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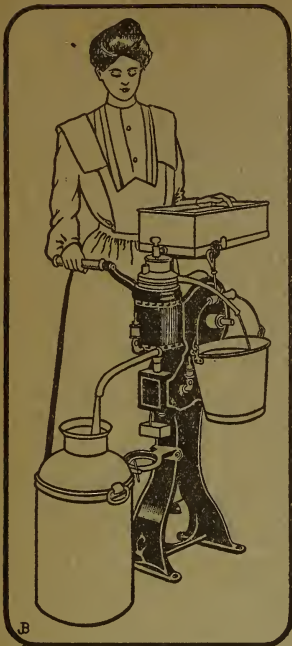
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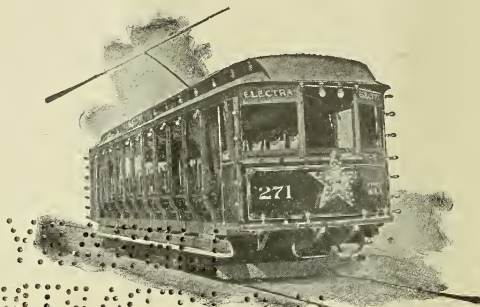
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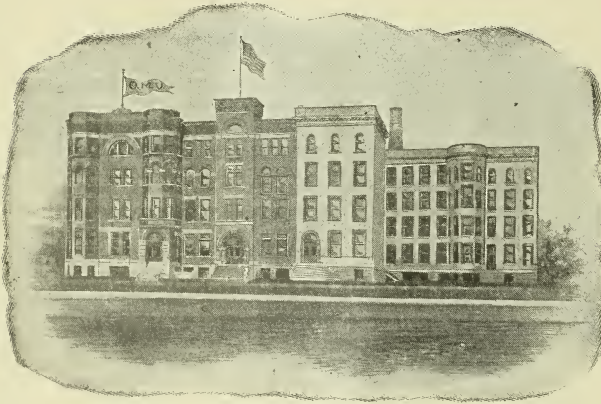
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CONTENTS

Editorial Comment	1
Should a Young Man Leave the Farm.....	2
Soil Bacteria in Relation to Agriculture	4
Voice From Australia	6
Suggestions on Stock Judging.....	7
Kaffir Corn Threshing Outfit.....	8
Kaffir Corn Culture.....	9
Experiments in Corn Breeding.....	9
Live Stock Conditions in Warren County and Vicinity	13
Something About Poultry.....	14
The Agricultural Society and College—Some Suggestions.....	16
Last Message of Ethan Allen.....	17
Agricultural News	18
University News	19
Alumni Notes.....	20

EDITORIAL COMMENT

THE AGRICULTURAL STUDENT has safely passed the eleventh milestone of its existence and with this issue the twelfth is begun. It is our hope that the same tone, purpose, and the same college spirit shall be maintained as in years previous. We shall merely take up the work where it was left off and with the advantages as regards location ever increasing, we think that the outlook for THE STUDENT is very bright. We are within easy reach of several noted herds of both beef and dairy cattle; of swine nearly all the breeds are represented; sheep are not so plentiful although conditions in this line are growing better; but the opportunities for studying horses of both the draft and coach types could not very well be bettered anywhere in the United States. The McLaughlin and Hartman stables are at our doors; Col. Crawford at Newark; Bell Bros. and the Winkler Horse Co., at Wooster. And besides these there are many smaller breeders and feeders who keep excellent horses. There are also advantages in the horticultural line with the many greenhouses, parks and fruit and vegetable farms at hand. And the agronomist, too, may find many an object



lesson in the different soil types and in the management and equipment of the several noted farms that may be reached by the trolley systems.

In the August number of *The Rider and Driver* under the heading of "New Animal Husbandry Instructor," and in speaking of Mr. E. L. Robbins, who is about to assume this title, the following statement was made: "* * * he (Mr. Robbins) was one of the Illinois stock-judging team which won the trophy at the first International Livestock Exposition in 1900, the only team that ever defeated Iowa." We wish to make a correction of this statement, the error probably having been due to an oversight on the part of the editor of that excellent paper, *The Rider and Driver*. Iowa, as Ohio State men know, was beaten last year by our own college team and as a memento of this occasion the trophy now stands just within the main entrance to Townshend Hall.

That all other business is dependent upon the farmer is true beyond a question. We know it because we have had it preached to us all our lives, but some of us may not have looked at it in its true light. Since science has revealed to us the fact that nearly every form of disease is caused by more or less minute organisms, or parasites, we refer to the above as a new form of parasitism. But if you wish to see for yourselves just what we mean visit Western Kansas. The farmer is the "host" and the real estate men, storekeepers, bankers, unskilled laborers, insurance men and agents of all kinds and men in all kinds of business are the "parasites." In a year of plenty, that is when there is a good wheat crop and the host is in a flourishing condition, the "parasites" begin their work; and finally after each one gets his share and there is

a surplus left over this the farmer is allowed to keep. But strike an off-year for wheat. The farmer can harvest what little crop he has, there are no hired men, no large grocery bills, no bills for new machinery, no deposits in the bank and real estate men and agents in general are out of business. In short when the "host" is poor and in a famishing condition the "parasites" lie low. But let the "host" prosper, then each fellow comes in for his share.

On the Stage of Life

We are like puppets in some conjurer's hands,

Who smiling, easy, nonchalantly stands
And says, amid the universal cheers:

"You see this man—and now he disappears."

—Tom Massey in *Munsey's Magazine*.

Should a Young Man Stay on the Farm

BY F. D. HECKATHORN.

In this day and age one of the greatest problems for the young man on the farm to solve is what he shall choose as a life work. Naturally he would follow in his father's footsteps and take charge of the farm when his father retires.

For centuries it has been the custom for the son to take up the work where his father left off, whether he was a physician, lawyer or farmer. The son thinks that profiting by his father's advice he will be better able to succeed if he starts in with him, grows up with the business and finally take charge of it himself. He never stops to consider his fitness for that work. Then, too, he is often influenced by his father and friends to adopt some business which is contrary to his own wishes.

But in the last few years there has been a change. Boys have begun to think for themselves and generally are choosing

that vocation which they think they are best fitted for, and that which they can enjoy and become sufficiently interested in to give it that attention and study which must needs be given if success is to crown their efforts.

It is here that a career rises so temptingly before a young man on the farm. Often he looks on the dark side of things and the dull, steady plugging on the farm does not compare favorably with the more exciting and attractive work in the city. He should seek the advice of his older friends for often by thus doing he will see things in a new light. He should be extremely careful about leaving the farm, with which he is more or less familiar, for something altogether new although it may be attractive.

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In deciding upon farming he should consider first his liking for the farm, and second his fitness. If he does not enjoy farm work he will not devote the proper attention to the minor details of farm life which in themselves determine the progress of a wideawake farmer. He will not be sufficiently acquainted with his work to see at a glance when anything is wrong and then take the proper steps to remedy it before any serious damage is done. But if he enjoys farm life, he will gladly forego a much-planned pleasure trip in order that the crops may be properly cared for.

A young farmer should take an interest in live stock to such a degree that he is not satisfied with what he has, regardless of the breed or the animals' individual worth, but should endeavor to get something better. He should know the conditions of his own locality and decide what breeds of stock are best adapted to that climate and will in fact profit him the most from every standpoint.

By studying the general soil conditions he can determine what crops will grow the best and what brand of fertilizer

should be used to improve the land's fertility.

An important factor in the makeup of a young man is his ability to farm. He must not only have the judgment but he must have the energy and push to carry out what his judgment decides is the best course to pursue.

A man with good judgment and no energy accomplishes nothing for himself although others may carry out and reap the profits of his suggestions. He does not deserve as much credit as the farmer with the energy but no judgment. The latter must be admired for his pluck but it is pitiable to see a man working hard and then losing out from a lack of judgment. In truth a successful farmer must have both of these qualities to a large degree. If a young man finally decides to farm and circumstances will permit, then he should secure an agricultural education at some good agricultural school. There he will acquire new ideas, formulate new methods of thinking and will find that much of the theoretical education can be made use of in a practical way. Some one will say that the bright young farmer who did not go to college is as good or even better than the one who went to college. That may be so, but the farmer from college is far ahead of what he would have been, and if the farmer without the agricultural education had gone to college he would be far ahead of what he now is.

All these things a young man must reflect upon when he decides to farm, and the wisdom of his preparation and forethought will afterward show in the success of his farming.

During the month of July the Department of Animal Husbandry purchased, through the help of Dr. Gay, two registered Clydesdale mares of the Brookside stock farm, Lafayette, Ind.

The following letter ought to be of interest to Ohio dairymen:

Zanesville, O., Aug. 14, 1905.

Prof. J. W. Decker, Ohio State University, Columbus, O.:

Dear Sir: I am writing you a letter in which you may find some encouragement for work at the Ohio Dairy School. I will attempt to explain to you the benefits I derived from my first year in the dairy school, especially in the line of milk production.

After attending school for about five weeks I returned home on a visit. Naturally I was interested in my father's dairy which consisted of thirteen cows of mixed breeding, shorthorns predominating. Father has been keeping from five to fifteen cows for ten or twelve years and is I believe as good if not better than the average farmer in caring for them.

I investigated the manner in which he was feeding them. After weighing the feed I found he was feeding a mixture of feeds with a nutritive ratio of 1:9 which cost about 22 cents per day for cows giving 25 pounds of milk per day. I induced him to change his feed by narrowing the nutritive ratio to 1:5.8 which cost about 20 cents per day for the same cows.

Returning to my dairy school work I asked father to let me know whether the change was beneficial or not. In about two weeks he wrote telling me that there was a noticeable increase. It was about the fifteenth of February when he changed his methods of feeding. During the months of January he was milking practically the same cows, the record of which is given below from the monthly creamery statements:

Month.	Milk lb.	Fat %.	Fat lb.
January	4575	4.55	208.1
February	5660	4.55	257.5
March	7144	4.00	285.8

From the above it is noticeable that there was a constant increase when ordinarily a decrease could be expected. In

March the test was low but upon examination of tests for March and April of preceding years I find that it is during these two months we always get our lowest test. Our herd averaged 5000 pounds of milk and 220 pounds of butter fat at the creamery last year. With the use of silage this winter and by keeping a record of each individual cow so that all "boarders" may be identified and cast out, we expect to increase about 1000 pounds of milk per cow this year.

Wishing you and the Ohio Dairy School much success, I remain

Yours truly,

J. W. SUTTON.

Soil Bacteria in Relation to Agriculture

BY LELAND E. CALL.

If we were to analyze any one of the numerous crops that are grown on the American farms, and especially on the grain producing farms, we would find that a goodly proportion of the protein is nitrogen. Not only is it true that all plants contain nitrogen, but it is also true that a plant must have nitrogen in order to grow, and in this normal condition the plant takes the nitrogen from the soil through the roots in some highly organized form. However, before this food is read for the plants the nitrogenous compounds must be decomposed by the action of certain bacteria. But before considering the preparation of plant food through the action of bacteria let us consider the ways in which the prepared nitrogen may be stolen from the soil.

In the first place large amounts of nitrogen are removed from the soil with every crop of grain or hay and when sold from the farm the plant food is entirely lost. Again nitrogen may be washed from the soil by the action of heavy rains at certain times of the year. But perhaps the greatest loss of nitrogen

to the soil comes through denitrification or the action of bacteria on the nitrates whereby they are deoxidized and the nitrogen set free. This process of denitrification is gradual, first there is a certain class of bacteria that work up on the nitric salts extracting an atom of oxygen and changing them into nitrous salts, another class of bacteria act upon the nitrous salts extracting more oxygen and converting the salts into ammonia; here another form of bacteria begins to act and reduces the ammonia, forming free nitrogen gas.

Conditions favorable for the action of these denitrifying bacteria are first a saturated soil, and second a lack of oxygen. We may safely say that these conditions are the result of mismanagement in farming.

Having touched briefly on the ways in which nitrogen may be lost, let us consider the ways in which it may be supplied. Of course it is furnished in a small way by commercial fertilizers, also from the small amount of ammonia in the air, but if we wish to seek the chief supply of nitrogen in the soil we must return again to the bacteria.

The bacteria which provide nitrogenous food for plants are of three great classes. One of these classes exerts itself only on the organic compounds or humus of the soil. The second class is developed with the plants as they grow, being found in colonies on their roots, and securing an oxidation of the free nitrogen of the atmosphere.

The third class and one of which we have little knowledge appears to have the ability in an independent form of life and without the aid of plant vitality to secure oxidation of the atmospheric nitrogen. We will limit our discussion to the first two forms of these nitrogen producing bacteria.

The first class, or those that act on the humus of the soil have the opposite action of those that act in denitrification. The first kind of bacteria to act on the humus are the ammonia forming bacteria. They are found constantly in the surface soils and work most actively under a temperature of from 80° to 100° F., and their work entirely stops if it becomes cooler than 32° or warmer than 100° . The next class of bacteria to act are those that convert the ammonia into nitrous acid, this occurring with little or no loss of nitrogen unless there is an excess of ammonium carbonate present. These bacteria are by far the most active of the nitrifying bacteria. The last class of organisms to act are those that convert the nitrous acid into nitric acid, and thus make it available for plant food. The most favorable conditions for the action of these nitrifying organisms is a temperature of from 85° to 95° F. A diminished light, therefore warm nights are the most favorable; proper aeration, a certain amount of moisture and a proper tillage of the soil.

The second method of producing nitrogen is by the free nitrogen-giving germs or tubercle forming bacteria. It has been noticed for a long time that upon the roots of certain leguminous plants grown under proper conditions that tubercles, varying in size from a pin head to a potato, were found. These tubercles were thought at first to have been the result of worm or insect bites, or caused by the condition of the soil, etc., and only within recent years has it been learned that their formation is due to innumerable bacteria, and unless these bacteria are present the plant is no more able to use the nitrogen from the air than any other plant incapable of forming these tubercles. These bacteria gain admission through the root hairs, and some have explained their action on the plant

in that they act as a stimulant, and the leaves are thus able to take up the nitrogen gas from the air and make nitrates from it, in much the same way that carbon is made from the carbon dioxide gas in the air. The more probable explanation, however, is that the bacteria themselves fix the nitrogen in the roots of the plant and that it is used as nitrates would be used from the soil.

It has been proven by numerous experiments that leguminous crops which bear tubercles will exceed similar crop without tubercles by from 100 to 1000 per cent. For example, a field of clover on a poor soil able to produce 200 lbs. of clover per acre without the action of bacteria, will by the action of tubercle-forming bacteria produce from 400 to 2000 lbs. per acre, and this without the cost of fertilizer or extra labor. The tubercles also cause the plant to bloom and fruit earlier, and produce a much larger amount of seed. It is plain therefore that it would be worse than folly to attempt to grow certain leguminous crops without the presence of bacteria which would enable them to fix free nitrogen from the air, and unless the bacteria are present the leguminous crop is of absolutely no value in furnishing nitrogen to the soil, but that as other crops they draw from the store of nitrogen already there. Most soils contain these bacteria, but when they are not found it is necessary to inoculate the soil.

There are two methods used in soil inoculation, first taking soils from fields known to contain these bacteria and applying it to the soils we wish to inoculate. The great cost and danger of transplanting weed seeds and plant diseases makes this method almost impracticable. A second method is the production of bacteria in cultures for the inoculation of soils. Investigation discovered that there were

special germs better adapted to produce tubercles upon a certain plant than any other germ, and separate cultures of bacteria are grown for each leguminous plant. This work of growing bacteria in cultures was first taken up in Germany, and later by experimenters in the United States, and by the use of proper media it was possible to secure a microbe whose power to fix nitrogen was five or six times as great as the common forms. These bacteria when grown are taken up by an absorbant and dried in the form of cakes which may be sent to any part of the world and still retain their vitality. When the bacteria is ready to be added to the soil it is necessary to revive them by soaking in water and with the addition of certain nutrient salts the original number may be greatly increased if allowed to stand a short time. In this way bacteria may be sent out to inoculate any number of acres of soil at a very small cost.

Thus it will be seen that every farmer has at hand a cheap and efficient way of renewing his ever escaping supply of nitrogen. That he already has the means at hand in most cases whereby this may be carried out, and that all it is necessary for him to do is to so manage his farm that these nitrogen forming bacteria will have the best possible conditions under which to work.

Voice From Australia

The Agricultural Extension work under the direction of Supt. Graham is certainly being crowned with success here in Ohio. But that the work is not confined alone to the states is evidenced by the following letter selected from ten or twelve others, and all written to Mr. Graham by children of the New South Wales public schools:

"Richmond, New South Wales, Australia, 12th July, 1905.

"Dear Friend: The Hawksbury Agricultural College and Experimental Farm are situated on a gentle slope overlooking the town of Richmond, about one and a half miles from the railway station and in close proximity to the Hurrajong Heights and Blue Mountains. Richmond is 38 miles from Sydney with which it has a service of three passenger trains daily.

"The farm comprises an area of 3500 acres of land, suitably fenced and subdivided. About 1000 acres are under cultivation.

"The above institution was opened in 1891 with twenty-five students, which number, in consequence of its deserving popularity and usefulness, has been steadily increasing until over 120 of our future agriculturalists, orchardists and squatters are now preparing for the work of going in to possess the land and develop its vast resources by the aid of modern science and practical agriculture.

* * * Very Truly Yours,

"DUDLEY INALL."

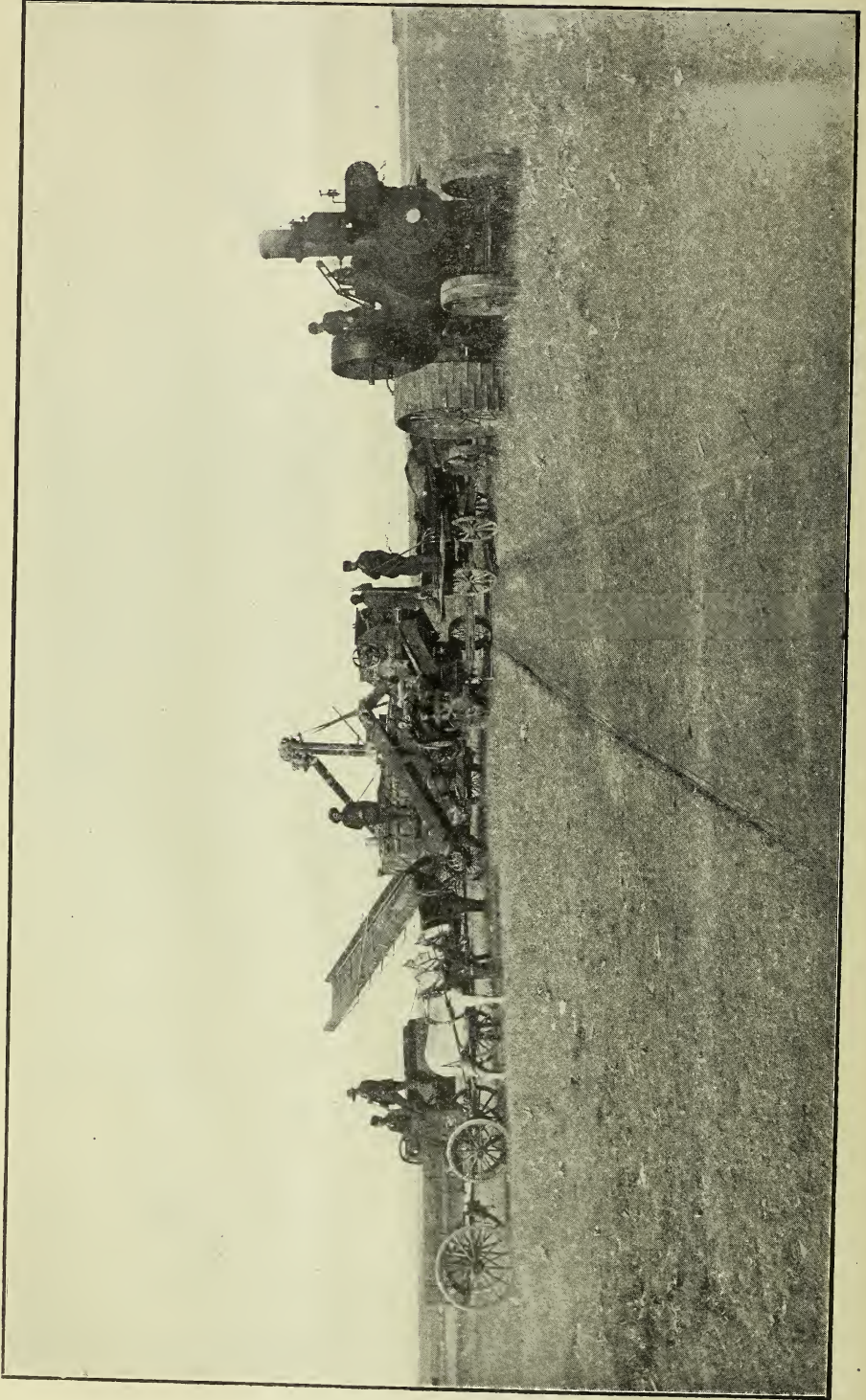
Footprints on the sands of time. Those who tiptoe through life either leave none or leave a fair proportion of posterity to wonder if a monkey did not pass by.—Rural New Yorker.

Suggestions on Stock Judging

All of our judges of live stock who have worked for any length of time and who have performed their work conscientiously can tell you that, to place a ring of animals is not so easy as it might appear. The onlookers think that all the judge has to do is to walk around a little while with his hands in his pockets, whistle and then pointing to a certain

animal say "Here put that one first, that one second," and so on. But for any one who really understands the conditions under which the judge is working, he can see that it is a very complex process. The judge, as he works along from one animal to another, must keep in his mind's eye an image of a perfect animal, or as nearly perfect as he can imagine, and if this ideal is wrong of course the judging will also be wrong. When the end of the line is reached it is found that there is not one perfect animal present, but instead are several more or less deficient ones and no two exactly agreeing in every detail. And right here is where the skill of the judge, or his lack of skill, is manifested. For example there is a ring of shorthorns under consideration. The judge has noted, as he went over the ring beginning with the first that No. 1 is a little weak in the hind quarter but very good in loin and rib development; No. 2 is good in the hind quarter, only fair in loin and rib but has a very coarse head and horn. And so it goes on down the line. After the points both good and bad have been carefully considered and comparisons have been made, the final question comes up: Which one of these animals most nearly represents the ideal? The first choice will have faults of course, as will the second and third, but they will be less marked. In summing up let us repeat that there must be an ideal and the right kind of an ideal and this is found after long study and a thorough understanding of animals.

Professor A. G. McCall spent the greater part of the summer in Washington, D. C., where he was working in conjunction with Doctors Briggs and Swingle. A part of the time was spent at the United States Biological Laboratory, Beaufort, N. C.



Kafir Corn Threshing Outfit, Southwestern Kansas

Kaffir Corn Culture

The raising of kaffir corn has come to be quite an industry in the far west. Not only is kaffir corn raised for the grain it produces but it is used largely as a forage crop, either sown broadcast or in drills. We have seen this plant sown with sugar cane, millet or Indian corn and in this way a large yield of choice feed is raised per acre. The usual method of harvesting is through the use of the self-binder; or it is often mown down, cured and put up like hay.

If grain is the main object the seed is listed in during the month of May, and after the plant has put forth a sufficiently large growth, the furrows left by the lister are filled in by a "sled." This sled is provided with two steel runners about six to nine inches apart, and these runners slide along the bottom of the furrow and on each side of the corn plant. Revolving on a bar, which connects the two runners at the top and to the outside of each runner, are two discs. These discs cut down and throw in around the plant the ridges left between the furrows. The lister itself is somewhat similar to a potato digger; the furrow is plowed and dirt is thrown up on each side and leaves, as was said, a ridge between furrows. The object is first to collect all the moisture possible in around the young plant, and second, when the plant is larger and dirt is filled in the root system is not so near the surface of the ground. If a crop gets one thorough sledging during its lifetime that is about all that is expected.

The harvesting of kaffir corn in certain sections and where the seed is sought for at the expense of fodder, is very crude. We have seen the crop cut with the usual self-binder, shocked till winter and then hauled in where the heads were cut off with a corn cutter or cutting box ready for the thresher. Another method is to use the common wheat beader but, con-

sidering the height to which the platform must be raised, it is hardly a success.

The grain is such that it makes a fairly good ration of itself and the whole plant is claimed by dairymen of the west to be an excellent milk producer. The average analysis for the grain shows 85.0 per cent. dry matter, 8.0 per cent. digestible protein, 57.9 per cent. digestible carbohydrates and 3.0 per cent. digestible fat.

Experiments in Corn Breeding

BY CYRIL G. HOPKINS, UNIVERSITY OF ILLINOIS.

As a fundamental principle, corn breeders recognize that every corn plant has an individuality which corresponds to the individuality of animals.

Probably few agricultural plants offer such advantages for improvement by breeding as the corn plant. The individual plant is of sufficient size to be distinguished easily, and the general characteristics of the plant are readily observed, as, for example, the height and diameter of the stalk, the number and size and position of the leaves, the position of the ear on the stalk, the length and strength of the ear shank, the size and shape of the ear, and the amount and quality of the grain.

The fact that the different grains of corn on a given ear are markedly uniform in composition and in their ability to produce plants similar to their progenitors is another advantage, but perhaps of equal or greater importance is the tremendous reproductive power of corn; that is, the multiplying power or the ability to increase in numbers or quality. A simple computation well illustrates this remarkable advantage in breeding corn. An ear of good corn commonly has sixteen to twenty rows of kernels, with fifty to sixty kernels to the row. Thus a single kernel of corn in a single season under favorable conditions will very com-

monly produce an ear bearing a thousand kernels usually amounting to at least three-fourths of a pound of corn in weight.

No one will doubt or question this and yet if these thousand kernels are planted and are equally prolific, we have a million kernels or at least ten bushels of corn at the end of the second year. At this rate in three years' time from a single seed we have 10,000 bushels of corn; in four years we have 10,000,000 bushels from a single seed, and in only five years from a single seed we have 10,000,000,000 bushels of corn, which is four times the annual corn crop of the United States and four times as much corn as would be required to plant the entire land area of the globe.

But you will say that this is impossible. Of course it is impossible on poor soil, with poor seed, or during a poor season, but is it impossible to grow 1,000 kernels of corn from a single grain? Is it impossible that under favorable conditions each one of these kernels might produce an equally large increase? If not then this computation may serve to illustrate the possibilities of reproduction in corn under ideal conditions. Columbus reported that the Indians grew corn with 700 kernels on the ear four hundred years ago. But we may reduce the size of the ear to 500 kernels and still we find the reproductive power of corn almost incredible.

One of the possible disadvantages in corn for breeding purposes, as compared with some other plants and animals, lies in the open fertilization of the corn plant and the consequent inability of the breeder to control absolutely the male parent, but this disadvantage is very largely overcome by placing the breeding plat in an isolated spot far removed from other corn, or what is nearly as satisfactory and usually more practicable, by surrounding the breeding plat of corn of practically,

and then destroying or detasselling all apparently plants.

One other possible disadvantage is the danger of too close inbreeding, but it now seems certain that, if this possible danger should prove to be real, it can be entirely overcome by detasselling the plants in the field rows from which seed ears are to be chosen.

In corn breeding there are required: First, the breeding plat; second, the multiplying plat; third, the commercial field.

Beginning with about fifty of the best obtainable seed ears, and with special reference to the qualities or characteristics desired, we plant the breeding plat, which should consist of as many field rows as we have seed ears, one being planted in each row. A record is made of the characteristics of each seed ear and the seed ears and field rows are so numbered that the performance record of each seed ear can be determined by the yield and other characteristics of the field row produced.

As the tassels begin to appear all apparently imperfect plants and all plants in unsatisfactory rows are detasseled.

Each of the field rows is harvested separately the exact yield being registered. The most desired ears borne on good stalks are kept from the imperfect ears. All corn is rejected for seed purposes except the most desirable ears from the best yielding rows. For a breeding plat of fifty rows we would select about five ears from each of the ten best yielding rows, making fifty seed ears for the next year's breeding plat.

The remaining good seed ears from the ten best yielding rows constitute the seed corn for the next year's multiplying plat, which will usually consist of from ten to twenty acres. All apparently imperfect plants in the multiplying plat are detasseled and the yield of corn produced is registered.

All the most desirable seed ears produced in the multiplying plat serve as seed corn for the next year's commercial field which may consist of several hundred acres. When the commercial field is harvested the yield is registered and the finest seed ears are selected and carefully dried (with artificial heat if necessary) and they constitute the first stock of pedigreed seed corn for the market.

It will thus be seen that three year's time is required before the seed corn breeder is able to furnish the market pedigreed seed corn from his commercial field.

The first year he has a breeding plat planted with carefully selected but not pedigreed seed (unless he has obtained registered seed from some other breeder).

The second year he has a breeding plat and a multiplying plat, both of which are planted with registered pedigreed seed obtained from the best yielding rows of his first year's breeding plat.

The third year he has a breeding plat, a multiplying plat, and commercial field, all planted with pedigreed seed, the seed for the breeding plat and for the multiplying plat and the seed for the commercial field being from the previous year's multiplying plat.

Of course, the breeder may sell a few pedigreed ears from his breeding plat if he has more choice ears from the best yielding rows than he needs for both breeding plat and multiplying plat the next year. He may also sell a few bushels of pedigreed corn from his multiplying plat in case it furnishes more choice seed than is needed for his own commercial field, but his main stock of pedigreed seed corn must always come from the commercial field.

The breeder himself does not plant seed corn taken from his own commercial field. Each year his own stock seed comes from his multiplying plat and the

seed from the multiplying plat must always come from the best yielding rows of the breeding plat, this seed being second only to the fifty most perfect ears which are each year selected for the next year's breeding plat.

In general this is the method of corn breeding which is followed:

We may breed corn only to increase the yield of grain or we may also breed for many other purposes, as first to improve the physical characteristics of the ear, so far as we know what are desirable characteristics; to increase or decrease the height or size of the stalk; second, to raise or lower the ear on the stalk; third, to improve the composition of the grain by increasing or decreasing the protein, oil or carbohydrates, as may be desired.

No sooner had the Illinois Experiment Station worked out the method and demonstrated absolutely (although on a small scale) the marked improvement of corn by breeding is possible, than the Illinois Seed Corn Breeders Association and more recently several other similar associations took up the work, and they are rapidly demonstrating that the breeding of corn is practicable and probable on a very large scale.

The individuality of the seed ear becomes apparent when one field row yields fifty bushels per acre and another adjoining row planted from a different seed ear on the same kind of soil produces 120 bushels per acre. Such differences are not usually in breeding plats. Similar differences are often seen in different animals, sometimes even among the different pigs from the same litter. Experiments have shown that one cow may produce 250 pounds of butter fat in a year while another cow, even when consuming the same quantities of digestible nutriment, produces only 180 pounds of butter fat.

In changing the height of the ear on the stalk we have selected one lot of ears

seven to eight feet from the ground, and another lot borne three to four feet from the ground, and when these two lots of corn, both of the same variety and taken from the same field, were planted on the same kind of soil, side by side, one lot produced ears which were about eighteen inches higher from the ground than those produced from the other lot.

In changing the protein content of corn we began by breeding the same kind of corn in two different ways, one lot to increase the protein, the other lot to decrease the protein. The first year the percentage of protein was the same in each lot. The second year it differed by .65 per cent.; the third year by .60 per cent.; the fourth year by 1.60 per cent.; the fifth year by 2.98 per cent.; the sixth year by 4.07 per cent. and the seventh year by 4.00 per cent.

Similarly we have tried to change the oil content in two lots of what was originally the same kind of corn, increasing the oil in one and decreasing it in the other.

The first year the one lot contained 4.70 per cent. of oil and of course the other lot contained the same. The second year the one contained 4.73 per cent. and the other 4.06 per cent. The third year the one contained 5.15 per cent., the other 3.99 per cent. The fourth year the one contained 5.64 per cent., the other 3.82 per cent. The fifth year the one contained 6.10 per cent., the other 3.45 per cent. The sixth year the one contained 6.09 per cent., the other 3.43 per cent. The seventh year the one contained 6.23 per cent., the other 2.95 per cent.

Several corn growers have suggested, and more recently two or three scientists have assumed (in theory) that it is a waste of time to breed high protein corn because we can get plenty of protein in clover hay and other legumes. Perhaps this is true but it would seem that an

extension of the same theory would do without corn entirely in the balanced ration, because we can get plenty of carbohydrates in straw or corn stalks.

So long as the livestock feeders continue to buy oilmeal, gluten meal and other concentrated food stuffs valued, chiefly for their protein content, so long the corn breeders will continue to breed high-protein corn for feeding purposes.

They will also breed high-protein, low-oil corn to meet the demands of the hominy mills. On the other hand they will breed low-protein, high-starch corn for factory use when the starch is purified or manufactured into glucose or alcohol, while the protein is considered an unprofitable by-product, and for those manufacturers who desire it and who are prepared to separate and refine it, the oil of corn will be increased by the corn breeders to meet that demand.

But the first object of the corn breeder should be and probably always will be, to develop corn for the highest possible yield of grain per acre.

Meeting of the Agricultural Society

The Agricultural Society of the O. S. U. will hold their first monthly meeting for the year 1905 in Townsend Hall, Wednesday evening, October 4. It is the duty of every agricultural student, if he has not already done so, to hand his name together with seventy-five cents to the secretary of this society; and this sum not only includes his membership fee but nine free copies of *THE STUDENT* as well, the entire publication for the year.

There are now 271 students enrolled in the College of Agriculture and Domestic Science.

The Live Stock Conditions of Warren County and Vicinity

BY S. H. SHAWHAN.

The raising of live stock in this section of Ohio receives a great deal of attention from the average farmer and while the cattle, sheep and swine industries are all very important, the horse within recent years receives more attention than any of the other three; or, at least this part of the state is more famed for its horses than any other class of live stock. Here the light harness horse reigns supreme. There are a few large drafters and some coachers but the light harness horse is far in the lead. Most farmers keep at least one or two mares either standard bred or grades for breeding purposes, and are mostly on the light order, say from 1000 to 1250 pounds. For these mares it is an easy matter to find a high class standard bred trotting pacing stallion having a good record. Although many farmers breed merely for a high class roadster which will command a high price in the eastern markets, many others, whether wisely or not we will not attempt to say, breed for the sole purpose of getting a race horse. A few years ago the horses were bred so small that if they were unfit for speed they were practically worthless, but of late the horses bred are considerably larger. While many have undoubtedly lost money on race horses others have been very successful and the number of horses in the Standard lists is very large. Quite a number have records below 2:10.

So strongly is the desire to produce a race horse imbedded in the minds of the breeders that one is almost safe in saying that three-fourths of those who breed presumably only for a roadster have a secret hope of securing a colt with sufficient speed to warrant training. A young man does not boast of having a

fast buggy horse unless it can move over the roads in at least a three minute clip. There are several high class stallions in this community that are today getting a large number of very fast horses. A few years ago it was claimed that with the exception of a single county in Kentucky, Warren had more fast horses than any county in the United States. However this may be the fact remains that this section need not be ashamed to show its horses at any time or place.

In the last year or two there seems to be a growing sentiment in favor of draft horses though they have been so little in demand that heavy mares are scarce and there are very few draft stallions of any breed.

The coach horse is raised to a limited extent but the sentiment now seems to be either a high class roadster or a draft horse as large as it is possible to breed them.

Many farmers are now breeding their larger and coarser mares to jacks and the demand for good mules is much greater than the supply. Some farmers claim there is more money in selling a span of mules at two or three years old than there is in raising horses.

The Shorthorn, Jersey, Aberdeen-Angus, Holstein, Freisian and Red Polls are the leading breeds of cattle distributed in numbers in the order named. There are quite a number of small breeders the majority of whom breed Shorthorns. Owing to the nearness of Cincinnati dairying is a very important industry. Several years ago a large dairy company of Cincinnati built a large central creamery at Lebanon, Warren county and a number of skimming stations throughout the county and in adjoining counties. Finding the business profitable the farmers increased their herds reasoning that it was very little more bother to milk a large number of cows than a few and at the same time

they would be increasing the fertility of their farms. The number of cows increased at a rapid rate until the creamery and skimming stations were taxed to their full capacity. Just a short time before the advent of the creameries the beef cattle craze had spread over this section and many farmers had stocked up their farms with beef cattle. With the arrival of the creameries beef production was lost sight of and milk production was the sole aim. After a few years mutterings of discontent were heard and in the past couple of years many farmers became dissatisfied and quit. When they again turned their attention to beef production many found their herds in a bad condition. Milk cows were a drag on the market and if they were Jerseys they could hardly be given away. While a large per cent. of the cattle are still Jerseys they are not nearly so numerous as before, many farmers not caring to take the chance of being caught in another such condition. While the cattle industry is in rather an unsettled condition at present, the business is rapidly returning to a normal condition though there will be a great many more dairy cattle than formerly.

Owing to the fertile soil and the dairy-ing industry sheep do not receive the attention they do in some other places. There are, however, quite a number of good flocks, composed principally of the Shropshires, Merinos and Oxford Downs distributed in numbers in the order named.

The swine industry is a very large and prosperous one. The Poland Chinas, Duroc-Jerseys and Chester Whites are the leading breeds occurring in the order named. The Poland Chinas are much more numerous than all other breeds combined. The breed originated in this section and despite some claims to the contrary it is rapidly increasing, both in

numbers and popularity. The droves are above the average grade of hogs found on most farms which is partly accounted for by there being several breeders of prominence in the vicinity. Nearly all farmers use pure bred sires and many use pure bred dams. The Duroc-Jerseys are rapidly gaining in favor although they will never attain the popularity of the Poland Chinas.

In summing up the live stock conditions we can say that the horse, hog and sheep industries are in a prosperous and flourishing condition, while the cattle industry is yet rather unsettled but is rapidly assuming a sound and healthful basis.

Something About Poultry

(The following paper was read by Gus. Weber, secretary of the Washington Township Agricultural School Club, at one of the business meetings, and afterward printed in The School Record. Master Weber is somewhat less than fifteen years of age and a breeder of fine poultry. We think that a great many of the older poultrymen would do well to consider some of these thoughts.—Ed.)

I am sure there is nothing more profitable on the farm than poultry. It is something which requires but a very little time in proportion to the income which follows. Some farmers have a very wrong idea concerning poultry. When they see them injuring the crops, at the edge of the adjoining fields to the barn yard, they think that every one of them should be killed. If they would stop to consider from what source they receive their groceries, and how nice it is to sit down at the table with a young fried chicken before them and the many ways which their eggs are served, they would let them scratch and destroy a few hills of corn.

But I believe the majority of those farmers who have such ideas are the ones which take no interest in their poultry. By taking no interest in poultry it will become a nuisance the same as weeds. If you do not gather the eggs regularly, set your hens and keep account of the number set, etc., and let your breed of chickens dwindle away until they become as troublesome as weeds in your corn-field.

One great mistake made by many people is that they do not keep their poultry free from lice. It is unreasonable to think that poultry can thrive when their blood is continually being sucked up by little living creatures on them. Therefore in the first place to reach the desired point the chicken houses must be kept free from lice. Chicken houses should be kept neat as well as the dwelling houses. During the summer the chicken houses should be cleared once a month, but during the winter months, they need not be cleaned quite so frequently. It is best to whitewash the inside of a chicken house once or twice a year. And if the chicken house is not ventilated and kept neat the chickens will vacate it and go to the trees as soon as the weather permits them. Poultry, roosting upon trees are exposed to great danger, or at least more so than they would be if they were locked up in their house.

Domestic poultry is something which depends largely upon the construction of the nests made by human labor. So it is necessary to construct suitable and convenient nests for your poultry. There are many different materials of which the inside of the nests may be made of, but straw is as good as anything if it is not left in the nests too long before changing it.

The part of poultry raising which requires the most care is to hatch and raise

the small ones. In selecting eggs for incubation one must use judgment. Never select a double egg, a deformed one, a soft shelled one, or one which is much smaller than the rest. A point is to select eggs laid by the old hens, rather than those laid by the younger ones. These are a few of the many cautions in selecting eggs for incubation but if the eggs are carefully selected this helps to make perfect and healthy chicks more than any other one thing. If an incubator is not used or a special place made for setting hens it is best policy to make some mark of distinction upon the incubator eggs. This can be done by a slight mark of a pencil in order not to stop up too many pores in the eggs. This mark is helpful in two ways; if other eggs are laid in the nest of incubator eggs they will begin incubation if not taken out, and if the incubator eggs have no mark upon them they are liable to be taken for fresh eggs, and in this way will be spoiled and unfit for other uses. When the eggs have hatched, the little chickens should be kept safe under cover for the first twenty-four hours. Afterwards they should be fed about once an hour but not much at a time. This should be continued for about two days then a small pen should be made so the old fowls cannot get with them. In this pen food should be kept so the little ones can get it any time. Their diet should consist just simply of one kind of food but should be changed frequently. If about three different varieties of food be kept, such as cracked corn, cheat and table scraps, one can keep his chickens in a very healthy condition.

As the chickens grow older and become large enough for marketing, do not sell them just as you come across them, but select from the entire number the ones you wish to keep for next year's breeding. This should be done in order to procure the best and in this way your

poultry will not run out or dwindle away.

Among the different kinds of fowls kept on a farm, chickens are found to be the most profitable for three reasons; first there is a greater demand for them; second, they produce eggs the entire year. Third, they are more easily cared for than other fowls. As the country is becoming more thickly settled and the land becoming more valuable it causes the farms to decrease in size from what they used to be. If this continues the farmer will be compelled to take up something else in connection with the regular farm work. Poultry is one thing which will be taken up because it can be done on a small area.

Prof. Lazenby at Kansas City

Professor Wm. R. Lazenby has just returned from a trip in the west where he has been attending the American Pomological Society. The meeting this year was held at Kansas City.

The Agricultural College and Society— Some Suggestions

BY E. J. KITCHEN.

The Agricultural Society of the Ohio State niversity organized in the spring term of 1904 with only eighteen active members, has increased its membership to seventy. This society was organized under the recommendation of the professors of the Agricultural College with no intention of the student promoters to hinder the advancement of any other society previously organized. The fundamental principals are laid down in the preamble to the constitution of the society in these words: "To promote greater agricultural interest, to bind ourselves in a closer union, familiarize ourselves

with agricultural investigations and to advance the cause of agriculture throughout the college and state."

The officers of the society deserve much credit for obtaining such good speakers of national reputation at our monthly meetings and the members have attended well and expressed intense interest in such meetings. A few suggestions may be added, however, as to what should be the duties of the members to promote the society's future interests.

As stated in the preamble, the main object is to promote greater agricultural interests. The main point is to keep the society always a progressive union, and when this is accomplished the best results must necessarily follow. The success of the society depends largely upon the success of the Agricultural College and the College's progress in turn depends largely upon the patrons of the school.

There is a lack of knowledge among the farmers of the state as to what really constitutes the agricultural course. Some farmers who consider themselves well informed know scarcely anything of the work done here. It would be safe to say that out of every one hundred farmers not more than one has ever visited the University. They should be directly interested and become familiar with the work done here so they may know the needs for improvement and advancement. They pay over forty per cent. of the taxes therefore should have some say as to how the money is expended.

And there are another class who feel a need of a higher education for the farmer but think there are better opportunities offered in some of the western schools, especially those better equipped in live stock. In the first place it is well to get this latter class of farmers interested in the work of the Agricultural Col-

lege. If the students continue to attend the western schools, one can fortell the results that will follow. No one doubts that the best results will come from patronizing home institutions, thereby creating a greater demand for better equipment.

How can the people be made to see that they are highly responsible for some of the existing unsatisfactory conditions if they choose to call it such? A co-operative movement with the farmers and the students offers a solution to the problem. The farmers organizations of the State have done much to promote agricultural interests yet the point is to get them in closer touch with the school.

A good method it seems to help correct these faults is through the influence of THE AGRICULTURAL STUDENT, which should be circulated to many of the farmers' homes, clubs and the country schools. The country student of the eighth grade and the student of the township high schools should have free access to THE STUDENT, either at the expense of the school board or of the University. In this way the students would become acquainted, and probably interested in the University, otherwise many would not. A catlagoue does not always suffice for the information desired by the prospective student. Another advantage in circulating the paper in the above manner would be to give it a wider correspondence. The reports of the experiments conducted by the many argicultural clubs of the schools could be published thereby furnishing the other clubs and also the College with news of such progress made in each case.

The agricultural conditions of Ohio are not just what we would like to see and it is up to us then to help make those conditions as far as possible correspond to our ideals.

In a few years we will be facing some of the same serious problems that the

farmers are now encountering. All must push forward and struggle for their rights. We are anxious to see the entire legislative body always in sympathy with the agricultural interests.

The relationship founded in the agricultural society will enable the members after they go from college to be better prepared for organizing into any movement for the betterment of agricultural interests. Through any well organized society the members can better make their demands felt and command greater prestige than otherwise. By strengthening the agricultural society each year with new members and extending THE STUDENT as before mentioned the College would be benefited, the farmer would be helped and a decided effect would extend to agricultural interests all over the state.

Professor Rudolph Hirsch is now in the employ of the Bureau of Chemistry, Agricultural Department, Washington, D. C.

Last Message of Ethan Allen

(This little poem first appeared in the American Horse Breeder about the year 1876. It is a fitting tribute to the memory of a beautiful horse, beautiful not only in form but in spirit and disposition as well. Ethan Allen, one of the greatest of that grand old strain of pioneer trotters, the Morgans, was born in the year 1849. On June 21, 1867 and at the age of eighteen, he defeated the great race horse Dexter, and this victory crowned him king of the Morgans. Shortly afterward he was purchased by the Messrs. Sprague and Aikers of Kansas, on whose stock farm he died in 1876, aged twenty-seven years.—Ed.)

I stand and gaze to the eastward,
 O'er prairies rolling and low;
 Seeking in vain for the mountains
 And friends of long ago.

And I long for the evergreen forests,
 For the sound of the brooklets' rill;
 And a draft of the sparkling water
 From the spring at the foot of the hill.

Time is fleeting, years are passing,
 Tears are dropping; I'm all alone;
 Quite forgotten, thinking, longing
 For my loved Green Mountain home.

Tell me, have they quite forgotten
 All the deeds that I have done?
 Do they think of Ethan Allen
 At the setting of the sun?

When my form was lithe and youthful,
 Like an Indian's supple bow;
 When my flight was like the eagle's,
 Or the lightning's vivid glow.

Days of triumph, days of victory,
 Dexter beaten, 'spite the taunt:
 "He is nothing but a Morgan
 Who is fighting for Vermont."

I can hear the joyous shouting,
 I can see the flowers they bring
 To deck their own, loved Ethan Allen,
 Crowned that day "The Morgan
 King."

Mr. Goff's Method of Plant Improvement by Hybridization

The practical and general application of Mr. Goff's system may be outlined as follows: In order to secure the benefits of existing material, make crosses between every available type, regardless of apparent objectionable characteristics.

Select sires from these and use on every wild species obtainable, on special and general lines, crossing and recrossing until desirable types are produced.

Then bring the selected offspring of all wild species together in intercrossing on special lines, as each wild species will prove more useful than another in some individual feature valued by us, for specialization becomes imperative.

The result of the foregoing will be the creation of new domestic types, valuable as sires for use in revitalizing crosses on existing varieties of merit, and the production of new forms and types of unexpected quality and value.

Horticulturists Meet

The Columbus Horticultural Society will hold their next meeting on October 14, at Mr. Vergon's orchard, near Delaware, Ohio. Mr. Vergon is said to have the best apple orchard in the state and the object of the above mentioned trip is to witness the gathering and barreling of the apples.

Agricultural News

BY N. E. SHAW.

Bulletin No. 30 just issued by the Department of Agriculture, contains several interesting articles compiled from experiment station records. Some of the principal papers are: Top Dressing Grass Land, Culture of Plants for Forage, Destroying Prairie Dogs, Construction of Poultry Houses and Production of Clean Milk.

The nineteenth annual convention of the Association of American Agricultural Colleges and Experiment Stations will be held at Washington, D. C., in the early part of November next.

From June 21-26, 1906, a large Agricultural exposition is to be held in Berlin. It will comprise a special division for prepared food articles, such as products of the dairy, dough, potatoes, fruits, wines and extracts, meats, beers, etc. Money prizes, diplomas and medals will be awarded. In order to test preserving capacity of these exhibits they will be sent to the tropics.

Mr. Chilcott, agronomist, of South Dakota Agricultural Experiment Station, has been appointed expert in connection with the cereal work of the Department of Agriculture.

Secretary Wilson estimates that thousands of dollars worth of buttermilk is wasted annually by American farmers. Buttermilk is thought to have a medical value in the treatment of kidney troubles and experts are now at work to determine its value for such purposes.

The peach crop of Michigan is estimated at 87 per cent. of a full crop this year. Ohio has a fair crop, Indiana over one-third, Illinois, Iowa and Missouri run low.

Steps have been taken toward the raising of \$150,000 to endow a chair of applied forestry and practical lumbering at Yale University. Lumber manufacturers are active in support of the plan.

The largest farm in the world is said to be a tract of 8,000,000 acres in Mexico, owned by Don Louis Terrazas. One million eight hundred thousand head of

stock are kept and between thirty and forty thousand people live upon the estate.

Dr. D. E. Salmon, chief of the Bureau of Animal Husbandry, has resigned, and Dr. A. D. Melvin, assistant chief, has been promoted to that position which will be vacated October 1. Dr. Salmon's resignation is probably due to criticism to which he has been subjected of late relative to the bureau management.

Experts report that the flax crop this year is unprecedented. It is claimed that the Dakotas and Minnesota raise over three-fifth of America's flax and in these three states last year the amount reached 20,840,000 bushels. This year it will be not less than 30,000,000, or about twelve bushels per acre.

The Ohio State fair this year surpassed all records for attendance and size and quality of exhibits.

University News

BY E. R. KITCHEN.

During State Fair week the Dairy Department of O. S. U. gave an exhibition of a working dairy over on the fair grounds. Milk was separated, bottled, churned, and, in fact as nearly as possible the daily working of the Dairy Department was shown to the public.

Professor Decker and Mr. Guthrie were sent by the State Dairymen's Association to Tuscarawas county to teach the dairymen in that section something about milk testing.

On September 14 Professor Plumb left for Portland, Oregon, where he is to judge Holstein cattle. The preceding week he was performing similar duties in Kentucky.

The Department of Agronomy is now in receipt of a silver medal from the Louisiana Purchase Exposition complimenting that department on their instructional apparatus for determining the real and apparent specific gravity, hygroscopic moisture and other physical properties of soils.

Mr. John F. Lyman, graduate of the Massachusetts Agricultural College and lately in the employ of the American Agricultural Chemical Company, of Baltimore, will occupy the position of laboratory assistant under Professor Vivian, for the coming year.

Last year's captain of Dennison's football squad, Van Voorhees, has entered the Agricultural College with the rank of junior.

The football schedule for the season of 1905 is as follows:

Sept. 23, Otterbein; Sept. 30, Heidelberg; Sept. 4, Muskingum; Oct. 7, Wittenburg; Oct. 14, Denison; Oct. 21, De Pauw; Oct. 28, Case; Nov. 4, Kenyon; Nov. 11, Michigan; Nov. 18, Oberlin; Nov. 25, Wooster; Nov. 30, Indiana.

Alumni Notes

Wm. A. Martin, '05, is on his father's farm near Kenton, O. He has been called upon, at several of the leading county fairs this fall to judge cattle.

Fred L. West, '05, is also running his father's farm which is situated near Bloomingburg, O.

J. V. Hyatt, '05, is foreman of the Tom Johnson Stock Farm, Camp Chase, O.

E. E. Finney, '05, has accepted a position in Southern Michigan, where he is manager of a herd of Red Poll cattle.

J. C. White, '05, is superintendent of the university farm and will again be in the university taking post graduate work.

E. S. Poston, '05, has been with his father on the farm near Logan, Ohio.

Thomas Wheeler, '05, has a position on the Drovers' Journal, Chicago.

E. L. Zehring, '05, is now in Washington, D. C., in the employ of the Bureau of Soils, Agricultural Department.

Henry H. Hamilton, '05, is farming near Brownsville, O.

Edward R. Minns, '05, is superintending and equipping a large farm in Northeastern Ohio.

Wm. H. Palmer, '05, has again entered the university, where he will take post-graduate work.

Dwight W. Weist, '05, is doing Y. M. C. A. work at Ada, O.

Reede L. Fromme, '05, is in the south employed by the Bureau of Plant Industry, Agricultural Department, Washington, D. C.

Miss Emma McKinley, '05, has secured a fellowship with Miss Stoner in the Domestic Science Department.

Miss Opal Tillman, '05, will be an assistant in the Botanical Department during the year.

Agricultural Education

BY PROFESSOR F. B. MUMFORD.

(In Missouri Agr. College Farmer.)

There is no justification for any form of education that does not give to its possessor a greater efficiency. Any type of education that diminishes to any extent whatsoever the ability of a student to

perform the practical duties of citizenship is a menace to the State. On the other hand, any form of education that gives to its possessor an increased efficiency to perform the necessary work of the world, or that better trains men to perform all duties devolving upon them as citizens of a free state is justified in the eyes of far-seeing statesmen who have at heart the real development and prosperity of the State.

One of the most significant modern developments in education is the effort on the part of educators to give to men an education which trains them specifically for the work of life. One of the phases of this interesting development is seen in the recent establishment of agricultural colleges for the training of those who propose to make agriculture their life work. It was formerly held by many able scholars that the farmer was a man like other men, and, like other men, an education which should result in general culture was best. The first agricultural colleges started out with this central idea. It is easy to understand why this kind of education failed of its purpose, and agricultural colleges were unpopular with those whom they most desired to benefit. The new era for agriculture began when agricultural colleges recognized that farmers needed technical training; that they needed scientific training in soil physics, soil chemistry, plant breeding, plant physiology, and in all other natural phenomena in any way influencing or governing the production of plants and animals.

It is not necessary to assume that because of the technical training necessary the agricultural student needs any less instruction in general culture subjects. It is, however, perfectly safe to say that the efficiency of the agricultural graduate is primarily dependent upon his training in technical agriculture.

In the early history of agricultural colleges it was claimed by many that a collegiate course in agriculture was only adapted to those who intended to become teachers or investigators in other agricultural colleges or experiment stations. Happily this idea has little favor among the best agricultural colleges of the present day. It is manifestly illogical to maintain institutions for the training of professional agriculturists. No agricultural college can long maintain its lead in this form of education that does not primarily train men for practical agriculture. It must, however, always be remembered that success in practical farming depends upon two qualifications: First, a knowledge of the theory and practice of agriculture and second, good business ability. The agricultural college can train men in the theory and practice of agriculture, but can not give men training in business ability. It is, therefore, possible for the brightest graduate of the agricultural college to become a hopeless failure in a business way.

While it is true that a thorough technical training must lie at the foundation of every successful curriculum in agriculture, agricultural colleges must not degenerate into mere trade schools. The short courses are in some respects similar to trade schools, and while they do much good, they do not solve except in a very limited way, the problem of agricultural education. The modern agricultural college as now existing is not a trade school. It is maintained upon a high plane of educational efficiency. It conforms to modern ideals of what university work should be. Every teacher is also an original investigator and the ability of men as original investigators is a stronger testimonial of professional qualifications than mere ability to instruct.

The agricultural college is in a class by itself when compared with other

forms of educational institutions in the efficiency with which it has carried the college extension idea to the people. It is a very conservative statement to make, that no institutions of any form have so efficiently solved the problem of college extension. Through experiment station bulletins, farmer's institute lectures, and similar agencies, the agricultural college carries directly to the people the results of its investigations.

These institutions belong to the State; they are supported by the taxes of the people. In the final estimate, therefore, they must yield something of value to the State, or their existence can not be justified. Their success and efficiency depend upon the liberality of the states supporting them. If they can be so managed as to yield large returns to the commonwealth, then may they expect to be generously supported.

The present outlook for agricultural colleges is very bright. The state governments have realized their value as public institutions and have, particularly in the Middle West, appropriated liberal sums for their development. The officers of the college and station have secured valuable experience in their management, and the future will see a much greater development in the real efficiency of these institutions. Thousands of students are enjoying the benefits of the instruction and investigation, and will return to their local communities there to build up a sentiment in favor of this form of education. The prevailing tendency of people generally toward country life will give to agricultural colleges a new importance. The intellectual problems connected with agriculture render it an alluring occupation for intellectual men.

The Agricultural Colleges and Experiment Stations will foster and encourage the growing love and respect for country life, and if they perform no other function than this their existence will be more than justified.

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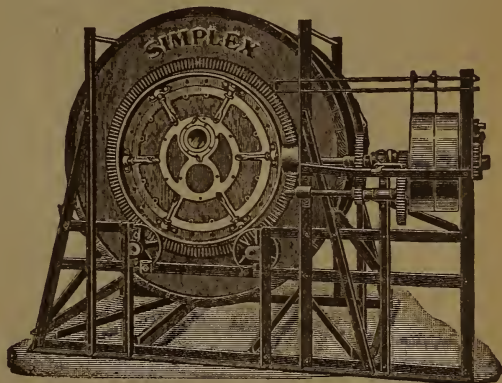
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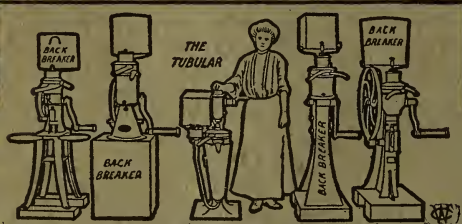
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