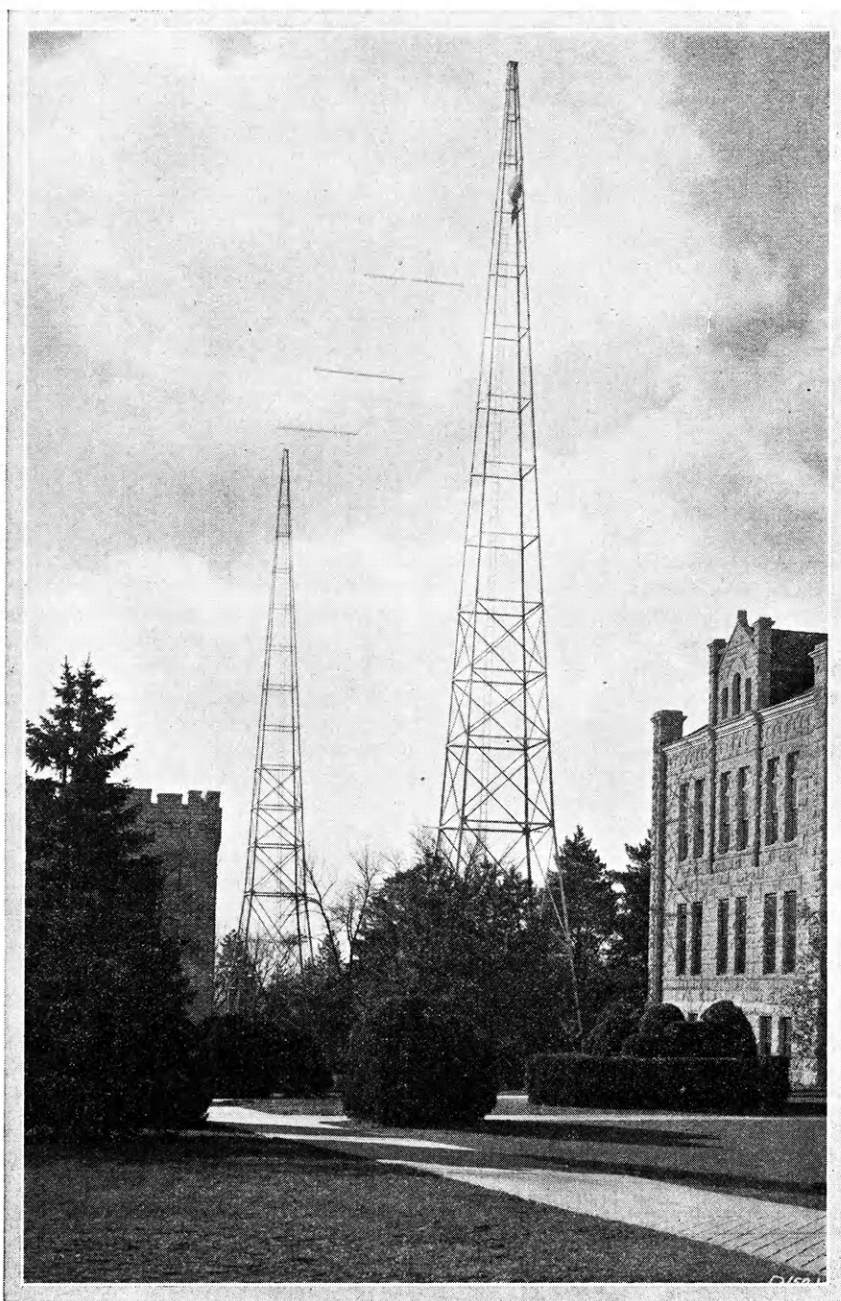
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ANTENNA AND TOWERS OF RADIO STATION KSAC

The Kansas Agricultural Student

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No. 1

The Farm Electrical Problem¹

H. B. Walker

The trend of progress in all industries of the Nation is to utilize electrical energy wherever practicable. It is a safe, convenient, and flexible form of power that is adaptable to many forms of industrial operations, particularly those which may be controlled automatically. The agricultural industry, although the largest of the Nation's industries, is the last great industry to use electricity extensively. This is not surprising when one considers the nature of the power used in agriculture. Power in farming is utilized principally for field work, hauling, and stationary work. These represent 48 percent, 22 percent, and 30 percent, respectively, of the total farm power used.

Electricity has not as yet been proved of real practical value in field operations. In other words, electrical appliances have not as yet been developed in this country to a place where they can compete successfully with animal power and tractors for drawbar work. In farm transportation the electric truck and trolley are used but little. The internal combustion engine in the automobile, the truck, and the tractor at present is supreme in this field. However, stationary power work constitutes 30 percent of the total farm power requirements. This work may be classified as heavy and light. The former includes such operations as grinding, threshing, silage cutting, baling, shredding, and wood sawing. Many of these operations are now performed on the farm with the tractor. In Kansas some of these so-called "stationary operations" are becoming portable drawbar operations as is evidenced by the extensive use of the harvester-thresher, the portable hay baler, and the increased use of the field silage cutters.

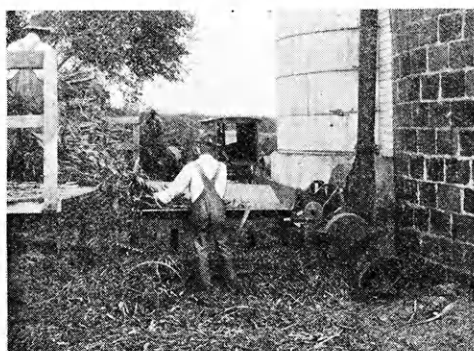
Light stationary work, which constitutes about 12½ percent of the total farm power requirements, includes the operation of such machines as the churn, the cream separator, the milker, the water pump, spraying machine, elevator, washing machine, etc. All of these stationary operations are easily electrified and motors are now used successfully for this character of work. Here is a field where the small motor serves a useful purpose on the farm, and such work provides a fairly wide distribution of use throughout the year. If electric power is extended into the heavy stationary field large electric motors are necessary. These, in turn, require transmission lines and transformers of high capacities with resulting heavy expenditures in such equipment. Furthermore, these heavy motors are used but relatively few days each year. It is possible that some of these heavy operations may be changed to utilize smaller motors with longer periods of operation, and when this is done electrical companies will consider the electrification of such farm operations more attractive.

It appears at present that the most attractive field for rural electrical development lies in the 12½ percent of farm power requirements classified as light stationary work. What can this do for agriculture? It can furnish the farmer with electric light. This is the answer the average farmer would give to the question, if the results of the rural electrical survey recently made by the Engineering Experiment Station of K. S. A. C. are correct. This survey, just recently completed, of 324 electrified farms in Kansas, indicates that the farmer's greatest appreciation of electrical service is for illumination purposes. But to supply electric lights to scattered farm homes by rural transmission lines is expensive, and the revenues from farm lighting service are too small to justify the expense. If only lighting ser-

¹ The author of this article is in charge of agricultural engineering in the Engineering Experiment Station. The article is based largely on Bulletin No. 16 of that station, issued July, 1925, on "Present Status of Rural Electrification in Kansas." Copies of this bulletin may be secured by addressing a request to the Engineering Experiment Station, K. S. A. C., Manhattan Kansas.

vice is desired the individual farm lighting plant will serve.

How about the 12½ percent of farm power requirements classified as light stationary work? Is it desirable to electrify such operations? Farm work is hard, seasonal, and many of the daily odd jobs and chores are tedious and tiresome. Pumping water, grinding feed, turning the grind stone, milking cows, cranking the cream separator, and turning the fanning mill are tasks the electric motor can do with relatively small expense. With such duties controlled by the electric switch, field work becomes more attractive, is better done,



SILO FILLING

This picture shows a recent silo filling scene at Kansas State Agricultural College. Note that an electric motor furnishes the power.

and the farmer's evenings may be used for rest and recreation. Surely the farm is interested in electrifying such tasks.

Attractive as electric service is for the farm worker it falls far into the back ground when compared to the possibilities for the farmer's wife. It has been said that if George Washington should by chance return to this country he would have to learn how to fight all over again, but if Martha Washington should return she could start again in her kitchen just where she left off. Progress for the rural housewife has not been quite as slow as this story infers, but surely it has not been as rapid as the progress in farm field operations. Electricity will bring improved equipment for the farmer's wife which will eliminate much of the tedious, everyday housework. The electric motor will operate the house pump which in turn will deliver water under pressure to the

home. Motors will operate the churn, cream separator, fan, suction cleaner, and perhaps best of all an electric motor will drive an automatic refrigerator. In addition to these power uses electric current may be used for the mangle, range, toaster, perculator, and curling iron. Some of these uses may sound like extravagance, but all of these services are now found in a few farm homes favorably located to central power stations.

The farmer must utilize more electrical energy than the urban dweller if he hopes to enjoy electrical service from transmission lines. A mile of city transmission line may serve from 40 to 80 customers and relatively few transformers may be necessary, while in the country from 2 to 4 customers will be served from a mile of transmission line and except in unusual cases, each customer must be equipped with a transformer. This deficiency of customers and excess of equipment required per customer, must be met by building up a volume of business on the farm which will be profitable to the farmer and which will add to the comforts of rural life. Can this be done? Only a few farmers in Kansas are using sufficient energy to meet this requirement and it is not known whether the average farmer can build up a volume of business which will make rural transmission lines profitable to public service companies.

The Kansas Committee on the Relation of Electricity to Agriculture has been organized to solve this problem. A field laboratory has been established near Larned to determine the practical applications of electricity to farm operations. The results of these investigations should provide data for the solution of the problem.

Earl Means, '22, editor of Vol. I of the Kansas Agricultural Student, is making a splendid success of farming near Everest, Kan. At the Topeka Free Fair his Durocs were winners in their class. Earl wears the smile this year that won't come off. Why should it? He is one of the newest members of the Ag Married Men's Club.

R. W. Russell, '25, is teaching vocational agriculture in the Wakefield Rural High School. His judging teams have been especially successful in contests this fall.

Dr. H. J. Waters' Contribution to Agricultural Research

L. E. Call

American agriculture has lost in the passing of Dr. Henry Jackson Waters one of its able scientific leaders. Agricultural research workers have lost from their ranks one of their wisest counselors and most stimulating thinkers. To confine one's search for Dr. Waters' contribution to agricultural research to the pages of station bulletins, scientific journals, farm papers, and other forms of printed literature is to fail to discover his greatest contribution in this field. His greatest contribution is not to be found on printed pages but in the hearts and minds of men—men whom he had touched and inspired with a greater determination to know the truth. In the lives of these men and in their work will be found the greatest contribution that Dr. Waters has made in this field.

It was my privilege and good fortune to know Dr. Waters from almost his first day on Kansas State Agricultural College campus and to work with him intimately during the years in which he labored so faithfully in steering the destiny of this institution. He touched my life at a formative period and made impressions upon me which I can never forget.

The first impression was made by the character, training, and vision of a few young men that he brought into the Division of Agriculture shortly after he came to this institution, men whom he brought to take up a number of different lines of research work. These men had caught from Dr. Waters an inspiration and love for their work that was not common among men on the campus at that time. These men loved Dr. Waters and he loved them and inspired them to outstanding accomplishments. Many of them are still with us and are living more useful lives and making greater contributions in their chosen field of work because of their contact with him.

It was a common practice with Dr. Waters when introducing some of these young men to visitors on the campus to refer to them as his boys. How I envied them and how I wished at the time that I might have been one of his boys. A few years later I well remember the

day as one of the proudest of my life when he said to a visitor in introducing me, "I want you to meet one of my boys." This personal reference is pardonable, perhaps, as it illustrates the keen interest that Dr. Waters took in every young faculty member and how that kindly interest stimulated all to better work.

Dr. Waters believed in and insisted upon high scholastic standards. He constantly used his influence to encourage college and station workers to subscribe for, read, and contribute to scientific journals; to spend a few hours each week in taking advanced work in classes on the campus; and in setting aside definite periods for graduate study at other institutions.

It was common knowledge among the younger men on the campus that those who were advanced in recognition for their work and in salary were those who were using every opportunity to better their training and make themselves more useful to the institution and the state. In this way the foundation for a high type of agricultural research was laid in K. S. A. C.

Dr. Waters' influence on scientific work was not entirely indirect. He has himself made a number of valuable contributions to agricultural science. He devoted a portion of his time to active research work long after he became president of K. S. A. C. Under his personal direction were continued at our Agricultural Experiment Station research experiments started at the University of Missouri to determine an adequate diet for a growing pig. These researches showed definitely the inadequacy of corn when fed alone as a diet for the young pig and proved conclusively the necessity of protein supplements and proper ash constituents in the ration.

While Dr. Waters recognized the value of this research in the economy of livestock production, he also recognized its greater value as contributing to our knowledge of the food requirements of the human family and often used the facts secured in these researches to impress upon a farmer's wife the necessity for

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My Impressions of Hazford Place

T. M. Kleinenberg, '26

Can there be a more striking example of man's ambition achieved, his hopes realized, and his goal nearly attained than Hazford Place? The owner, Mr. Hazlett, may well be styled an artist, for has he not molded into being a herd of Herefords that without fear of contradiction can be classed as the finest in the world? Slowly, surely, and with untiring perseverance, he has aimed at this distinction; but even greater than that, he has succeeded. It is of that success which I wish to give my impressions.

To those who have been fortunate enough to visit the ranch, it may seem unnecessary to describe it. Yet, there are many who have not been so fortunate; and it is for them that I shall attempt the description.

Hazford Place is located one and a half miles from the prosperous and progressive city of Eldorado in southeastern Kansas; at one time and perhaps even now, the Mecca of oil men. The oil derricks scaling the heights of the surrounding hills are literally in thousands, obliterating the surrounding country from that grand and glorious view, "The Rolling Prairie." As I received my first impression of Hazford Place, it seemed to me an oasis in the desert, refreshing and picturesque. The tall trees shading the farmstead, the fresh green pastures, and the sleek-haired Herefords dotted all over them, seemed to blend together and paint a picture that fascinated me. Hazford Place is a home, as well as a breeding and commercial establishment.

My first visit was to the big brown tent, which had been erected to serve as headquarters for the visitors of Hereford Field Day, and as a temporary home for those aristocrats of Hazford Place—The Show Herd! There they lay; well nigh fifty of the best and purest blood Herefords of today. As individuals it would be hard to fault them, as a group, impossible.

My eye feasted on this wonderful sight; and as I ambled slowly back and forth, I was struck by the type, quality, breed, character, and uniformity of this wonderful Hereford Show Herd, each one a prize winner, I am sure, every one a breeder positive.

My next visit was through the lots, and

it needs an abler pen than mine to describe what I saw. In one lot, a group of Senior Yearling heifers; in another, Junior Yearlings; in another, Senior calves; and in yet another, a group of about twenty-five bull calves. Each lot was uniform and it was difficult to single out individuals. I wonder how many International prize winners will be singled out from those lots. Each lot was the product of thorough knowledge, careful selection, painstaking efforts, and indefatigable persistence—the product of 27 years of personal supervision, the work of a master artist. What greater qualifications can a breeder require than these?

The groups were worthy representatives of their breed—low-set, deep-bodied, and broad-backed; and their sleek hides and smoothness indicated the very essence of quality. Neither constitution nor size had been sacrificed at the expense of quality, and there was a happy blending of these three qualities. In brief let it be said that Hazford Place Herefords are typey, big-boned individuals with sufficient quality, uniformity, and constitutional vigor. There was not a weak one among them; with heads raised and ears alert, they sniffed the air, and watched the passers-by. It was indeed a pleasing sight to the lover of animals.

I then wandered through the pastures, where gazed contentedly the progenitors of these blue bloods. What grand old matrons they were. Their size impressed me, these big rugged cows with sweet breedy-looking heads. They were all in good breeding condition, well fleshed and smooth; and I was surprised to learn that no grain was fed to the cows after their third year, except in some instances after calving. The cows, furthermore, are on pasture the whole year and calve in the open. This, I think, indicates that adaptability is a factor which has not been overlooked in the selection of Mr. Hazlett's breeding herd of over 400 cows.

The pastures, too, give evidence of being well cared for and certainly do not show any signs of being overstocked or overgrazed. It is not surprising then to understand why cat-

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The Child Labor Amendment

Roy R. Cameron, '26

It is desired, at the outset, to explain what the child labor amendment is and what it is not. The proposed amendment reads as follows:

"Section 1. The Congress shall have power to limit, regulate, and prohibit the labor of persons under 18 years of age.

"Section 2. The power of the several states is unimpaired by this article except that the operation of state laws shall be suspended to the extent necessary to give effect to legislation enacted by Congress."

Simple as the article may seem, there are those who have misinterpreted its meaning and conceived the idea that this is a law which is about to be enacted and are therefore fighting it from all quarters.

It is not a law—its purpose is to give Congress the power to do the very thing that it has twice undertaken to do under child labor laws. It simply undertakes to remove a limitation on the power of Congress which the Supreme Court of the United States declares exists. It is not an untried experiment. Actual practice has shown the effect of a Federal child labor act. The first and the second child labor acts, instead of resulting in indifference on the part of the states either in enforcing existing state laws or in raising state standards, actually increased state interest and state responsibility.

In 1916 Congress passed a law prohibiting the transportation in interstate commerce of the products of child labor in certain industries. These were commodities produced in mines or quarries employing children under 16 years of age; and products of canneries, workshops, factories, or manufacturing establishments which employed children under 14 years of age, or which employed children between 14 and 16 more than 8 hours a day or more than 6 days a week, or between the hours of 7 p. m. and 6 a. m. Less than two years after its enactment, this law was declared unconstitutional by the Supreme Court of the United States. Early in 1919 Congress passed another law containing exactly the same regulations as the earlier one, and imposing a tax of 10 percent upon the profits of all concerns which violated

any of these provisions. Within two years this act was also declared unconstitutional.

The present proposed amendment simply endeavors to remove this handicap from Congress. The intention is to leave it up to Congress to pass what laws may seem necessary.

The need for child labor laws has grown out of the fact that so many of our children are at work. According to the 1920 census, there were in the United States 12,502,582 children between the ages of 10 and 15 years. Of this number 8½ percent were engaged in gainful occupations, 61 percent of these being engaged in agricultural pursuits, 88 percent as laborers on the farm. Of the working children under 16, 17.5 percent were employed in manufacturing and mechanical industries. Cotton mills provided work for 2 percent of the employed children, 33 1-3 percent of whom were employed in Massachusetts, 38 percent in North Carolina, South Carolina, and Georgia, and 28 2-3 percent scattered in other mills.

In the southern states children over 14 work 60 hours per week, 11 hours for 5 days and 5 hours for one day. The largest percent of child labor is in the east south central states, comprising Kentucky, Tennessee, Alabama, and Mississippi. In Mississippi more than one-fourth of the children between 10 and 14 years are at work; in Alabama and South Carolina, 24 percent are at work; in Georgia, 21 percent; and in Arkansas, 19 percent.

Every state in the Union has some form of child labor law, but only 18 of the 48 states possess laws whose provisions are equal to those in the two former Federal laws.

The states have the power to protect and educate their own children, but many of them have failed to make use of it. The result is a nation whose children are receiving unequal opportunities and preparation for life according to the states in which they happen to live, and bringing the states with efficient child labor laws into competition industrially with those of lower child labor standards. The cost of production is higher where adult labor is employed and must meet the competition of products produced more cheaply under child labor. The remedy seems to be a constitutional

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Apple Growing in Doniphan County

H. L. Lobenstein, '26

Kansas has been recognized as an important producer of apples for several decades. Early settlers who came to the plains territory brought with them their favorite fruit in the form of such varieties as they knew best in their eastern homes. It did not take Kansas pioneers long to observe that some sections of their newly adopted state were well adapted to the production of apples. This is especially true of northeastern Kansas, which is now considered one of the leading apple-growing sections of the Missouri valley. Doniphan county, which lies in the northeast corner of the state, is the outstanding county in production and acreage. Commercial orchards have been grown in this county for many years and the average annual production for 10 years (1912 to 1921) was 288,000 bushels. This crop was produced on 98,216 trees. In addition, the 1923 report of the Secretary of the State Horticultural Society reports the county as having 134,953 apple trees below bearing age.

No matter what other conditions are, fruit-growing practices fail whenever soil conditions are unsuitable. Undoubtedly the Doniphan soil is the basis of the county's success as an orchard region. This soil is of the loess type—one which is regarded as being best suited to the bearing of fruit trees. Such a soil is very deep, fertile, and markedly uniform. This permits the maximum penetration, spread, development, and functioning of the roots of the trees.

One of the greatest problems the growers have before them is that of soil management. Because of the hilly nature of Doniphan county, practically all methods of soil management except sod culture are injurious through erosion. Consequently, the beneficial results of clean cultivation and the growing of cover crops cannot be secured.

Due to the rolling topography of the county, frost is not a serious factor in apple production in Doniphan county. Almost perfect air drainage is secured on nearly all commercial orchard sites. In the late spring the cold air flows down the steep hills, draining into creeks and river bottoms before it has time to seriously damage the fruit blossoms. Further the growing season is not cut short by

early fall frosts, hence the fruit reaches proper maturity before severe weather makes harvesting necessary. Rainfall is seldom a limiting factor in this part of Kansas, as it is in many other parts, the average being about 33 inches, which insures good size and development of both trees and fruit.

The region is well supplied with transportation facilities. Two railroads traverse the county and cater to the apple shippers because of the large tonnage shipped yearly. A concrete highway extends from Troy, located in the heart of the apple district, to St. Joseph, a good marketing center. Doniphan county apples thus readily find their way to important markets north, east, south, and west.

At the present time over 90 percent of the yearly crop is marketed in barrels or bulk. Practically all the first-grade apples are barreled, while a large portion of the lower grades are shipped in bulk or sold within the county as cider apples. Within the last few years, efforts have been made, with some success, to have the growers grade and size their products, have them inspected by a government official and certified by him as belonging in one of the several U. S. standard grades. Such a process has been found profitable and will, in time, come into more general use. Some growers are seriously considering packing their product in boxes as the northwest growers do, and if their plans are carried out, Doniphan county fruit will mount several rungs higher on the ladder of market value and apple growers in this region can compete successfully with growers in the Pacific Northwest.

A visitor to Doniphan county is invariably impressed with the large number and extensive acreage of young apple orchards, from one year of age to those just coming into bearing, which seemingly occupy every available site. A trained observer can easily see that many of these orchards will never be profitable by reason of their unfavorable site, lack of care, or poor varieties. However, the number of young orchards being started correctly by capable growers is certainly large and increasing rapidly.

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A Good Investment

J. C. Wallace, '26

When Albert L. Beal, now of Colony, Kan., returned from overseas at the close of the late war, he found that his father's forty-acre farm was awaiting his management. Being a businesslike young man, he took an inventory of his resources before making any plans for the operation of the farm. This showed that although the farm was fair medium upland, with some rougher pasture land included, it would fail to return a sufficient cash income without selling all of each year's crop. "Bert" knew such a system would soon leave him a wornout soil, and turned to dairy farming which would return a larger cash income and at the same time maintain the fertility of the soil.

Up to this time the cattle on the Beal farm had consisted chiefly of "red" cows with a few brindles and yellows that denoted a trace or more of Jersey blood. A bull of rather uncertain ancestry had been used. The Jersey grades had proved their superiority at the pail over the other cows kept, so quite naturally Bert's choice of a breed was the Jersey.

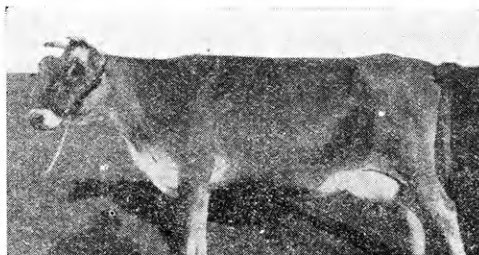
It was Bert's good fortune to attend a farm auction sale about this time, in which were included several purebred Jersey cows and heifers. He purchased at this sale one purebred heifer for the sum of \$50. She was not a prepossessing heifer in appearance at this time so Beal was forced to withstand a great deal of chaffing on the part of friends and neighbors concerning his purchase. However, he had informed himself on her breeding, and being a good judge of livestock, had confidence in the future development of the heifer.

It has since been shown many times that his faith was not misplaced. In the Allen County Cow Testing Association last year this cow produced 402.2 pounds of butterfat. She was once grand champion female at the largest county fair in Kansas. She has been a reproducer of type and production as shown by her 14 descendants now in the Beal herd. She is the dam or granddam of five out of the fifteen cows in this herd which averaged 303 pounds of butterfat in the cow testing association last year.

The start in the dairy business which this 50-dollar investment gave the Beals (now Beal Brothers since a younger brother entered the

business) has meant the building of one of the most successful purebred Jersey herds in southeastern Kansas. The herd now numbers 35 purebred Jerseys in spite of the fact that very few females have been purchased in the seven years of the herd's existence. Bulls of good individuality and from tested dams have been used. Culling is now in progress through a testing association and as soon as feasible the boys intend to do semi-official testing.

It would be fallacy to imply that a lucky strike in the purchase of the original heifer has been responsible for such a distinct success in building this Jersey herd. Such is far from true. Only undaunted enthusiasm and patient, diligent, and intelligent effort on the part of the man back of the enterprise could have succeeded, even though he made a good



start in purchasing a heifer of marked productive and reproductive capacity. Disappointments have hit Beal Brothers as they do all dairymen and breeders. Crops have failed and losses from disease and accident have been as prevalent on their farm as elsewhere. These were accepted as a part of the game, however, and the plan for the development of the herd progressed steadily in spite of all hindrances of that nature.

Today 40 more acres have been added to the farm; the herd is being carefully weeded out and improved; Bert is able to divide the management with a younger brother and so devote more time to the study of his business; and what is most important of all, he has contentment and interest in the steady progress of a creditable farming program. His opportunities were not unusual. In fact such opportunities in dairy farming are within the reach of hundreds of young men in Kansas.

Conducting Soil Survey

Raymond H. Davis, '27

In making a soil survey the first thing to consider is the question of a base map. Maps may be secured either from the county engineer or from the United States Geological Survey. The Bureau of Soils, with whom the states cooperate in soil survey work, desires a very careful and accurately made map. For this reason the soil surveyor usually makes his own base map. This is done by a plane table and an alidade and is made on either a one- or two-inch to a mile scale. Geological survey maps are not available for all areas, and when they are used they require some correction, such as locating exactly the course of all streams.

In making the map the speedometer of a car is used for measuring all distances. A reading of the speedometer is taken at the beginning of each mile, and readings are taken of houses, churches, school houses, cemeteries, drainage ditches, creeks, and soil boundaries; and these are all located to scale on the map.

As the name implies the important thing in the soil survey is the actual classification and mapping of the soils. The soil type is the basis of all classification. The soil class and the soil series taken together, determine the soil type. The soil class is a grouping of soils based on texture only. In all field work the soil class is determined by the feel of the soil, but an accurate mechanical analysis is made by the Bureau of Soils before the final report of the area is made. The soil series is a number of soil classes, differing in texture and structure but alike in all other characteristics, such as color, origin, mode of formation, depth, drainage, topography, and natural productivity.

In beginning work on an area that is unfamiliar to the soil surveyor, it is necessary for him to spend some time of very careful study of the soils before any mapping is done. The surveyor should study and become familiar with the important types of the area in this preliminary work. Each type is given a number and when mapping the different soils they are always designated on the map by their particular numbers. Any system of numbering may be used. During the actual mapping, new types will be found from time to time,

and some types will probably have to be separated into two types. A soil type will vary considerably within itself. Classifying soils is similar to judging livestock. You must have the ideal type in mind and then be able to recognize variations from that type when they occur. Usually a given soil is distinctly one type or another, but it is not uncommon to find a soil that requires considerable study before classifying it correctly. In some instances it will depend upon the individual judgment of the surveyor as to the type with which it will be classified.

The number of soil types an area may have varies with the section of the country in which that area is located. For instance Clay county, Kan., has about 15 soil types. A certain area in New Jersey which has been surveyed has more than 100 types. Accurate mapping becomes a difficult task when you have this many types with which to deal.

In soil survey work it is best that two men work together. One man with a car can work on the roads and map a quarter of a mile on each side of the road. The other man can walk down the half mile lines of each section, mapping a quarter of a mile on both sides of the half mile line. In this manner the section is completed. The man who walks through the section does his mapping on a piece of graph paper, and this is then transferred to the original map. It is necessary for the person who walks to have a pace scale in order to locate all culture that is to be put on the map. By the men alternately using the car and walking, the work does not become tiresome.

It is necessary for each man to have a soil auger with him at all times, as borings must be made into the subsoil in order to classify the soil properly. When doing road work a great deal of boring may be eliminated by merely viewing the grader ditches along the roadsides. Another great help in mapping soils is the fact that in a good many cases, soil boundaries follow topography. In other words the soil boundaries as shown on a map somewhat resemble the contour lines of a topographical map.

When the actual field work of an area is
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Sunlight and Health

J. S. Hughes

Practically every one recognizes that living out in the open is much more conducive to good health than living inside in an office or factory. In recognition of this fact people in poor health whose occupation keeps them indoors are advised to take a vacation and get out in the open so they may benefit by the health-giving qualities of an outdoor life. Usually in such cases a prompt recovery is made so there is no question at all about the value of outdoor life for good health. But the question arises—What is it in outdoor life that is so beneficial? Some think the benefit is derived from the kind of exercise one takes when out in the open; others believe that the fresh air is the all-important factor in the beneficial action of the outdoor life. Undoubtedly fresh air and exercise have some value, but they can not be the most important factors, for exercise and fresh air alone will not restore one to health as will outdoor life. Some think that light might be the health-giving factor. But this can not be the case, for a room may be flooded with sunlight through window glass or any amount of ordinary electric light in the office or factory may be obtained without producing the beneficial effect.

What then is there in Nature's out of doors that has this health-giving quality? A few years ago no one could answer this question. Recent investigations, however, have shown that the benefit one derives from outdoor life comes very largely from a peculiar property of the direct sunshine. To understand why direct sunshine has this wonderful health-giving quality that is lacking in sunlight which has passed through glass windows, it is necessary to understand something of its composition. Direct sunshine is made up of a large number of kinds of light differing in their wave lengths. The longest of these wave lengths that the eye can see is red, and the shortest that can be seen is violet. Between these two are the various wave lengths which give the other colors of the rainbow. If sunlight is allowed to pass through a prism, it will be separated into its component parts giving these rainbow colors.

However, only a small portion of all the

wave lengths can be seen by the eye. There are many wave lengths longer than the red and shorter than the violet which the eye can not see. The wave lengths longer than the red, which are known as infra-red, can be felt as warmth but can not be seen. The light having wave lengths shorter than violet, known as ultraviolet light, can neither be felt nor seen. However, these short wave lengths are very active chemically. They are the part of the sunshine which is responsible for sunburning and tanning. Light that will not sunburn or tan contains very little, if any, ultraviolet light. It is this ultraviolet light in the sunshine that is responsible for its health-giving quality.

This ultraviolet light can not pass through glass. For this reason sunlight which has passed through a glass window, although it appears the same as direct sunlight to an individual, contains very little of ultraviolet light and so has very little of the health-giving quality.

Ordinary electric lights contain practically no ultraviolet rays, so they can not be substituted for direct sunshine so far as health of man and animals is concerned. This is not true for plants as they utilize the visible portion of the light.

This ultraviolet light seems to cause its beneficial action by developing a substance in the skin which is necessary for the health of the individual. This substance is known as Vitamin D. It is carried to all parts of the body by the blood stream. If the body does not have this Vitamin D it can not make the proper use of its minerals. As a result the bones do not develop normally and the teeth decay. This condition in growing children and in young animals is known as rickets. It was in the study of this substance in children that the importance of ultraviolet light to health was discovered.

It is not necessary to produce this Vitamin D in the body by ultraviolet light as some food substances contain it in amounts sufficient to keep the body in fairly good health. Cod-liver oil is quite rich in Vitamin D. It is because of its Vitamin D content that cod-liver oil is given to children to prevent or cure rickets.

Other sources of Vitamin D are butter and egg yolk. The amount of vitamin which these substances contains, however, depends upon the amount of direct sunshine the cows and hens receive which produce them. For this reason a child fed milk from cows that are not out in the sun very much is apt to develop rickets unless Vitamin D is given in cod-liver oil or the child is put out in the sunshine so that it can develop its own Vitamin D.

Mother's milk is also very low in Vitamin D unless the mother is out in the direct sunshine for if she is not out in the direct sunshine she will not receive very much ultraviolet light, which is essential if the body is to build this vitamin. It is stated that from 50 to 75 percent of the children in the larger cities have rickets in more or less severe form. This is because neither the mother nor the children get a sufficient amount of direct sunshine to give them the necessary ultraviolet light to keep them in good health.

The bones are not the only tissues to suffer from an improper utilization of minerals caused by the lack of Vitamin D. Both the nerves and muscles are affected. Children suffering from rickets and adults that do not receive a sufficient amount of ultraviolet light usually become very nervous and irritable due to the abnormal condition of the nerves. In severe cases of rickets the child is very apt to go into spasms due to the oversensitiveness of the nervous system. Experiments have shown this oversensitiveness of the nerves to be due to a lack of calcium in the tissues. Usually this nervousness in the rickety child or in the adult is quickly overcome when Vitamin D is supplied to the body in the food or developed in the body by the action of ultraviolet light.

The muscular weakness which results from an improper mineral balance caused by a lack of Vitamin D often is manifested in heart trouble. The large percent of young children, boys and girls, who have heart trouble is probably due to this cause.

All these disorders resulting from the lack of ultraviolet light are much more prevalent during the winter months than during the summer months. This is partly due, no doubt, to the fact that the sunshine reaching the earth's surface during the winter months when the sun is near the horizon has much less of the ultraviolet light than the sunshine during the summer months. That there is not as

much ultraviolet light in the sunshine in winter as in summer is shown by the fact that one is not sunburned by the winter sun as by the summer sun.

Besides the harmful effect the unbalanced minerals have on the various tissues of the body they also lower the resistance of the body to many kinds of harmful organisms. The outstanding illustration of this is tuberculosis. Very seldom, if ever, does a person develop tuberculosis who is out in the direct sunshine enough to produce a good coat of tan. The reason tuberculosis patients are sent to the mountainous districts of the southwest is because the sunshine there has much more of the ultraviolet light than the sunshine in lower altitudes. This is true because the dust particles and moisture in the air tend to screen out the ultraviolet light in the lower altitudes.

Since the importance of ultraviolet light to health has been discovered a special kind of electric lamp has been developed which contains several times as much ultraviolet light as the summer sunshine. The light is produced by passing an electric current through a vapor of mercury in a quartz tube. Quartz, instead of glass, is used for the tube because the ultraviolet light will pass through quartz but will not pass through ordinary glass. A one-minute exposure to such a lamp will produce as much of a sunburn as several hours exposure to direct sunlight. These lamps are used now to a limited extent by many physicians with excellent results.

In addition to the development of Vitamin D in the body, which is necessary for normal health, the ultraviolet light has a powerful germicidal action. For this reason the light from these mercury arc lamps is one of the most powerful and at the same time safest of disinfectants. As this light will not penetrate the tissues deeper than the thickness of ordinary paper it is of value only in treating surface infection. It will cure cases of eczema and other such skin troubles that will not yield to any kind of medical treatment.

The X-ray, which is also used somewhat for treating skin disorders, differs from the ultraviolet light only in its wave length. It has very much shorter waves than ultraviolet light and penetrates the tissues, which ultraviolet light will not do. For this reason the

(Continued on page 32)

Income from Agricultural Products in 1924

Leonard B. Harden, '26

A combined return of 3.6 percent to the farm operator on his own capital investment and for his managerial services in 1924 is reported by the United States Department of Agriculture in a report on agricultural income for the year ending June 30, 1925. The estimated number of farms in the United States is 6,448,000, representing a capital investment of approximately \$59,154,000,000 on which there is a debt of \$12,250,000,000, leaving an unencumbered capital investment of \$46,904,000,000. The landlord has an investment of \$14,388,000,000 which leaves the farm operator a net capital investment of \$32,516,000,000.

The gross income available for all capital invested in agriculture for the fiscal year ending June 30, 1925, was \$12,136,000,000. The cost of production (not including wages of operators and their families) was \$6,486,000,000, leaving a net income of \$5,650,000,000 as compared with a net return in 1923-24 of \$4,825,000,000. Deducting the wage allowance for operators and their families of \$4,473,000,000 the return to the operator is \$1,117,000,000 with which he can pay interest on his own capital investment and his wages for management. This is 3.6 percent on his own capital investment.

The United States Department of Agriculture reports a return on capital invested in the agricultural industry and for managerial services of operators as 4.6 percent. This difference is the result of investment in agriculture of capital by nonagricultural interests which has demanded a higher rate of return. For example, the rate of interest paid on mortgages and other indebtedness was 6.7 percent in 1919-20; 7 percent, 1920-21; 6.8 percent, 1921-22 and 1922-23; 6.6 percent, 1923-24; and 6.4 percent in 1924-25. The rate, 3.6 percent, represents the pay for managerial services of the operator and for interest on the capital invested by him. During the past six years the reports have shown the rate of returns to farm operators to be as follows:

1919-20	-	-	-	-	6.1 percent
1920-21	-	-	-	-	3.6 percent

1921-22	-	-	-	-	1.7 percent
1922-23	-	-	-	-	1.7 percent
1923-24	-	-	-	-	1.5 percent
1924-25	-	-	-	-	3.6 percent

These figures show the effect of the business depression following the war. They also show that agriculture is slowly regaining its earning ability as compared with other businesses but it is not yet on a par with other businesses.

Yet it is not safe to conclude that agriculture is so rapidly regaining its prewar status without looking into the causes of the increased returns. A glance at the comparative price levels of 1923-24 and 1924-25 will readily show that the increased returns are due partly to the higher price level of 1924-25, especially as regards wheat and hogs. Also, we find that the increased rate of return has been on a decreasing current value of the operator's net capital investment, the operator's net capital investment dropping from \$47,223,000,000 in 1919-20 to \$32,516,000,000 in 1924-25.

During the recent depression period the reduced income has left little, if any, income as a reward to the operator for his labor, for his managerial ability, and for his own capital investment. Even now when the operator's net income is reduced to a per man basis it is only \$876. Allowing a conservative interest rate of 4.5 percent on his investment the operator has \$649 as a reward for his labor and management including that of his family. These returns are a considerable improvement over those of 1921-23 but they are still inadequate when compared with annual wages received by hired labor. In 1924-25 the average reward for the labor of farm hands was \$569 while that remaining for the farmer and his family was \$649. The value of the farmer's labor estimated on the basis of hired labor is \$694. He received only \$649.

R. L. Graves, '12, is in charge of breeding experiments for the dairy division of the Bureau of Animal Industry, Washington, D. C. In his work he is ably assisted by J. R. Lawson, '17.

Control of Mammals Injurious to Agriculture in Kansas

G. E. Johnson

The mammals, or haired animals, that are detrimental to agriculture in Kansas include a number of rodents and the mole. The rodents may be recognized by their two chisel-like teeth in the front of each jaw. The mole is blind, has a pointed snout, and has broad trowel-like nails on its front feet by means of which it pushes dirt aside. The pocket gopher, rat, and prairie dog are our most destructive rodents. Woodchucks and mice are also destructive, and rabbits and ground squirrels are if too numerous. While the injury done by the mammals mentioned is so great that, except in the case of rabbits and ground squirrels, eradication should be sought, it should be emphasized that only after careful study should war be waged on other wild life. Many beneficial birds and useful snakes, such as the bull snake, are killed without cause each year.

THE POCKET GOPHER

The pocket gopher is a burrowing rodent which throws up mounds from short lateral passages from its main tunnel. The mound, which is the shape of a palm leaf fan and is rounded on top, should not be confused with the little rough peaked hills sometimes pushed up by the mole. A pocket gopher never raises ridges between the mounds; a mole ridges the soil above its tunnel and often throws up no mounds at all.

Gophers do much damage in alfalfa fields where a chain or system of mounds of a single animal may smother many square feet of growth as well as make mowing very difficult. By feeding on the alfalfa roots gophers destroy many plants. Because they are most active in late fall and early spring control measures taken at these seasons usually prove most successful. The best method of combatting them is by introducing poisoned bait into the main tunnel. The method of locating the tunnel and properly placing the poisoned bait is ex-

plained by use of the accompanying illustration. Each system of mounds belonging to one gopher should be treated in at least two places, or one may treat every fourth or fifth mound.

When much baiting is to be done a probe made from water pipes by a blacksmith is very useful. The old mounds should be dragged down after baiting so that new ones may be seen and treated after a few days. In the fall or in the early spring continued retreatments if correctly made should kill all or nearly all of the gophers in the field.

THE PRAIRIE DOG

Prairie dogs commonly eat 50 percent or more of the vegetation in pastures and may destroy large areas in cultivated fields. Their control is not difficult, but requires community action. Grain is an effective and economical bait and the State law provides the machinery for organized drives against the pests. Townships are required to provide the materials needed and the trustee supervises the eradication work. With a large number of people working together in distributing the bait properly, the cost in time and materials is small compared with the losses caused by the prairie dogs.

Poisoned oats are recommended, not because they are more effective than poisoned wheat or kafir, but because birds and poultry do not eat them so readily. A shaken tablespoonful, about as much as one can pick up between the thumb and first three finger, is scattered with a throw of the hand on the *dry hard ground near each occupied burrow*. It should not be thrown on loose dirt, in the grass, or in the burrow. When young are present and feeding two or three shaken tablespoonfuls of bait should be scattered near each home den. Care must be taken to scatter the bait properly, otherwise livestock will be endangered by being able to pick up the grains.

Often some "dogs" escape the first treatment. A second more liberal baiting should

¹ This article is an excerpt of a manuscript prepared for publication as a circular of the Agricultural Experiment Station by the author who is the station mammalogist. Beyond doubt the circular will be available for distribution in the near future. Address requests to Agricultural Experiment Station, K. S. A. C., Manhattan, Kan.

² Poisoned grain may be procured from the Department of Zoology, K. S. A. C., Manhattan, Kansas.

then be given to the burrows still occupied. If a third treatment is necessary wheat or kafir should be used or the dens fumigated with carbon disulphide (two tablespoonfuls on some absorbent material thrown far into the burrow and the burrow closed with sod) or with calcium cyanide flakes (a heaping tablespoonful or a little more thrown deep into the burrow).

THE RAT

Rats do untold damage and are difficult to eradicate. Dwellings should be built rat proof, the basement being lined with concrete and no openings left between the basement and the spaces in the walls of the house. If rats occur in a house, different traps and baits should be

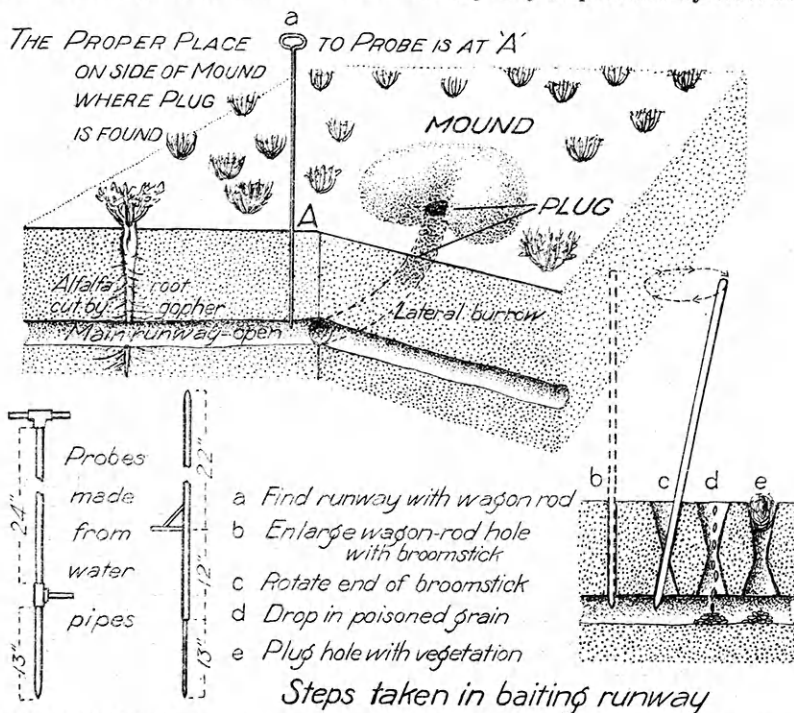
being put out each evening till the rats are gone. Other foods should be kept away from the rats before poisoning is begun.

OTHER INJURIOUS RODENTS

House mice may be trapped with the small inexpensive mouse traps on the market, cheese or other bait being tied on the triggers. Mice may also be poisoned with grain or barium carbonate.

Woodchucks or "groundhogs" may be baited with two tablespoonfuls of poisoned grain scattered near the burrow or may be gassed as directed for prairie dogs.

Rabbits may be hunted for food, or if necessary may be poisoned by scattering teaspoon-



DIAGRAMATIC REPRESENTATION OF A POCKET GOPHER RUNWAY SHOWING METHODS OF PLACING POISON

used from day to day. In stables, granaries, and corn cribs rats may best be poisoned with barium carbonate, though sometimes poisoned grain works well. The barium carbonate is mixed (one part by weight) with the following kinds of moistened bait (four parts): Ground or mashed meats, pieces of fruits or vegetables, and cereals. Teaspoonful-sized baits are wrapped each in a piece of paper or a small paper bag. The bags are scattered in places where rats occur. The uneaten baits are removed and destroyed each morning, fresh ones

ful doses of poisoned oats along their paths. Box traps are useful in orchards. Trees may be protected at the bases by wrappings or netting.

Ground squirrels may be poisoned easily when they damage crops, by placing teaspoonful baits of poisoned oats near their burrows.

THE MOLE

No method of combatting the mole has yet been proved more certain than the proper use of a mole trap, the choker type apparently being the best.

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A TRIBUTE TO DR. HENRY JACKSON WATERS

The passing of Dr. Henry Jackson Waters has aroused expressions of profound sympathy and deepest respect from his many friends because they now realize that their personal associations with a great agricultural leader have been ended abruptly. The friendship of individuals in Kansas State Agricultural College, either on the instructional staff or in the student body, for Dr. Waters is too great to be estimated. The service which he rendered the college as president and since in his editorial capacity with the Weekly Kansas City Star can never be determined in terms of value nor in the essential good which they have accomplished.

Although K. S. A. C. regretted the personal loss of Dr. Waters when he resigned as president, still it realized that he was entering a field where his work would not be limited to the boundaries of Kansas, but that it would extend throughout the Missouri valley and far beyond.

Dr. Waters never advocated the theory that country people are the sole maintenance of the nation, the backbone, so to speak, and the only people going an economic good. He was broader minded. He believed in the equality of rural and urban society. He was not radical in his efforts to instill an appreciation of farm life.

However, he did see the necessity of improving country life and social conditions; and this was his purpose from first to last. He directed his energy toward the rural youth with full confidence in their capacity to handle agricultural enterprises.

Improving the country home, making it a home where one could live while he was living were movements that Dr. Waters fostered. He loved the country and he believed that the country was the place where God intended the most of us to live. He never intended to picture the farm as a field in which millionaires should gamble. He did not picture it as a place for a poor boy to become rich. But, on the other hand, he did sincerely think that the country was the ideal place to build a home, the place that should show evidence of a cultured society.

Colleges and universities pay tribute to Dr. Waters for his great influence in increasing the number of college-trained men and women. In most cases his energy was expended upon the youth from the rural districts and his appeal to them was influential in upbuilding and maintaining interest in college curricula in agriculture. He was optimistic enough to believe in the ideals of rural people, the social equality of rural and urban life, and the recognition of the value of an education on the farm. He was a most worthy counsellor, a faithful friend, a capable executive, a great man.

SHOULD THERE BE MORE ELECTIVES IN THE CURRICULUM IN AGRICULTURE?

The students in the Division of Agriculture are asking why they can not take more electives instead of some of the required work for which they are held. They ask their older fellows if the portion of their time in college demanded by certain college courses is not greater than the value of these courses warrants. Couldn't the required work be reduced by 10 to 15 semester credits, the electives increased by a corresponding number, and the curriculum be at the same time improved both in efficiency and attractiveness? Many students and alumni say, "yes."

No one doubts the value of the fundamental sciences on which agricultural practices are based. These sciences furnish the truths on which new correlations are made. But we can go too far and require an unjustifiable portion of the student's time grinding on basic sciences. The changes suggested would have many advantages.

1. They would relieve overcrowded conditions in the required work of a few departments and have a tendency both to eliminate the work of a few teachers that is below standard and secure a better organization and presentation of the required work.

2. They would allow more opportunity for specialization and at the same time provide a broader field for the selection of objectives. Not only would they provide a stronger major but also a stronger group of supporting elective courses.

3. They would more fully meet the demands for a limited number of elective credits in the physical or biological sciences, English, professionals in education, business courses, and courses in agricultural engineering.

4. They would even provide leeway for a limited number of credits in a sideline in which the student was particularly interested and possessed talent, such as music, athletics, debate, or military science.

These changes would, therefore, make the work of the curriculum in agriculture appeal to a larger number of students. At the same time the new curriculum, in our opinion, need not be weak in fundamentals. In other words without weakening the framework of the curriculum it could be made to appeal to a larger percent of the young men in Kansas high

schools, especially those reared on farms, and thus have a larger part in the progress of agriculture and agricultural education in the future.

AN OUTSTANDING STUDENT ACTIVITY FOR AGRICULTURAL STUDENTS

From the time a student enters college he has heard about football, basketball, baseball, track, and many other forms of athletic activities. He has been urgently requested to participate in one or more of these activities. It is well and good that he should support athletics because of the physical fitness which they intend to accomplish. But on the other hand, there are fine opportunities for agricultural students—those physically fit for athletics as well as those who lack the necessary weight and strength—to train and display mental acumen and practical judgment in lines of activity which will mean as much to them as a letter in athletics.

Reference is made to the most outstanding departmental activities of the Division of Agriculture—the work of the judging teams. Whether it be the judging of dairy cattle, fat livestock, poultry, fruit, or grain there is an opportunity for a student to determine early in his college career to make one of these teams. He who directs his energy and devotes his time toward that end is going to be repaid for the efforts he has put forth.

When a student has made the team there is much in store for him. No doubt the practice judging after the team is selected will give the individual invaluable training in practical judgment which can never be attained in the class room. The trips which the team make give him a broader view of the scope and significance of the industry in which he intends to serve. They bring in personal acquaintances with men who are really great figures in that industry. The student is benefitted because of the intangible feeling a personal acquaintance insures.

After all is over, in all intercollegiate judging contests, regardless of where the team has placed, regardless of where the individual ranks in any one particular contest, there remains a fixed impression which alone makes one feel that the effort has been well worth the time.

College Notes

WINNERS IN STUDENT JUDGING CONTESTS

The following is a brief summary of the student judging contests held during the spring semester, 1925, and mentioned in the Ag Student, Vol. IV, No. 4, pages 114-15.

Seventh Annual Students' Grain Judging Contest

Fifty-one students entered this contest. A possible score of 1,015 was attainable. The three high men in each division together with their scores and winnings are as follows:

SENIOR DIVISION			
Place	Name	Score	Prize
1st	A. G. Jensen	802	\$15
2d	E. B. Coffman	711	\$12
3d	P. P. Rumold	709.5	\$8
JUNIOR DIVISION			
Place	Name	Score	Prize
1st	A. Watson	782	\$15
2d	S. M. Raleigh	699	\$12
3d	E. F. Carr	605	\$8

The Twenty-Third Annual Students' Stock Judging Contest

There were 136 entries in this contest, 118 of which were in the junior division. The contestants judged eight classes of livestock, two each of horses, beef cattle, sheep, and hogs. The total points possible for any one individual to score was 600. The five students ranking highest in the senior division and the ten students ranking highest in the junior division together with their winnings are as follows:

SENIOR DIVISION			
Place	Name	Score	Prize
1st	Lionel Holm	508	Gold watch
2d	C. N. Yapple	489	Silver medal
3d	Wayne Rogler	467	Bronze medal
4th	T. N. Kleinenberg	465	Book
5th	A. C. Hoffman	458	Book
JUNIOR DIVISION			
Place	Name	Score	Prize
1st	A. D. Lovett	548	Gold watch
2d	E. I. Chilcott	528	Silver medal
3d	Dale A. Scheel	525	\$5.00
4th	L. E. Melia	518	\$4.00
5th	L. M. Pike	516	\$2.50
6th	Elmer Russell	506	Breeders' Gazette
7th	G. I. Rogers	506	Breeders' Gazette
8th	L. H. Gunn	503	Breeders' Gazette
9th	I. M. Atkins	502	Breeders' Gazette
10th	R. M. Lindburg	500	Breeders' Gazette

Eighteenth Annual Dairy-Judging Contest

There were 20 students enrolled in the senior division and 74 in the junior division. The total possible score was 1,200.

SENIOR DIVISION			
Place	Name	Score	Prize
1st	C. W. Thole	1,086	Gold watch
2d	A. C. Hoffman	1,045	\$5.00
3d	Louis Lauritson	1,030	Hoard's Dairyman
4th	Howard Vernon	1,017	Hoard's Dairyman
5th	Harry Rust	1,005	Hoard's Dairyman

The high man on each breed is shown in the

following tabulation:

Breed	Name	Prize
Ayrshires	George F. Ellis	Ayrshire Digest
Holsteins	A. C. Hoffman	Holstein World
Guernseys	Louis Lauritson	Guernsey Journal
Jerseys	C. W. Thole	Jersey Bulletin

JUNIOR DIVISION

Place	Name	Score	Prize
1st	Arlo Stewart	1,020	Gold medal and Kansas Farmer & Mail and Breeze
2d	A. D. Lovett	1,001	Silver medal
3d	H. H. Moore	992	Bronze medal
4th	Geo. J. Stewart	988	Hoard's Dairyman
5th	Harold E. Myers	984	Hoard's Dairyman
6th	H. N. Springer	978	Hoard's Dairyman

The high man of the junior division on each breed is shown in the following tabulation:

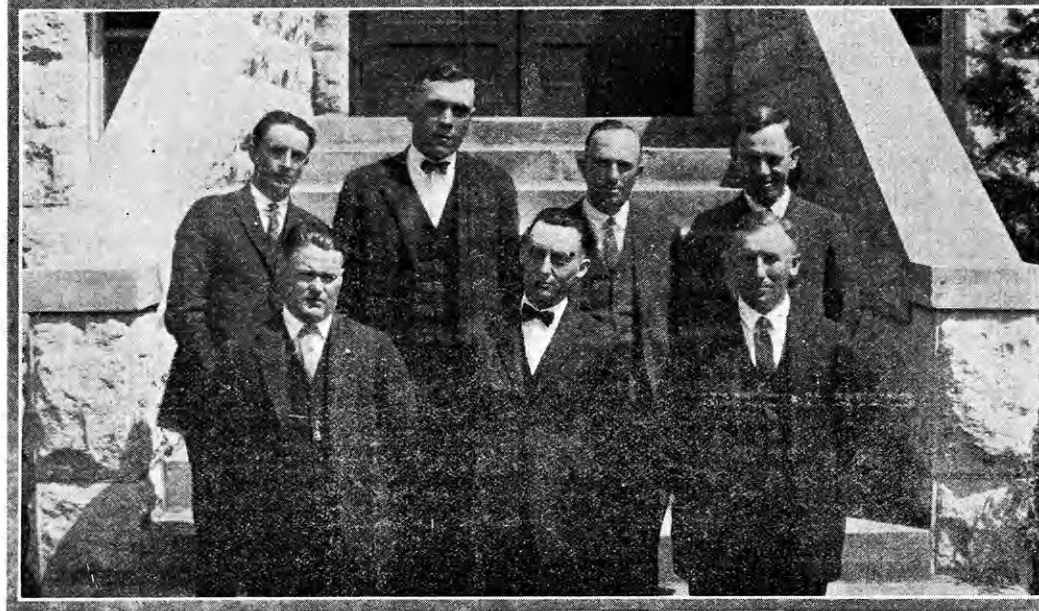
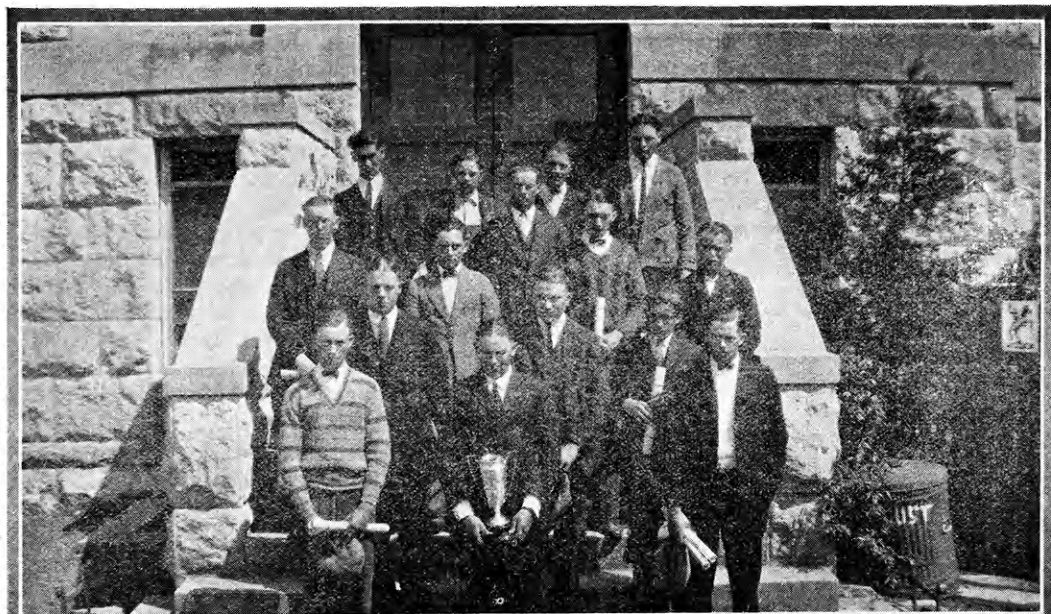
Breed	Name	Prize
Holsteins	S. R. Stewart	Holstein Register
Ayrshires	H. A. Moore	Dairy farmer
Guernseys	Vance Washington	Dairy Farmer
Jerseys	A. D. Lovett	Dairy Farmer

FIFTH ANNUAL STATE HIGH SCHOOL JUDGING CONTEST

The fifth annual State High School Judging Contest was held at the college on Thursday and Friday, April 30 and May 1, 1925. Sixty-two high schools of the state were represented by teams composed of three men each.

The contests were arranged in four groups: (1) Beef cattle, sheep, hogs, and horses; (2) poultry; (3) dairy cattle; and (4) grain. These groups were in charge of the Departments of Animal Husbandry, Poultry Husbandry, Dairy Husbandry, and Agronomy, respectively. The contestants were graded on the basis of their ability, both teams and individuals, to judge and grade classes in these four groups of farm products.

In the animal husbandry section of the contest, four animals of each of the following classes were judged: Fat steers, Shorthorn cows, fat barrows, Poland China sows, fat wethers, and Shropshire ewes. Classes of animals representing each of the four leading dairy breeds were placed in the dairy judging section, four animals for each class. In the poultry judging section, 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. The grain judging section included the following: Market classes and grades of winter wheat and of oats, judging wheat, judging alfalfa seed, and judg-

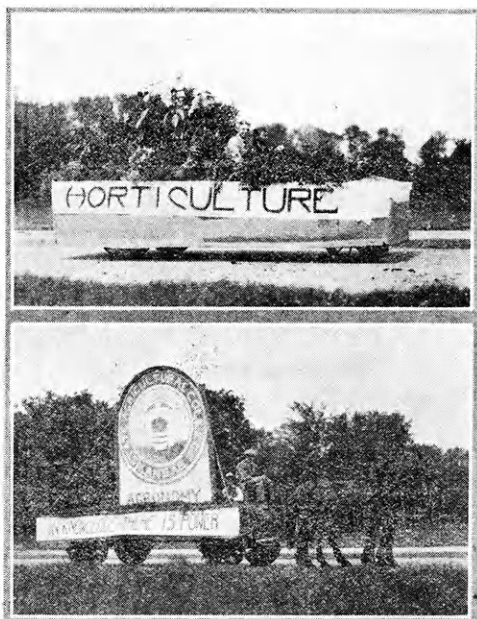


WINNERS IN THE FIFTH ANNUAL HIGH SCHOOL JUDGING CONTEST

The photographs above reproduced were taken Saturday, May 2, 1925. The top group shows each boy who was in a team winning one or more sections of the contest, or who was high individual in one of the four sections of the contest, or who was both high individual and a member of a winning team. The bottom group presents the coaches of the winners. Members of this group are as follows: First row, left to right—W. R. Essick, Lawrence High School; C. A. Davis, Washburn Rural High School; E. F. Burk, Hill City Memorial High School. Second row—C. C. Holmes, Miltonvale Rural High School; H. W. Schmidt, Manhattan High School; Kenney L. Ford, Norton County Community High School; H. E. Mather, St. George Rural High School.

ing ear corn; also the identification of 100 or more varieties of grain crops.

Prizes were awarded as follows: The F. D. Farrell parchment certificate and trophy cup offered by the Ag Fair Association to the team making the highest total score on all four groups of judging was won by the Manhattan High School team. The Dean's prize, a parchment certificate, awarded to the individual making the highest total score on all four groups of judging was won by Tom Bentley of Manhattan High School.



SCENES FROM THE AG FAIR PARADE

The men at the head of the four departments of the college represented in the contest offered parchment certificates to the teams making the highest general average in their respective section of the contest. The C. W. McCampbell parchment certificate, awarded in the animal husbandry section, was won by the Manhattan High School. In the dairy section of the contest, the J. B. Fitch parchment certificate was won by the Norton County Community High School. The parchment certificate awarded to the team making the highest general score judging grain, was won by the Washburn Rural High School. Lawrence High School was awarded the parchment certificate

offered by the Department of Poultry Husbandry.

Medals were presented to the individuals who scored the highest general average in each of the four sections of the contest. These medals were offered by the student departmental organizations of the Division of Agriculture. In the animal husbandry section, the Block and Bridle club medal was won by Roy Gustafson, Hill City High School. In the dairy section, the Dairy Club medal was won by Lester Henn of St. George Rural High School. In the agronomy section, the Klod and Kernal Klub medal was awarded to Allan Bentley of Washburn Rural High School. The Poultry Club medal awarded in the poultry section of the contest, was won by Walter Buell of Miltonvale Rural High School.

Other high ranking teams in the entire contest were: Wakefield, second; Clay Center, third; Washburn Rural High, fourth; and Frankfort, fifth.

The coaches of the various winning teams and of the individuals who won prizes in the contest were: H. W. Schmitz, Manhattan; K. L. Ford, Norton; H. E. Mather, St. George; C. C. Holmes, Miltonvale; C. A. Davis, Washburn Rural High; W. R. Essick, Lawrence; and E. F. Burke, Hill City.

OUTSTANDING INTERCOLLEGIATE CONTESTS

Three annual agricultural exhibits are scheduled for the near future as follows:

American Royal Livestock Show

Kansas City, Mo., November 14 to 21
International Livestock Exposition and Grain and Hay Show

Chicago, November 28 to December 5
Western National Livestock Show

Denver, January 16 to 23, 1926

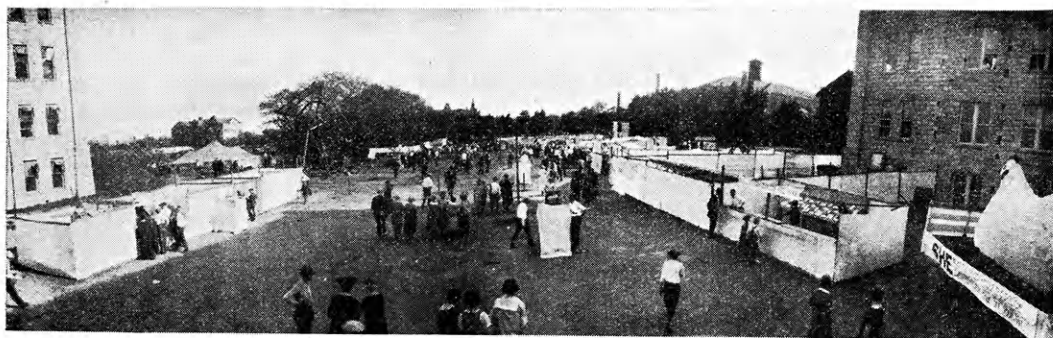
An intercollegiate stock judging contest will be held at each show and K. S. A. C. will be represented by a team, capable, we believe, of upholding the fine record made by our teams during recent years. In the Chicago show we will also have a student team competing in the intercollegiate grain judging contest. Whether they place first or lower we know they will make a creditable record. We extend our best wishes to all our representatives in these worth while contests.

FIFTH ANNUAL AG FAIR

The annual Ag Fair, presented by the students of the Division of Agriculture, was held on the north campus Saturday, May 9, 1925. In spite of threatening weather, approximately 3,500 people attended this annual exposition.

The mile-long parade composed of departmental floats, show livestock, and other ingenious displays, started from the college campus at 12:30 o'clock p. m. and toured the city. The main pike opened at 3 o'clock. Besides the various amusement devices on the pike, the rodeo, follies, minstrel show, farmers' vaudeville, and the dance contributed largely to the entertainment of the crowds. Considerable interest was shown in the educational exhibits which were prepared and displayed by the students of the various departments in the division.

President Farrell was the first speaker on the program and gave a brief description of the experimental work of the Agricultural Experiment Station. He pointed out that corn is the only purely native cereal grass plant in Kansas and that all others have been brought in from other regions of the Central States and from foreign countries, that they have been adapted and are still being adapted to Kansas conditions by the work of the scientists connected with the agricultural experiment stations. Prof. J. H. Parker, chief investigator in wheat varieties work, explained the tedious method by which wheat varieties are crossed, selections of the resulting hybrids made, and new varieties eventually developed. John H. Martin of the Office of Cereal Investigations, Bureau of Plant Industry, United States Department of Agriculture, in a short talk com-



FIFTH ANNUAL AG FAIR—LOOKING SOUTH ON THE PIKE

The fair is an annual event organized and conducted by the students of the Division of Agriculture. Its major purpose is to teach organization and team work, both of which are important factors in the training of college students. Each member has a definite job and responsibility assigned to him and the success of the fair depends on the efficiency of this organization.

FIRST ANNUAL AGRONOMY FIELD DAY

The first Annual Agronomy Field Day was held on the Agronomy Farm, Saturday, June 11, 1925. About 500 people attended, coming from counties as far west as Phillips and Jewell and as far east as Leavenworth. Preceding the program at 1 o'clock, the college furnished ice cream and coffee which supplemented the basket lunch brought by the visitors.

mended the work being done by the Kansas station and the excellent co-operation extended to the United States Department of Agriculture. L. E. Willoughby, extension crops specialist, in discussion of leguminous crops, pointed out the need of such a crop as sweet clover in the rotation of Kansas crops. The history of the Agronomy Farm was interestingly outlined by Prof. R. I. Throckmorton, head of the Department of Agronomy and chief sponsor of the Field Day.

The men were conducted in squads over the Agronomy Farm to the various experimental plots. The experiments that were of particular interest to the farmers were alfalfa varieties, wheat on alfalfa ground, varieties of wheat, stages of cutting alfalfa, sweet clover, sorghum varieties, oat varieties, small grain improvement, smut control demonstration, rate-and-date-of-seeding corn, and demonstra-

tion of the creosote barrier in controlling chinch bugs.

The women visitors enjoyed a very pleasant and practical afternoon in Calvin Hall under the direction of Miss Amy Kelley, well known and popular head of the extension specialists in home economics.

RADIO STATION KSAC IS MAKING A RECORD

Radio Station KSAC will carry valuable information to countless thousands this winter. Its third year promises to be a banner year. The project is truly a wonderful extension enterprise and every citizen of Kansas should have some acquaintance with the program. Detailed information may be secured by dropping a post card to Radio Station KSAC, Manhattan, Kan., and requesting a copy of Extension Bulletin 51. The following outline of the program will be of interest:

Rural School Program

9:00 TO 9:25 A. M.

The first ten minutes of this period is usually devoted to a musical program, followed by five minutes each devoted to inspirational talks, an agricultural primer, and calisthenics.

Housewives' Half Hour.

9:55 TO 10:25 A. M.

This period presents interesting readings and discussions of numerous problems of special interest to women.

Noon Day Program

12:35 A. M TO 1:30 P. M.

12:35 TO 1:05 P. M.

A program is being given during this half hour that will be both cheery and helpful in thousands of homes. Readings, timely agricultural talks, and questions and answers will be included regularly.

Matinee Program

4:40 TO 5:00 P. M.

This is distinctly a new period for the radio station. Home study courses, high school credit courses, and programs for women's clubs are being presented. The Wednesday afternoon programs are devoted to athletics.

College of the Air

6:30 TO 7:30 P. M.

The big evening hour presents the climax of each day's program. Opportunity talks, home study radio courses, college credit courses, and extension courses make up regularly the most substantial and worth-while hour's program ever broadcasted.

A Five-Day Schedule

The regular programs briefly outlined above are given five days each week, Monday to Friday, inclusive. It is impossible to estimate the possibilities or even the immediate value of this new and wonderful service.

VOCATIONAL TEACHERS HOLD ANNUAL MEETING

The annual vocational education conference was held at the college June 4, 5, and 6, and was considered by those attending as the most successful conference yet held.

Sessions of the agricultural section of the conference opened Thursday morning in the east wing of Waters Hall with an address by Pres. F. D. Farrell. He spoke on "The Personal and Technical Requirements for Agricultural Success" stressing the need for vocational agriculture teaching as essential to progress in farming generally. Following the president's address, the program of talks by high school teachers and members of the Department of Education began and continued through the morning and afternoon sessions. Round table discussions were held on a number of topics.

The banquet for vocational agriculture teachers was held Thursday evening in the community house and was so successful that those in attendance voted to make it a feature of each annual conference. Prof. C. V. Williams acted as toast master. Short talks were given by C. M. Miller, state supervisor of vocational education; Lawrence Parker, teacher training agent for trades and industries at Pittsburg; and L. B. Pollom, state supervisor of vocational agriculture. Music was furnished by the Harmony Male Quartet of Manhattan and a stunt was given by the "Neophytes," graduates from the college this year who will go out to teach vocational agriculture next fall.

Other speakers from outside the state who contributed to the success of the conference were: Dr. C. A. Prosser, director of the William Hood Dunwoody Institute, Minneapolis, Minn.; and Dr. H. J. Waters, editor of the Weekly Kansas City Star.

G. E. Taylor, '23, was granted the degree, M. S., from the Michigan Agricultural College in June, and is now working as a dairy specialist in that institution. George crossed another mile-stone last August when he qualified for the Ag Married Men's Club.

HONOR ROLL, 1924-25

Fifty three students in the Division of Agriculture during the college year, 1924-25, received special commendation for outstanding achievements in scholarship. Each of these students carried on regular assignment not less than sixteen credit hours of work each semester, had no delinquencies against him throughout the year, and made a total of not less than fifty points on his two assignments, according to the K. S. A. C. point system.*

The three highest ranking students in each class were given special mention as winners of high honors. The names and home addresses of the group winning "high honors" and the group winning "honors" are given below.

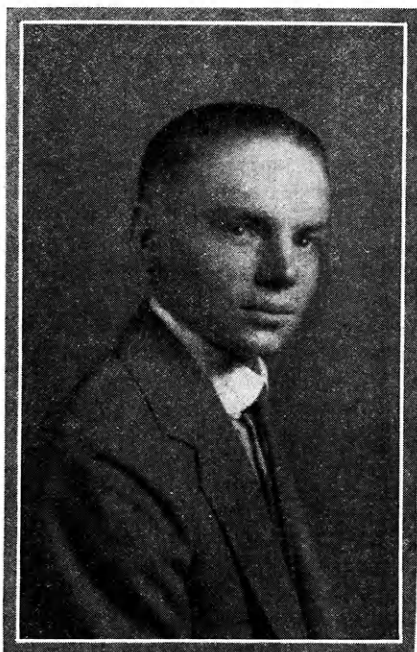
High Honor Roll, 1924-25

Seniors	Home P. O.	Credit hours passed	Total points
Walter Wisnicky	Green Bay, Wis.	33	96
G. F. Ellis	East Las Vegas, N. M.	37	86
W. J. Daly	Tucson, Ariz.	33	66
Juniors			
Lionel Holm	Denmark	39	107
C. M. Murhpy	Tahmaga	38	93
A. G. Jensen	Neodesha	34	93
Sophomores			
H. H. Brown	Edmond	42	104
Russel Reitz	Belle Plaine	36	104
E. I. Chilcott	Manhattan	39	91½
Freshmen			
Harold E. Myers	Bancroft	37	98
C. P. Crews	Elk Falls	40	9½
James L. Blackledge	Sheridan, Wyo.	37	77

Honor Roll, 1924-25

Seniors	Home P. O.	Credit hours passed	Total points
R. L. Anderes	Kansas City, Mo.	37	61
A. I. Balzer	Inman	33	55
F. A. Hagans	Augusta	35	51
A. A. Haltom	Alden	34	65
W. H. Hukriede	Cleburne	37	56
J. R. Wood	Trousdale	37	63
Juniors			
Austin Brockway	Olathe	38	80
Harold Brodrick	Osborne	35	68
Paul M. Brooks	Columbus	35	80
R. R. Cameron	St. George	38	50
H. M. Cary	Ogden	33½	53½
Fred P. Eshbaugh	Manhattan	35	60
Robert W. Fort	St. John	36	59
Mary E. Haise	Crowley, Colo.	35	65½
L. B. Harden	Centralia	42	86
A. C. Hoffman	Abilene	36	74
Ralph M. Karns	Ada	34	68
W. J. Kraus	Hays	36	56
J. H. Shirkey	Madison	34	68
Zaven K. Surmelian	Ecole, Armenia	40	83
G. K. Terpenning	LaPryor, Texas	40	80
R. von Trebra	Oswego	37½	71
Norman N. Weberg	Salina	35	62

Sophomores			
M. I. Atkins	Manhattan	35	82
Paul Axtell	Argonia	36	59
B. Lowell Barr	Manhattan, R. R. 3	36	56
T. Lovell Barr	Manhattan, R. R. 3	36	62½
C. R. Bradley	Mayetta	37	65½
C. M. Carlson	Lindsborg	36	75
Kenneth W. Enechtel	Larned	38	68
Karl W. Niemann	Muskogee, Okla.	39	79
Collins W. Thole	Stafford	37	85
James R. Wells	Bolivar, Mo.	37	69
Freshmen			
Vernon C. Ahnquist	Great Bend	38	62
Howard W. Hillee	Full River	36	71
Rognar N. Lindburg	Osage City	37	63
LeRoy E. Melia	Lord	37	69
Edward A. Sorensen	Iron	38	74½
Loren F. Ungeheuer	Centerville	37	53
George B. Wagner	Whiting	37	72
Special			
George R. Mahan	Toronto	32	52

**HAROLD E. MYERS**

S. Lynn Copeland, '22, is assistant professor of dairy husbandry at the South Dakota Agricultural College, Brookings. On the college faculty he is classed among the newlyweds.

Carl F. Huffman, '17, is beginning his fourth year of research in dairy nutrition in the Agricultural Experiment Station of Michigan, East Lansing. A recent quarterly bulletin of the Michigan Agricultural College contains four pages on the mineral metabolism work with dairy cattle that has been carried on there under his direction.

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

Is Quicker Turnover in Beef Cattle Advisable?

H. Wayne Rogler, '26

There has been considerable comment in the past few years in regard to a quicker turnover in beef cattle, yet little attempt has been made to substantiate the facts by an argument for the handling of younger cattle. This article is the result of data kept on several thousand head of yearling steers and compared to similar data on older cattle for the seasons of 1924 and 1925. The territory covered includes sections of Chase, Butler, and Greenwood counties. That particular section of Kansas is well known for its cattle-grazing value.

The summer of 1924 was a little unusual, due to almost ideal seasonal conditions. An abundance of grass, cool weather, few flies, and plenty of well-timed rains increased gains somewhat over other years. Large cattle, especially three- and four-year olds, showed no profit in many cases, and seldom did their profits compare with those on yearlings. While the profit from young steers was small, losses were very rare.

Good-quality Hereford yearlings, purchased in the panhandle districts of Texas and put on Kansas grass in April, 1924, showed an average gain of from 250 to 300 pounds during the summer. Figuring summer grazing at \$5 per head, plus the interest and marketing charges, these cattle ordinarily showed a profit of from \$2 to \$5 per head. Three- and four-year old steers showed a summer gain of from 300 to 400 pounds. The grass cost was approximately \$9 per head, and considering interest and marketing charges very few herds showed any profit; in many cases there was a loss.

On wintered cattle there was a heavy loss in practically all cases, due partly to a high feed bill during the winter of 1923-24 and partly to the price paid for the cattle in the fall of 1923. On comparing the figures on winter yearlings with those of more mature wintered steers, it was found that the yearlings not only made cheaper winter gains but their summer gains compared favorably with those of the older cattle.

In the feedlot the young cattle again proved

more profitable compared with two- and three-year old steers. Calves weaned in October, fed on alfalfa hay until December, and then given a full grain ration netted a profit of from \$5 to \$8 per head. While older cattle could not be compared on exactly the same basis, most of them fed to overcome a loss at the end of the grazing season made little or no profit.

As to the best method of handling young cattle, records show a decided advantage in feeding them for baby beef over that of selling them as calves or as yearlings off the grass. Undoubtedly, the tendency for the next few years will be to feed calves, especially so with men in the grazing region herein discussed who were successful in the winter of 1924-25. In fact if the demand for feeder calves continues to increase as it has in the past, it will probably pay the men who raise the better quality cattle to sell their calves at weaning time rather than take the chance of feeding them out. The same fact holds true for the better grade yearlings.

Because of widely different conditions and variation in quality of cattle and in feeding methods, these results would not hold true in all cases, but as a whole they are very representative for the territory which they include, and are an indicator of the general trend in those sections of the country in which livestock farming is practised extensively.

John I. Rogers, '25, is farming near Buffalo, Okla.

H. A. Pennington, '09, Hutchinson, Kan., Route 3, was an exhibitor of Holstein cattle at the recent State Fair at Hutchinson. He is a substantial and successful farmer of Reno County.

Hubert L. Collins, '23, is teaching vocational agricultural in the Westmoreland Rural High School. He spent the summer doing graduate work in agricultural economics at the University of Wisconsin, Madison.

Soybeans in Kansas

E. B. Coffman, '27

Although soybeans have been grown in Kansas for more than 30 years, very little interest was taken in their production prior to the last decade. In 1918 there were 10 acres of soybeans reported in Kansas, while in 1923 the acreage had increased to 26,700, distributed over various farms in 14 counties. The phenomenal increase is due largely to the work carried on by the Agricultural Experiment Station and the Agricultural Extension Service of K. S. A. C. showing the high value of soybean hay and grain as livestock feed, and the ability of soybeans to increase the nitrogen content of the soil by the aid of the nitrogen fixing bacteria on the roots of the plant.

Soybeans can be grown in the eastern part of Kansas. In that section they may be grown for hay and grain, both with corn and alone. In order that the fixation of nitrogenous nodules on the roots may take place, the proper

bacteria, *Bacillus radicicola*, must be present in the soil. On new land it is usually necessary to inoculate the seed. The use of a prepared culture is perhaps the most satisfactory way of doing this, although the seed may be mixed with fine dry soil from a field that has grown soybeans and is known to be inoculated. In some cases the finely pulverized soil is mixed with water and sprayed over the seed.

It should be borne in mind that if the proper bacteria are not present in the soil when the plant starts its growth, the plant will obtain its nitrogen from the soil and not from the air, and in that way decrease rather than increase the amount of available nitrogen in the soil.

There are eight varieties of soybeans recommended for planting in Kansas. These are Haberlandt, Morse, A. K., Manchu, Virginia, Wilson, Midwest, and Peking. Of these vari-

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THE ART CRAFT, Manhattan, Kansas
Over Manhattan Mutual Life Insurance Co.
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eties, A. K. has proved to be one of the highest yielders of grain and hay at Manhattan. The Virginia is distinctly a hay variety and because of this use there is usually a special demand for the seed.

Kansas farmers are giving more thought to soil fertility each year. Wherever soybeans can be grown successfully their value in increasing the nitrogen content of the soil will give them a large place in the crop rotation.

DR. WATERS' CONTRIBUTION

(Continued from page 5)

the home garden and a varied diet for young growing children on the farm.

Another line of investigation in which Dr. Waters was a pioneer was the study of effect of time and frequency of cutting perennial forage plants upon the permanency of the stand of these crops. Doctor Waters had been impressed while professor of agriculture in Pennsylvania State College with the fact that Pennsylvania farmers who harvested their timothy in an immature condition for the use of livestock on the farms soon depleted their meadows; while other farmers who marketed their hay and allowed the crop to mature before harvesting retained their meadows in excellent condition for many years. This led to the discovery by Dr. Waters and his co-workers that timothy, during the latter period of its development stored in the bulbs of the plant at the surface of the ground a reserve supply of plant food for the use of the plants the following year. For this reason, such plants when harvested in an immature condition soon become exhausted and die.

It was at Dr. Waters' suggestion that similar investigational work on alfalfa was started at the Kansas Agricultural Experiment Station which has demonstrated conclusively that alfalfa cut too frequently is soon exhausted; that stands are quickly ruined by frequent cutting; and that delayed cutting which allows the alfalfa to mature after harvest is an aid in retaining a profitable stand. Thus Dr. Waters' researches on timothy contributed indirectly to the knowledge available to every alfalfa grower in Kansas of the effect of the time of cutting on the permanency of the stand.

To close this brief statement without mentioning the one outstanding quality that contributed so much to Dr. Waters' ability as a leader in and director of agricultural research

would be to neglect to mention one of his greatest personal characteristics, that friendliness. Dr. Waters was a sincere and true friend. He was interested in the welfare of others and especially those with whom he was thrown in contact in his college work. A young member of the college faculty in speaking of this quality said, "I always felt free to go to Dr. Waters for counsel and advice. His advice was usually good and I always knew that as far as he could determine his advice was always for my best interest."

Dr. Waters' friendship and his deep personal interest was not confined to the people in his particular walk in life. Laboring people who had served him were never forgotten. Just this last summer when Dr. Waters came to the college to deliver the summer school commencement address he had me wait at the railroad station while he got out of my automobile to greet a man who had faithfully served him as a cab and taxi driver while he was president of the college. It was acts of this kind that endeared Dr. Waters to all who knew him. It was this spirit of friendliness that made him such an effective leader of men and enabled him to contribute so much to agricultural research.

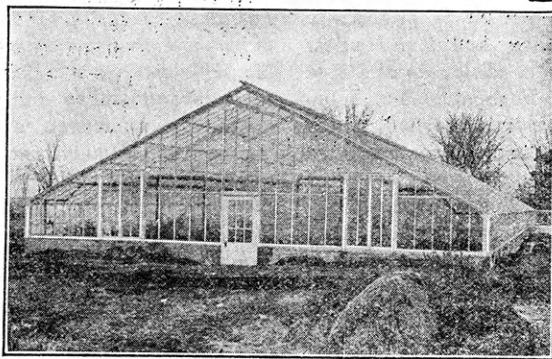
APPLE GROWING

(Continued from page 8)

The growers are correcting many mistakes made with older plantings, especially in regard to the choice of varieties and the methods of pruning. Ben Davis, Missouri, Gano, and other varieties of comparatively low quality are being supplanted by Jonathan, Winesap, Grimes, Stayman, and Delicious which rank among the high-quality apples now under cultivation.

Judging from the extent of new plantings and the better care given bearing orchards, together with the progress of the growers in better orchard practices, one can safely forecast that Doniphan county has an especially bright future before it as an apple growing section. The region gives promise of becoming one of the foremost apple-growing regions of the country, one of which Kansas may justly be proud.

Raymond Campbell, '20, is a prominent and successful dairy farmer near Parsons, Kan. He is treasurer of the board of education of the Labette County Community High School.



How Would You Like to Take 5 or 6 Thousand Dollars From a Piece of Land 60x300?

NOT take it once, but year in and year out,
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You can do it with a greenhouse growing flowers.

Figures will plainly show you that for an equal
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in the money returns.

Write home about it.

Let's all get-together and talk it over.

More and more every year, college men are going
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Don't know of one who isn't making good money
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If interested write to the Manager of our Service
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Philadelphia
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Chicago
St. Louis
Greensboro

HAZFORD PLACE

(Continued from page 6)

tle on Hazford Place do well under these conditions.

Except in rare cases of Hemorrhagic Septicemia and pneumonia, disease is practically unknown on Hazford Place, and Mr. Hazlett attributes this fortunate condition to the free open pasture and God's fresh air. Yet I believe there is another factor concerned, which is the constant and careful supervision given to the cattle on pasture.

In the afternoon I studied the buildings and equipment. Again it was evident that everything was well cared for. The manager's residence is a large comfortable building sheltered by tall trees, as is also the boarding house for employees—proof enough that Mr. Hazlett cares well for those men who in turn shoulder the responsibilities of caring or such blue bloods as the offspring of Beau Brummel, Don Carlos, and Bocaldo 6th, and such cows as The Lady Ileens, The Blosses, The Lady Baltimores, the Hazford Lassies, and their progeny.

The barns are spacious and practicable, and I was impressed with the convenient layout of the buildings and lots. Pens surround the barns warranting that important factor, exercise. These pens have been erected so as to be convenient, and in the corners of each are large drinking troughs, each trough incidentally serving as a watering place for four lots. Hay racks and feeding troughs are scattered through the various lots, and in each lot there is an open shed which serves as shelter or shade during adverse conditions. Among other buildings are two elongated structures with rounded corrugated iron roofs. In side them are stalls conveniently arranged for bulls, and as I passed through one, a man was busy "bedding down" with fresh clean straw.

Three large silos are centrally located, and in close proximity to them is a grain elevator where all the grain is stored. There is also a mill where all the feed is prepared, the oats rolled, and the corn ground. For still further feed preparation a cook house has been built, and is well fitted with boilers and the necessary equipment. Yet another building that interested me was that which is evidently the show room. It is fitted with stocks, lifting pads, and the necessary contrivances for hand-dressing and show preparation work.

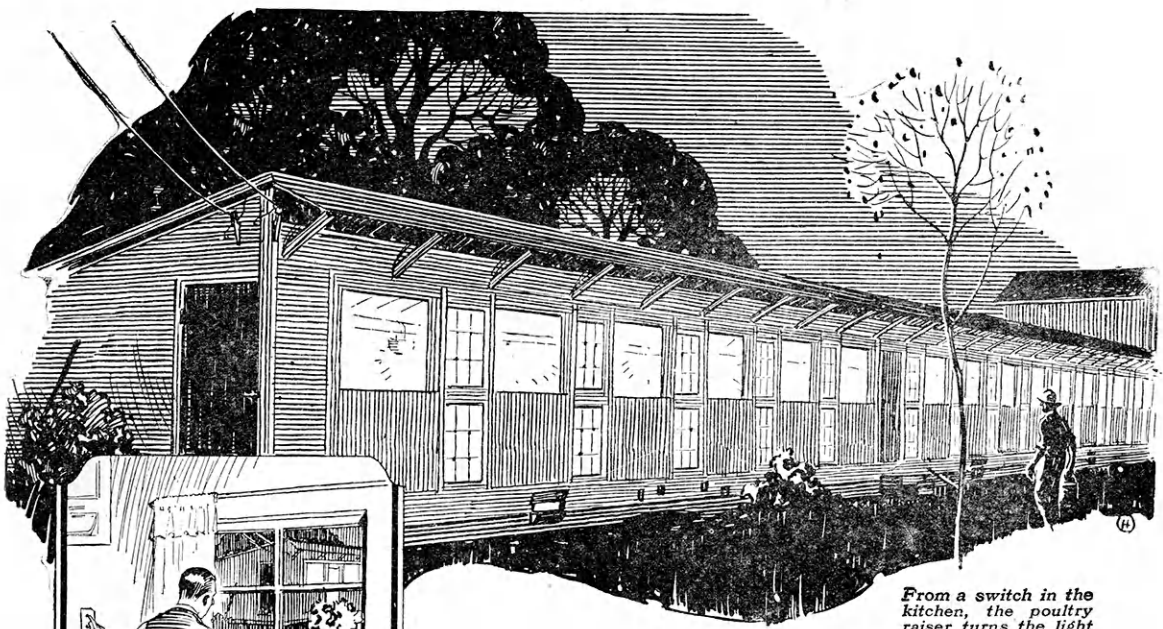
Everything is convenient and well kept, the barns are scrupulously clean, as are also the lots. The fences too are strong, well kept, and neat, indicating that pride is taken in the farmstead as well as the cattle. Hazford Place has been carefully laid out, and is the result of careful thought by an experienced farmer. Mr. Hazlett has studied two conditions carefully, practicability and efficiency, and thirdly there is another feature that strikes the eye of the visitor; namely, economy. The buildings, although substantial and serviceable, have been erected economically, and there are no signs of the "check book farmer" on Hazford Place. The buildings are within the reach of many farmers' pocket books and Hazford Place is a striking example of efficiency and pride of ownership.

Who could fail to be impressed by the interest that was shown in Hazford Place and Hereford Field Day? Prominent men in the livestock industry and in other industries had journeyed to Hazford Place to pay tribute to the master breeder, Mr. Hazlett. There were representatives from the large packing plants, from the railroad companies, from several agricultural colleges, from many states, and also from individual farms.

The program arranged for the afternoon was inspiring, and Mr. Hazlett's speech will long be remembered by those present. Other speakers from various parts of the country, representing different interests, endorsed each others remarks in paying tribute to Mr. Hazlett and his cattle. Mr. Hazlett must have been a proud and happy man to think that his life's work was appreciated by so many.

Alas! the day passed all too quickly. Who can study the conditions that exist on Hazford Place in one day? It needs a week, a month, even a year; yet even so, the impressions gained are lasting. Hazford Place shall always stand high in the annals of the Hereford history. The owner, as President Farrell of K. S. A. C. so admirably said, "is one of the finest representatives of the finest ideals," and in the words of Dr. Waters is, "A great constructive breeder." Hazford Place and Hazford Herefords are models for present and for future breeders. What a contribution to American agriculture and to that of the world!

Old men and young men saw Hazford Place saw the Herefords, and heard from the lips of Mr. Hazlett of his life's task. All were inspir-



From a switch in the kitchen, the poultry raiser turns the light on and off in the poultry house.



More light— more eggs

Eggs command the highest prices in the winter when the hens lay the fewest.

By using electric light to prolong the day in the hen houses, many poultry raisers are increasing their winter output of eggs and thus increasing their profits.



Wherever opportunity offers, the General Electric Company is devoting its resources to finding the best way to use electricity.

Electricity is also extensively used in some sections of the country for heating incubators and brooders.

GENERAL ELECTRIC

ed and deeply impressed. Each one went away feeling the richer for what he saw.

Our ideals and ambitions have been strengthened by this visit to Hazford Place, and with such men in the lead as Mr. Hazlett, can we fail to follow?

THE CHILD LABOR AMENDMENT

(Continued from page 7)

amendment which will give Congress the power it now lacks to legislate or to bring about a minimum standard of child protection in the United States.

It is of course understood that many of these children are working because of an economic need, but in many cases the conditions under which they work need regulation.

Since the boys and girls of today are to be the men and women of tomorrow and are to be depended upon to meet life's problems, they should be given every opportunity to grow and develop physically and mentally. "This, it is believed, cannot be done when they are required to work long hours in undesirable surroundings and at a tender age.

A Texas newspaper tells of a cotton-picking contest between boys five years old. One youngster picked 2,002 pounds of cotton between August 29 and November 2, his best day's work being 81 pounds. The parents of another boy five years old boasted that he had averaged 50 pounds a day during the season.

In New Jersey 1,044 children were absent from school during all of September and October in one school district alone because they were working in the adjacent cranberry bogs. According to the Philadelphia Bureau of Compulsory Education these children picked berries 10 hours a day crawling through marshes on hands and knees and bunking at night in 7- by 9-foot shacks shared with four or five others.

These are some of the reasons why child labor legislation seems necessary.

On the other hand there are those who drastically oppose the amendment. Among the most common objections are: First, the regulation of child labor is a local and not a national matter. Every state has power to protect the children from industrial oppression and it is better for this duty to be performed by the State Legislature than by Congress. Second, that the amendment would tend to make loafers of their children by restricting them from work and that there is already too

much idleness. Third, that Congress would take the liberty of creating a so-called Congressional mother to step between the child and its parents. Fourth, that the amendment is socialistic and will tend to make Bolsheviks of their children. The socialist idea is carried because some of the promoters of the amendment are socialists. They point to Owen R. Lovejoy who is a socialist and friend of Eugene Debs. Also to Miss Grace Abbott who comes from Hull House which they contend is a "hot-bed of socialism."

So far as the arguments offered for the amendment are concerned, it is generally thought that little harm would probably come from the adoption of the amendment, and the arguments seem well founded. On the other hand the opposition seems to have gone to extremes and imagined that Congress is going to go the full limit of its power and enact laws which will entirely destroy the relation between child and parent. The propaganda in opposition must have been well spoken so far as legislators are concerned, because only one state, Arkansas, has ratified the amendment to date.

CONDUCTING A SOIL SURVEY

(Continued from page 10)

completed and the map is made, the map is then sent to the Bureau of Soils. Photographs are taken of the map, and the original copy is sent back to the fieldmen for coloring. All the maps that are published are colored the same as the original map.

It is also the duty of the field men to write a rather extensive report when the field work is complete. In this report is contained a description of each soil type and a discussion of the history, climate, and agricultural conditions of the area. This report in connection with the map is frequently printed in bulletin form.

Edward Shim, '16, has resigned his position as head of the Department of Agronomy of Canton Christian College to become technical adviser on fertilizers for Bruner, Mond & Co. (China) Ltd. His headquarters are Shanghai and his work is largely both instruction and demonstration work among Chinese farmers.

William K. Evans, '05, is a successful farmer and stockman near Goodland, Kan.



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SUNLIGHT AND HEALTH

(Continued from page 12)

ultraviolet light treatment is not dangerous as X-ray treatment sometimes is. The X-ray, in the hands of an inexperienced operator, may produce serious burns deep in the tissues which are difficult to heal. The most serious injury that can be obtained from ultraviolet light is no worse than a severe sunburn, and will heal in a few days.

One of the very interesting discoveries in connection with ultraviolet light is that it will produce Vitamin D in many food substances by merely exposing them to the light for a few minutes. Ordinary grain, such as wheat and corn, will develop enough Vitamin D with a few minutes exposure to the light of a mercury arc lamp to keep young animals from developing rickets. In this way cottonseed oil or olive oil can be made as valuable as cod-liver oil so far as preventing rickets is concerned.

From this it may be seen that ultraviolet light can bring about the chemical changes necessary for bringing Vitamin D in the non-living as well as in the living tissues. So far as Vitamin D is concerned the individual may take the ultraviolet light treatment or have his food treated.

These new discoveries will, undoubtedly, do much for both children and adults in the future and it is not too much to expect that in the very near future homes, factories, and offices may be lighted with light that contains a sufficient amount of ultraviolet light to keep their occupants in as good health as if they were to live out in Nature's out of doors.

E. C. Smith, '25, is county agricultural agent of Marion County, Kan.

C. C. Huntington, '25, is farming near Eureka, Kan.

Preston O. Hale, '16, visited K. S. A. C. June 17. Preston is county agricultural agent of Goodhue County, Minn. His post office is Zumbrota.

Lester J. Bell, '15, is Kansas and Oklahoma salesman for Collis Products Company, Clinton, Iowa. Dried buttermilk, used largely for poultry feeding, is their only product. His address is 522 East 5th St., Ottawa, Kan.

GREAT MEN AND SINGING BIRDS

"As I think of Isaak Walton I am reminded of his haunts, particularly along the Valley of the Itchin, where he whipped the waters with his fly for trout, and the fact that there lives today another very famous fly-fisherman who but a few years ago, for a brief period, represented his country over here — Lord Grey, who at the time he occupied the post of Foreign Secretary in England, received from England's ambassador to this country, at that time Mr. Bryce, a communication, a rather unusual diplomatic communication from the then President of the United States, saying that the President of the United States expected to reach England about a year and a half later, and that he wanted very much to hear English birds sing. He knew of them as specimens in a museum, he knew of them in literature, but he had never heard them sing. He had a very limited time and could Mr. Bryce secure through the Foreign Secretary in England some ornithologist who would take him directly to where he would hear birds sing.

"Sir Edwin Grey replied through Mr. Bryce that he was an English ornithologist and he would be delighted to take Mr. Roosevelt on a walk where he might hear English birds sing. So he planned a week through the Valley of the Itchin, where Isaak Walton fished, and then through the New Forest.

"Here there were two noted men of their generation, one President of the United States and the other the Secretary for Foreign Affairs of England, who had a sufficient interest in birds to plan for a year and a half ahead a day when they might quietly be together in English fields, woods, and copses to hear birds singing.

"There must, I think, be some real reason for this desire, and I feel that back of that reason there is as yet unrealized value of bird to man, and when a bird singing can bring to us a message of the day, of the season, of the year, of some association, bird life then will have a value to us not to be expressed economically but through a sentiment which is not to be measured by existing commercial values."— Dr. Frank M. Chapman in an address to The New York Farmers.

E. L. Reichart, '24, is instructor in dairying and manager of the college creamery at the University of Nebraska, Lincoln.

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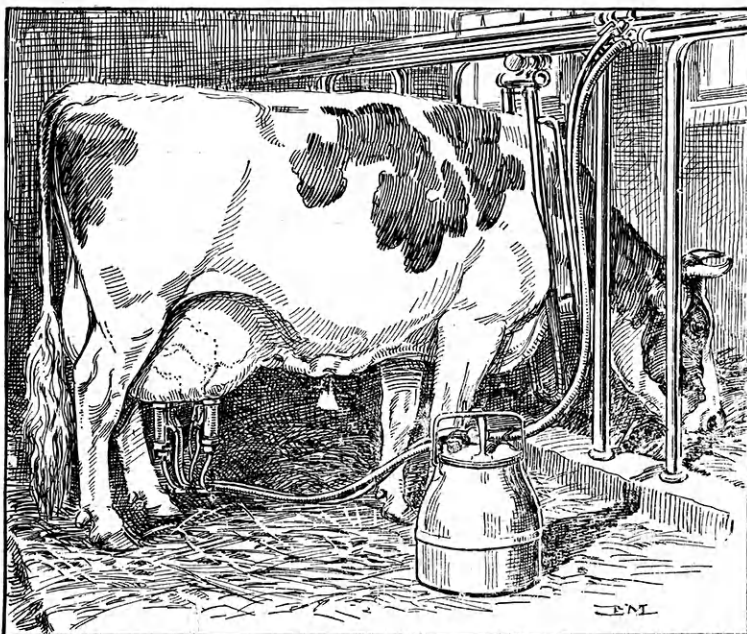
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