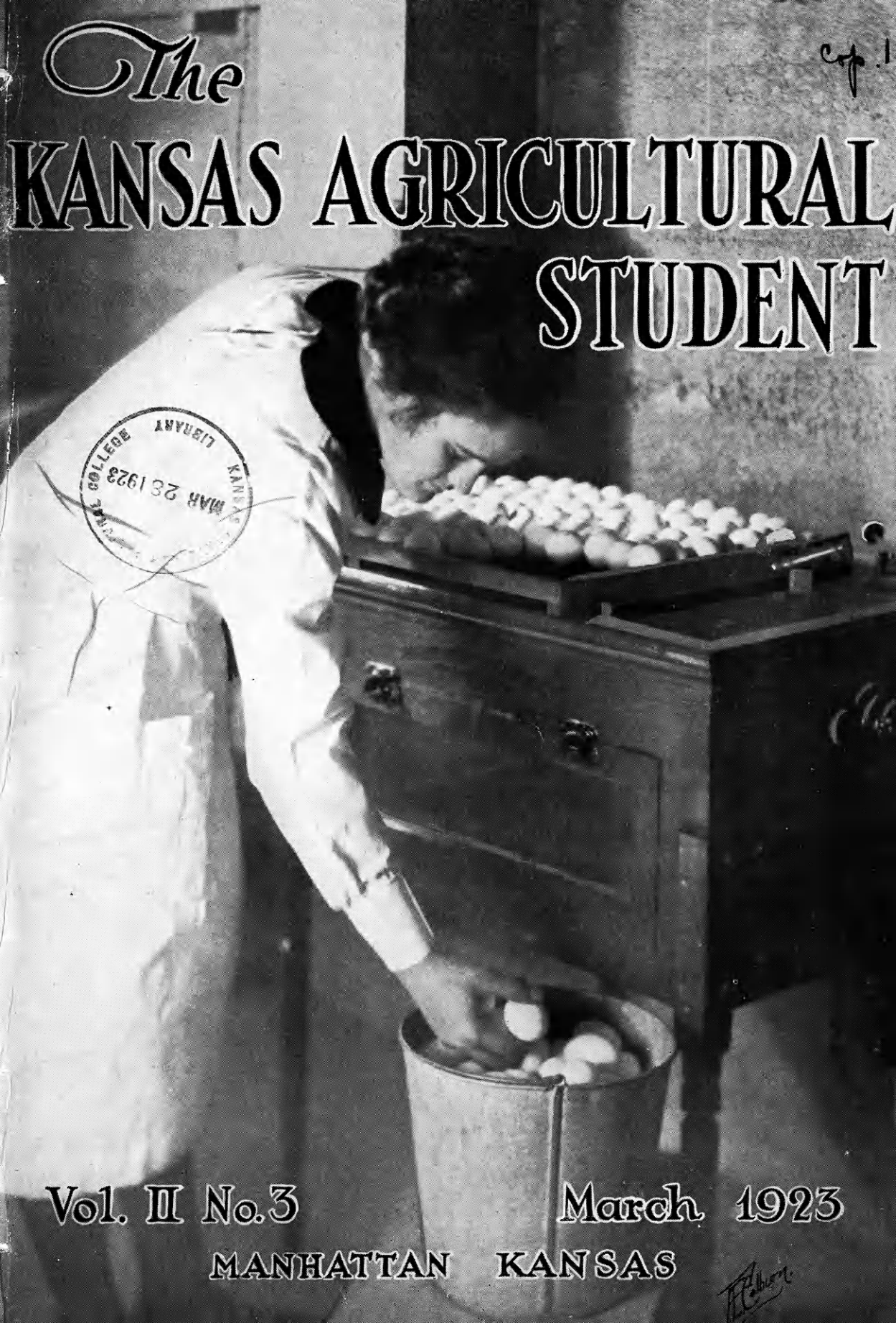
The KANSAS AGRICULTURAL STUDENT



Vol. II No. 3 March 1923

MANHATTAN KANSAS

A Practical Reminder for Everyday Farmers

You know your farm like a book. Whether it covers 80 acres or 320 acres, you are perfectly familiar with every corner of every field. You know the lay and contents of the buildings that make up your homestead. With your eyes shut you can tally the livestock and all the items of farm equipment. To be well posted on these things is a matter of pride with you and a matter of careful management besides.

This policy could well be carried a step further. Profitable, economical farming is so largely a matter of modern, improved machines that every good farmer should keep posted also on the equipment on the market so that when occasion arises he may invest to the very best advantage by the purchase of new machines.

We are therefore printing here for your information the list of standard, reliable, most popular farm equipment—

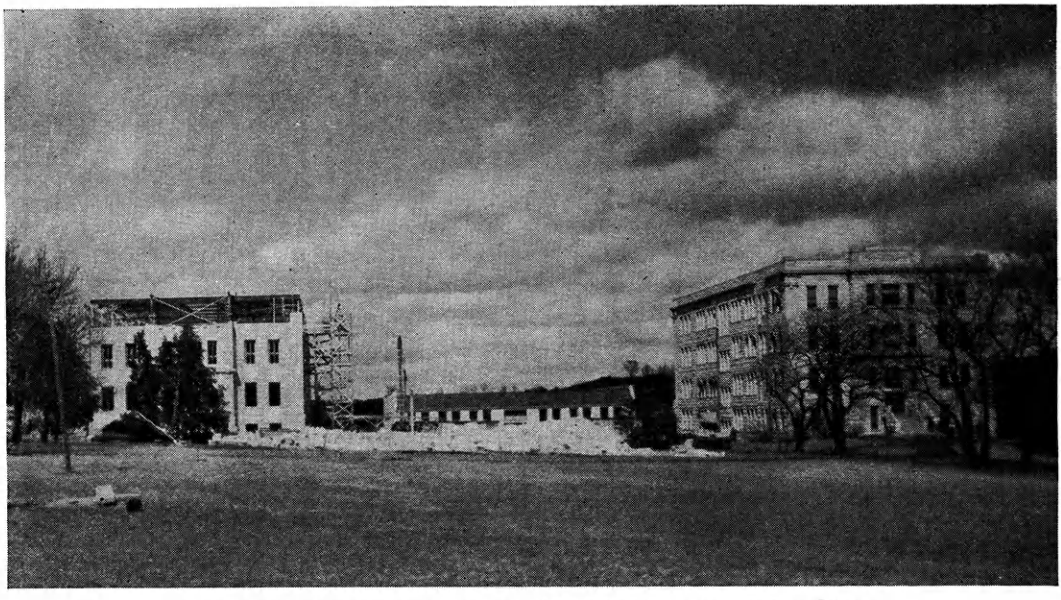
THE McCORMICK-DEERING LINE *of* FARM OPERATING EQUIPMENT

Grain Binders
Threshers
Harvester-Threshers
Headers
Push Binders
Mowers
Hay Rakes
Tedders
Hay Loaders
Side-Delivery Rakes
Sweep Rakes and Stackers
Combined Side Rake and Tedder
Baling Presses
Corn Planters
Listers
Corn Cultivators
Corn Binders
Corn Pickers
Corn Shellers
Ensilage Cutters
Huskers and Shredders
Huskers and Silo Fillers
Beet Seeders
Beet Cultivators
Beet Pullers
Cotton Planters
Grain Drills
Lime Sowers
Broadcast Seeders
Tractor Plows
Walking Plows
Riding Plows
Disk Harrows
Spring-Tooth Harrows
Peg-Tooth Harrows
Tractor Harrows
One-Horse Cultivators
Culti-Packers
Kerosene Engines
Tractors
Motor Trucks
Cream Separators
Manure Spreaders
Stalk Cutters
Feed Grinders
Stone Burr Mills
Cane Mills
Potato Diggers
Wagons
Twine

This equipment is always available for you at the store of the McCormick-Deering dealer. In the list are many items for farming in winter—such as engines, various belt power machines, cream separators, motor trucks, etc. Make the McCormick-Deering dealer's store your headquarters. Use the service for which his establishment is famous. Write us direct for information on any of the above machines.

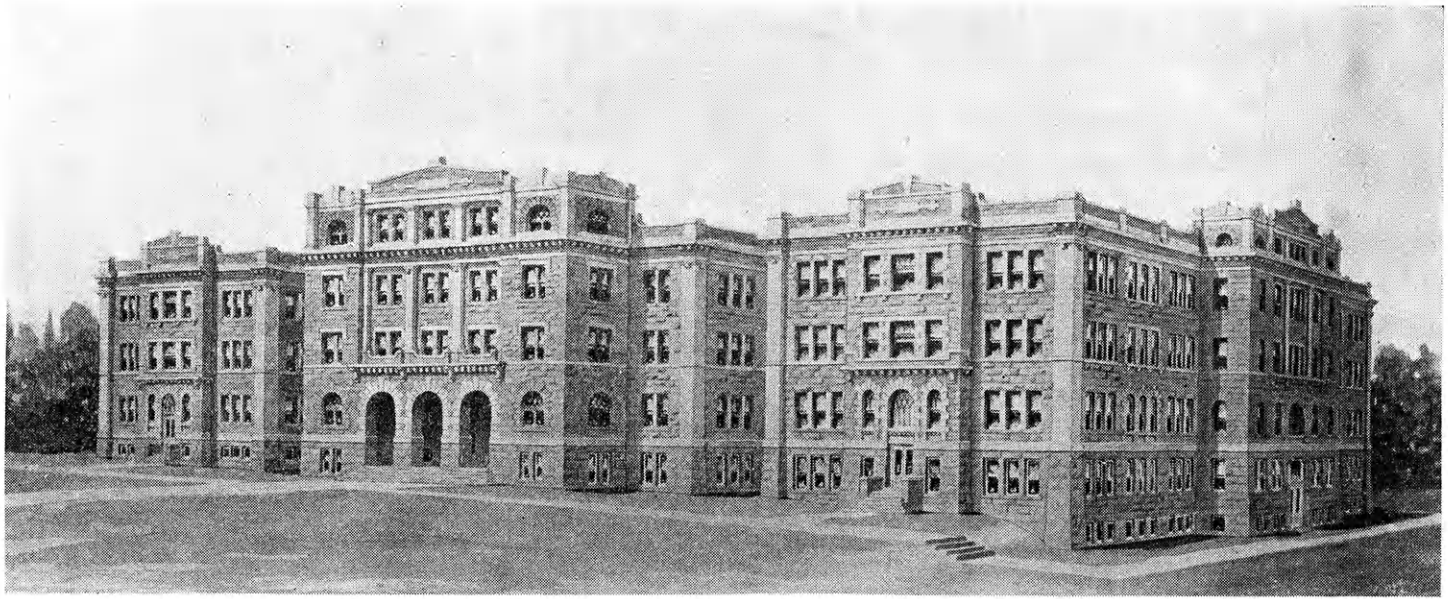
INTERNATIONAL HARVESTER COMPANY
Chicago of America (*Incorporated*) U S A

93 BRANCH HOUSES AND 15,000 DEALERS IN THE UNITED STATES



WATERS HALL, UNDER CONSTRUCTION, MARCH 6, 1923

CONTENTS



WATERS HALL

The above picture represents Waters Hall as it will look when completed. The east wing was built in 1912. The construction of the west wing is well under way as may be seen by the picture on the preceding page. In general appearance the two wings are alike. The finish is the usual rock finish common on the college campus, but the trimming of Bedford stone is peculiar to Waters Hall. Each wing is 80 feet wide by 169 feet long and four stories high. The west wing, however, is superior to the east in construction, it being an entirely fire-proof structure. It will be provided with a hydraulic lift for the Department of Dairy Husbandry and an automatic electric freight elevator. The completion of the new wing will provide substantially enlarged quarters for the work of the Division of Agriculture.

The opening of the college year, 1923-24, should bring the largest enrollment of freshman students to the Division of Agriculture that the institution has ever had.

The Kansas Agricultural Student

VOL. II Manhattan, Kansas, March, 1923 NO. 3

The Feed and Care of Baby Chicks

Fred D. Strickler, '24

Chicks taken from the incubator or mother hen should be placed at once in a brooder or other warm place and should not be fed solid food until 48 hours after hatching. It is best to give them buttermilk within a few hours after hatching. They can be made to drink by pushing their beaks in the buttermilk. At all times milk or buttermilk should be before them.

The brooder should be clean and the temperature steady at about 95° F. on chick level. The room should be well ventilated, yet free from drafts. The capacity of the brooder should not be overcrowded and the openings should be sufficiently large to prevent jamming. Plenty of room is required for healthy vigorous chicks. None but good brooders should be used. In the main, coal burners are the most satisfactory. For commercial purposes units accommodating three or four hundred chicks may be used, or portable hovers providing room for 50 to 75 chicks are satisfactory for smaller numbers.

A good brooder may be made as follows: Take a tight box and remove a strip about four inches in height from the bottom of one end. Provide a lid with cleats such that it can be put in place readily. Fasten strips of cloth about one and one-half inches apart on the inside of the lid, using enough cross strips to go from one end of the box to the other. The strips should be long enough to reach to within one-half inch of the bottom of the box when the lid is placed in position. Each cross strip should be cut into strips about one inch in width. Put such a home-made box brooder in a warm room and it is ready for use.

The Department of Poultry Husbandry recommends the following mixtures as suitable solid food for young chicks:

SCRATCH GRAIN

Cracked Corn	60 pounds
Cracked Kafir	20 pounds
Cracked Wheat	20 pounds
	100 pounds

DRY MASH

Bran	30 pounds
Shorts	30 pounds
Fine Corn Chop	25 pounds
Meat Scraps	10 pounds
Bone Meal	5 pounds
	100 pounds

The scratch grain should be fed five times daily the first week in such amounts as to be cleaned up readily. The second week the scratch grain should be fed three times daily and the dry mash twice daily. Some green feed, such as sprouted oats, lettuce, rye, or finely cut onions should also be provided after the first week. After the second week the dry mash should be in hoppers before the chicks at all times. Sour milk or buttermilk should be before them at all times from the beginning.

About the sixth week whole kafir and wheat may be substituted for cracked grain in the scratch mixture. The ration may then be continued with but little change until the chicks are about six months old.

Chicks must be protected from weather and diseases, as well as from hawks, rats, cats, and other carnivorous animals. Artificial shade should be provided if they have n't natural shade. The site should be well drained and provide ample sunlight. A fine litter should be kept on the floor to keep the chicks' feet warm and the entire quarters thoroughly cleaned at least every two weeks.

Proper feeding and management with emphasis on cleanliness and an occasional use of disinfectants will usually keep away disorders and insure profits.

The Development of Plant Resistance to Insect Injury

F. C. Lewis, '23

The control of insect pests is one of the most serious problems the farmer or fruit grower has to face. In attempting to solve this problem four classes of measures have been developed; namely, (1) cultural or preventive measures, (2) artificial or remedial measures, (3) the introduction of natural enemies to the insect pest, and (4) the development of plants resistant to insect injury.

In cultural or preventive measures, methods of preventing injury to plants yet untouched by devastating insects are used. Protective sprays, burning rubbish which protects the pest, regulation of the planting date, and rotation of crops are among the more important preventive measures.

Artificial or remedial measures involve the destruction of insect pests already present on the crop. Although this method is extensively practiced it is of least practical importance, especially in the control of cereal crop pests, because of the comparatively small increase in returns and the extreme difficulty of being thorough and thus effectively destroying the pests. The application of poisonous and contact sprays and mechanical removal of the insects, such as the removal of borers from the trunks of peach trees, are common examples of these measures.

The introduction of natural enemies of the insect causing damage would seem to be of real practical value, for insects have many natural enemies, not only of their own kind, but in the bird world as well. But the success of this method of control has been limited by various factors. In the first place climatic conditions may be unfavorable. This is especially true in the case of insect control by the use of parasites. The newly introduced enemy may change its food habits entirely and gain its sustenance from some other source than the one intended. It may even itself become a pest, thus increasing the difficulty of the control problem.

The development of plants resistant to insect injury is still in its infancy but promises to be of enormous value in the control of some of the most serious insect pests that endanger future crop production. That there is such a thing as natural resistance is a well-established fact. Many instances occur in nature which prove this point beyond a doubt. The resistance of the Winesap apple, for instance, to damage from codling moth, curculio, and scale insects as compared to the susceptibility of the Ben Davis to damage from these same sources is a fact well known to every apple grower. The resistance of the Keiffer pear to damage by scale insects is another example, and the slight damage to acid varieties of apples by apple maggots as compared to the great damage done to sweet varieties is still another.

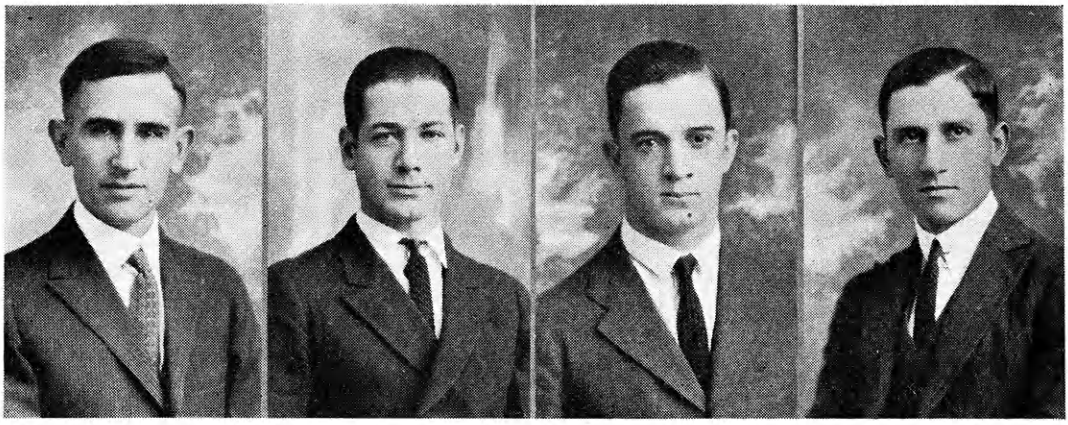
Plant pathologists have made use of natural resistance for many years in the control of plant diseases, but only recently has the entomologist turned to practical account this characteristic which, as its study advances, seems to open a field of ever-broadening possibilities.

The Agricultural Experiment Station at Kansas State Agricultural College has for several years been studying the resistance of different varieties of corn to corn earworm and corn leaf aphis, the resistance of different varieties of sorghums to chinch bug injury, and the resistance of different varieties of wheat to Hessian fly.

In taking up the study of resistance there are certain definite steps which must be followed and failure to complete any one of them may result in the ultimate failure of the project. In the first place evidence of resistance must be established; it may appear in a variety, a strain, or even in a single plant. The next step is to improve the commercial value of the resistant plants if improvement is possible. This necessitates a careful search for the factor or factors caus-

(Continued on page 90)

Phi Kappa Phi Elects Four Ags



HONOR STUDENTS IN THE DIVISION OF AGRICULTURE

Frof left to right: E. R. Ausemus of Cherokee; G. D. Stockwell of Larned; Warner Adams of Maple Hill; and L. V. Hunt of Wilmore.

The national honorary scholastic society, Phi Kappa Phi, has this year begun the practice of electing to its membership near the close of the first semester of the college year the 5 percent of the members of the senior class ranking highest in scholarship and otherwise meeting their requirements. Under the new rule eleven seniors were elected to membership in the society and the Division of Agriculture has the distinction of having four representatives in the group. Mr. Ausemus and Mr. Hunt are majoring in agronomy; Mr. Stockwell is majoring in Agricultural Economics; and Mr. Adams in Animal Husbandry.

A recent issue of "The Kansas Industrialist" includes the following paragraph in its comments on the election:

"To the Division of Agriculture goes the honor of placing the largest number of members in the election. Four from the Division of Agriculture, three from the Division of Engineering, three from the Division of General Science, and one from the Division of Home Economics were elected to the organization."

Alpha Zeta Announces Freshman Honors

The Kansas Chapter of the Fraternity of Alpha Zeta announced in the fall of 1921 that it would give a prize, a silver medal, to the member of the freshman class of the Division of Agriculture each college year ranking highest in scholarship. Though scholarship figures for last year have been obtainable for some time the results of this contest were not announced until March 5. Marvel L. Baker of Syracuse won the distinction and was awarded the prize.

Mr. Baker earned 38 college credit hours of work last college year, making a total of 71 honor points. In other words, he made 71 out of a possible 76 honor points or an average of 1.868 or 95.68 percent.

Mr. Walter J. Daly of Tucson, Ariz., ranked second, earning 33 college credits during the year and 58.5 honor points. His average for the year was 1.772 or 94.72 percent.

A. W. Aicher, '15, is County Agricultural Agent of Kiowa County, Colo.

Cattle Management on the Jornada Range Reserve

R. F. Copple, '21

The Jornada Range Reserve as an experiment station is in a class by itself. It has cactus and yucca for trees, adobe houses for living quarters, and sand for sidewalks. The range lies along the mesa east of the Rio Grande Valley about 50 miles north of the Mexico boundary.

The Jornada Range Reserve, established by the federal government in 1915, consists of 202,000 acres of land that is typical of millions of acres in the Southwest. Upon this area graze from 1,500 to 5,000 head of good grade Hereford cattle. The elevation varies from 4,100 to 8,200 feet. The average annual rainfall is 8.6 inches. The rainy season, if any, is during July, August, and September. Snow is rare, but high winds with sand are not uncommon.

The range forms part of that historic and romantic basin known as the Jornada del Muerto (the Journey of Death), the name given it by the Spanish explorers who, as early as 1540, found their way from Old Mexico along the Rio Grande past El Paso and Santa Fe into Colorado. Much of the country along the river is rough and it was necessary for travelers to cut across the bends thus often go far back into the desert into regions where, though the feed was generally excellent, the water was scarce. Due to lack of water, several parties, in early days, making the crossing in the hottest part of the summer when the thermometer hovered at 106° or higher, died before they could reach the river.

There is an interesting variety of wild life on the Reserve despite the scarcity of water. In the San Andres Mountains on the east a half-dozen mountain goats have their playground in the high rocky cliffs. More than two dozen deer have been seen in the mountains. A roving mountain lion makes his semi-annual tour through the high mountains each year on a quest for mule meat. His chief posture is lying in the bear grass ready to snap the first mule's neck that curiosity tempts near enough. The coyote, "Clown of the Desert," is plentiful, as well as red foxes, bobcats, and badgers. On the flat areas or mesas there are antelope, survivors of a herd of hundreds that formerly roamed on the Jornada. The list would not be complete without mentioning rattle snakes, tarantulas, rabbits, quail, lizzards of all colors and speeds, prairie dogs, kangaroo rats, sand fleas with a "kangaroo-hop," and many other necessary nuisances.

One of the most important problems that must be met on the range is the variation in forage production. The major factors responsible for this variation are drought and improper grazing. In cycles of eight to ten years there may occur three to four consecutive years during which precipitation is enough below the mean for the period to result in droughts. The main growing season is during July, August, and September. The annual precipitation recorded at headquarters since the establishment of the range is as follows:

1916	8.88 inches
1917	3.54 inches
1918	8.76 inches
1919	12.78 inches
1920	12.02 inches

Grama grass, *Bouteloua eriopoda*, similar to that on the Jornada Range Reserve, begins to die out the second year of drought and when a drought lasts three years the stand of forage on ungrazed range may be reduced as much as 40 per cent. The depreciation of grama grass range increases as grazing increases. The depreciation is especially marked under too heavy grazing during the main growing season—July, August, and September. Overgrazing a range also results in a decrease in the best forage species on the range and their replacement by plant

species of less forage value. Drought has a direct influence on the carrying capacity of the range. Range with a grazing capacity of 27 acres per cow per year will carry stock only at the rate of 32 acres per head the first year of drought, 45 acres the second, and 54 acres the third and fourth years of drought.

The Southwest is primarily a breeding section. Surplus forage is utilized profitably by holding over or by buying young steers and heifers to be disposed of in time of drought to make all range available for the breeding stock.

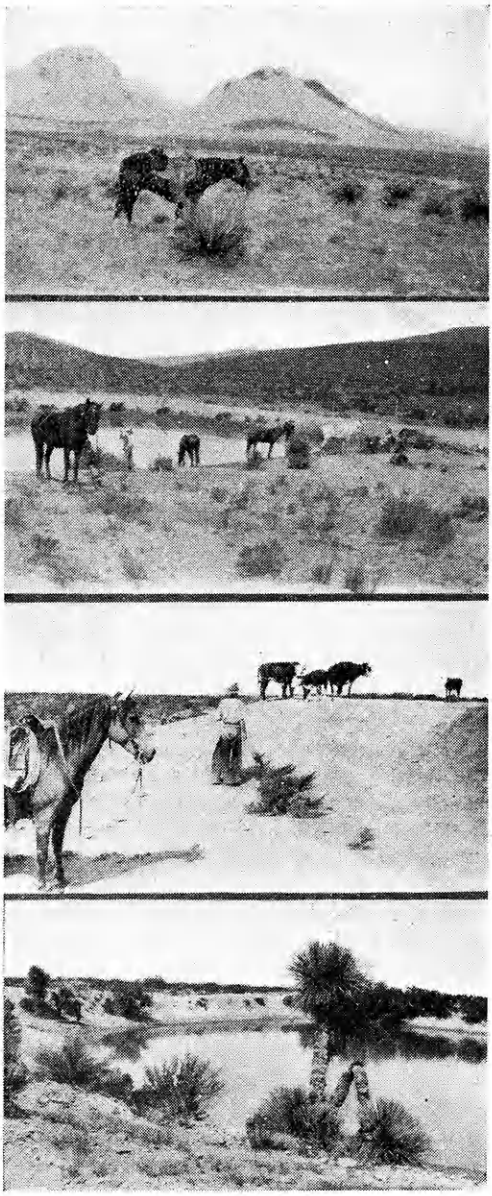
Proper distribution of stock for full and even utilization of the range may best be secured by adequate watering facilities, proper salting of stock, and riding the range. Permanent watering places should not be more than five miles apart on the mesa range and much closer in mountainous country.

The question of salting is an important one. One experienced cowman says that a ton of salt well placed on a range is worth one live cowpuncher riding. From the present data, on the Jornada, cattle eat more salt in the winter than during the growing season or summer months, though no satisfactory reasons for this have been found.

The grade of stock may best be improved by the use of purebred bulls and culling the poorest grade cows and replacing them with the best grade heifers obtained as a result of the use of good bulls. Over a hundred purebred Hereford bulls have been purchased from breeders in eastern and central Kansas to improve the grade of stock on the Jornada.

On many ranges the loss of young stock from blackleg yet runs into incredible figures. The losses have been as much as 10 percent of the calves branded. On the Jornada the loss for 1921 was reduced to one-tenth of 1 per cent, or but one calf for every 1,000 branded. This loss of one calf can probably be accounted for because the writer accidentally vaccinated one of the helping cowpunchers instead of the calf, and during the argument the calf beat a hasty retreat into the mesquite brush, thus preventing a perfect record.

From a herd of 500 first-class young cows and 20 registered Hereford bulls, an average of 74 per cent calf crop was obtained on the Jornada Reserve. The thinnest cows were fed a small amount of cottonseed cake and the remainder of the herd rustled for



SCENES ON THE JORNADA RANGE

themselves. The following table shows the number of calves per 100 cows of breeding age obtained in two herds of the Jornada

Range Reserve and also data obtained for similar open range in southern New Mexico, and for the state as a whole:

Year	Southern N. M.	N. M.	Jornada herds (1,000)	(500)
1916	55	—	72	81
1917	35	33	64	68
1918	25	30	59	80
1919	35	25	44	52
1920	70	66	83	88
1921	50	60	75	75
Av.	45	42	66	74

These big pastures are really open ranges in every sense of the word. The smallest pasture on the Jornada contains about a section and the largest 74,000 acres.

A small amount of cottonseed cake is fed during the winter and spring. As an emergency feed, Soapweed or Yucca is cut up and fed to carry the stock through the critical period.

The old days of the happy-go-lucky range period are gone. For the next few years the profits of all lines of endeavor will be found in stopping the leaks and wastes, big and little, that have slid by or have been overlooked in the past.

It is impossible even to touch the high spots in an article of this length. Interesting results of the Jornada have been published in U. S. D. A. Buls. 588 and 1031 which give observations up to date.

The Wheat Industry of Montana

R. E. Kellog, '22

Montana is the third largest state in the union and contains 93,000,000 acres, or nearly twice the acreage of Kansas. Of this large acreage, however, only about 30,000,000 acres are classed as farming land. The state has an average elevation of about 3,900 feet and an average annual precipitation of about 15 inches. The growing season averages about 100 days although it varies from 40 to 140 days.

The Montana farmer therefore is faced by different problems in his production of wheat than is the Kansas farmer. With an annual precipitation of only 15 inches it is necessary to "dry-farm" or to irrigate in order to raise a crop. With such a short growing season the crop is often damaged by frost before it is mature. With the high altitude and low winter temperature, winter wheat is confined to limited areas.

Where irrigation is at all possible it is the method of farming adopted. Only 8,000,000 acres are under irrigation, however, so dry land farming is the common practice in the state. By dry land farming it is necessary to summer fallow in order to assure a crop the next year.

Because of conditions, about 2,000,000 acres of spring wheat were harvested last year in comparison to 300,000 acres of winter wheat. Of the spring wheat grown, Hard Red Spring is first in acreage, with the Durums and White wheats coming next in order. Of the winter wheat grown, Hard Red Winter is the most important although considerable Soft Red Winter wheat is grown.

A recent official crop report estimates the spring wheat yield for 1922 at 32,555,000 bushels, an average yield of 17 bushels per acre. The winter wheat is estimated at 5,100,000 bushels, or an average yield per acre approximately the same as that of spring wheat. The total yield of 37,655,000 bushels is the second largest crop in the history of the state, being second only to the crop of 1915.

Montana, while not one of the leading wheat-producing states, is generally recognized for the quality of its wheat. This is shown by the following figures:

	Percent Grading No. 1	No. 2
Total spring wheat in United States	24.1	25.6
Spring wheat in Montana	74.7	18.2
Total winter wheat in United States	19.7	39.9
Winter wheat in Montana	68.1	20.6

Montana is the leading state in average production per acre, having an average of 19.28 bushels per acre for the 10-year period, 1910-1919, which includes three of the driest years of the state's history.

The Third Annual Ag Fair

Percy Sims, '23

The Third Annual Ag Fair will be held Saturday, May 5, 1923, on the college campus. The Ag Fair has been put on each year by the students of the Division of Agriculture and is an event looked forward to with great enthusiasm. Its success and popularity can best be judged by the fact that it now holds a place on the college calendar.

The State High School Judging Contest is scheduled for May 3 and 4. At this contest there will be boys from every part of the state. In the lives of many of these boys this visit to K. S. A. C. probably will be the deciding point for their future education.

A GENERAL VIEW OF THE SECOND ANNUAL AG FAIR

Prizes will be awarded Saturday morning, May 5, and the boys will have an opportunity to remain for the big Ag Fair in the afternoon and evening.

The outstanding feature of the Third Annual Ag Fair is to be the educational exhibits. The Department of Milling Industry will show a variety of flour samples and demonstrate milling processes by the use of a small mill. The Department of Entomology will present an exhibit of injurious insects, another of beneficial insects, and still another of rare specimens of the insect world. Accompanying the exhibit of injurious insects will be pertinent suggestions regarding their control.

The Department of Dairy Husbandry will feature both dairy products and milk production. The highest-producing cows in the college dairy herd—some of the highest in the country—will be shown. The Department of Poultry Husbandry will exhibit specimens of the leading breeds of chickens and practical feeding rations. They will also make some unique demonstrations in the care and management of flocks. The Department of Agricultural Economics will exhibit charts showing relative prices of producer and consumer; also charts showing economic values, the law of supply and demand. The Department of Animal Husbandry will, by means of pictures, charts, or specimens make clear some of the outstanding points in their investigations. Some of their best livestock will be exhibited. The Department of Horticulture will have their usual instructive and beautiful display. The Department of Agronomy will exhibit samples of the various economic farm crops of Kansas as well as present in an impressive way some of the high points in their experimental results.

The two previous Ag Fairs have been noted for their variety of clean entertainment and, beyond doubt, the third will up-

hold the reputation heretofore established. Some of the prominent entertainment features will be: The Farm Hand Follies De Luxe, a show that will compete with any show in Kansas City or even New York City; The Raggedy Jazz Minstrel, the most hilarious, happy, jazzy singing Ethiopians in Kansas; The Spanish Fandango put on by the Spanish students of the Division of Agriculture. Its music will be the kind one can not sit still and listen to. There will be the ukulele, the banjo, the guitar, and various unique instruments; also the Spanish dancers. This show made the hit of the year in its first appearance at the second annual Ag Fair. The revised and enlarged presentation will be a leader among the 1923 entertainments. A big one act play and a Wild West Show will be going on at the grounds at all times. The ferris wheel, designed and constructed by the students of the Division of Agriculture is the only ferris wheel in the world designed, constructed, and operated by the students of a college. Besides the larger attractions there will be candy wheels, ice cream and pop stands, a shooting gallery, doll wheels, hamberger stands, and a score or more of side shows.

The Grand Parade of the Ag Fair will start from the college campus at 1 o'clock the afternoon of May 5, and the big ball starts to rolling at 3 o'clock. Each department of the Division of Agriculture will have a float in the parade. The Department of Animal Husbandry will make the livestock parade of special interest and include many animals that have won prizes at the larger fairs such as the American Royal at Kansas City and the International at Chicago.

Dairy Department to Get Needed Room and Equipment

Ernest Reichhart, '24

In the west wing of Waters Hall now under construction the college is to have one of the best buildings on the campus. Among the departments allotted room in the new wing none is more in need than the Department of Dairy Husbandry. During recent years this department has struggled under a great handicap of having inadequate room for its classes as well as inadequate machinery for the successful teaching of its courses. With the full equipment of laboratories, classrooms, and offices provided for the department in the new building, K. S. A. C. may be ranked as one of the leading schools in the teaching of dairying and dairy manufactures.

On the ground floor of the new wing there will be model butter, cheese, and ice cream factories, and a market milk plant. The butter factory is to have a capacity of 500 pounds per hour. A refrigeration plant with a capacity of 26 tons will furnish the ice and refrigeration necessary for these plants. A sales counter will be installed to furnish a local market for some of the products. This equipment will make the courses in butter, ice cream, and cheese making take on a more realistic form as the students will be working in laboratories that are better than those of most commercial plants. Such modern equipment will also enable the department to serve large numbers of short course men—men who are anxious to make an intensive study of their vocation for a short time under ideal conditions.

The possibilities for research work in all branches of dairy manufactures will be enlarged. For the general course in dairying required of all freshmen, there will be two large laboratories, one for milk and cream testing, the other for farm butter making and for studying some of the leading separators and other dairy machinery.

Foley Kiang, '21, writes from Y1191 N. Szechnen Road, Shanghai, China, under date of January 22, 1923, that in the recent magazine he "found every article interesting and instructive." Mr. Kiang has been teaching in non-agricultural schools since his return home, September, 1921, but is planning to start a small agricultural enterprise in the near future. In March, 1922, he was married to a Miss Lee of Shanghai.

The Mechanics of the Farm as Treated in Vocational Agriculture

Lester B. Pollom, '13

Ordinarily the successful farmer is thought of as a man engaged wholly in such enterprises as wheat growing, beef production, dairying, swine production, etc.; as a man versed in the scientific reasons for crop rotation, soil fertility, soil drainage, and balanced rations; and as a man skillful in the chief operations of his enterprise involving both production and marketing. Seldom is a successful farmer thought of as a mechanic or even a man handy with carpenter's tools, blacksmith's tools, or plumber's tools. If, however, a farmer's daily activities for one year were studied, the per cent of his working time spent in some phase of farm mechanics and general farm shop work would probably cause surprise.

BUILDING THEIR OWN SHOP
The school shop of the Coats Rural High School under construction by the class in vocational agriculture.

With the coming of modern farm machinery such as tractors, gas engines, autos, and farm lighting plants, together with the mechanical work necessary for the operation and repair of this machinery and equipment, and the increasing amount of small construction work required on diversified farms, the farmer who is not reasonably handy with a variety of tools is at a serious disadvantage.

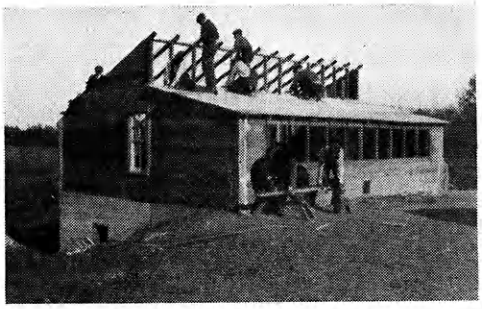
A visitor in a Kansas farming community during the last harvest and plowing season was surprised at the number of tractors standing idle in implement sheds and around the farm yards. Inquiry revealed that a majority of these tractors had been used but one or two seasons and were by no means worn out. They were simply out of running order and in need of such minor repairs as cleaning out carbon, grinding valves, fitting new rings, taking up bearings, and replacing bushings. Usually the owners explained that they didn't feel capable of making the repairs themselves and the scarcity of ready cash prevented employing a mechanic. As a result a large number of tractors, each representing an expenditure of from $500 to $1,500, were standing idle at a time of year when tractors should be delivering at a maximum. This illustration is given simply to contend that if a farmer has money tied up in a tractor about the only way he can get at least a part of his money back is to work it out of the tractor and to do this the tractor must be in reasonably good running order and the owner should be able to keep it in such order.

On the average farm today, especially the diversified and livestock farm, there frequently arises a need of concrete equipment such as water tanks, feeding floors, concrete walks, and dipping vats; also of many such simple articles of equipment as hog troughs, hay frames, wagon boxes, and self-feeders, the construction of which requires reasonable skill with carpenter's tools. Farmers frequently point out that many times they go on from year to year without many of these needed conveniences because they do not feel they are handy enough with tools to do the work themselves, neither do they feel able to hire the work done at tradesmen's wages. They also point out that, were they trained in the use of tools, they could find ample time to do much of the work during the dull season.

Being raised on a farm where these everyday conveniences and necessities are

lacking is in itself enough to create in a farm boy a distaste for the farm.

Not a small portion of the mechanical work on the farm is of a repair rather than a constructive nature. Probably nowhere is the old adage, "A stitch in time save nine," more applicable than on the farm. How frequently is an expensive piece of farm machinery relegated to the junk heap as



GETTING USEFUL TRAINING
Major farm carpentry project of the class in vocational agriculture, Arkansas City, 1921-22.

worn out when a few minor repairs at the proper time might have added years to its usefulness. Every farm has its occasional job of pipe fitting or pump repair work and if it is necessary to call a plumber for such work it becomes expensive.

A present-day farm home may enjoy practically all the conveniences of a city home at a very reasonable cost, if the owner or operator has mechanical ability. Most of these conveniences may be installed by such a farmer himself or at most with but little outlay for skilled workmen. Then every farm will provide many small, but nevertheless necessary jobs that require mechanical skill such as rope splicing, crowning, whipping and tying, soldering, use of stocks and dyes, blacksmithing including welding, shaping, and tempering, belt lacing, and stringing of ropes and pulleys. In fact, a survey of the mechanical requirements of the operator of a present-day farm proves that a system of agricultural instruction which does not recognize these mechanical problems, is inadequate.

The Smith-Hughes Vocational Agricultural program, as it is being carried out in Kansas, recognizes the mechanics of farming to the extent of giving approximately two-fifths of the time allotted to the teaching of agriculture to farm shop, farm engineering, and farm machinery. The farm shop and mechanics course calls for equipment in the school shop of the tools necessary for carpentry, blacksmithing, harness repair, soldering, belt lacing, rope work, glazing, and concrete work.

For the most part each boy's home project, together with the home farm, furnishes the farm shop and mechanics problems for the boy enrolled in vocational agriculture. If his major livestock project is a swine project the boy may have need of a self-feeder, a watering trough, a breeding crate, or a hog shed; thus his shop practice is linked up with and motivated by the need of his project. After the needs of his project have been taken care of the farm as a whole furnishes the mechanical problems, both of a constructive and repair nature, from which the instructor and the boy plan the year's work in the farm shop course. The boys bring a variety of jobs from home to the school shop. They bring water pails and wash boilers to be soldered; harness to be washed, oiled, and repaired; broken ropes to be spliced; broken wagon and implement tongues and pitman rods to be replaced; chisels and punches to be tempered; saws and other tools to be sharpened; and other jobs too numerous to mention.

Many vocational teachers include in the carpentry course, at least one major class project annually. This class carpentry project usually consists of the construction of a garage, a grain bin, or a poultry house, or some building of similiar size and scope, one that involves the use of as many carpenter's skills as possible. Usually farmers in need of such buildings are glad to furnish the material for such class projects. The general plan, usually followed, consists of a rotation of the jobs so that each boy gets as wide a variety of experience as possible. Each boy gets to cut a few steadings, a few rafters, lay flooring, nail weather boarding and sheathing, fit windows, and hang doors. Each boy is also required to figure the lumber bill. Some schools allow an extra amount of credit to boys who, outside of school hours, do a

(Continued on page 92)

The Soil Fertility Problem in Western Kansas

L. V. Hunt, '23

In that portion of Kansas which lies west of the ninety-ninth meridian the conditions of climate and soil are so widely different from those of the central and eastern parts of the state as to call for a distinct type of cropping system and soil management. Although it is one of the driest sections of the Great Plains, this area is nevertheless a highly productive agricultural territory and one which contributes a great deal to the wealth of Kansas.

The elevation in this section increases gradually from east to west, reaching its maximum of 3,700 feet at Goodland. The annual precipitation decreases from east to west, varying from 25 to 15 inches or less, and the mean summer temperature and rate of evaporation increases from north to south.

The soil of western Kansas is largely silt-loam and is noted for its fertility. Practically all the land is well supplied with lime and organic matter and carries an abundance of plant food. Without question moisture is at present the limiting factor in crop production.

The quantity of potash in the prairie soils is practically inexhaustible and is not removed from the land to any appreciable extent in the marketed grain. The supply of available phosphates is more limited, and because a considerable amount is removed each year in the grain produced and sold, it is only a matter of time until the phosphate content of the soil must be replenished by the use of commercial phosphatic fertilizer. However, the chief fertility problem centers around the maintenance of the supply of organic matter and available nitrogen.

Ordinary farm practice in the west is extremely exhaustive of the plant food in the soil. Western Kansas is a one-crop country. Except in the driest counties wheat has been grown and will continue to be grown as the money crop. The limited crop adaptation leaves a choice of producing some other small grain, less profitable, or of growing sorghum which is in most respects harder on the soil than is wheat. So long as moisture remains the limiting factor the effects of continuous cropping will not be evident, but there is no reason to believe that the existing farm practice will not ultimately bring poverty to the hitherto rich and productive lands of the western Great Plains.

For several reasons it is not possible to apply any fertility program adapted to farm practice farther east. In the first place the crop adaptation of western Kansas is exceedingly narrow. The usual rotation including a row crop, small grain, and legume, cannot be practiced because there is no adapted legume. In the second place it would be the height of folly to make the huge applications of manure and straw so commonly made in the more humid sections. Extreme caution must be exercised in the addition of organic matter in this semi-arid region.

Although no complete rotation can be worked out for the West, it is possible to avoid continuous cropping by making use of dry farming methods, particularly the summer fallow. There is no advantage attached to the wasteful practice of alternating wheat with fallow. A much better system from a fertility standpoint is some such sequence as wheat three years—sorghum one year—fallow. This arrangement has a number of advantages. It affords a time to incorporate into the soil a considerable amount of organic matter without danger of burning to any crop; it makes possible the inclusion of a green manure crop whether in the form of native weeds or a planted crop; it greatly stimulates the formation of soil nitrates by micro-organisms; it destroys the deleterious effects of sorghum on the soil before the next wheat crop is sown; and it practically doubles the farmer's chance of having fall and winter pasture for his livestock, enabling him to return directly to the soil the greater part of the animal excreta.

From these suggestions the fertility program can be outlined somewhat as follows:

(Continued on page ~~22~~ 128)

Science Versus Tradition in Seed Corn Production

D. F. Jones, '11

"What would animal breeders think of a system which considers only the dam and pays no attention whatever to the sire?"

In this article, Dr. D. F. Jones, '11, Plant Breeder, Connecticut Agricultural Experiment Station, New Haven, explains a scientifically sound method of seed corn selection which has proved highly practical. To Dr. Jones goes most of the credit for developing a method of selection that promises the corn grower a remarkable return.

There are many instances of true-breeding, white flowered varieties of plants which, when cross-pollinated, give colored flowers. Two black individuals of the Holstein Angus breeds of cattle sometimes produce red calves. Is any more evidence needed to show that the old rule-of-thumb that in heredity "likes produce like" is not an adequate formula upon which to base a seed industry? The practice of selecting the best ears of corn for seed has become a tradition, although everyone now knows that the fine looking ears of corn exhibited at the grain shows often yield no more than other specimens from the same field that are much inferior in appearance.

A good ear may be produced on a plant which has had exceptionally favorable conditions in which to grow but these it cannot pass on to the next generation. Environmental factors must, of course, be considered in the production of seed. High germination, freedom from disease, and a sufficient store of nutriment to ensure a strong early growth are highly desirable in all kinds of seed, but compared to the HEREDITY carried all else is relatively less important. But where cross-pollination is contiually going on, as with corn, good hereditary combinations are not fixed so that the good qualities of a desirable corn plant, even when due to heredity, are not handed on to all of the succeeding progeny. Therefore, selection that produces results is a more difficult undertaking with corn than with naturally largely self-fertilized plants such as wheat and cotton.

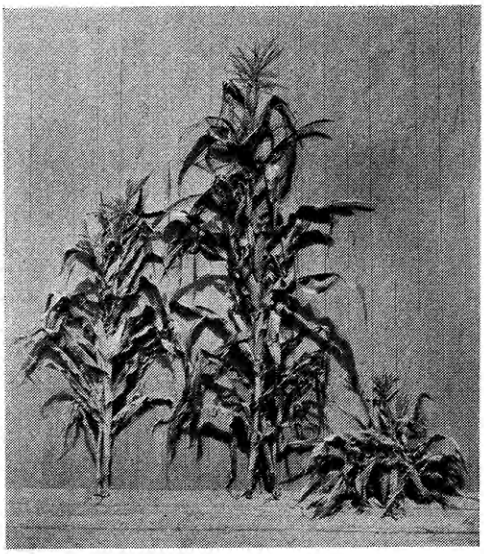
At present seed corn selection is based almost wholly upon APPEARANCE. Over two thousand years ago the producers of the Arabian horse and two hundred years ago the founders of the Shorthorn, Hereford, and other great breeds of livestock realized that appearance is an untrustworthy guide as to future PERFORMANCE.

From the several hundred plants grown from a prize-winning ear at a corn show only a very few, or perhaps none, will yield ears equal to the type planted. To get satisfactory seed ears in quantity the whole field must be looked over. To choose a dozen ears that will attract attention at a corn show many thousands of ears of corn have to be examined carefully. In every field there are barren stalks. Plants with nubbins and ears with poorly developed grains are all too common in the best cared for fields.

The reason for this undesirable state of affairs is not generally appreciated. The corn plant is pollinated by the wind which "bloweth where it listeth" and the result is that corn is in a constant state of crossing and recrossing. This germinal mixing brings about a very unstable condition as every livestock raiser knows who attempts to breed from mongrel stock.

The way in which undesirable features are covered over by crossing is well shown in the following illustration. A curious type of corn with golden-colored leaves instead of the normal green has been known for some time and breeds true to that color. Such plants are weak and usually small. When this type is crossed with a dwarf form, anoth-

er hereditary freak, the result the next year is a very fine, tall-growing, dark green lot of plants which are perfectly normal in every way and fully productive. The healthy green color comes from the dwarf and tall stature from the golden parent. What one race lacks is made up by the other. This is a universal principle and applies to both animals and plants. It seems to be a wise provision on the part of Nature to enable the offspring to make the best of bad ancestry.



A cross of golden by dwarf corn showing how hereditary weaknesses are covered over by hybridization.

It is important to know that the undesirable qualities which have been suppressed are still there, covered over and hidden from sight but they are not lost. Like a "drowned cat" they reappear later but in increased numbers. The importance which this has for seed corn is a vital one. The first cross of two different types is usually beneficial but when these hybrid plants are bred together all the poor qualities which their ancestors had will reappear in their offspring. In addition to the constant germinal mixing, every seed on fine-looking selected ears has an unknown inheritance on the staminate side. That is, no matter how carefully the mother plant and the ear which it produces are examined, they can tell us nothing as to the good or bad qualities of the plants which furnish the pollen that must be carried to the silks before the seeds can develop.

What would animal breeders think of a system which considers only the dam and pays no attention whatever to the sire? Such a method of breeding would absolutely ruin any purebred herd, yet it is tolerated as a method of producing seed corn, and corn is the most valuable plant in America.

The reason that no better method is used is because up to the present time none has been found which is practicable. Individually, plants are of such small value that one cannot select particular plants as seed parents and other fine plants as pollen parents, hand pollinate them, and keep a record of their ancestry as is done in principle in pedigreed livestock breeding.

But there is a method available which will give even better results. When corn is self-pollinated by putting the plant's pollen on its own silks and this closest kind of inbreeding is continued year after year there is a marked reduction in size and vigor. Along with this general result freak plants and degenerate types of all sorts appear, many of which are sterile or so weak and unproductive that they cannot survive. But all such forms are quickly eliminated. Along with these strikingly unfavorable results there is a marked improvement in the uniformity of the plants which survive. For example, in every ordinary field of corn there are white cobs and red cobs. Some ears are long and slim and others are short and thick. Tall plants and short plants, differently colored plants and seeds and many other variations are common-place. But after such corn is self-fertilized for a few years all the plants in any one family come to be exactly alike in type, having very nearly the same height, the same shape and size of ear, the same form of tassel, and the color of the grain and cobs alike throughout. The inbred families finally reach a point where there is no further change and as long as they are not crossed with other kinds of corn they remain the same year after year. Inbreeding does not cause degeneration and does not lead to extinction as has long been thought, but it is merely a process of sorting out. If bad

(Concluded on page 81)

THE KANSAS AGRICULTURAL STUDENT

KANSAS STATE AGRICULTURAL COLLEGE
MANHATTAN, KANSAS

VOL. II. MARCH, 1923 NO. 3

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

DAN CASEMENT ON FARMING

The future American aristocrat will live on the land and operate a farm, and his society, cooperation, and counsel will be sought after by the leaders in finance, industry, and government, according to Mr. Dan Casement, who recently talked to the agricultural freshmen of K. S. A. C. at one of their weekly seminars.

Mr. Casement, who operates Juniata Farm near Manhattan, also has a farm in Colorado and another in Ohio, the latter being managed by a graduate of K. S. A. C. After graduating from Princeton University more than twenty years ago, Mr. Casement became interested in farming, and he follows this profession both because he likes it and because he makes it pay.

A sincere message from a successful farmer is always valuable to a young man who is trying to decide upon a career. Mr. Casement's message briefly is as follows:

If agriculture is efficient it is certain to be profitable in the long run, because it produces things which people cannot do without. To be efficient, agriculture must be business-like. This requires the use of the best scientific information available and the services of men who are trained to apply scientific and business principles. It also requires a diversity of farm enterprises, usually including both crops and livestock. Because it involves life in the open country and constructive relationships with plants and animals, agriculture essentially is interesting and ennobling to receptive men and productive of the best type of American citizenship. To be successful in it, a man is called upon to exercise sound judgment, to be industrious, open minded, and intelligent, and to maintain strict standards of business and personal honor.

Mr. Casement thinks that agriculture is both a challenge and an opportunity to vigorous young men who are casting about for a career. His sentiments agree with those of most well informed, clear-thinking Americans.

TO THE COMING FRESHMAN

All readers of the Ag Student will be interested in the pictures on the first and second pages of this number of the magazine. The one on the "Contents" page shows Waters Hall with the familiar east wing on the right and the west wing under construction on the left as it appeared March 6, 1923. This new wing will be occupied by the Division of Agriculture during the summer months and fully ready for use with the opening of the college year, 1923-24. It is one of the very best structures on the campus, thoroughly fire-proof, made of reinforced concrete and structural steel, and solid native stone walls. The finish is the usual rock finish common on the college campus, but the trimming of Bedford stone is peculiar to Waters Hall.

After you have noted the present status of the splendid new wing being built to provide better equipment for agriculture, turn the page and see Waters Hall as it is planned for the future. If the importance of college instruction in agriculture is properly appreciated by Kansas youth, the dream of the agricultural leaders of K. S. A. C. will be realized in the near future.

Science Versus Tradition in Seed Corn Production

(Concluded from page 79)

heredity exists in the stock it will come to light and be eliminated. Good heredity can be selected with a surety that is not possible in any other way.

It is impossible to go into all the features of the inbreeding problem but it is well to note that many naturally self-fertilized plants like wheat, rice, peas, and beans are always inbred in every generation and are not lacking in vigor. On the other hand even the best inbred strains of corn are never so large and productive as they were in their natural cross-pollinated state. But when two such inbred strains which came from different plants at the start are crossed there is an astonishing increase in size and rate of growth in the generation immediately following the cross. All these hybrid plants are, barring accident, closely alike in height and vigor. Picture a field of corn in which every plant grows to an even size, in which every stalk produces a large ear and there are no barren individuals, no nubbins, no slackers. Such an ideal is very closely realized in hybrids between types of corn which have been purified by inbreeding. A field of this kind of corn differs in a remarkable way from the corn commonly grown. Selection in self-fertilized lines in this way followed by crossing to restore maximum vigor is the only effective way of controlling the heredity in both the pollen and seed parent.

This fine result is obtained only the first year after crossing. When these plants are allowed to breed among themselves, weak plants and poor producers again appear. But the value of the first generation hybrid can be realized every year by planting crossed seed. After the inbred strains are reduced to uniformity, hand pollination is no longer needed and it is only necessary to plant the two types to be crossed in alternate rows and detassel all the plants of one kind before pollen is shed. This process is no more difficult and expensive than pulling broom corn and this crop is harvested on thousands of acres annually.

The best methods of utilizing inbred strains of corn have not yet been fully worked out. Other ways of producing crossed seed than by detasseling are possible. A machine is now available to sort seeds according to color. With this machine it is possible to grow two types which differ in color of the seed in the same field and separate the colored crossed seeds from the uncolored inbred seed. In this way unlimited quantities of hybrid seed can be produced cheaply.

CORN SHOWING UNIFORM TYPE
A field of corn in which there are no barren plants, no slackers, and in which every stalk has a good ear.

Seed production is more and more becoming a specialized industry. With corn the cost of seed is the lowest item in producing a crop. What is a small additional expense for seed compared with the outlay for labor and fertilizers necessary to secure an appreciable increase in yield? The present ineffective practice of seed corn selection is giving way to a method which is scientifically sound because it is backed by investigations in the fundamental principles of heredity and by actual demonstration. The country which produces three-fourths of the world's four billion bushels of corn should not be slow to apply anything which offers so much, both to the producer of the seed and to him who plants it.

H. J. Bower, '10, is farming at Osage City. Harley reports that he finds farming profitable in spite of adverse economic conditions.

Is Vocational Agriculture Worth While?

Louis Vinke, '21

Less than 40 per cent of Kansas boys and girls who enter high school are graduated, and less than 40 per cent of these high school graduates enter college. Moreover, while on the average 12 to 16 per cent of all students enrolling in Kansas high schools later enroll in our colleges, the percent of these college students coming from our cities is greater than that coming from the rural districts. These facts clearly indicate the need of vocational education in Kansas high schools and especially of vocational agriculture in rural communities.

Vocational agricultural education has been correctly defined as that education which gives the skill and knowledge necessary to the control of plant and animal production, to the end of economic profit, and is so articulated with other education as to promote the most desirable farm community life. Many persons can get vocational education by "pick-up" methods, but such methods are too expensive, take up too much time, and do not create interest in the vocations. Agriculture, more than any other vocation, requires the application of all of the sciences, and this relationship can best be grasped through vocational agriculture. This course takes one-half the school day, the boy using the other half in general subjects—English, mathematics, physical and biological science, history, civics, etc.

Vocational agriculture helps to make the boy like the farm. Through study in the classroom, experiments in the laboratory, and field trips, coupled up with his home project, the boy learns to appreciate the environment in which he is living. He learns to like a good cow, hog, or chicken because he comes to know why it is good. He is taught how many of the disparaging features of farm life can be eliminated and how by proper management standards of living can be raised. The work is arranged so as to emphasize some of the bright sides of farm life.

Farming communities do not need more farmers, but do need more good farmers. Because of his interest in good livestock and crops the student of vocational agriculture is alert to grasp and apply information along these lines. Textbooks, reference books, and other available agricultural publications are studied with a purpose. Live discussions assist the students in organizing their information, and home and school projects assist them in the application of this information. The basic sciences, especially botany, chemistry, and physics, are studied with more interest and understanding because of their connection with the everyday problems of life. Thus not only the one-half of the student's time spent in the distinctly vocational agricultural work, but his entire high school curriculum is vitalized by keen observation and numerous points of contact with local conditions.

In studying cattle feeding, for example, the underlying principles of physiology and chemistry are presented. This is followed by a study of commercial and home-grown feeds and their value for beef production. Cattle feeding results obtained by Agricultural Experiment Stations are studied, prices of feeds secured, and the most practical rations computed. Several classes in judging feeders are arranged for and the boys are taught how to select good feeders. Some of the boys may take cattle feeding as a home project, giving them practical experience, while the rest of the class, as regards this phase of the work, learn by observation.

In studying insect control various economic insects are studied in the classroom and effective control measures practiced in the field. Plant diseases are handled in a similar manner. Poultry work is made worth while by actual practice in culling and caponizing. When the problem of seed corn selection comes up the boys are given the necessary preparatory work in the classroom, after which they go out on some farm and select good seed ears. Following this, the class may be dismissed for one day and each boy picks seed corn on his home farm. The in-

structor visits each farm the day the boys are doing this work. Most of the work in vocational agriculture is handled by such methods. Local, district, and state judging contests add interest and promote efficiency in various phases of the work.

In the shop the boy makes things he can use on his home farm. Every board that is sawed must go into some article he is making. Repairing and adjusting machinery is part of the shop work. Plumbing and wiring are practiced by doing repair jobs for the school. Gas engine work is handled in the most practical way. The principles are explained and demonstrated in the classroom and the boys practice them in overhauling and repairing engines and tractors. Before spring work begins on the farms, harness from the home farms is repaired. In this way all of the farm shop work is vitally connected with farm practices.

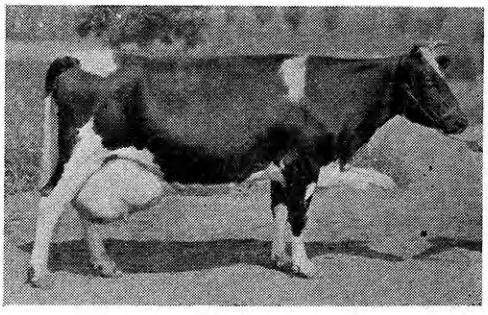
In many schools class projects are carried on. A class poultry project is the most popular. The boys each furnish a number of hens which are all housed together on the school grounds. Colony houses and other necessary equipment are constructed by the class. Another class project is feeding a carload of steers. Wakefield Rural High School has such a project this year. The school board buys the cattle, the instructor buys the feed, and the profits will be divided equally between the boys and the vocational department. Each boy brings in a hog to follow the steers.

Vocational agriculture draws the school, the country people, and the town people together and stimulates cooperation. It multiplies contacts and actually brings the farm to the school and takes the school to the farm. Self feeders, wagon boxes, truck bodies, and other equipment for the farmers are built in the school shop. In the school laboratory the farmer has his milk and cream tested, his seed tested, and obtains valuable information on many of his farm problems. Through soil fertility tests the farmers, boys, and instructor are brought closer together. Poultry culling and insect control cmpaigns stimulate mutual interest. Boys' and girls' club work is carried on hand in hand with the regular program in vocational agriculture. Judging contests, community fairs, and other community activities promoted or stimulated by departments of vocational agriculture continually attest to their value under present-day conditions. In short, both the farmer and the merchant cooperate with the high school department of vocational agriculture for the development of the boys of the community into factors of real community progress. Is not such work worth while?

Lady Vale Walker

Theodore Cole, '23

In the death of Lady Vale Walker, 270,-082, the Department of Dairy Husbandry at K. S. A. C. lost one of their best purebred



LADY VALE WLAKER

Holstein cows. Lady Vale was one of a group of four heifers purchased from H. B. Cowles of Topeka.

Over a period of five years Lady Vale Walker's production record stood second in the college herd. A daughter, Canary Paul Walker, produced 13,767 pounds of milk and 449.63 pounds of butterfat as a two-year-old. She is on test again and is producing about 75 pounds of milk daily.

The most interesting thing concerning the record of Lady Vale Walker is that four of her sons are in as many Holstein herds in Kansas. Two of them are in state institution herds, one at Osawatomie, the other at Lansing. One son is owned by Lyman Streeter of Milford, Kan., and the fourth is being used in the Holstein herd at K. S. A. C.

Dr. C. W. McCampbell recently attended the Sherman County Livestock Breeders' Association at Goodland, Kan. He found among the principal boosters of this organization W. K. Evans, '05, C. L. Zoller, '10, Charles Hartwig, '12, and Frederick Hartwig, '16.

The Third Annual State High School Judging Contest

W. P. Raleigh, '23

In the Second Annual State High School Judging Contest held at K. S. A. C. May 4 and 5, 1922, 46 Kansas high schools were represented. The winners are shown in the accompanying picture. Each year more high schools are becoming interested in the contest and it is expected that at least 75 schools

WINNERS IN THE SECOND ANNUAL HIGH SCHOOL JUDGING CONTEST

will enter teams in the Third Annual Contest to be held May 3 and 4, 1923.

As in the past two years, each contestant will spend one-half day in judging each of the following groups: (1) Beef cattle, horses, hogs, and sheep; (2) dairy cattle; (3) grain, including ear corn, winter wheat, sorghums, oats, and alfalfa seed; and (4) poultry. In the first group, eight classes of livestock will be judged; namely, fat steers, Shorthorn cows, fat barrows, Poland China sows, fat wethers, Shropshire ewes, Percheron mares, and Belgian mares. In dairy judging, one class of each of the four leading breeds of dairy cattle will be judged.

In the judging of both dairy cattle and beef cattle, horses, hogs, and sheep, each class will consist of four animals. No scoring will be done but each class will be ranked in the order of its excellence. The work of the contestants will be graded on the basis of 75 percent on placings and 25 percent on reasons.

There will be six classes of material to be worked upon in the grain judging contest: (1) Crop samples to be identified. (2) Samples of winter wheat to be graded. (3) Samples of oats to be graded. (4) Samples of wheat to be judged. (5) Ten-ear samples of corn to be judged. (6) Samples of alfalfa seed to be judged.

The poultry judging will consist of placing one class of four hens of the same age of each of the following breeds: (1) Single Comb White Leghorn; (2) Barred Plymouth Rock; (3) White Plymouth Rock; (4) Single Comb Rhode Island Red. The hens in each class will be placed on the basis of their past production records and the contestants will be graded on placings only.

Suitable parchment certificates and medals will be awarded to the winners of the contest as follows: (1) A parchment certificate to the team making the highest general average on all classes. (2) A parchment certificate to the individual making the highest general average on all classes. (3) A parchment certificate to the team making the highest general average in judging beef cattle, horses, hogs, and sheep; one to the team making the highest general average in judging dairy cattle; one to the team making the highest general average in grain judging; and one to the team making the highest general average in judging poultry. (4) A medal to the high individual in each of the four sections of the contest. The winners of these 12 prizes will have reason to be proud.

P. C. Mangelsdorf, '21, is assistant to Dr. D. F. Jones, '11, Plant Breeder at the Connecticut Agricultural Experiment Station, New Haven. He writes that his work is confined chiefly to corn and that during the summer months he spends most of his time on the station farm while in the winter he takes graduate work in genetics under Dr. E. M. West of Harvard University.

A Combination of Two Mortgage Lifters

E. R. Button, '23

This is one of the most critical periods ever experienced by the American farmer. He must adopt a plan for his farm which will yield him the greatest profit. To do this he must combine farm enterprises so they will work together with as little waste as possible. Two classes of farm animals come nearer accomplishing this than any other livestock. They are hogs and dairy cattle. The dairy cow is a most economical producer when fed on either cheap or high-priced feed. She produces a large amount of milk which can be separated and the sweet cream sold. The cream always commands a high price and the skimmilk is left as almost clear profit. This can be fed to the hogs making the most valuable feed for producing rapid growth and economical gains when combined with grain.

In selecting the kind of dairy cattle to keep, the most important thing is to select high-producing cows within the breed. The question will come up as to whether purebreds or grades are to be kept, and in deciding this the farmer should consider his experience and the capital he has to invest. For the average beginner the best plan will be to start with grade cows and gradually work up a purebred herd because good grades are cheaper than purebreds and often yield as much profit.

Proper feeding is one of the most essential factors for high production. The man who knows what to feed and how to feed it is the man who will get the greatest returns from his cows. Dairy cows respond very quickly to good feed and as soon as they are neglected at the feeding end they will slow up in milk production. The feeds fed should be governed somewhat by the feeds grown on the farm or produced in the neighborhood. Care should be taken to get a properly balanced ration. The milk cows should be watched closely to see that none of them are off feed, for a dose of salts will often keep a cow from becoming sick or cure her when she first shows signs of not eating.

The dairy cow may economically use much waste feed, such as damaged hay and fodder, and cheap feed such as silage and pasture. The skimmilk can be considered as costing practically nothing to produce because sweet cream can be sold for nearly as much as whole milk thus making the skimmilk clear profit and skimmilk stands unexcelled as a protein feed for hogs. It decreases the time and feed necessary to fit a hog for market. In the past years the high prices of the manufactured protein feeds, such as tankage, has caused many hog raisers to come out with a loss instead of a profit. Ofttimes the substitution of skimmilk, produced on the farm and costing practically nothing, for high-priced protein feeds, would have produced a handsome profit.

Hogs have long had the reputation of being the farm mortgage lifters. The important thing in selecting hogs is to select a large, big-bone, early-maturing type. The number of hogs kept will depend upon the size of the farm, the amount of skimmilk available, and the amount of grain and pasture produced by the farm. The prevailing price of pork will also determine somewhat the number of hogs to be raised.

A uniform distribution of labor throughout the year means greater profit to the farmer and hog and dairy cattle farming will come as near providing a uniform distribution as any plan that could be adopted. The present-day farmer is finding that he must have more than one important source of income on his farm. This plan gives two important sources. The farmer who is not afraid to work may adopt this plan and develop his farming operations into a very profitable business.

R. F. Copple, '21, is now grazing assistant in the United States Forest Service with headquarters at Albuquerque, New Mexico. When he first entered the service in the summer of 1921 he was assigned to the Jornada Reserve and remained there for one year.

Poisonous Plants of Kansas

Gladwin A. Read, '25

A glance through the pages of history illustrates the important part which poisonous plants have assumed in the past. The first mention made of them is in mythology. Hecate was said to have been their discoverer and her knowledge passed, in turn, to Medea. It is recorded that the Egyptian kings not only had a knowledge of these plants, but that they were also familiar with the uses of many of our most common species. We know that the deaths of Socrates, Demosthenes, Hannibal, and Cleopatra were due to the administration of poisons derived from plants. In Roman history, instances are recorded of soldiers committing suicide by consuming such poisons. Even the various Indian tribes realized their importance and used them in the preparation of poisons which were applied to arrowheads.

Infectious and contagious diseases on the open pastures do little harm, and the losses from predatory animals sink into insignificance when compared to those from poisonous plants. The exact number of livestock lost in Kansas each year due to this cause can only be estimated, as veterinarians are not required to report each death. Loco losses may be estimated at 5 to 55 per cent and not unusually larkspur losses run up to 10 percent. Colorado has estimated her annual loss from these plants at one million dollars.

The most important of the stock-poisoning plants of our pastures are cicuta, loco, death camas, and larkspur.

The cicuta or "water hemlock," as it is sometimes called, is the most poisonous of all plants in the United States. Not until recently did it make its appearance in Kansas. This is an umbelliferous plant that attains the height of about three feet. It is an erect, branching herb, with a spotted stem and small white flowers. Its distinguishing characteristic is a transversely chambered root stalk, which is the poisonous part of the plant. It is most likely to be found around watering places. Most cases of cicuta poisoning, of either man or beast, are fatal.

The loco weeds rank second in importance to the cicuta. The word "loco" is of Spanish derivation and means crazy. The name is applied to these weeds because they are supposed to produce such an effect upon their victims. Some short story writers have seen their chance to appeal to the imagination of the fiction-loving public and have claimed that these plants produce this effect upon humans. However, these tales have no scientific foundation. Locos affect all grazing animals, especially horses. They are leguminous plants that grow best in semi-arid regions.

Another seriously poisonous plant is the one commonly known as the death camas or wild onion. In general appearance this plant resembles an onion. It comes up in the early spring before the grasses have started and matures its seed by May or June, during which period the most cases of poisoning are reported. The bulb is the most poisonous part of the weed. Sheep are the only class of livestock affected by it.

The prairie larkspur is of considerable importance in the western part of Kansas. The plant is a perennial that attains the height of three to five feet. The distinctive feature of this plant is the flower which is covered by a spur-like structure. The plant is said to lose its toxicity during the flowering period, which occurs about July 1. Sheep are the only class of livestock not affected by larkspur.

There are also numerous common farmyard plants that may cause as much damage as pasture plants. Of these the buckeye, Sudan grass, jimson weed, and poke berry are perhaps of the most importance.

The buckeye is a small shrub that leafs out in the spring a few weeks before other vegetation makes its appearance. Because it is conspicuous animals find is readily, resulting in a number of losses each year.

Sudan grass, as some of the other sor-

(Concluded on page 96)

The Production of Market Pork

Francis Houlton, '23

The United States is the outstanding country of the world in pork production, having in 1919, 75,587,000 hogs, or 45 percent of the world's swine population.

The relative supply and demand are factors which govern the prices paid for hogs. During the past few years medium butcher hogs, weighing 200 to 260 pounds, are the ones which have topped the market. Hogs of this size top the market for the following reasons: First, they are a nice size to handle; second, they hang up a neat carcass; and third, they yield the size of cuts which are in demand by the American people.

Economical production and early maturity must be recognized in all kinds of livestock production; consequently the foundation herd is the starting point for those who are raising hogs for the market. Grade sows and purebred boars are favorites of producers of market hogs who are limited in capital and are just beginners. A big-type boar crossed on a medium type sow produces growthy pigs which mature early and come nearer attaining market condition any time the market is ready for them.

Housing for hogs is essential because they are quite susceptible to the unfavorable influences of dampness, cold, heat, and drafts. The hog house should be located at a suitable elevation and be given drainage that will insure against dampness. The location should be as convenient as possible with relation to other farm buildings and to the hog pastures. The house should be durable, serviceable the year around, and still of reasonable cost. It is best to have pens in the house that will accommodate between 10 and 15 sows. These separations in the winter and at night are necessary in order to keep the sows in proper condition and prevent any injury before farrowing.

Little or no shelter is required by the brood sow during the summer. But sows bred to farrow early in the fall are frequently handicapped by hot weather. This emergency is met by providing shades in the open and a supply of fresh cool water.

As soon as the sow shows signs of farrowing, clean out the pen to be used and supply a small amount of short fine bedding, usually straw. The amount to be used depends upon the weather. The bedding and pens should be kept dry, clean, and disinfected. Good ventilation and sunlight are great aids in keeping them so.

On placing the sow in the farrowing pen she should be disinfected thoroughly. The sow and pigs should be oiled regularly and kept free from all parasites. The pens, feed troughs, and self-feeders should be limed every week or two, or troughs and self-feeders may be scalded with a 5 percent solution of bluestone. If the weather permits, force the sow and litter to stay out in the open while cleaning and disinfecting the pens and houses. Exercise is highly important and one of the chief means of keeping the sow and her litter healthy.

The common intestinal round-worm is one of the most injurious of the various kinds of parasites that infest the pig. It causes digestive troubles, retards growth and development, and in other ways interferes with the well-being of the pig. Young pigs are most susceptible to infection and suffer most seriously from the infection during the first few weeks of life. To prevent this early infection, cleanliness and sanitation are absolutely necessary. If the pigs become infected they should be wormed as soon as possible so that they will obtain all the benefits from their feed, thus making maximum growth.

Hog cholera destroys more hogs than all other diseases combined. In 1917, 1918, and 1919 cholera took about 3,000,000 hogs annually in the United States, and in 1920 and 1921 the number lost, due to cholera, greatly increased. Vaccinating is the only way to control cholera. Pigs should be vaccinated shortly after weaning because less serum is required and the growth of the pig is not retarded.

The average age at which pigs are weaned is from eight to ten weeks. A few days before weaning a change should be made in the rations of both sow and pigs. With the sow

the amount of feed given usually is reduced, especially the slops and the chief milk-producing feeds. The supplementary ration of the pigs is increased both in quantity and richness. Slops, shorts, skimmilk, tankage, and corn should be fed in increased quantities.

It is best to wean the pigs all at once. If the sow's udder becomes congested, allow the pigs to have an additional meal or two for the purpose of relieving the sow. However, some men prefer to take away the larger pigs first and allow the runts to suck longest. By this method they claim the sow does not suffer and the runts get a needed boost. Weaning is generally completed inside of two weeks.

Having developed a strong framework of bone, ample lean meat tissue, and a roomy, vigorous digestive tract, there now remains the final operation of finishing the animal for the block. Pasture is a prime factor in economical pork production and no hog raiser who wants to make maximum profit can afford to be without it. With a combination of alfalfa, Sudan grass, or sweet clover, rye, and oats, pasture can be provided the year around. These forage crops are rich in protein and add the necessary bulk to a concentrated ration. At all times it is important that enough protein-rich feeds be added to balance the ration and stimulate the lagging appetite.

The fattening period is short. During this period all of the carbohydrate-rich concentrates should be fed that the animal will consume. All fattening animals should drink water freely, being forced to do so if necessary by placing it in their feed. At all times such minerals as wood ashes, lime, and charcoal should be accessible. During the last few days of the fattening period feeds as milk, oilmeal, and new corn in the hard dough stage, which produces bloom, should be fed.

Spring litters should be ready for market between October and January of the same year, and fall litters should be ready for the market between April and September the following year. As a rule it is best to sell to the local buyer if the producer does not have a carload. If shipment is made in the summer time when the weather is hot, it is best to load the hogs early in the morning or late at night, which is most generally the coolest part of the day. If hogs are to be shipped in the winter, load them during the warmest part of the day. Have the cars thoroughly cleaned and well supplied with bedding.

Juniors Second at Denver

A. P. Atkins, '24

In the face of stiff competition at the National Western Livestock Show, Professor Bell's junior team placed second—32 points behind the winning Colorado team. Nebraska stood third, and Wyoming fourth. Three Kansas men placed fourth or above in the contest.

Intensive work for the junior team did not start until December, due to the fact that Professor Bell was busy developing a winning senior team for the Royal and International livestock shows. Immediately after the International he turned his attention to the juniors, and after some preliminary work, eliminated all but a round dozen from the 45 he started with. These men put in extra time during the Christmas vacation, and shortly afterward six were picked to make the Denver trip. These men were: A. C. Magee, G. R. Warthen, J. L. Farrand, M. D. Roberts, Harry Moxley, and A. P. Atkins. A week before the contest Professor Bell took these men to Lincoln and Cambridge, Nebr., where purebred herds were visited and new knowledge gained of judging work.

Harry Moxley was high man of the entire contest and also high man on fat stock. J. L. Farrand tied with a Nebraska man for second place, and A. C. Magee placed fourth. G. R. Warthen and A. P. Atkins placed thirteenth and fifteenth, respectively.

Was it worth while? Ask any of these men. What about next year? Well, the history of judging teams indicates that all of these men will not be on the senior team next year, but they're all going to be trying and they've set a mark for next year's junior team to measure up to.

Wing Kei Lau, '22, having spent several months studying conditions in various parts of the United States sailed from Seattle in January enroute for his home in China.

Alumni Notes

M. L. Otto, '21, is farming near Riley, Kan.

George Starkey, '22, is herdsman on a Holstein farm at Alsuma, Okla.

J. T. Quinn, '22, is assistant in horticulture in the University of Missouri, Columbia.

W. F. Turner, '10, and F. S. Turner, '17, are operating a dairy farm at Pleasant Hill, Mo.

H. S. Baird, '12, is manager of the California Milk Producers' Association plant at Sacramento, Cal.

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

Roland S. Mather, '22, has recently accepted a position as chief chemist of the Leavenworth Milling Company.

Ray B. Watson, '21, is the traveling representative of the Dieges-Clust Jewelry Company, 58-64 W. Randolph St., Chicago.

Charles R. Enlow, '20, ex-football and track man, is teaching in the high school and coaching athletics in Junction City.

M. D. Snodgrass, '06, is operating a farm and a coal business at Fairbanks, Alaska. He represents his district in the territorial senate.

John Seiglinger, M. S. '15, is assistant agronomist in cereal investigations, United States Department of Agriculture, Woodworth, Okla.

H. H. Wilson, '15, is herdsman of the Berlwood Stock Farm at Hueneme, Cal. The farm is a dairy farm specializing in the breeding of Holstein cattle.

A. G. Phillips, '07, head of the Department of Poultry Husbandry, Purdue University, is recognized as one of the leading men in the country in his line.

H. W. Avery, '91, of Wakefield, is a member of the State Board of Agriculture representing the Fifth District. He was president of the organization last year.

One of the prominent personages attending the Kansas Livestock Association at Wichita, Kan., the week of January 25, was Carl Miller, '08, of Belvue, Kan. Mr. Miller, besides owning one of the best purebred herds in the state, handles from 3,000 to 5,000 head of steers annually.

Lester B. Pollom, '13, is State Supervisor of Vocational Agriculture with headquarters in the office of the State Superintendent of Public Instruction at Topeka. Mr. Pollom is one of the successful teachers of the state. Previous to his election to his present position he taught agriculture for five years in the Arkansas City High School.

C. H. Morgan, '22, Head of the Department of Agriculture in Alaska Agricultural College and School of Mines, Fairbanks, Alaska, writes that the agricultural development of Alaska has as yet scarcely started. There are about 115 homesteads in the Tanana Valley, the chief agricultural district of the territory. Their most important crops are potatoes and small grains. There are but few livestock and the farmers generally depend partially on hauling wood and mining for a living. The soil is fertile and the seasons usually long enough to mature their crops.

Harry V. Harlan, '04, who has charge of the barley investigations of the United States Department of Agriculture, sailed from New York on February 28 for a year of plant exploration work for the Department in Algeria, Morocco, Egypt, Abyssinia, and India. The months of May, June, and July will be spent in India, where most of the hull-less barely varieties now grown in the United States were originally obtained. Later Dr. Harlan will visit Abyssinia during the barley harvesting season there. The North African regions will be visited in March and April. Before returning to the United States, Dr. Harlan will visit the principal plant-breeding stations in France, Sweden, Germany, and Austria.

The Development of Plant Resistance to Insect Injury

(Concluded from page 68)

ing resistance in order that they may be transmitted by crossing or grafting. It also involves improvement by means of plant breeding and seed selection. The final step is further verification of the points apparently established. This involves repeated experiments under a wide range of conditions in order that errors, if present, may be discovered and corrected.

The study of the resistance of wheat to Hessian fly injury was begun in 1916 by the Department of Entomology in cooperation with the Department of Agronomy. Previous to that time numerous references had been made to the fact that such a characteristic existed, but no one had endeavored to determine the basis of resistance. Two lines of experiments were outlined. The first was to determine the relative infestation and injury of different varieties of wheat. The second was to determine why certain varieties are resistant, or if not resistant, why they escape injury where other varieties are badly injured.

The work during the first three years was devoted to the first line of experiments. Large series of plants grown in the field and in the greenhouse, and a careful study of the number of eggs deposited on each variety and the subsequent infestation established definitely two points: (1) That practically as many eggs were laid on one variety as on another. (2) That there was a marked difference in the subsequent infestation, certain varieties showing unmistakable evidence of resistance, others susceptibility, and still others displaying erratic behavior, being resistant in one test and very susceptible in another.

As soon as sufficient evidence was gathered to warrant this classification, the number of varieties used was greatly reduced in order to simplify the work and permit a more careful study. Among the resistant varieties kept were Illini Chief, Dawson Golden Chaff, Beechwood Hybrid, Currell Select, and Dietz. Some susceptible varieties retained were Kharkof, Marquis, and Zimmerman, while Kanred, Clark Blackhull, and Fulcaster were common varieties retained because of their inconsistent behavior.

Since the eggs of the Hessian fly are laid on the wheat blades the larva, when hatched, must migrate down the leaf between the leaf sheath and the stem to a position near the joint from which the blade arises, or to the crown of the plant if the leaf arises from there. It is then in its normal place of feeding and growth. The larvae are very delicate when first hatched and it was thought that differences in morphology or form of the plant might influence their ability to reach their normal region of growth and so cause the resistance or susceptibility which appeared. Therefore a careful study was made of the form of the leaf, the character of its surface, the height of the ligule (a lip-like structure extending upward along the stem from the top of the sheath), and the distance and rate of migration of the larvae. Little or no correlation could be found to exist between these characters and resistance and susceptibility. In any event a sufficient number of larvae found their way to the normal place of growth to have severely injured or killed the plant had they been able to develop after they arrived there, but repeated examinations showed that on the resistant varieties many or all of these larvae failed to develop at all. No growth had taken place after they had had sufficient time to become full grown. They died apparently because of inability to obtain food.

The establishment of this fact led to a study of the physiological characteristics of the different varieties and since silica is the main stiffening or hardening element in plant tissue, an effort was made to determine whether or not the silica content of a plant could be controlled or influenced by the food material used by the plant, and if so, what relation existed between the amount of silica and the resistance or susceptibility of the plant to Hessian fly injury.

The varieties of wheat under test were then grown in plant food solutions of known composition and containing varying amounts of sodium silicate and the effect of the various culture solutions on the development of the larvae carefully noted. The results, while

not conclusive, have been extremely encouraging. There seems to be little doubt that the resistance or susceptibility of a plant can be influenced at will by careful control of the amount of silica available for its use. This indicates that the silica content of the plant is at least one factor influencing resistance. Whether or not other factors may be discovered and to just what extent the influence of variation of silica in the plant food may be carried, remains yet to be seen.

The study will be continued to find out, if possible, those characteristics which influence resistance and develop them in the best commercial varieties of wheat. Such an accomplishment might result in the eradication of that serious pest, the Hessian fly.

Purebred Livestock Pointers

1. Be honest.
2. Choose a breed and stick to it.
3. Breed with the correct type in mind.
4. Study pedigrees for inherited characteristics, relative merits, and value.
5. Keep your herd or flock free from disease.
6. Develop the young animals and maintain the breeding animals through wise feeding and management.
7. Boost better livestock in your community.
8. Advertise judiciously.
9. Exhibit at county, state, and large livestock shows.
10. Be prompt in registering and transferring animals and make good all guaranties.
11. Remember that a satisfied purchaser is your best advertisement.

Mechanics of the Farm as Treated in Vocational Agriculture

(Concluded from page 76)

good piece of home carpentry work, following the experience gained in the class carpentry project.

In one instance in Kansas a rural school was in need of a coal shed at the school house. It was during the winter months and thinking to save the district some money, the board decided to do the work of construction themselves. All went well until the job of cutting the rafters was reached. None of them knew how to cut rafters and in their quandary the vocational agriculture teacher in a city high school a few miles away was called over the phone and asked to explain to them how to cut rafters or if he couldn't explain the process over the phone, they would be glad to pay him for his trouble to come out and show them how to proceed. The vocational teacher was anxious to help them, but for the moment too busy to go out and he also doubted if he could explain the process over the phone satisfactorily. However, he told them he could send one of his vocational boys out who could do the work. He therefore selected one of his class, incidentally a son of one of the school board members and sent him out to teach father and his fellow board members how to cut rafters. Needless to say these three men began to see some of the benefits of the course in vocational agriculture.

Some instructors charge a nominal fee for such work done as practice work by the class in constructing buildings. The money thus collected is put into a fund for financing the stock-judging team on trips and other like activities.

The advanced iron work together with the gas engine, auto, and tractor mechanics is usually given during the second year. Gas engines and tractors are usually brought in from the homes of the boys or their neighbors to the farm shop where they are overhauled and used for instruction purposes. One boy, enrolled in advanced shop work, bought a Ford chassis for $50, took it to the shop, gave the motor a complete overhaul-

ing, and built a truck body on the chassis, which he used to bring milk to town each morning as he came to school. Another boy brought his Fordson tractor to the shop where it was overhauled and a top built on it. Old wagon tires were used to support the top. Many other incidents might be mentioned but for lack of space.

Another feature of this farm shop course in high schools is, the boys are aided and encouraged to construct and equip shops at home, thus increasing their chances of putting the school course into actual operation on the home farm.

It should be borne in mind that, while two-fifths of the time allotted to vocational agriculture is spent at such training as has just been described, in no sense is there an effort made to develop or train tradesmen. It is not the aim of the shop and mechanics course to train farm boys to the point that they would be able to draw union wages or even to the point that they would be tempted to leave the farm to enter any of these trades, but believing that the measure of joy and satisfaction that any man derives from his vocation will be determined by his ability to meet and master the everyday problems arising in that vocation and in the same vein believing that nothing is so discouraging in a vocation as inability to master its daily problems, the administrators of the vocational agricultural work in Kansas firmly believe that a thorough course in the mechanics of the farm is a long step toward making the farm boy master of the situation, and incidentally such a mastery should do much to lighten the one-way traffic on the road between the farm and the city.

Louis Vinke, '21, is Director of Vocational Agriculture in the Wakefield Rural High School in Clay County. All reports indicate that Vinke is neither afraid to use gray matter nor to work perseveringly for the best interests of his community. Some of his students are carrying on under his direction some distinctive work in beef cattle feeding.

Harlan A. Sumner, '16, became Extension Specialist in Crops at K. S. A. C. January 1. He was formerly in the Department of Agronomy of the Montana State College of Agriculture.

Poultry Students Start Practice for Next Judging Contest

Loyal F. Payne

The first midwest intercollegiate Poultry Judging Contest was held in connection with the Coliseum Poultry Show at Chicago in December, 1920, with four teams competing. In 1921 six teams entered the second contest, and December 7, 1922, eight argicultural college teams competed in the third contest, ranking as follows: Iowa, Indiana, Kansas, Michigan, Oklahoma, Nebraska, Wisconsin, Missouri. Three additional colleges are making plans to send judging teams for the fourth annual contest to be held December 13, 1923.

Arrangements are already under way to have a banquet in connection with the next contest, at which all contestants, coaches, and prominent poultrymen and judges in attendance are expected to be present. Following the contest a day will be spent visiting the markets, exchanges, and packing plants of Chicago under the direction of a well-informed guide.

Four classes of hens, representing Barred Plymouth Rocks, Rhode Island Reds, White Wyandottes, and White Leghorns, respectively, are placed on the basis of their last year's egg production as revealed by their trap nest records. This feature is unique among stock-judging contests in that the student's judgment is not compared with that of another judge but with the actual performance of the bird. The classes consist of four birds each and are selected with approximately 20 eggs difference between individuals in yearly production. One class from each of the same four breeds is placed for breed type and color. These classes consist of representative cockerels and pullets from their respective breeds. The official judging of these exhibition classes is under the supervision of a licensed judge and a committee of specialty judges and breeders.

Four large silver loving cups and six medals are awarded the winners as follows: (1) A large cup for the winning team which will become the permanent property of the institution whose teams first win it three consecutive times, a sweepstakes cup for the best all-around team, a cup for the team ranking highest in judging the production classes, and a cup for the high team in exhibition judging; (2) gold, silver, and bronze medals for the best individuals in production and exhibition judging, respectively.

This was the first year Kansas has been represented by a collegiate poultry-judging team. Fred Strickler of Hutchinson, Ben Grosse of Jamestown, Robert B. Smith of Raton, N. M., and B. A. Campbell of Denison, Tex., alternate, composed the team which placed third in the contest. Fred Strickler won the gold medal for highest honors in exhibition judging. His score was 340 points out of a possible 400, or 85 per cent.

Eligibility on these teams is restricted to regular four-year college students who have been in college a full year previous to the contest and whose work is of a passing grade. Spring practice for next year's team will begin in April in order that those interested may have an opportunity to get the fundamentals well in mind for further work during the summer vacation.

D. F. Jones, '11, Plant Breeder of the Connecticut Agricultural Experiment Station, New Haven, is recognized as one of the leading young plant breeders in the country. In his present position he succeeded E. M. East and H. K. Hayes. Doctor Jones has done some of the most worth-while work in corn breeding that has been done in the United States. He is the junior author of "Inbreeding and Outbreeding," a series of monographs on experimental biology published in 1919. Another important contribution covering his recent investigations is due to come off the press in the near future.

Poisonous Plants of Kansas

(Concluded from page 86)

ghums, is often poisonous when grown under conditions of deficient water supply. This is especially true if the plant goes through a period of dormancy. Death is due to a poison formed within the animal and may take place seven minutes after the plant has been taken into the body.

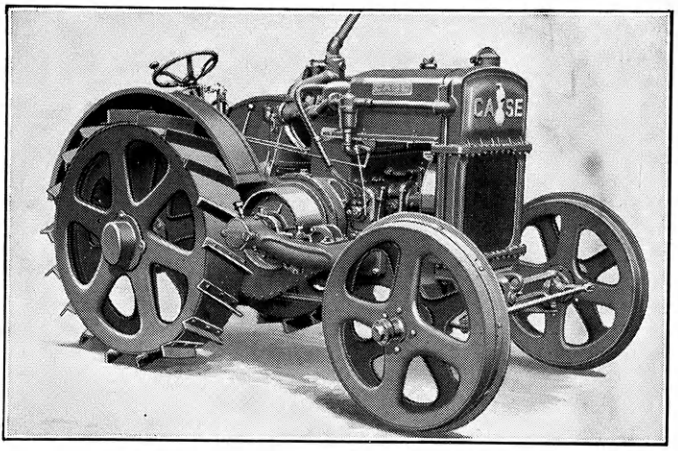
The familiar jimson weed contains an extremely poisonous substance in the seed. Livestock rarely touch the plant because of its unpalatability. However, many children die each year from eating the seed.

Most instances of poisoning from poke berry are due to eating the seed or the fleshy roots, which are quite easily confused with those of horse radish. The young shoots are sometimes used as a substitute for asparagus, and these may be eaten with impunity.

There is a popular idea that animals will seek out poisonous plants and eat them by preference. This is entirely erroneous, for most plants that are classed as poisonous are quite distasteful. Animals eat them only in the absence of suitable forage. Another point of interest is that most of the stock-poisoning plants in the United States produce illness only when eaten in large quantities.

Little can be expected from medical remedies to reduce losses due to poisonous plants. Only effective eradication and control measures will remove the possibility of trouble.

Oscar Steanson, '20, has been transferred from Monmouth, Ill., to Washington, D. C. He is still in the cost of production work of the Bureau of Agricultural Economics of the United States Department of Agriculture.



The Importance of POWER

IN this day of efficient farm implements and improved farming methods, power is still about the most important thing on the farm.

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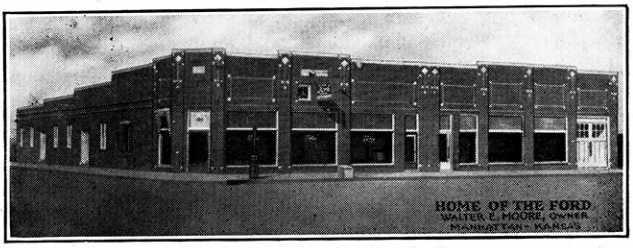

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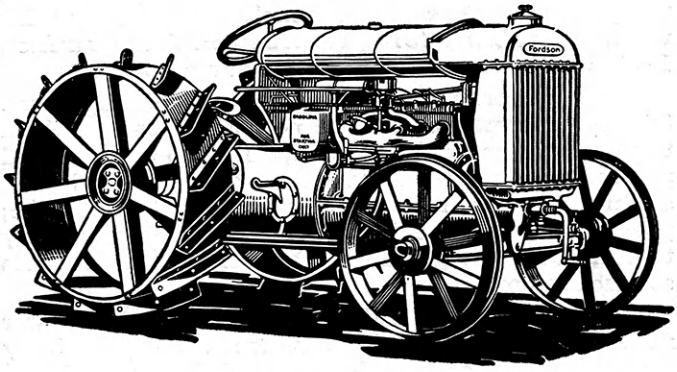

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