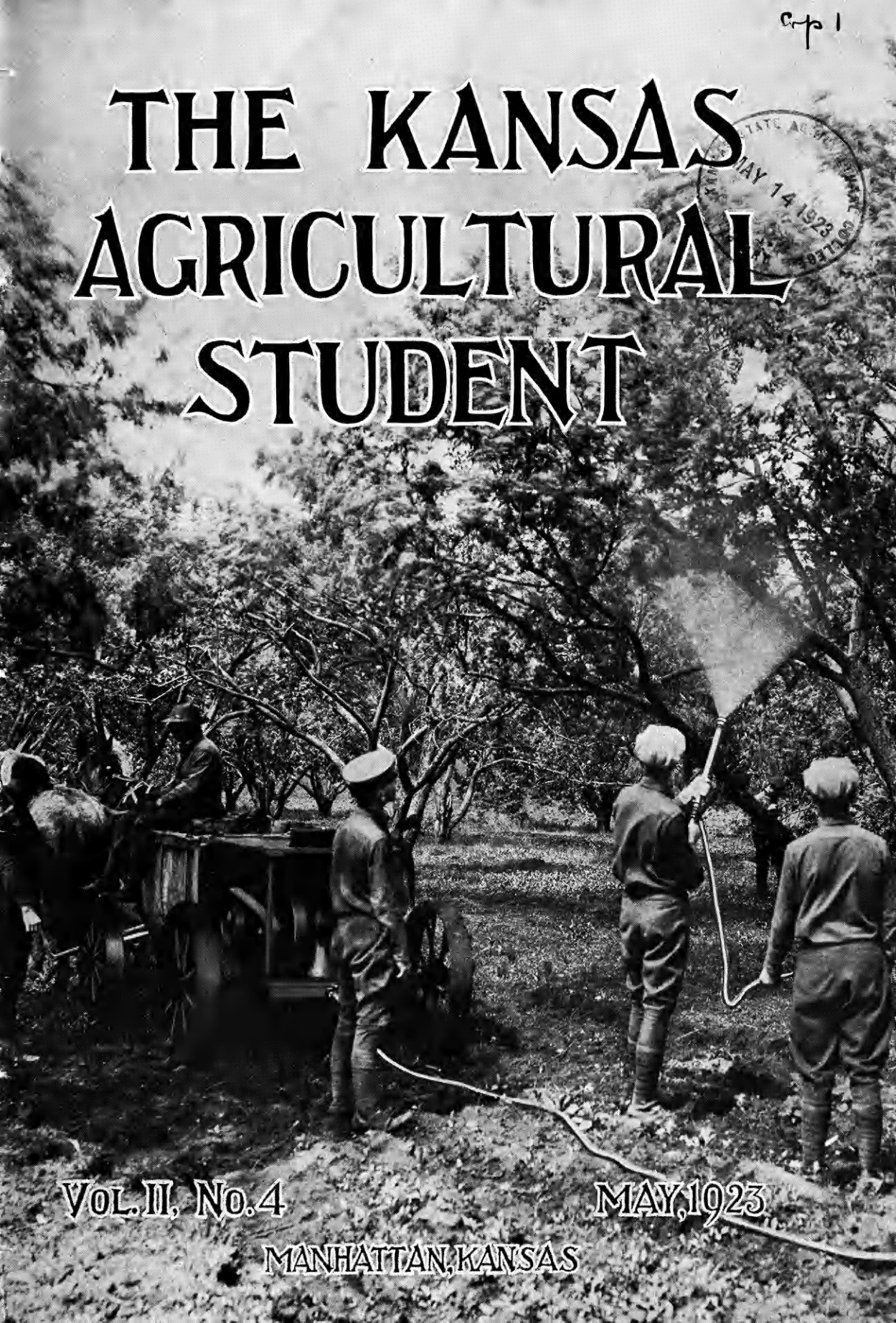


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# THE KANSAS AGRICULTURAL STUDENT



VOL. II, No. 4

MAY, 1923

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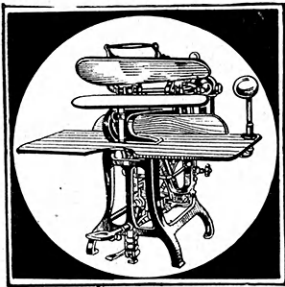
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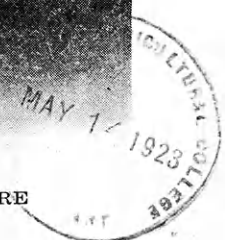
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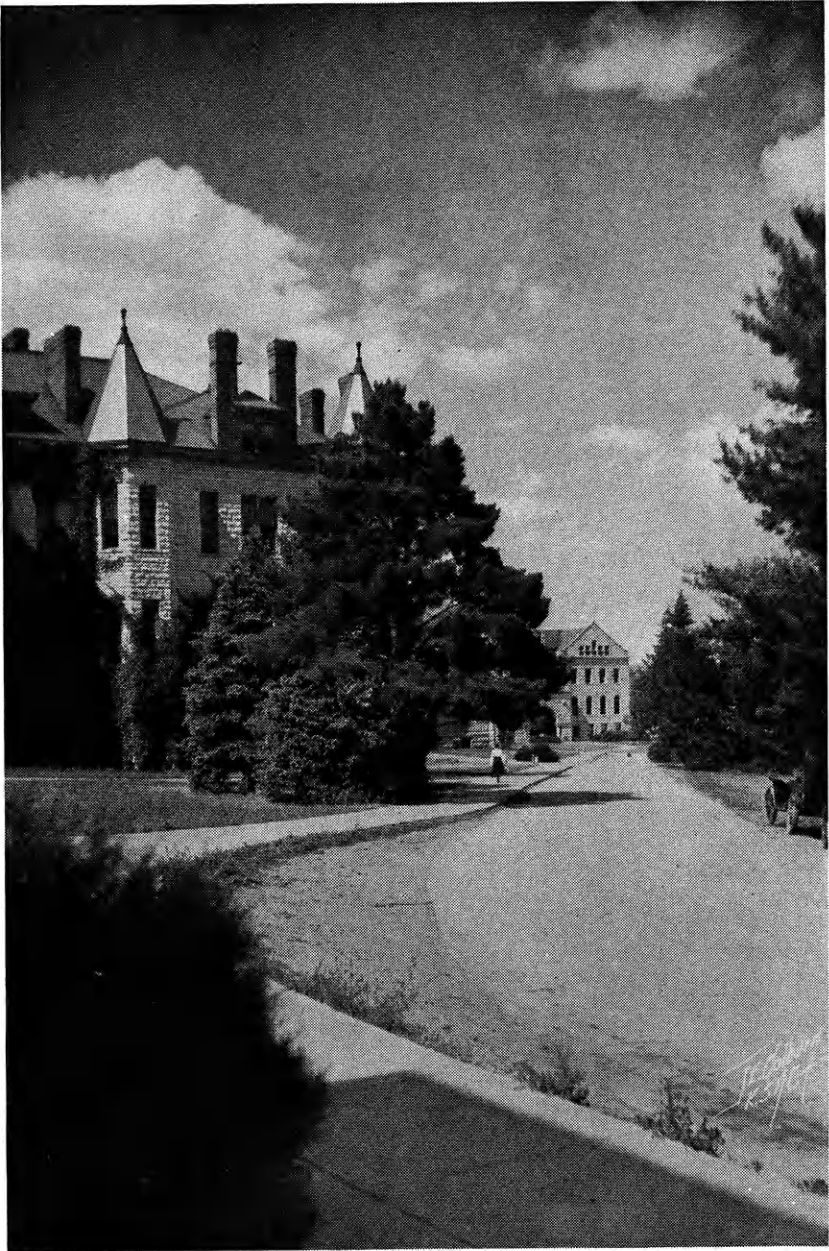


A PART OF THE COLLEGE DAIRY HERD ON SWEET CLOVER PASTURE



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A FAMILIAR VIEW AT K. S. A. C.



# The Kansas Agricultural Student

VOL. II

Manhattan, Kansas, May, 1923

NO. 4

## Dairy Calf Clubs for Boys and Girls

R. W. Morrish

Dairy Calf Clubs are coming to the front in Kansas. With the bringing in of calves for calf club work, dairying is being advanced.

Boys' and girls' club work is a national, state, and county movement to interest farm boys and farm girls in farm and home problems and to teach a three-fold objective: (1) To give rural boys and girls training in agriculture and home economic problems through practical demonstrations and instruction. (2) To develop such organization and leadership among the boys and girls that they will gain the experience of organization and cooperation at an early age. (3) To give boys and girls, through this organization, instruction by the best available leaders of the community, county, and state.

Club work is conducted as an extension activity through County Farm Bureaus or other organizations. Counties having a farm bureau organization with a county agent to supervise the work are able to conduct more clubs, give more supervision, train local leadership, and correlate the whole work of the county better than non-organized counties. In non-organized counties high school teachers of agriculture often conduct successful clubs.

The agricultural clubs conducted or supervised by the Extension Division, Kansas State Agricultural College, are: Swine, beef, dairy, sheep, farm accounts, poultry, corn, sorghum, soy bean, garden, livestock judging, and dairy judging. Any boy or girl in Kansas between 10 and 20 years of age may become a member of any of these clubs except the farm accounts club. Members of the farm accounts clubs must be at least 15 years of age.

The community is the unit of organiza-

tion. There may be one or there may be several clubs in a community. No community should be without a club. The organization should be made a permanent activity within the community. It develops community interest, community cooperation, community spirit, and community pride.

Club work has in mind the development of rural boys and girls. Farm practices that will return a reasonable profit are used to base this training on. The idea is not to start the boys and girls in on practices that will return the most profit in the least possible time, but to start them with something they can handle properly and that will, in due time, promote both reliable training and safe profits.

Experience in dairy club work leads us to recommend the dairy calf for beginners. This calf should be six to nine months of age. By starting with calves of this age, boys or girls learn to feed and manage the calf and heifer for a period of a year and a half before they have to feed for milk production. Sometimes mistakes are made by becoming too enthusiastic about immediate returns and bred heifers are secured. Bred heifers for club members should not be secured unless the members have had successful experience feeding and handling livestock in less important projects. Older boys who have been reared with dairy herds are competent to handle the bred heifers. Younger members having had no experience with dairy cattle often get the heifers off feed and very often may spoil good prospective dairy cows.

The best time to organize dairy calf clubs is in October. Spring heifer calves, preferably purebred, from high-producing cows should be secured. In a number of Kansas

(Continued on page 124)

# The Fords of the Dairy Industry

H. G. Burt, '24

The milk goat industry in the United States is as yet in its infancy though it is growing by leaps and bounds. Recent well-authenticated experiments, which have shown goat's milk to be free from tubercular infection and remarkably well adapted for infant feeding, have done much to give the industry an impetus and to interest the right type of people in it.

The value of milk goats in foreign countries



**PUREBRED ANGLO-NUBIAN WITH TRIPLET DOE KIDS**—This purebred, A B's San Jose, No. 8433 in the American Milk Goat Record Association, took first prize at the California State Fair, Sacramento, 1920. The triplets were born April 4 and the picture taken April 14, 1923.

is well recognized. Mr. F. S. Peer, a well-known importer of livestock, after investigating conditions in Switzerland, reported to Mr. John R. Mohler, Chief of the Bureau of Animal Industry, United States Department of Agriculture, that, "The goat of Switzerland is the Swiss peasant's cow, the Swiss baby's foster mother, a blessing to the sanitariums for invalids, and a godsend to the poor."

There is no native goat on the American continent. The Rocky Mountain goat is not

a goat at all but a species of antelope. The so-called native or common goat is the progeny of goats smuggled in by immigrants and left to degenerate into that much ridiculed nuisance, the common billy goat or barnyard goat. The modern milk goat with her large udder, generous-sized teats, heavy production, and gentle loving disposition is as far removed from these common goats, which most people think of when you mention "goat," as the high-producing dairy cow is from the old-time "Texas Longhorn."

At present there are three important breeds of milk goats in the United States—the Saanen and Toggenburg from Switzerland and the Anglo-Nubian from England. The Saanens are pure white and are heavy producers, comparing to other breeds of goats as Holsteins do to other breeds of dairy cattle. The Toggenburg is brown, with characteristic white markings and compares favorably to the Saanen in production but is the smallest of these three breeds of milk goats. The Anglo-Nubian has no definite color, being black, brown, red, white, cream, roan, spotted, etc. It gives the richest and best-flavored milk, comparing favorably with Jersey cow's milk only being higher in butterfat. Nubians are ideal goats for family use because enough cream rises on their milk for coffee and breakfast foods, leaving a skim-milk for drinking and cooking that is as rich as most cows' milk. Nubians are unequalled in production, gentle to handle, and best adapted to life in small enclosures.

The accompanying cut shows a prize-winning purebred Anglo-Nubian with her triplet doe kids. She is from a family of five-quart milkers and shows promise of beating that record. Her fine young triplets were 10 days old when the picture was taken.

The milk from milk goats is usually richer than cow's milk but is subject to greater variations in percent of butterfat. San Jose's milk will test about 5 percent butterfat for the first six months after freshening, or the period during which the milk flow is the largest. As the amount of milk flow decreases the percent of butterfat may in-

crease as much as 2 percent. A yearly average of three quarts of milk a day is no uncommon record for a purebred milk goat, and a Saanen goat, Blossom of Three Oaks, made an average of a fraction less than seven quarts a day for a period of ten months while on official test under the supervision of the University of California.

On the government farm at Beltsville, Md., where experiments are being conducted with grade goats, a yield of three pints of milk a day is considered only fair; two quarts a day, good; three quarts a day, very good; and anything above that exceptional. This seems very conservative, as many grade goats in Kansas give over five quarts a day.

As economical producers of human food goats are unequaled. In 1916 the California Agricultural Experiment Station carried on an experiment to determine the relative cost of producing goats' milk and cows' milk. They found that when the same feeds were used the cows produced milk at a cost of 8.3 cents a gallon and the goats for 23 percent less, or 6.4 cents a gallon.<sup>1</sup> During this ex-

<sup>1</sup>Voorhies, Edwin C. The Milch Goat in California. Cal. Agr. Expt. Sta. (Berkeley) Bul. 285:85-116. 1917. (Page 111.)

periment the animals were fed alfalfa hay and grain supplemented with pasture.

Thousands of city dwellers now have their own clean tuberculin-free milk supplied by a goat kept in a small enclosure in the back yard. Two goats, one freshening in the fall and the other in the spring, will insure even a large family with an ample and uniform supply of milk at all times and the sale of kids will pay the feed bill. Furthermore, two goats will require no more care and will not make as much dirt or smell as a few chickens. Contrary to popular belief the milking doe has NO disagreeable odor and the milk when properly handled has a rich delicious flavor unequaled by cows' milk.

All new industries develop slowly and the milk-goat industry in the United States has been particularly hampered by the American Public's sense of humor. Now that the value of the product of the modern milk goat is becoming more generally appreciated, prejudices are disappearing and this most useful animal is coming rapidly into her deserved place as a producer of dairy products for the American family.

## Dairy Judging Contest

Clarence R. George, '23

The Sixteenth Annual Dairy Judging contest was won by H. L. Collins of Wellsville. He was awarded the gold medal on his score of 1,016 points. F. D. Strickler of Hutchinson won the silver medal by placing second with a score of 1,006 points. The bronze medal was won by F. E. Charles of Republic, with a score of 989 points. A. O. Turner of Valley Falls was the high freshman in the contest, with a score of 960 points.

The contest was the largest and most successful of the 16 that have been staged by the Dairy Club. One hundred and thirty students competed for honors. In all, eight classes of purebred dairy cattle—one class of cows and one class of heifers of each of the four leading dairy breeds—were judged. In each breed 100 points was allowed on placing cows, 100 on reasons for placing cows, and 100 on placing heifers. A perfect or possible score was thus 1,200 points. Prof.

H. W. Cave believes that the contest was an excellent practice for the boys trying out for the dairy judging team next fall.

Silver medals were won by the men placing first on each breed as follows: F. E. Charles, Ayrshires, 280 points; H. H. Carnahan, Holsteins, 284 points; G. E. Taylor, Guernseys, 291 points; and H. L. Collins, Jerseys, 281 points. A five-dollar cash prize was awarded the high freshman. The leading farm and dairy papers showed their interest in the contest by contributing 32 yearly subscriptions to the men standing high, the "runners up," in the entire contest and in each of the four divisions of the contest. Papers thus contributing toward the success of the contest are Kansas Farmer and Mail and Breeze, Hoard's Dairyman, Dairy Farmer, Guernsey Breeders' Journal, Jersey Bulletin, and Holstein-Friesian World.

# Who Gets the Money?—A Story of Wheat

Lewis E. Long, M. S., '23

I was thinking the other day of old Bill Scroggins, the neighborhood Socialist. You remember him; he lived in the little house down by the creek, trapped in the winter, and worked around by the day in the summer—when he wasn't fishing. 'Remember the time about the first summer after you had started to high school when Bill was helping your father put up hay? It was Saturday afternoon and you and Bill had remained in the field to weight the stacks after the others had gone in. 'Remember how he used to say, "Don't work too hard, son. Me an' you aint got no chance. Them rich birds have stole everything. They get it all." And then how he proved his statement by the Socratic argument—though he didn't know it was Socratic—by asking you, "Why do we (He used the "we" figuratively.) sell our wheat 60 pounds for 80 cents, and then pay \$1.10 for 48 pounds of flour when the by-products pay for the grinding?" And you, not being versed in such matters, couldn't give the answer; so you tacitly admitted that he was right, though you had your doubts? 'Remember that? Well, he did me that way, too.

As I was saying, I thought about Bill the other day and I decided that now, since I have managed to acquire a limited amount of education in spite of "them rich birds" who "get it all," I would look farther into the matter and see if I could answer Bill's question.

About the first thing that I discovered was that Bill's viewpoint was wrong and his vision limited. He thought the price of wheat was determined by the working of the buyer's liver. That is, it depended upon how the buyer felt. I found that the price was determined by how bad the eaters of bread wanted flour and the amount of money that they had—that the money which the ultimate consumer pays for the wheat product must be distributed among all those through whose hands the wheat has passed, the amount re-

ceived by each depending upon the service which he performs. Suppose we begin with bread and do a little back-tracking.

The following table shows the distribution of the consumer's dollar as tabulated in the Report of the Joint Commission of Agricultural Inquiry, 1921, Part IV, page 208:

Retailer of Bread	Cents
Profit .. . . . . .	2.9
Cost. . . . .	15.7
<b>Baker</b>	
Profit . . . . .	8.5
Overhead expense . . . . .	5.7
Selling cost . . . . .	16.4
Cost of bread making . . . . .	12.3
Transportation to Mill . . . . .	2.6
Manufacture of Flour <sup>1</sup> . . . . .	.6
Elevator Margin . . . . .	2.8
Transportation to Mill . . . . .	2.6
Producer . . . . .	28.1
Total . . . . .	100.0

Here we see that out of each dollar which the retailer got for bread, he retained a profit of 2.9 cents, paid 15.7 cents to keep his business going, and handed the balance over to the baker. The baker, after taking out his profit of 8.5 cents, met a long list of bills. He had an overhead of 5.7 cents to pay, and he spent 16.4 cents in selling the product. This item seems high, but the consumers insist on it. The cost of making the bread was 12.3 cents. Bakers' wages and fuel were the main items paid for here. The railroad received 4.4 cents for carrying the flour from the mill to the bakery, and 2.6 cents for carrying the wheat from the elevator to the mill. The mill received 0.6 cents and the elevator 2.8 cents. The balance of the dollar, or 28.1 cents, goes to the producer.

But Bill would condemn the buying of bakers' bread. Mrs. Scroggins was a hard-working woman and always did her own baking. So let us follow Bill's dollar, which he pays for FLOUR, back to the wheat which Bill's neighbor sold. We will use figures ap-

<sup>1</sup>Net cost of manufacture and distribution of flour and miller's profit, less return on by-products.



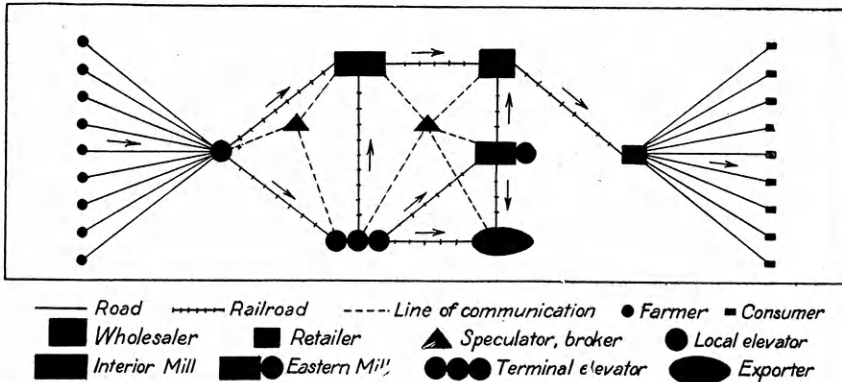
pearing in "Efficient Marketing for Agriculture," by Theodore Macklin:

	Cents
Retailing flour .....	10.00
Freight on flour .....	5.00
Wholesaling flour .....	5.00
Manufacturing (128 mills, 1916-17).....	14.11
Freight on wheat .....	7.00
Elevator margin .....	3.00
Producer . . . . .	55.89
<b>Total . . . . .</b>	<b>100.00</b>

Out of each dollar the retailer took, on an average, 10 cents to cover his costs and profit on handling flour. The railroad took 5 cents for carrying the flour from the wholesaler to the retailer; the wholesaler took 5 cents for his services, and the miller retained

for the flour, his neighbor should receive 55.89 cents plus 10 per cent, or 61.49 cents for the wheat, but, at 80 cents per bushel the wheat brought 90 cents. According to our table, the costs were all charged against the flour, so that the difference is in reality the price paid for the by-product which amounts to 19.5 pounds.

The next time I see old Bill I'll shift the conversation until he asks the old question, then I'll take the floor with the method of instruction made famous by Mr. Socrates, and as I draw a rough sketch on a board, I'll talk to him thus: "Here are the local elevators. Can we do without them? Here are the agents who deal in wheat and who, by



HOW WHEAT TRAVELS FROM PRODUCER TO CONSUMER

The farmer hauls his wheat to the local elevator which may sell either to an interior mill or to a terminal elevator company. The mill processes the wheat and sells the products to the wholesaler. The terminal elevator company may sell either to an interior mill, a large eastern mill, or an exporter. The large eastern mill processes the wheat and sells the products to the wholesaler or exporter. The wholesaler sells to the retailer and the retailer sells to the consumer. In most of the transactions, speculators, brokers, and salesmen play a part.

14.11 cents to cover his costs and profit, the latter being 3.45 cents on flour and by-products combined. The railroad again comes in for 7 cents more for moving the wheat from the local elevator to the mill. The local elevator claims 3 cents, and the balance of 55.89 cents goes to Bill's neighbor.

Now let us take Bill's problem on 80-cent wheat and flour at \$1.10 for 48 pounds and see how we come out. It takes an average of 270 pounds of wheat to make a barrel of flour. From a barrel of flour may be gotten four 48-pound sacks. Dividing 270 by four, we have 67½ pounds of wheat required to make 48 pounds of flour. If Bill pays \$1.10

their knowledge of marketing and their willingness to assume risks, make a steady market possible. Shall we put them out of business? Here are the railroads. Can we dispense with them? This is the terminal elevator and this the interior mill. Can they be eliminated? Here are the exporters and the large eastern mills. Can we do without them? This represents the wholesalers. Shall we dispense with them? And here are the retailers. Could we get along without them? " Then, with an air of finality, I'll squelch old Bill with a crowning question, "What does the Good Book say in First Timothy, V, 18?"



# The Stock Judging Contest

D. B. Ibach, '23

The twenty-first annual students' stock-judging contest was held on April 23, 1923. This annual contest is held for the purpose of promoting interest in student judging work and is an important factor in developing student judging teams to represent K. S. A. C. in the International and other inter-collegiate judging contests. It is always open to students from any department or division of the college.

The contest this year was larger and more successful than ever before. There were two divisions, the contestants being classified on the basis of their stock-judging training. Those having had any training in Advanced Judging were entered in the senior division and others in the junior division. In the former there were 45 entrants and in the latter, 189. The senior division was won by Edwin Hedstrom of Manhattan, junior in animal husbandry, and the junior division by W. W. Taylor of Smith Center, freshman in agriculture.

The five high men in the senior division and the ten high men in the junior division, together with their scores and winnings, are shown in the following tabulations:

## SENIOR DIVISION

Place	Name	Score	Prize
1st	Edwin Hedstrom	519	Gold Medal
2d	H. F. Moxley	513	\$10
3rd	B. W. Wright	493	5
4th	A. C. Magee	491	3
5th	H. E. Ratcliff	487	2

## JUNIOR DIVISION

Place	Name	Score	Prize
1st	W. W. Taylor	518	Gold Medal
2d	Z. L. Pearson	513	\$10
3rd	Paul Schopflin	506	7
4th	W. H. Atzenweiler	493	5
4th	J. J. Dlabal	493	3
6th	G. A. Aikins	492	2
7th	W. J. Ross	487	2
8th	J. V. Hays	482	2
9th	C. B. Hudson	481	2
9th	G. D. Beougher	481	2

Eight classes of livestock were judged, one each of draft horses, Belgian fillies, fat steers, Shorthorn cows, fat barrows, Poland China gilts, fat wethers, and Hampshire ewes. Reasons were required on four of the eight classes. The junior division gave written

reasons and the senior division oral. Fifty points were allowed on placings in each class and fifty points on reasons in each class where reasons were required, thus making a total possible score of six hundred points.

The contestant placing high in each class of livestock in the senior division, also in each class of livestock in the junior division, was awarded a three-year subscription to the Breeder's Gazette. These eight winners are as follows:

## SENIOR DIVISION

Class of Livestock	Name	Address
Sheep	A. P. Atkins	El Dorado
Hogs	J. W. Farmer	St. Joseph, Mo.
Cattle	Reid Machir	Kansas City, Mo.
Horses	C. F. Gladfelter	Emporia

## JUNIOR DIVISION

Class of Livestock	Name	Address
Sheep	W. W. Taylor	Smith Center
Hogs	L. J. Schmutz	Junction City
Cattle	R. W. Russell	Jewell
Horses	G. D. Beougher	Oakley

As usual the contest was held under the auspices of the Block and Bridle Club and in direct charge of the members of the senior stock-judging team, most of whom were ineligible to participate in the contest because of having served on an inter-collegiate judging team. The judges were members of the Department of Animal Husbandry as follows: Cattle, C. W. McCampbell and C. E. Aubel; hogs, F. W. Bell and B. M. Anderson; sheep, W. R. Horlacher; and horses, D. L. Mackintosh.

The spirit of contest prompts the best possible work and adds to the zeal with which students enter into their work. The results of this year's contest do not show by any means who will make the team next year. They are only indications. Stock judging requires a keen eye, a steady nerve, and an everlasting spirit of keeping at it. To a lover of livestock it makes an appeal that is as keenly felt as is the feeling of a victorious football team. This feeling the annual stock-judging contest seeks to perpetuate.

# The Passing of the Campus Vineyard

E. M. Litwiller, '24

The old campus vineyard at Kansas State Agricultural College, a planting dating back over 35 years and occupying the familiar slope east of Horticultural Hall, has been grubbed out that an arboretum may be established upon the ground it occupied. One of

which is a clay loam lacking somewhat in fertility and having out-croppings of moraine gravel. S. C. Mason, who followed Popenoe, did a great deal to make the planting a success and Fred Sears, now a prominent horticulturist in Massachusetts, assisted Mason in



NEW VINEYARD ON HORTICULTURAL FARM

This new Agricultural Experiment Station vineyard was established in the spring of 1922. The winter vetch to be seen between the rows was planted June 23, 1922.

the reasons why the Department of Horticulture has destroyed the old vineyard is because of the difficulty in getting the fruit after it had ripened. Birds would eat a considerable number of the berries, but it seems that the most serious losses of fruit were due to curious persons wandering through the planting. In fact, during the ripening period it was necessary to guard the grapes day and night whenever important tests were being made.

It was in the spring of 1888, soon after the establishment of the Agricultural Experiment Station, when E. A. Popenoe was in charge of the Department of Horticulture and Entomology, that most of the work was done in starting this vineyard, the soil of

this work. However, some of the vines were planted as early as 1879. Records show that some of these oldest vines were still healthy and in a vigorous growing condition when they were pulled out.

It is interesting to note that only two plants of each grape variety chosen were at first planted, since the object was to test out the largest number of varieties possible in the limited space available. The first planting consisted of 64 varieties. In all, over two hundred varieties have been tested in the vineyard. Frequently the vines, which were originally planted, have died and others have been planted in their places so that many of the varieties now being grubbed out are not the same as those first planted.

During the vigorous period of the life of the vineyard experiments were conducted to determine hardiness, resistance to fungous diseases, vigor of growth, date of blooming, date of ripening, and the character of the fruit as to size, color, flavor, texture, shipping, and keeping qualities. Work was done experimenting with various systems of pruning and trellising and in bagging the fruit. Species of grapes have been grown which needed special protection against the winter temperatures of this climate. Most of the two hundred varieties grown have not proved satisfactory for conditions at the station so that only a few varieties are now grown and recommended. Bulletins have been issued by the station giving the results of these investigations. In 1891, Bulletin 28 was published; Bulletin 44 in 1893; and in 1902, Bulletin 110 was issued.

To combat the grape leaf hopper the first practical spraying upon the campus, and probably in the state, was done in this vineyard with a knapsack sprayer. A number of years ago, when many persons believed there was great danger of being poisoned from spray materials adhering to the fruit, the Department of Chemistry of the college made an analysis of some fruit that had been heavily coated with a lime and copper spray. It was found that there was not the slightest danger of poisoning from this source, since less than 0.002 of 1 per cent of the weight of the fruit was metallic copper.

In 1892 at the state fair in Topeka, 150 varieties of grapes grown in this vineyard were exhibited. The next year the same number were shown at the world's fair in Chicago. Since these exhibits contained the largest number of grape varieties ever grown in the state they excited considerable comment. For such collections as these the bunches of fruit were grown inside of paper bags in order to prevent injuries from birds, insects, or fungous diseases. The experiments in bagging the fruit have shown that the practice is advisable when fruit is destined for a fancy market. The cost was found to be about 1 cent per pound.

In the spring of 1922 a new vineyard was established on the Horticultural Farm a mile west of the campus. This planting includes only commercial varieties adapted to Kansas. The varieties set in the new vineyard

were Agawam, Brighton, Concord, Diamond, Moore, Niagara, and Worden. Instead of being a test of varieties, the experiments in the future will deal mainly with systems of pruning and with soil management problems. To date the soil management has consisted in an effort to increase the fertility of the soil through the use of winter vetch as a cover crop.

The old vineyard has been the laboratory where hundreds of Kansas boys and girls have learned something of how to grow, prune, trellis, spray, and harvest grapes. Being so favorably situated for classroom use it is to be regretted that this planting had to be destroyed.

According to the plans of the landscape gardener at the college, the old vineyard is to be supplanted by an arboretum established for the purpose of making the campus more beautiful and serviceable.

### Feeders' Day Convention

The Eleventh Annual Feeders' Day Convention will be held at the college, Wednesday, June 20, 1923. The program will consist of speaking and reports on the livestock feeding experiments conducted during the past year.

Two outstanding livestock men from outside the state will appear on the program: J. S. Montgomery, '07, Manager of the Central Cooperative Commission Association of St. Paul, Minn., whose subject will be "Marketing Livestock Cooperatively;" and J. E. Poole of Chicago, Livestock Editor of the Breeder's Gazette, who will speak on "Marketing, Processing, and Distributing Meat." Among the Kansas men outside of the college faculty who will appear on the program are: Gov. Jonathan M. Davis whose subject will be "What About the Farm?" and C. W. Floyd, banker and livestock man, President of the Kansas Livestock Association, who will discuss "Livestock Credit." A. B. Carney, member of the Board of Administration, will preside.

In years past the attendance at the Feeders' Day Convention has ranged from 600 to 1,600. Out of the 105 counties of Kansas, 101 have been represented. It is hoped that the attendance this year will exceed all previous records.



# Early Seedbed Preparation Improves Yield and Quality of Wheat

R. S. Mather, '22

When the Federal Grain Standards were adopted in 1916, the grain dealers and farmers believed an important step had been taken in determining the true value of grain. However, the men who drew up the standards relied entirely on physical factors in determining values. Since these standards were adopted much attention has been given to the chemical composition of grain as related to value. The protein content of wheat is now influential in determining wheat values. Protein content, test weight, and physical appearance make fairly accurate measurements of the value of a sample of wheat.

Because of this fact the purchasers of wheat are now demanding, as a general rule, that protein tests be included in the standards to determine values. This demand for protein analysis has resulted in the establishment of commercial protein laboratories at some of the principal wheat markets. It has also resulted in this state in the installation of protein laboratories operated under the direction of the Kansas State Grain Inspection Department, of which Mr. J. S. Hart is Chief Inspector. Already three state laboratories have been installed, one each at Hutchinson, Wichita, and Kansas City. These laboratories have college trained chemists in charge of them. They issue protein certificates giving the results of their tests.

The protein test of wheat has proved of value to both the grain dealer and miller by giving them another point to consider in buying or selling their products. In fact the wheat trade depends so much upon the percent of protein that practically all hard wheat is tested before the samples leave the tables on the board of trade.

The superior qualities of the gluten contained in the black hard winter wheat of Kansas are of great importance to the grain trade. This is evidenced by the fact that the millers of northern hard spring wheat use from 10 to 25 percent of good high-protein Kansas wheat in their milling mixtures to give them flour of a desirable quality. The de-

mand of the northern mills for high-protein Kansas wheat is, in fact, influential in fixing the price.

Kansas wheat farmers should take advantage of the new factor determining the price of wheat and raise wheat higher in protein content. The results of recent experiments have shown clearly that this can be done. The time that the seedbed for wheat is prepared will influence the amount of available nitrogen in the soil. The amount of protein in the wheat is proportionate, within limits, to the amount of nitrogen in the soil. The Kansas Agricultural Experiment Station, for example, found the following amounts of protein in wheat produced under various dates of tillage:

	Percent
Plowed in Sept., 3 inches deep.....	13.87
Plowed in Sept., 7 inches deep.....	13.84
Double disked in July, plowed in Sept. ....	15.66
Listed in July .....	15.88
Plowed in July, 7 inches deep .....	15.92
Plowed in July, 3 to 4 inches deep ..	15.68

Results obtained at the California Agricultural Experiment Station show that by the addition of nitrogen to the soil the protein content of the soft white wheat of that state could be increased from 11 to 15 percent.

Farmers over the state know that they can get higher yields of wheat when wheat follows legumes. It is also true that wheat produced after legumes contains a higher percent of protein and will sell for a higher price per bushel than wheat grown on soil deficient in nitrogen. Often the price of high-protein and low-protein wheat will vary from 5 to 20 cents per bushel. A good system of crop rotation with legumes, early plowing in preparation of seedbed, and, in humid portions of the state, the addition of barnyard manure or commercial fertilizers to the soil, will not only increase the protein content of the wheat produced, but also give a larger yield per acre thus doubly increasing the returns to the farmer.

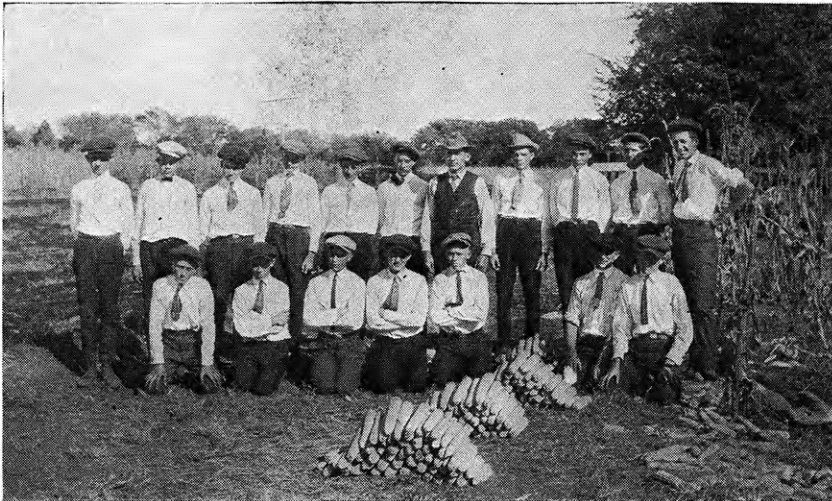
# Worth-While Activities in Vocational Agriculture

C. G. Randell

The job of the teacher of vocational agriculture is to make his community more prosperous, contented, and happy. The following activities, if carried out successfully, will help to make a community what it ought to be.

plained why trees didn't grow and incidentally showed one of the many leaks we find in the farm business.

2. **Encourage Diversified Farming.**—Ninety per cent of the economic troubles on the farms in my community are due to a one-



A GROUP OF PRODUCERS

1. **Help Farmers Reorganize Their Business.**—During our recent period of deflation and low prices of farm products it took a great deal of moral courage for a vocational man to sit down with a farmer and go over his accounts with him. When the average farmer sees that he is not making money, his first impulse is to leave the farm and get a job in town. It doesn't occur to him to reorganize his business, cut down the overhead expense, and eliminate the leaks. The vocational teacher may assist the farmer in this operation. This spring a farmer remarked to me that he had spent three hundred dollars in the last five years trying to get an orchard started near his home. A simple test with a soil auger showed a gumbo hardpan 10 inches under the surface. That ex-

plained why trees didn't grow and incidentally showed one of the many leaks we find in the farm business.

cash-crop system of farming. There should be four or five cash products. Last year a severe hail storm struck this territory just before harvest, beating to the ground thousands of acres of wheat. One wheat grower was encouraged to feed out a carload of lambs to utilize the down wheat. The neighbors reminded him that the wheat beards would kill the sheep, but they couldn't shake his faith. This fall he marketed the sheep. His accounts showed that he received \$4.50 a bushel for the corn and \$75 a ton for the alfalfa he fed his lambs besides receiving a handsome profit from the wheat fields that afforded pasture.

3. **Banish Scrub Livestock.**—The beginning of many a purebred business on our farms is the home project. When Dad sees

that purebred hogs and cattle are making more money for the boy and himself, it's "good-by scrubs" for him. In this project the vocational teacher can do a great deal through the organization of Boys' and Girls' Clubs.

**4. Reclaim and Maintain the Fertility of the Soil.**—The soil is the basis of our wealth. The teacher of agriculture must safeguard this wealth if the community is to prosper. When he sees the once barren uplands covered with sweet clover and alfalfa and many fields covered with straw that formerly provided fuel for big bonfires, he feels that the seed he has sown in demonstrations and in literature has fallen on good ground.

**5. Develop Acclimated Varieties of Farm Crops in the Community.**—This can be done by assigning crops to students as projects and assisting the boys in improving them. After a while farmers in the neighborhood will be wanting to buy seed from the boys. The accompanying illustration shows one of the classes in vocational agriculture at Marysville and samples of their improved Boone County White seed corn which outyields other corn in this locality.

**6. Encourage and Foster Cooperative Marketing.**—The cooperative marketing movement is sweeping all over the country. The teacher of vocational agriculture can render real service to his community by helping organize livestock shipping associations, cooperative creameries and elevators, or by assembling specialized products and finding markets for them.

**7. Hold Rural Meetings and Make Personal Calls.**—Many community contacts are made by holding meetings at rural school houses and having farm institutes. Supplementing the agricultural talks and demonstrations with music and light entertainment is relished by country folk. The farmer, especially in the isolated districts, gets hungry for company and it pleases him to have you stop and visit with him and his family.

**8. Beautify the Community.**—Unightly home surroundings have contributed much to drive boys and girls away from the farm. Farms successfully landscaped will make the owner and his family proud of their place. His next step will be to name it. Then he gets purebred livestock and certified seed to advertise on his letterhead. In this com-

munity in just three years forty thousand dollars worth of landscape work has been done by the department of vocational agriculture. The accompanying illustration



BANDSHELL, MARYSVILLE CITY PARK

shows a bandshell, one of the features of the Marysville City Park, designed by the vocational class.

**9. Break Down Barriers Between Town and Country.**—The commercial club should be encouraged to invite farmers in to their meetings and farm organizations should invite business men to their meetings. "Know your neighbor tours" can be planned. Have business men gather up their families, provide themselves with basket dinners, and visit farmers who are doing good pieces of work. Many towns have adopted a half holiday in the summer which lends itself to this scheme. These visits can of course be mutual. Getting town and country folks together for banquets and entertainment have also been successful. Vocational students going back to the farm should be trained in citizenship as well as agriculture. They should have the viewpoint of the baker, the butcher, and the merchant as well as the farmer. They are going to be a great factor in breaking down the barriers between town and country.

**10. Advertise the Community.**—The community can be advertised by preparing proper exhibits for the county and state fairs. The purebred livestock and good seed farmers can be organized and a directory prepared and sent over the country to encourage buyers to come to the community for their needs. Feature articles for papers and magazines citing experiences of successful men in the community are effective in advertising the community.

# Effect of Pasteurization on Vitamin C

J. C. Jenkins

Vitamins are divided into three main classes: A, B, and C. (A fourth, class D, newly discovered, will not be discussed here.) These may be described briefly as follows:

Vitamin A, or Fat Soluble A, is known to occur in such materials as raw milk, butterfat, egg yolks, green leaves, and cod liver oil. Its lack causes a deficiency disease characterized by sore eyes, lack of growth, serious nervous disorders, etc., and sometimes known as xerophthalmia.

Vitamin B, Water Soluble B, occurs in many substances such as raw milk, the outer covering of seeds, yeast, green leaves, and some vegetables. Its lack causes a deficiency disease known as beri-beri, characterized by loss of control and then paralysis of voluntary muscles.

Vitamin C, or Antiscorbutic vitamin, occurs in fruits, green leaves, raw milk, and some vegetables. The lack of this vitamin causes scurvy, characterized, among other things by abnormal bone development including loosening of the teeth.

A recent experiment conducted at the Kansas Agricultural Experiment Station by J. S. Hughes, N. E. Olson, and J. C. Jenkins seems to indicate that Vitamin C is seriously affected by pasteurization. This experiment may explain why mothers are so partial to unpasteurized milk for feeding infants. The aim of the experiment was to determine the effects of five different kinds of pasteurization on the vitamin content of milk. The methods of pasteurizing used were as follows:

1. Vat Pasteurized—The milk was heated to 145° F. for 30 minutes in an ordinary vat pasteurizer where the heat is supplied by a coil revolving in the milk, through which hot water passes. This aerates and heats the milk.

2. Bottle Pasteurized—The milk was bottled in pint bottles and then placed in a large water vat, the temperature of which was raised to 150° F., and held there 30 minutes.

3. Air-Free Bottle Pasteurized—The milk was heated the same as "bottle pasteurized" after the dissolved oxygen and other gases had been removed.

4. Boiled milk was brought to a boil in

a glass beaker without stirring and then cooled immediately.

5. Autoclaved—The milk was bottled in one-half pint bottles and heated in an autoclave at 230° F. for 3 hours.

To demonstrate Vitamin C, the antiscorbutic vitamin, guinea pigs are used. They are peculiarly adapted to this as they show unmistakable signs of scurvy quickly. In this experiment 30 cubic centimeters of milk was fed to each guinea pig per day in addition to a scurvy-producing ration of 90 per cent oats and 10 per cent alfalfa. Since in the case of raw milk 30 c.c. per day per guinea pig will not furnish sufficient quantity of Vitamin C to prevent indefinitely the development of scurvy, in the case of the various kinds of pasteurized milk scurvy will develop more quickly if the process of pasteurization has destroyed any of the Vitamin C.

The Vitamin C results may be tabulated as follows:<sup>1</sup>

Number of Pigs	Kind of Milk	Av. Num. of Days before Scurvy Developed	Av. Num. of Days before Death
23	Raw milk	30.24	56.17
35	Vat pasteurized milk	18.78	38.10
31	Bottle pasteurized milk	20.30	41.15
8	Air-free bottle pasteurized milk	15.50	42.62
16	Boiled milk	16.25	42.18
26	Autoclaved milk	17.81	30.43
9	Basal grain ration only	12.50	22.70

From the above tabulations the following conclusions may be drawn:

That the Vitamin C content of milk is very much affected by all means of pasteurization. The vat pasteurization seemed little better than the autoclaved which is supposed to destroy all of Vitamin C. Pasteurizing in a bottle and bringing to a boil in a beaker did not destroy quite as much of the Vitamin C as vat pasteurizing. The removal of the dissolved oxygen in the milk before bottle pasteurizing had no appreciable effect on the destruction of the Vitamin C. However, the

<sup>1</sup>The original data showed that Vitamins A and B are little affected by pasteurization. The seasonal variation in vitamin content was also noted in the complete data.

(Continued on page 125)



# Rural Life and the Student of Agriculture

Walter Burr, '20

With the founding of the Land Grant Colleges there began a new era for American agriculture. Morrill, whose name the act bears, and Abraham Lincoln, who gave it the presidential signature, were prophets of the new era. It is significant, however, that in spite of the inauguration of this governmental project, a period of rural decadence began and increased throughout the nation.

The Smith-Lever act and the Smith-Hughes act were admissions of our fault in not recognizing the human values in the American rural community and in not having the facilities offered in terms of personal, sympathetic service for the rural people where they lived.

The development of our school programs in the various states parallels the same trend. We believed that we could hand down from national and state boards of education, theories, and even in some cases subsidies, that would revitalize the rural school.

In that book of our childhood days, "Uncle Tom's Cabin," when Little Eva says to Topsy, "Miss Ophelia loves you," Topsy replies scornfully, "Miss Ophelia? She'd sooner tetch a toad!"

We are just beginning to learn that in revitalizing American rural life the job cannot be done successfully by absent treatment. The personal touch is the necessary factor. For men and women in city centers, commercial or educational, to SAY they love the rural people and to attempt to advise them how to make rural life wholesome, is as objectionable and as surely doomed to failure as is ever any attitude of distant superiority. The prophetic gospel of the man whose signature honors the Morrill act, "Of the people, by the people, for the people," must be applied.

This means nothing less than a leader in the local rural community who will be a real servant to carry into efficient action the program adapted to the local community, the power for which will be found in resident forces.

Positions for leaders, such as county agricultural agents, home demonstration agents, rural high school principals, boys' and girls' club leaders, teachers of vocational agriculture—all of these are opening so rapidly as to require each year large numbers of men and women trained in our agricultural colleges. The person taking training for such leadership should add to technical, scientific knowledge of agriculture, the knowledge of human values, without which knowledge he is doomed to failure.

In some states we have recently been passing through a period of minimizing the SOCIAL values to be conserved by county agricultural agents and men in like positions. One who studies the situation nationally and comparatively can note very accurately the rapid failure of such work in the states that have fostered this one-sided view. A man to continue successfully in the leadership of groups of men, women, and children organized on the family unit basis, which we find in the farm community, must "know his stuff" about soils, crops, hogs, fertilizers, and the like, PLUS those accompanying social values of the rural home, school, and church, with their intimate contact with the emotional and esthetic life of the people. To quote from Dean F. D. Farrell in a recent address before the Division of General Science, he must "understand the relationship between a manure pile and a lily."

The rural life movement is entering the stage in which it is to progress only through native rural institutions. These are primarily social institutions, and agricultural graduates, who have "agricultural education—PLUS," are enthusiastically welcomed into this new day of the movement.

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Ralph W. Morrish who, since July, 1920, has had charge of the state boys' and girls' club work for the Division of College Extension, received his degree, B. S. A. from Purdue University in 1920.

# THE KANSAS AGRICULTURAL STUDENT

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## A CHALLENGE AND AN OPPORTUNITY FOR HIGH SCHOOL GRADUATES

Shall I study Agriculture? This question will be consciously or unconsciously in the mind of hundreds of young men in Kansas this spring as they receive their diplomas from high school. The way the question is answered will affect not merely the lives of these young men but will affect in a very important way the future development of our great commonwealth. Answered in the affirmative and there will be developed in this state an educated class that will provide wise future leadership for agriculture. Answered in the negative and there will be lost to our farming industry the educated leadership that the industry must have if it is to retain its present position and remain the bulwark upon which all industry and society in this country is builded.

Young men of the rural high schools of Kansas, the farming profession needs you. Accept the challenge to get the college training that you must have to compete with the educated leaders of other groups of organized society and take your place as leaders in agriculture. This opportunity for service is yours. Will you accept it?

## TO OUR K. S. A. C. READERS

Save your copies of The Kansas Agricultural Student and have them bound. Such volumes will be of incalculable value to you in the future. You will find articles pertaining to your line of work, written either from authentic experimental data or by men successful in a practical way. Furthermore, you will become attached to the bound cop-

ies because they will represent and picture to you those good old days at K. S. A. C.

## TO THE CLASS OF '23

Someone has said, "Tell me what the students of Oxford are thinking about and I will tell you the policy of the British Empire 20 years hence." Our seniors are graduated from K. S. A. C. destined to play an important part in the world's agriculture of tomorrow.

The Kansas Agricultural Student extends to the Class of '23 the best wishes and hearty congratulations of the Division of Agriculture. As the years roll by you will become increasingly loyal to your Alma Mater. You will take keen interest in the research work and contributions to scientific agriculture made by the staff of the Agricultural Experiment Station. You will follow the winnings of future student judging teams with pride and exultation. The activities of the division, such as the Ag Fair and the annual judging contests given by the several departments, will revive pleasant memories. The work and location of former friends and classmates will mean much to you.

These are a few of the reasons why you should continue your subscription to The Kansas Agricultural Student. Let this magazine be the medium binding all Ags together.

## AN APOLOGY

By an oversight in the last issue of the Agricultural Student the continued portion of the article beginning on page 77 on "The Soil Fertility Problem in Western Kansas"

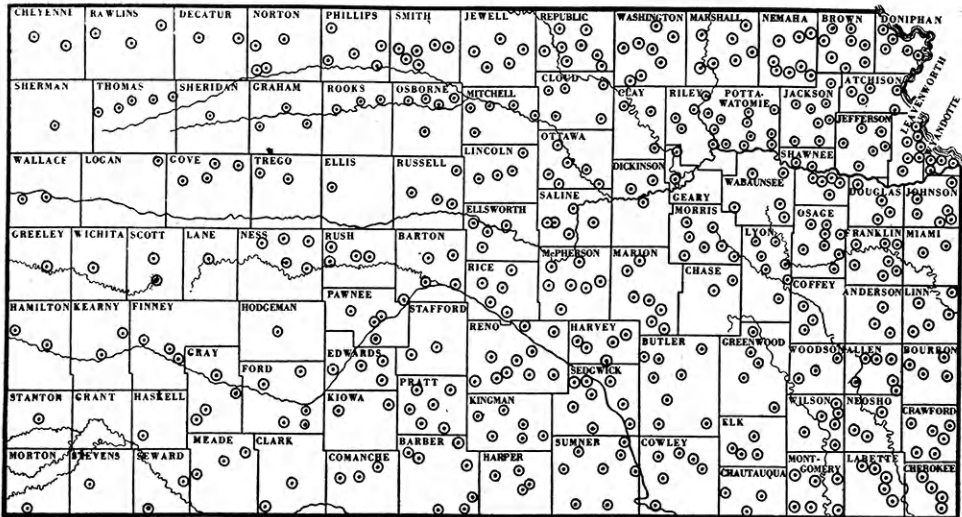
by L. V. Hunt, 23, was omitted. We beg the pardon of both Mr. Hunt and our readers. The portion of the excellent article previously omitted will be found on page 128 of this issue.

**OUR HIGH SCHOOL READERS**

Provisions were made last fall whereby any Kansas teacher of high school agriculture might secure, primarily for class use,

455 other high schools have, we hope, found pleasure and profit in reading Nos. 1, 2, 3, and 4 of the *Agricultural Student* this school year.

Scores of these teachers and students of high school agriculture have expressed their appreciation of "The Kansas *Agricultural Student*." One teacher says his class devotes one period each two weeks to reports on articles in agricultural papers and maga-



*EACH DOT REPRESENTS A KANSAS HIGH SCHOOL WHERE ONE OR MORE CLASSES IN AGRICULTURE HAVE ACCESS TO "THE KANSAS AGRICULTURAL STUDENT"*

the four numbers of "The Kansas *Agricultural Student*" to be issued during the school year. Through the cooperation of county superintendents, city superintendents, and high school principals the names and addresses of all high school teachers of agriculture in the state were secured. The head teacher of agriculture in each high school was then given an opportunity to file a written application to receive the magazine for use in his high school especially in the classes studying agriculture. By the time the first issue of the magazine was ready to be mailed, 456 high school teachers of agriculture had made application for this service. The location of the schools these teachers represent is shown approximately on the accompanying outline map of Kansas. Find the dot supposed to represent your school and see at a glance where your fellow students in

zines and that they find the *Agricultural Student* far more popular and valuable than anything else available. It is common for teachers to say that they have used certain articles for special class reports and found them exceptionally worth while. In several cases teachers subscribed for additional copies. Two such teachers say they expect to have a set filed for future use. One K. S. A. C. graduate and teacher of vocational agriculture in a first-class western rural high school writes: "The boys in my class read the magazine from cover to cover and aside from the articles of merit on agricultural subjects it has introduced them to K. S. A. C. in a more intimate way than has been possible through any other medium." Another teacher writes that the boys have learned to look forward to receiving the numbers of the magazine each issue of which contains sev-

eral articles closely related to their class work. Another teacher writes that the magazine "occupies an important place in our reading room and at times fits in nicely with our recitation work." Still another writes that the magazine is in "constant demand during the regular reading periods."

It is clear that the magazine has been appreciated by high school classes studying agriculture and that the service rendered has been valuable. We have only made a begin-

ning, however. Next year we hope that more nearly 100 per cent of Kansas high school teachers of agriculture will use the magazine. The publication should come as an old friend to the hands of hundreds, yes thousands, of high school students of agriculture and its usefulness should thereby be vastly enlarged. The publishing staff for the coming year already have their work well planned and prospective high school readers have received due consideration.

## Grain Judging Contest

M. E. Rowe, '24

The Fifth Annual Students' Grain Judging contest was held Saturday, March 17, 1923. The prizes awarded were larger and more numerous than in any previous contest. There were two main divisions of the contest: (1) The identification of crop varieties, both grain in the head and threshed grain, and the naming of grain damages such as smut, yellowberry, etc., and (2) commercial grading and judging. This division included three subdivisions; namely, the small grains, corn and sorghums, and alfalfa seed.

The small grains included three classes as follows: (1) Commercial grading of wheat; (2) commercial grading of oats; and (3) judging of hard red winter wheat. The corn and sorghums included two classes: (1) Judging ear samples of corn, and (2) judging head samples of kafir.

Prize ribbons and cash prizes were awarded for the three highest scores in the first division of the contest and each of the three subdivisions of the second division of the contest. In the first division the cash prizes were \$10, \$8, and \$5, respectively; in small grains they were \$8, \$5, and \$3; in corn and sorghums, \$5, \$3, and \$2; and in the judging of alfalfa seed, \$5, \$3, and \$2. Cash prizes of \$25, \$20, \$15, \$10, and \$5, respectively, were given to the contestants who made the five highest scores in the entire contest. The three highest-ranking freshmen were awarded \$5, \$3, and \$2, respectively. Thus a total of \$144 was awarded in cash prizes.

The following firms made up the purse that was distributed in cash prizes: Kansas Crop Improvement Association; Armour Grain Company; Cochrane Packing Company; Curtis Publishing Company; D. O. Coe Seed

and Grain Company; Barteldes Seed Company; Southwestern Wheat Improvement Association; T. Lee Adams Seed Company; and Cudahy Packing Company. The Weekly Kansas City Star, Breeder's Gazette, Kansas Farmer and Mail and Breeze, Farm and Fireside, Capper's Farmer, and Successful Farming gave one or more yearly subscriptions.

Those placing highest in the entire contest were: First, L. V. Hunt; second, Edward Watson; third, W. H. von Trebra; fourth, C. W. Bower; and fifth, E. M. Litwiller. In identification the five high men were: First, Martin Henrichs; second, Ben Grosse; third, L. D. Keller; fourth, J. I. Rogers; and fifth, F. M. Alexander. In small grain classes the five high men were: First, R. L. Stover; second, G. S. Atwood; third, M. M. Hoover; fourth, J. D. Buchman; and fifth, W. E. Stone. The five high men in corn and sorghums were: First, H. A. Ames; second, L. J. Schmutz; third, W. T. Crotchett; fourth, M. E. Rowe; and fifth, D. B. D. Moses. In judging alfalfa seed the five high men were: First, W. P. Raleigh; second, F. W. Kerns; third, O. L. Norton; fourth, B. W. Wright; and fifth, A. K. Banman. The freshmen prize winners were: R. W. Fort, first; G. W. Landis, second; and C. J. Jackson, third.

This contest is held each year under the auspices of the Klod and Kernel Klub, an organization of upper classmen and faculty members of the Department of Agronomy. Its object is to stimulate interest in the crop courses and to give the students who are to become county agents, grain dealers, millers, teachers, and farmers, some practical training and experience in such judging and identification work as will confront them later.



# Purebred Livestock for Kansas

Robert T. Patterson, '24

There are but few purebred livestock on Kansas farms. The chief reasons for this situation are to be found both in the large investment and the high cost of maintenance in keeping these animals. The initial cost is high, insurance is high, taxes are high. Further, a farmer generally feels that when he has such valuable animals it is advisable to take unusual care of them and provide the best possible housing facilities in order to have them in the best condition when prospective buyers come to look them over.

In a great many instances one individual of a purebred herd is more valuable than a whole herd of common stock. It is not unusual for a breeder to pay \$10,000 for a well-bred bull, or \$20,000 for an exceptional stallion. The rate of turnover on this stock is often very slow and the banks and other financing organizations are not willing to loan money on such long-time notes. Under these circumstances it is very hard for a farmer to carry such a heavy financial obligation without some aid from the outside.

The handling of purebreds requires a wide and comprehensive knowledge of animal breeding, heredity, and genetics. The mating of animals of the purebred class is not a case of guesswork but a hard problem in genetics. After so many years of selective breeding and culling the present animals are very prepotent and it is this characteristic that makes the nicking of different animals a decided success or a mere cross. The ability to practice inbreeding methods is a factor that the average layman is better off to forget about, but if it is practiced by men who are good breeders it results in such great individuals as Anxiety 4th in the Hereford world or Great Orion Sensation in Duroc Jersey circles or Brilliant 1271 in Percheron breeding. So it is very easy to see that a wide and varied experience is essential to a successful breeder.

After the animal has produced the offspring half the work and anxiety is still before the livestock man. The young animal's every move must be watched to keep him coming on in as fast and normal a manner

as is possible. A few days off feed may mean the difference between a winner and a second rater. The greatest skill is required at all times to keep the individual in the best possible condition and the most presentable form. It is this pleasing appearance and attractive style that induce a prospective buyer to admire the animals and give the price asked. Diseases and pests must be guarded against very carefully as a disease may wipe out an entire herd if it once gets a foothold. Even if the animals do not die they are often rendered unfit for breeding purposes which is practically as bad as death as far as a breeding animal is concerned.

Kansas needs purebreds for greater profits. They always sell higher than common animals. The greatest price that common animals will bring is their value for commercial purposes. Because purebreds are so prepotent it is always desirable to obtain individuals as near the ideal as possible. In crossing two animals of nondescript breeding the results are always a chance. It is often found that though the parents are of very desirable type and conformation the offspring may be the most objectionable mongrel in the herd. It is this uncertainty in dealing with common stock that often induces a man to say it is all a gamble and that the man who really has something good only has it as a matter of chance. For desirable characters a man is willing to pay almost unbelievable prices for individuals in which he has a great deal of confidence.

Purebreds are in greater demand throughout the country today than they ever were in the history of livestock breeding. Stockmen in the Southwest and in the West are continually asking for more and better animals to head their herds and breed them up to a greater state of efficiency. Purebreds or high grades have always topped the markets at the great livestock centers, and are practically the only kind of livestock to attract any attention at the great shows and fairs of the country. New herds are constantly being established and new breeders

are desirous of getting as good individuals as their means will permit. These new breeders, along with the old breeders who wish to introduce new and better strains into their herds, are constantly in the market for outstanding individuals to introduce into their herds. This constant demand without a sufficient supply of animals to satisfy it tends to keep the prices for purebreds high.

It really requires the same amount of labor to care for common livestock properly as it does to care for purebreds. Common critters must be fed every day; they must have shelter and care; and are just as susceptible to disease as other stock. However, the only demand for common stock is in the immediate vicinity of the owner or at the big packing houses of the cities.

The fact that purebred livestock men of this country and of all other agricultural countries are outstanding financial successes and leading citizens should be an incentive to the younger generation to follow their lead. The men who have livestock that has

been winning are often as proud of this accomplishment as of acquiring a new office of profit and esteem. The whole community shares the pride of a man who has won out in a successful contest of this kind. Since it is the desire of most people to have the best they can get, it follows that purebreds will some day be the rule rather than the exception in Kansas agriculture. Purebreds have been a source of profit and pride in our agricultural achievements and will continue to be such until it will be a disgrace to have common or scrub stock on the farm. When Kansas comes to that stage in her livestock development she will be a more prosperous state and a finer place in which to live. Purebreds can make of Kansas what the fruit industry has made of California. This condition is just as far off as the coming generation of farmer boys is willing to let it stay. When chance and luck are taken out of farming and brains and pluck are introduced then will agricultural pursuits be the most thought of profession of the country.

## Insects as Material for Study

Roger C. Smith

Some of the states, notably New York, have stressed nature study, which includes a graded course of insect study, as an important part of the school curriculum. In the Cornell Study leaflets there has been outlined suitable study material designed especially for rural schools, beginning with the first grade. Plants and animals near at hand of varying degrees of economic importance are studied both on field trips and in the school room.

In the elementary and high schools of Ohio and several other states some studies of insects are carried on in connection with courses in agriculture. Naturally less time is available, and the study of insects is likely to be confined to the enemies of plants. In the larger cities, with better school facilities and public museums, students have an opportunity to learn much of insect life. For example, they become familiar with numerous insects by their orders and common names as well as many facts concerning their life histories.

Relatively few teachers realize the valuable study and teaching material available in this omnipresent group of tiny creatures. A good variety can be had during most of the year and with but little effort. Furthermore, relatively little is known about insects by the average person. They are just "bugs," and when stepped on are properly disposed of. Insects, however, can be studied as living creatures, and as such quicken a new interest in most students. The training and practice in careful observation is needed by all. Making an insect collection provides a pastime filled with interest and practical value, both for the individual and his associates.

Any elementary teacher with the proper point of view and an acquaintance with the most important insects can carry out insect studies successfully. That many teachers are interested and find the work valuable is evidenced by the popularity of extension courses in entomology. The many school ex-

(Continued on page 127)

# How One Farmer's Wife Makes Poultry a Profitable Sideline

(Harriet Myers, '26, in Capper's Farmer)

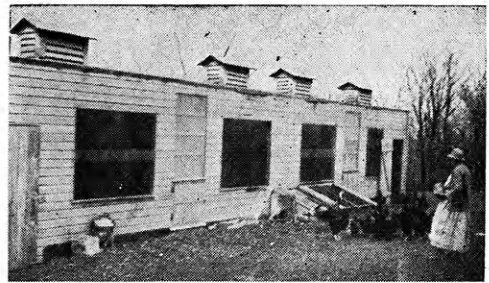
Mrs. John Linn, a farmer's wife who lives seven miles southwest of Manhattan, is making her farm poultry an asset rather than a liability. Perhaps the principal means by which she accomplishes this are proper housing, careful feeding, intelligent culling, early artificial hatching and brooding, sanitation, and a good market near home. Her flock consists of 160 standardbred Rhode Island Reds. The reasons she gives for keeping this particular breed are good coloring of the eggs, pin feathers, and shanks, and the natural protection from hawks and vermin afforded by the coloring.

The hens on the Linn farm are housed in a shed-roof, open-front house, 18 by 40 feet, built in 1913 at a cost of \$300. The building is located near the farm house on a steep, well-drained north slope. The house is divided into three parts; 10 feet on one end being used for a feed room and the rest being divided equally, one part for pullets and one for hens. Dropping boards are used under the roosts and are cleaned once a week by running a wheelbarrow along just under the edge and scraping the droppings into it. The nests are built in such a manner as to make them dark, the hen entering from a common passage in the rear. The front of the nests is on hinges so that it may be dropped for gathering eggs and cleaning. The floor of the house is cement covered with a three-inch wheat straw litter. The litter is changed about once every six weeks. "Inclosed dust baths take care of the lice," says Mrs. Linn. She sprays the roosts, dropping boards, and walls near the roosts to prevent mites from getting a start. The house is lighted with electricity and during the winter months when it is still dark at 6 o'clock in the morning the lights are turned on from six until it becomes daylight.

The flock is fed partly home-grown and partly purchased feed. During the winter a scratch feed consisting of kafir, corn, and

wheat is fed morning and evening in the litter and a mash of 100 pounds bran, 100 pounds shorts, 50 pounds meat meal, and a little charcoal is kept before them in hoppers at all times. Beets are fed at noon as succulence. The hens are always well supplied with pure water, shell, and grit. In the summer the feed is the same except the range provides the necessary succulence.

The flock is culled carefully each fall



FRONT VIEW OF THE LINN POULTRY HOUSE

about the last of September or first of October. Each bird is handled separately and must conform to a reasonably high standard if it is to be kept. The pullets are tested for vigor, color, and capacity for egg production. The hens are much more carefully examined than are the pullets because they are to constitute the breeding stock for the next season. They also must pass the test for vigor, color, capacity, and besides these qualities they must show that they have laid well during the past year. All the hens past two years old, with the exception of a few unusually good ones, are culled out.

The hatching season on the Linn farm begins early, sometimes as early as January. Artificial methods of both hatching and brooding have been used successfully. This year, however, due to the fact that the brooder house is in need of repair, Mrs. Linn is using the natural method. Her equipment

(Continued on page 125)

# An Outstanding Colt and His Sire

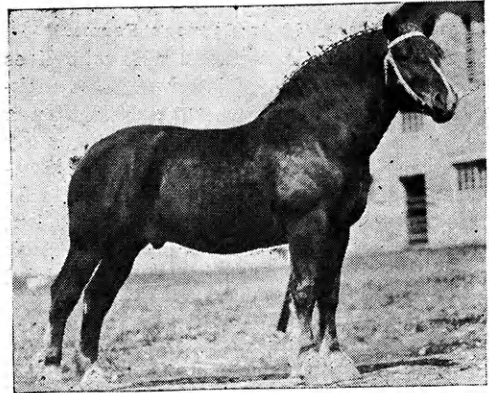
R. W. Sherman, '24

One of the most unusual products of Kansas State Agricultural College's Belgian stud is a sorrel colt foaled on March 20, 1923. This outstanding colt, sired by Colgo 11942 and out of Bernadine 3909, weighed 204 pounds at birth, a remarkable weight when compared to the usual birth weight of from 150 to 160 pounds. Growthy and heavily muscled throughout, this colt gives promise

on which the college's Belgians are being built.



BERNADINE'S COLGO—An unusually promising colt. He was three days old when this picture was taken.



COLGO—CHAMPION PUREBRED BELGIAN

of carrying on the high standard set by its sire and dam.

Bernadine, the dam, is a 2,100-pound mare out of Mirza de Bou, an imported ton mare

Colgo, the sire of this foal, is a stallion developed at the college. He was junior and grand champion Belgian stallion at both the Kansas Free Fair at Topeka and the Kansas State Fair at Hutchinson, 1920. His foals shown during the past season were undefeated in class at the Hutchinson, Topeka, and American Royal shows. Since 1920, Colgo has headed the K. S. A. C. Belgian stud, only recently having been sold to Mr. A. L. Stuenkel of Linn, Kan.

## Some Results of Corn Variety Tests

W. H. von Trebra, '24

Cooperative tests with field crops are an important part of the investigational work of the Department of Agronomy of the Kansas Agricultural Experiment Station. Farmers realize the importance of knowing the best varieties for their respective conditions. Last year 309 variety tests were conducted with the important crops of the state. This spring 75 farmers, representing 42 counties

of the state, are carrying on variety tests with corn alone.<sup>1</sup> To conduct this work 775 lots of seed of 21 varieties have recently been sent out by H. H. Laude, in Charge of Cooperative Experiments.

The question may be asked, "Why are all these extensive tests necessary?" Because the soil, rainfall, and climatic factors are so variable that no one variety will produce the maximum yield throughout the state or on all farms within a section of the state. In fact one farmer may get good results with a variety that is not suited to his neighbor's

<sup>1</sup>The results of corn variety tests for the years 1911 to 1919, inclusive, have been published in Bulletin 227 of the Agricultural Experiment Station, "Varieties of Corn in Kansas."



farm. Furthermore, it may be questioned if it is possible to increase the average corn yield of the state. This can be done by growing high-yielding varieties adapted to conditions existing in various parts of the state. If only an average increase of one bushel per acre is secured the total annual production of corn in Kansas will be increased six million bushels with very little additional expense.

The outlying tests are conducted on farms in cooperation with the Department of Agronomy. The department, in addition to supplying seed, furnishes directions for the work which provides that the land must be uniform as to slope, fertility, previous manuring, and cropping. The varieties are planted side by side in plots four rows wide extending across the field. One twentieth-acre from the two center rows is harvested for yield test; the two outside rows act as guards and tend to overcome detrimental effects of taller, earlier, or more vigorous-growing varieties which may be grown on adjacent plots.

The seed is obtained from a reliable source, thus insuring pure uniform seed true to name. Because of the fact that the seed of each variety is taken from the same lot for all tests the results of any test can be compared with similar tests made by other farmers.

The value or desirability of a variety of corn is determined largely by its production, the time required to mature, and the purpose for which it is grown. Production or yield is the first consideration and determines, more than any other factor, the variety a farmer grows. Production includes the amount of forage, either green or dry, and the amount of grain. The time required to mature is important because a variety to be satisfactory must ripen before frost. This time varies from 95 days for the earliest field varieties to 135 days for the latest. The purpose for which the plant is grown varies greatly. The whole plant may be ensilaged, or the crop may be cut for fodder when nearly mature, the grain being husked later and the roughage fed, or the corn may be grown exclusively for the grain.

In the western part of Kansas an early variety is needed not only to insure maturity within the season but also to escape drouth. The varieties grown in the northeastern part of the state must be somewhat earlier than

those grown in the southeastern part. In eastern Kansas it may be desirable to grow a very early variety for some special purpose, such as early feed for hogs. Freed White Dent or Colby Bloody Butcher will mature 15 to 20 days earlier than standard varieties grown in the eastern part of the state. Their value in that section lies principally in the fact that they can be used as a source of early feed where a farmer wishes to start feeding hogs before his general corn crop is mature enough to feed. Also if conditions are unfavorable for planting standard varieties at the right time, these early varieties may be planted later and good results obtained.

Large late-maturing varieties are in general adapted to fertile soil where the season is long. For example, Hildreth Yellow Dent, a good representative of these varieties, can be recommended only for the best bottom lands in southeastern Kansas. On the average soils in that section, as is shown by 36 cooperative tests covering a period of five years, Pride of Saline and Commercial White outyield Hildreth Yellow Dent, 5.2 bushels per acre.

Commercial White, a relatively late-maturing variety that is well adapted to southeastern and south central Kansas, will, as a rule, outyield Pride of Saline on good corn soils, but on medium soils under less favorable conditions the relation of these varieties is usually reversed.

Shawnee White, a variety developed in northeastern Kansas, gives the largest yields on the best lands in that section, but for average conditions in that section through a period of years including 59 cooperative tests, it has averaged the same as Pride of Saline.

Pride of Saline probably has the widest adaptation of any variety tested in Kansas. It yields high not only in eastern Kansas but throughout central Kansas as well, where it stands at the top of the list. In the western part of the state, however, Colby Bloody Butcher and Freed White Dent outyield Pride of Saline.

Midland Yellow Dent, Reid Yellow Dent and Kansas Sunflower are good varieties of yellow corn adapted to certain sections of Kansas. Midland Yellow is best suited to southeastern and south central counties. Reid

(Continued on page 121)

# Some Impressions of Northern Nebraska

H. B. Winchester

That part of northern Nebraska included in the western quarter of Knox county and all of Holt and Rock counties presents a picturesque example of various kinds of agriculture as determined by soil conditions. In the part of Knox county mentioned the soil has a tendency toward sandy loam and is capable of raising a fairly good crop of corn, alfalfa, oats, and, of course, the omnipresent prairie hay. Beef cattle and hogs are the main livestock crops of the four-footed varieties. Every farm and ranch has its chickens, geese, guinea fowl, and some turkeys.

Holt county, the second largest county in the state, presents about as kaleidoscopic agricultural operations as one might wish to seek. The soil types are quite varied, although the dune sandy type of soil predominates. The soil of some of the creek and river bottoms is as good black loam as can be found in Iowa or eastern Kansas, yet the soil along other streams is streaked. Some will be very rich and highly productive; others gravelly and sandy, only rushes, slough and prairie grasses being capable of existing. There are similar sections in Rock county, although it is considerably more sandy and not so well adapted to farming methods.

In southern and western Holt county, as well as Rock county, is what is known as the "sand hill country," and it does not belie its name. It consists of great bald hills of sand ever changing with the winds that blow without much provocation. Here and there will be depressions that might resemble shell holes where the wind has swept out the sand. These are called by the natives "blow-outs." However, quite a large part of the sand country is covered with good, nutritious grasses. All of this kind of country is adapted mainly to ranching and selling the hay that grows wild all around. Some ranchers attempt to grow corn but it is pitifully small, with only nubbins for ears. This is not true of all ranches, however. Those that

are blessed by having a small creek or river going through them raise corn that will average 35 to 40 bushels to the acre, and mixed hay, mainly clover and prairie, that yields a ton to the acre on the average. In the spring some of the bottoms are so wet that an ordinary bucket or gal keg can be sunk without much effort in the soil.

One is impressed by the number of trees that dot the landscape. They are set out in regular rows and consist mainly of cottonwoods, elms, some pines, and Osage orange. These were put out under the laws of the Homestead Act as applied to Nebraska, which stipulated that each homesteader should set out a grove of trees. This was keen foresight, as any ranch that does not have suitable windbreaks is not considered as amounting to much when the general fitness of the place is being considered.

The agricultural or farming operations of this country seem to be of three distinct kinds: First, diversified farming where corn, alfalfa, oats, buckwheat, and other small grain can be raised in addition to feeding cattle and hogs. Second, hay farming on which nothing is raised outside of man's efforts, except taxes! These hay farmers do not break the sod for anything except to run fireguards, depending on Nature to supply the moisture and a good crop. I know of one man who cuts a section of hay land each year and apparently makes a good living, judging from the neatness of his buildings and other property. He keeps a few cows to milk, has a corn crib but buys his corn to fill it. Third, strictly ranching with cattle, of course, as the backbone of the industry. This is confined to the more sandy areas and is of course the only natural thing to do under the soil conditions.

The topography of all the territory runs from flat, undulating prairie to rolling and hilly country. The extreme northern edge of Holt and western Knox counties is very hilly

due to the fact that the Niobrara river courses its way through deep canyons. This country is somewhat on the order of the terrain south and east of Manhattan.

The little town of Newport in Rock county, with a population of only 400, shipped over 2,600 cars of prairie hay last year. The hay may be hauled as far as 15 to 20 miles to the railroad. The town of Stuart, 12 miles away to the east, also shipped out approximately 2,600 cars. Then there are a number of other twons that ship from 1,000 to 1,500 cars annually, thus giving some conception of the enormity of this business.

There are hay crews that make a specialty of contracting the cutting and stacking of hay. They carry their own chuck wagon, horses, mowers, and some have tractors. In the hay country a man is known usually by his ability as a loader of baled hay. Of course this leads to contests, and in Stuart, Holt county, each year about November 1 they have what is called the "Annual Good Roads Holiday." There are amateur rodeos such as riding and roping, dancing, the inevitable speech making, and of course a hay-loading contest. This latter is undoubtedly the "headliner" of the day's events. Competition is keen, the prizes small, but the honor great. Incidentally, the smallness of the prizes is more than made up by a number of side bets that run well into three figures. Briefly, the hay-loading contest is the ability and speed of a man to load 80 bales of hay on a wagon and tie them down ready to travel in the shortest space of time. It is surprising to know how conservation of energy is just as important in a contest of this kind as it is in a collegiate cross country run. The winner, a former professional wrestler, knew how to conserve himself, so won out in the remarkable time of eight minutes. The runners-up set the pace at the start but fell down badly due to lack of energy at the finish. There is just as much rooting and good-natured bantering as in any college sport contest.

There is a great field of endeavor to be developed in making good roads. When it is dry in the sandy portions of this territory conveyances get stuck in the sand. Some very nice appearing roads are sometimes the very worst. In order to make some roads

passable, hay is placed upon them. In fact, the value of manure, as far as impassable roads are concerned, is thoroughly recognized. To be sure it is needed to raise crops but not half so much as to promote a road whereby the family flivver may get to town. However, large sums of money are being spent to haul clay and spread it upon the sandy roads in order to make them passable.

Livestock consists mostly of grades, very few purebreds being used. A purebred is in name only, and an inferior purebred, if it carries condition, will outsell a much better bred but thin animal. Health conditions as far as livestock are concerned seem to be ideal. Vaccination against hog cholera is not necessary except in isolated cases where infected animals have been brought in. The farmers feel that if vaccination is once resorted to on a place, it must always be done. Also if one animal is vaccinated, all must be. AM of which leads to a quotation of Dean Farrell's, taken from a recent number of the Kansas Agricultural Student. He says, "More and more, the people engaged in agriculture must make use of the facts of science—in production, in distribution, and most important of all in country life."

## Some Results of Corn Variety Tests

(Continued from page 119)

Yellow Dent yields well on good soil under favorable conditions in northeastern Kansas, but lacks hardiness and ability to yield under adverse conditions. Kansas Sunflower, in general, yields well in eastern and central sections of the state. However, none of these yellow varieties will yield under average conditions as much as the best-producing white varieties, except in the southeastern and south central one-fourth of the state where Midland Yellow Dent and Kansas Sunflower practically equal the highest-yielding white varieties.

E. G. Schafer, '07, M. S., University of Illinois, '10, is head of the Department of Farm Crops in the State College of Washington (Pullman). Since going to Washington, Professor Schafer has written bulletins of distinct value to the wheat growers of the western states.

## Alumni Notes

W. J. Burtis, '87, is farming near Manhattan.

John Poole, '96, is a Hereford breeder living near Manhattan.

George O. Greene, '00, is engaged in livestock farming near Paradise.

George P. Potter, '07, is a farmer and cattle feeder located near Peabody.

Walter E. Tomson, '12, is assistant Professor of Dairying at University Farm, Davis, Cal.

T. W. Morse, M. S., '95, is Livestock Editor of the Kansas Farmer and Mail and Breeze.

C. H. Howe, '22, is a graduate student and fellow in soils, University of Maryland, College Park.

Ralph E. Hunt, '11, is professor of animal husbandry, Virginia Polytechnic Institute, Blacksburg.

C. J. Doryland, '08, is soil bacteriologist of the North Dakota Agricultural Experiment Station at Fargo.

G. C. Wheeler, '95, may be addressed at 1518 Court Place, Denver. He is editor of "The Spirit of the West."

W. L. Blizzard, '10, is head of the Department of Animal Husbandry, Oklahoma A. & M. College, Stillwater.

S. P. Clark, '12, is in the Agronomy Department of the Agricultural Experiment Station of the University of Arizona, Tucson.

Walter Burr, '20, author and professor of sociology, contributes a short but important article to this issue of the Agricultural Student.

P. E. McNall, '09, M. S., University of Wisconsin, '21, is assistant professor of Agricultural Economics in the University of Wisconsin, Madison.

Claude B. Cross, '21, is Superintendent of the Otoe Consolidated School at Barneston, Nebr. He also handles the vocational agriculture work in the high school.

Perry H. Lambert, '13, of Hiawatha, is

a member of the State Board of Agriculture representing the First District. His work is much appreciated by the board.

Louis H. Hodgson, '16, may be addressed at Harveyville. He is farming and specializing in hog feeding. On November 15, 1922, he was married to Miss Rachel Clark, '17.

Earl C. Butterfield, '98, is Superintendent of the Arlington Experimental Farm, Rosslyn, Va. This farm is a laboratory of the U. S. Bureau of Plant Industry and Mr. Butterfield has general charge of the work in horticulture.

V. H. Florell, '14, member of the scientific staff of the Office of Cereal Investigations, United States Department of Agriculture, who during recent years has spent most of his time at the Plant Introduction Gardens, Chico, Cal., has been transferred to University Farm, Davis, Cal.

Arthur I. Gilkison, '14, county agricultural agent, who recently transferred from Cheyenne county to Rice county, has gained a reputation for the neatness and system with which he works. Sudan pasture and summer tillage of wheat land have been the projects which won him distinction.

John V. Hepler, '15, is county agricultural agent in Washington County. His outstanding work has been the development of a dairy program in the vicinity of Greenleaf. At one time this community brought in four carloads of purebred or high-grade dairy cows. Hepler has the reputation of finishing what he starts.

C. H. Kyle, '03, Office of Cereal Investigations, Bureau of Plant Industry, has been engaged in corn investigations since 1907. He has been especially successful in his studies of corn ear worm and weevil and in the selection of varieties which are somewhat resistant to these destructive insect pests. He has written a number of technical articles and popular bulletins on corn growing and corn breeding with special reference to the problems of southeastern United States.



A. J. Ostlund, '10, is a farmer and breeder of Angus cattle living near Washington, Kan.

J. L. Pelham, '07, is located at Leesburg, Va. He is superintendent of the orchards of the American Fruit Growers, Inc.

R. C. Smith, Ph.D., Cornell University, '17, Associate Professor of Entomology, contributes a valuable article to this issue.

J. L. Garlough, '16, is geologist for the firm of Allen and Lee, oil producers. He may be addressed at 221 S. Green St., Wichita.

O. B. Whipple, '04, formerly professor of horticulture in the University of Montana, is now manager of large fruit-growing interests at Grand Junction, Colo.

W. I. Turner, '20, is making good as a dairy farmer in Sumner county. He sends from Milton a newsy letter full of "brass tacks." Would that we had more "Bill" Turners among Aggie graduates.

C. G. Randell, who contributes the excellent article on vocational agriculture in this issue, is a Hoosier by birth. He received the degree of bachelor of science in agriculture from Purdue University in 1920. This is his third year as Director of Vocational Agriculture in the Marysville High School and the excellent work he has done there is widely recognized in the profession.

Charles A. Thresher, '22, writes from his home at Jetmore that he has been managing the home farm since graduation. He has a real western Kansas farm which includes 360 acres of wheat, 140 acres of spring crops, and 2,200 acres of grazing land. Besides his stock cattle Mr. Thresher is wintering 100 head of calves. He will fatten a carload of lambs before spring. It may be inferred that he is still majoring in animal husbandry.

V. M. Emmert, '01, is the premier county agricultural agent of Kansas. Mr. Emmert has been in McPherson county since 1916. When the extension service wanted to see if it was possible completely to rid a county of prairie dogs they called on Emmert and, as the Pied Piper piped the rats out of Hamelin, so did Emmert cause an exodus of prairie dogs. He also has an enviable reputation for organizing the most enthusiastic community fairs in the state.

A. C. Maloney, '18, has been county agri-

cultural agent of Bourbon county since 1918. He is given credit for having the best functioning farm bureau in the state. His poultry demonstrations have been outstanding. He organized the first Dairy Improvement Corporation in the state. This piece of work has resulted directly in the placing of more than 100 purebred dairy cows with farmers of Bourbon county and indirectly in making Bourbon one of the best dairy counties in the state despite unfavorable soil conditions.

A. M. Paterson, '13, Professor of Sheep Husbandry in K. S. A. C., has resigned and accepted a position with the Kansas City Stock Yards Company as special livestock representative in its trade territory and as-



PROF. A. M. PATERSON

sistant secretary of the American Royal Livestock Show. Professor Paterson is recognized internationally as a leading authority on sheep and has established the reputation of being one of the best judges of all classes of livestock in America. His sterling character, wonderful energy, genial disposition, and splendid ability have appealed strongly to students and farmers and have made him exceedingly popular both in and out of the college. He was an ideal faculty member, always placing departmental above personal interest, a splendid teacher, and an investigator of unusual ability.

W. W. Houghton, '18, formerly one of the county agricultural agents of Kansas, a few months ago started work as county agricultural agent, Middlebourne (Tyler County), W. Va. He is noted for red hair, pep, and efficiency.

J. C. Jenkins, Pennsylvania State College, '21, assistant chemist of the Agricultural Experiment Station, in an article in this issue shows some significant and useful results obtained from some of the station's recent work on vitamins.

L. M. Peairs, '05, entomologist of the West Virginia Agricultural Experiment Station and professor of entomology in West Virginia University (Morgantown) has the enviable reputation of making college students work hard and making them like it.

L. A. Fitz, '02, for ten years head of the Department of Milling Industry, now in the employ of The Fleischmann Company of New York City, in charge of their industrial research laboratories, visited scores of old friends "on the hill," Friday, April 27, 1923.

R. E. Karper, '14, superintendent of Texas Substation No. 8, located at Lubbock, has made important contributions to our knowledge of pollination habits of sorghum and has conducted pure line selection experiments with Blackhull White kafir which have resulted in the production and distribution of a distinct and valuable strain known as Texas No. 153.

## Dairy Calf Clubs for Boys and Girls

(Continued from Page 99)

counties the bankers have agreed to make boys and girls 6 per cent loans for such calves, making notes for a period of one year, renewable for a period of two years. Thus, by the time a boy has been in the club for three years he has the experience of the complete cycle of dairy production and is able usually to pay off his original investment from the income.

All dairy club members are required to keep standard records on their animals. These records show accurately what it costs to develop a growing dairy calf or a growing dairy heifer. As regards the cow, they show in detail both the feed consumed and the milk produced and thus the cost of milk produc-

tion. Record books and all other club record material are furnished free to club members by the State Club Leader.

Monthly meetings of the club are held for the purpose of discussing dairy problems, general farm practices, and business principles which will help the boys and girls develop into better farmers. These meetings are conducted by the club members, assisted by a local leader. Club tours are made to study dairy herds and dairy equipment. Socials and entertainments are put on by the club to raise funds, to maintain club interest, and to create community interest.

Another phase of dairy club work, which is helping to create a more general knowledge of farm dairying and a more general interest in dairying, is dairy judging. Realizing that many high school boys are so situated that they cannot attend school and take care of a dairy animal, dairy judging club requirements have been changed to meet these conditions. The dairy judging is made a separate club demonstration. Any boy or girl may enter any dairy judging contest for club members if he enrolls in a dairy judging club. The main requirements of this club are that the members learn to judge the four leading breeds of dairy cattle and that they keep a record of the number of animals scored and the number of classes judged.

The Annual State Dairy Club Judging Contest is held at the Kansas State Fair, Hutchinson, Kan. Last year the winning team from Osage County was given a free trip to the National Dairy Show, St. Paul, Minn., where they entered the National Dairy Club Judging Contest.

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## Effect of Pasteurization on Vitamin C

(Continued from Page 110)

addition of oxygen by stirring during pasteurizing, that is, stirring in fresh oxygen all the time by the revolving coil, may cause the difference between the vat and the bottle pasteurized milk.

One should not interpret this experiment to show that raw milk is always to be used in feeding infants. Sometimes a little knowledge is a dangerous thing. One scientist often discovers a truth which if applied would cause harm from other sources. At one time a certain scientist discovered that acidity caused the swelling in diabetes. He, therefore, advocated the use of soda as a neutralizer and entirely overlooked the fact that soda in sufficient quantities to neutralize the acid is very hard on the nervous system. The same principle applies to this experiment on milk. Unless every step in the production and care of the milk is known, including the cow, milker, bottles, sanitary conditions, etc., it does not pay to run the risk of bacterial contamination of the milk. Of course, certified milk has a guaranty of cleanliness but it is better to use pasteurized milk which is safe from a bacterial standpoint and supply the lacking Vitamin C by the addition of a little canned tomato juice or orange juice. We do not have any positive guaranty that raw milk will always contain vitamins in sufficient quantity to supply the human infant, so the best and safest course in all cases would be to add them.

## How One Farmer's Wife Makes Poultry a Profitable Sideline

(Continued from page 117)

for artificial incubation and brooding consists of a 150-egg Prairie State incubator and two coal-stove brooders with a capacity of about 250 chicks each. Mrs. Linn expects to raise about 300 chicks this year.

Of course the time necessary for the care of the flock varies with the season. During the winter the time per day will average less than an hour, but in the spring when there are small chicks to care for as much as three hours is necessary. A team and wagon is needed about once every six weeks to change

the litter and take away the droppings.

Disease causes little or no loss in the Linn flock. Sometimes in the spring two or three hens that have laid heavily during the winter will die from apparent exhaustion, otherwise no old birds are lost. Neither is there much loss from weak chicks in the hatch or from small chick diseases. The only measures taken to prevent disease are sanitation and careful feeding.

Mrs. Linn finds her poultry very profitable. Manhattan furnishes both private trade and a good general market. Between January 1, 1922, and January 1, 1923, \$147 worth of poultry was sold and about \$116 worth used at home. The flock numbered 150 birds at the beginning of the year and 160 at the end. During the year 11,590 eggs were laid, many of them being used at home. The total expense for the year amounted to \$153.55 and the total income, \$446.73, leaving a profit of \$293.18, or nearly two dollars per bird.

O. O. Browning, '16, Linwood, is a farmer engaging extensively in sheep raising.

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## Insects as Material for Study

(Continued from Page 116)

hibits of insect life made at fairs are evidences of the appeal of the work.

Brief suggestions, by way of example, of some suitable insects or problems for study in school work are as follows:

In the autumn many caterpillars, such as the corn ear worm, tomato worm, walnut datana, striped maple worm, cabbage worm, army worm, and wooly bear, may be readily collected, brought into the school room, fed on their preferred food, and carried through to adults or to pupae for wintering. The house fly and mosquito may be reared in small containers with little attention. The relation of insects to health may then be profitably studied and emphasized. Overwintering insects may be studied by field trips when cocoons of the large moths may be collected, and observations made on the hibernation of chinch bugs, codling moth larvae, cutworms, squash bugs, egg pods of grasshoppers, and pupae of moths in the soil, as of the corn ear worm. Stored grain insects, such as the cadelle, Indian meal moths,

and the Angoumois grain moths may be reared and studied during the winter, and simple experiments in their control by heat and fumigants performed. In the spring the chinch bugs, apple tree tent caterpillars, canker worms, and alfalfa butterflies emerge early and are available for rearing. In the garden at the same time, the flea beetles, potato bugs, cabbage worms, cutworms, white grubs, and many others are available.

Lady bird beetles, lace wings, and the honey bee can be studied readily during the spring or fall as examples of beneficial insects. Silk worm eggs can be obtained in the spring also, and this important insect is easily reared. Valuable display collections and life-history mounts may be made which can be used advantageously in class work.

Insects can best be studied confined in small cages or large-mouthed bottles in the laboratory and frequently observed by the students. The idea is that the students shall obtain most of their information by their own observations and a minimum by explanations. From these life histories it is a

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short step to an explanation of metamorphosis and the stages in the life cycle of various insects, kinds of mouth parts, and other fundamentals looking toward the successful application of control measures and a better understanding of literature dealing with insects and their control.

The aim is not to make naturalists or entomologists of the students, but rather to take a few steps in the understanding of this portion of their environment. The economic value of such studies is apparent and is worthy of emphasis. The aesthetic value must not be overlooked. Such studies bring about an appreciation of the various forms of life about one. The world becomes larger and more wonderful with the understanding of the habits and life processes of these lowly creatures. The fundamental need of any individual is to be placed in sympathy with his environment. By enriching the life of the student and developing his powers of observation, he will be finding new things throughout his whole life.

### The Soil Fertility Problem in Western Kansas

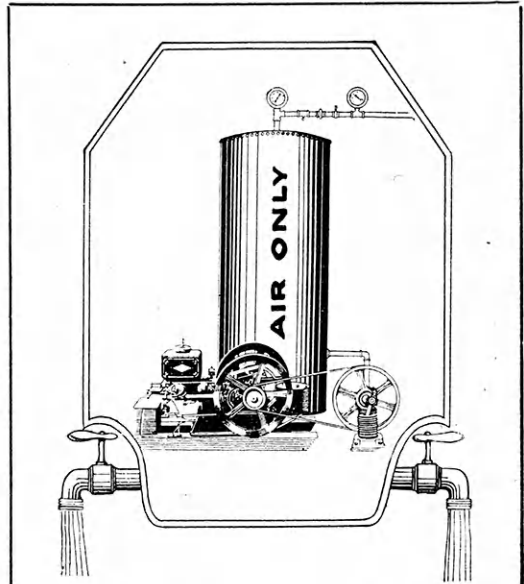
(Continued from No. 3, Page 77)

Establish a definite system of crop sequence, including wheat, sorghum, and fallow, varying the proportions to suit conditions. Fallow one field each year. Precede the fallow with the sorghum crop. Apply all accumulated straw and manure before the feed crop or immediately after. Take advantage of any weed growth for green manure in conjunction with the fallow. Keep as many livestock as this system permits.

This program can be adopted with profit by a great majority of the farmers in western Kansas. Its practice will postpone indefinitely the time when the wheat raisers' profits must go for the purchase of costly nitrates. It will insure, along with a fertile soil, a permanent and prosperous agriculture for the West.

J. M. May, '10, is head of the Department of Agriculture in the State Normal School at River Falls, Wis.

A. J. Mangelsdorf, '16, is pursuing graduate work in plant genetics under Dr. E. M. East, Bussey Institute, Harvard University.



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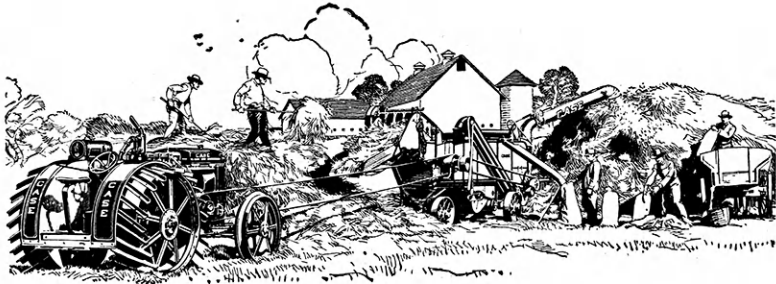
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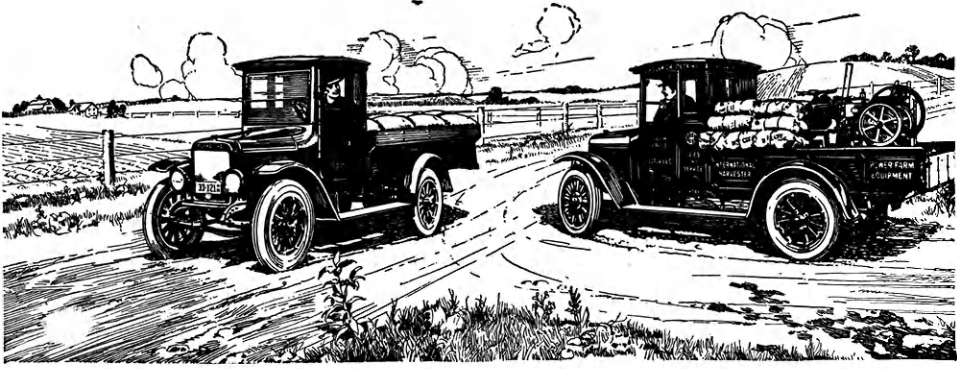
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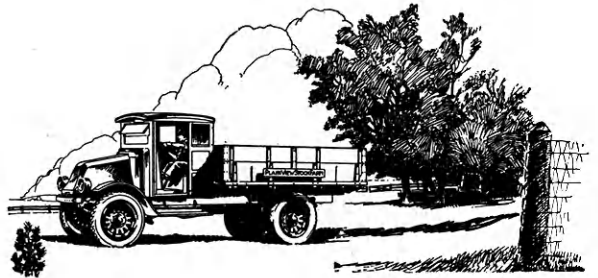
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