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A FEW WORDS FROM PRESIDENT SCHURMAN

RECENTLY I spent some pleasant hours with a young man whose family for nearly three hundred years have occupied the same farm in the State of New York. It is a farm of some 4,000 acres, part moorland, part devoted to crops, but the largest portion in grass which supports a stable of thorough-bred horses, a goodly herd of cattle, and immense flocks of sheep. The "labor problem" has been settled by bringing negroes from the country districts of the South and allowing most of them, when the cold weather comes to go home, where they deposit or display and spend their wealth during our winter months, after which they again return to the rural scene of their Northern labor and prosperity. The picture painted by the young man was a very attractive one; he obviously rejoiced in the life they led and the work they wrought; and he looked forward with pride to making improvements in the estate when in the course of time it should come into his own hands. He was no city "agriculturist"; his family had been and were actual farmers; he was proud of the name and calling, though it was no longer necessary for him to make his livelihood by manual labor.

Clearly the case is different from the case of the hardworking farmers of our State. Nevertheless it has suggestions of value. This young man loved the country and desired to spend his days there, and he was loyally attached to the spot where a dozen ancestors had lived and died. Here is something to admire and imitate at a time when so many of our people are given to wandering and the country is being drained of its youth for the benefit of the city. This case shows too that the farms of New York are not exhausted though they have been cultivated five or ten times as long as the richest portions of the Western prairies. And the methods of farming practised on this farm may explain why the soil is still productive: there has been diversification of agriculture, and diversification, according to the best authorities, is the hope of the agriculture of New York at the present time. Two other factors have made this farm a success. One is the adaptation of products to the excellent markets with which our State abounds; the other—the supreme factor—is the owner's industry, knowledge, skill, and organizing and executive ability.

Can the factors requisite to success in farming be communicated to students by school or college? Brains are the gift of nature. Character is the individual's own creation. No college of agriculture can make an effective farmer out of a silly or vicious boy. But the country is a good place to be born in and to grow up in, and the farmers' boys are above the average in intellectual endowments and in moral stamina. Such boys can indeed obtain much in an agricultural college to aid them in their farming. Above all they can acquire that knowledge, accurate and comprehensive, which we therefore call scientific, of the soil and its constitu-
ents and of the best methods of cultivation and of plants and animals and
the best manner of breeding and using them, which form the fundamental
conceptions and operations of agriculture. The prospective farmer has his
intellectual horizon enlarged by a course in an agricultural college; his
mind is vitalized by new ideas; and these new ideas are not about the sun,
stars, or other remote objects, but about the very objects, operations, and
practices out of which as a farmer he is to extract a livelihood. His
training is as scientific as physics or chemistry and, in its outlook and
application, as practical as crop-raising, cheese-making, or poultry-keep-
ing. The savage goes by rule of thumb; the American farmer of the
Twentieth Century must walk by the light of agricultural science. The
rule of thumb may still suffice for the virgin prairies of Dakota or Saskatch-
ewan; but the old farms of New York are to be rejuvenated and enriched by
the energy of applied science. Knowledge is power, said Lord Bacon: no-
where today can it be more powerful than on the farms.

Cornell University is devoted to both theoretical and practical knowl-
edge. That is why it has always had a department or college of agriculture.
Whether from the point of view of knowledge itself or from the point of
view of service to the people of the State, no college is better entitled to a
place in the University. None has been more anxiously watched by the
authorities of the University. Unfortunately they were always hampered
by lack of funds, for agricultural education is the costliest of all education.

In my Inaugural Address as President, I advocated the policy of State
support for the Colleges of Agriculture and Veterinary Medicine. Up
to that time New York had never contributed a cent from the treasury of
the State to the College of Agriculture or any other College of the Uni-
versity. My policy commended itself to the people. Within a year the
State built and equipped a Dairy De-
partment. Then followed the State
College of Veterinary Medicine with its annual appropriation for maintenance. Then came the buildings of the College of Agriculture, followed by its organization as a State College with an annual appropriation for its maintenance, which for this year amounts to $150,000 of regular income and $75,000 for special objects.

The State has generously carried out the policy which the University had outlined for it. That policy is for the benefit of the people, not for the aggrandizement of the University. And the people all over the State now expect great things of the College of Agriculture. I feel deeply that Cornell University has put upon it. For the control and management of the State College of Agriculture devolve as completely upon Cornell University as the control and management of any other College on the Campus. But my anxiety is relieved when I reflect that the College of Agriculture has been given, by the Trustees of the University, the same organization which has worked so successfully in the other Colleges of the University, and, especially, when I recall the zeal, devotion, and high ability of the Director and Faculty of the College. The highest ambition of these men is to acquire agricultural knowledge, to communicate it to the young men and women who come here, to diffuse it by extension and other methods throughout the State, to elevate and improve the agriculture of the State, and to make the farmer's work more productive, more intelligent, and (may we not hope?) more joyous and inspiring.

AGRICULTURE FOR HIGH SCHOOLS

By G. F. Warren.

Assistant Professor of Agronomy.

The outlook for the introduction of agriculture,—During the last session of Congress, a bill was introduced by C. R. Davis of Minnesota providing that 10 cents per capita of the population of each state and territory shall be furnished by the national government to aid in teaching agriculture and domestic science in rural high schools and mechanic arts and domestic science in city high schools. It provides that the funds shall not go to aid in the support of more than one school in each county and that the school shall furnish buildings, and instruction in other subjects that are necessary for a well rounded high school course. In a recent letter, Mr. Davis says that the aim is to extend the benefits of the Land Grant Act to all the people.

Whether the bill will pass is a question, but it is arousing serious discussion not only because of the far reaching results that would follow such an action, but because it calls for an annual appropriation of eight millions of dollars. It would also lead to even larger expenditures by the states.

Within the last few years there has been a remarkable growth of interest in agricultural education. Ten states now require their teachers to pass examinations in elementary agriculture, and ten states require the subject to be taught in rural schools below the high school. Less has been done in high schools, but there is now a strong movement for the introduction of the subject therein. Alabama has established an agricultural high school in each congressional district. A year ago the Georgia legislature started an annual appropriation of $6000 for aid in maintaining a high school in each congressional district. The people of the state responded by private subscription with over a hundred times this amount for equipment.

It is only within the last ten or
twenty years that enough real scientific knowledge of the principles of agriculture has been put into pedagogic form so that any vital teaching of the subject could be given even in colleges. But now a quite well organized system of college education is established. The next step is to extend this training to high schools. The rural schools will best be reached by training the rural school teachers while they are students in the high school.

Agriculture in the regular high schools.—To accomplish this purpose, agriculture should be taught in high schools just as algebra is taught except that agriculture should be an elective.

To those who are not familiar with the nature of agricultural teaching it may seem like a trade subject, but it is much more than a trade subject. The study of agriculture gives the same educational development as that given by the study of botany, chemistry and other sciences. It merely selects from the infinite number of subjects for scientific study, those that are concerned with the growth of plants and animals that are useful to man.

Only about half of our population are engaged in agricultural work. But the interest in agriculture includes nearly all the population. A very large part of our city population, particularly of the larger cities, is coming to take the keenest interest in agricultural questions. The number of agricultural inquiries that have come to the Cornell Experiment Station from New York City within the past few years is very remarkable, but no more so than the movement for the ownership and management of farms by city men. Nearly every one is interested in growing plants and animals, and there are some fundamental principles of this growth that every boy and girl should have an opportunity to learn, if they so desire. Not that they may become farmers or farmers' wives, but for the educational training and intelligent interest in life that this knowledge brings. This training is often as desirable for those who are to live in cities as for those who are to live on farms. We can never wholly separate our interests from the soil on which we walk and the plants and animals on which our life depends.

It is not desirable that a teacher try to make farmers of farmers' sons or lawyers of lawyers' sons. The thing that distinguishes America from the Old World is the mobility of its society. Each man may do what he likes and become what his energy will make him. While it is not desirable to make farmers, it does seem desirable to stop unmaking them. The present trend of all our education is cityward. We have been living in a city making epoch. The bright farm boy as he has attended the village high school has been taught much that would naturally interest him in city occupations. The teacher has become interested in him and encouraged him to "make something of himself." This usually means that he become a lawyer, doctor, or perhaps an engineer. The nature of his books and the advice of his friends have led him to believe that these were the lines in which mental ability would bring the greatest returns. If he did become a farmer he frequently felt that by doing so he lost his real opportunities. In the past this may have been so: but to-day, law, medicine and the ministry are not the only learned professions. The practice of agriculture now offers as great a field for scientific study as is offered by the practice of medicine. The study of agriculture is one of the best subjects for producing citizens that are mentally alert, industrially efficient and morally sound.

The teaching of agriculture will make more farmers who will make more money. It will lead more boys to choose farming as a profession, because it will open up a field for intellectual life whose existence they never suspected. But the great reason for this work is that it is one of the best means of training a student's mind, and it is one of the best means because it studies the things that
come within his experience,—the things with which and by which he lives.

Shortage of prepared teachers.—At present the greatest obstacle to introducing the subject is the lack of desire on the part of school authorities, but lack of knowledge as to just how to go about it. Few high schools can secure graduates of agricultural colleges, because such graduates are so few in number and because they cannot be secured at the same wages that are paid to other high school teachers.

The Pennsylvania State College has a plan that promises to bring good results. It is proposed to offer a teachers' course in agriculture next summer. The idea being to teach a year's agriculture in six weeks just as Cornell and other summer schools now teach a year's French in six weeks. And just as in the case of the French, the student will study nothing but agriculture during the six weeks. Very little good would come from a six weeks study if other studies were taken. The idea is not to make trained agriculturists but to teach teachers to teach a syllabus of agriculture. After such a course a teacher will be able to start instruction in agriculture and carry it on successfully when provided with a good set of laboratory and recitation directions.

Before taking up such a course, a teacher should have a good knowledge of high school botany and chemistry and as many other sciences as possible.

It is also extremely desirable that one who proposes to give good solid instruction of a high school grade should have experience in doing farm work.

The place of agriculture in the high school course.—Agriculture may be placed in the high school course as an elective after the class has studied botany, chemistry and as much other science as can be arranged for. The following suggested courses for high schools are given to show a few of the many ways in which agriculture might be arranged for without greatly modifying the present courses. It is not the writer's intention to indicate what the entire high school course should be, but to indicate the minimum changes that are necessary in order to include agriculture in courses that are now commonly given. With a larger teaching force it is an easy matter to make courses that are less alike and that will, therefore, probably be better suited to each purpose. The language courses here included are about such as are given in many high schools in the United States.

High School Course for Schools having three Teachers.

<table>
<thead>
<tr>
<th>Language</th>
<th>Agriculture</th>
</tr>
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<tbody>
<tr>
<td>FIRST YEAR</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td></td>
</tr>
<tr>
<td>Latin or modern language</td>
<td>same</td>
</tr>
<tr>
<td>Algebra</td>
<td></td>
</tr>
<tr>
<td>Biology (botany and some zoology)</td>
<td></td>
</tr>
</tbody>
</table>

| SECOND YEAR |
| Latin or modern language |
| History |
| Algebra and Plane Geometry |
| Chemistry |

| THIRD YEAR |
| English |
| Physics or Solid Geometry | same |
| Civics (½) Bookkeeping (½) |
| Latin or modern language |
| Agriculture |

High School with Four Teachers

<table>
<thead>
<tr>
<th>Language</th>
<th>Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRST YEAR</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td></td>
</tr>
<tr>
<td>Latin or modern Language</td>
<td>same</td>
</tr>
<tr>
<td>Algebra</td>
<td></td>
</tr>
<tr>
<td>Zoology (½), Physical Geography (½)</td>
<td></td>
</tr>
</tbody>
</table>

| SECOND YEAR |
| Latin or modern Language |
| History |
| Algebra and Plane Geometry |
| Botany |
THIRD YEAR
Latin or modern language  
Geometry  
Chemistry  
Language (ancient or modern)  
Agriculture

FOURTH YEAR
Latin or modern language  
English  
Physics  
Language (ancient or modern)  
Civics (½)  
Bookkeeping (½)

The language course as here suggested if well taught will admit to some courses in nearly any college in the United States. To include the agriculture in such a high school requires the addition of but one or two classes. This amount of work is commonly given by high schools with four teachers, and sometimes by those with three teachers, but it is very doubtful if three teachers should attempt more than the three year course.

If more classes could be taught, the agricultural students might be given commercial geography (½) and physiology (½) in place of language in the fourth year. If it is desired to give less science, biology might be given in place of zoology, physical geography and botany. This would place chemistry in the second year and allow some additional study in the third year. In some parts of the country less language is given than in this course, but such a condition does not influence the ease with which agriculture can be introduced into the high school course.

High schools with more than four teachers will probably have no difficulty in introducing agriculture. Such a school can teach enough subjects so as to offer as many different courses as seems best.

High schools wishing to offer a strong agricultural course. Such a school will usually offer other courses, only the agricultural course is here suggested.

FIRST YEAR
English  
Latin or modern language  
Algebra  
Zoology (½ year), Physical Geography (½)

SECOND YEAR
Latin or modern language  
History  
Algebra and Geometry  
Botany

THIRD YEAR
English  
Geometry  
Chemistry  
Agriculture (plant industry)

FOURTH YEAR
Civics (½), bookkeeping and business forms (½)  
Commercial geography (½), physiology of man and of domestic animals (½)  
Physics  
Agriculture (animal industry)

It will be seen that any of these courses give a fairly general education. The laboratory work in science and agriculture furnishes much practice in drawing and English. It has been said that a liberal high school or college education should include studies from each of the following groups: English, language other than English, history, mathematics, natural science. If this is true, then any of these courses would satisfy the definition.

FARM PRACTICE
By J. L. Stone
Professor of Farm Practice

ATTENTION is called to the second paragraph on page 21 of the new Program of Courses of Instruction of the College of Agriculture, which reads, "No degree will be given until the student has satis-
fled the college of his knowledge of farm practice;" Also to course 19 on page 34, "Farm Practice. An elective course especially designed for students who are not familiar with ordinary farm methods and practices. Throughout the year. Not given for University credit, but to assist students in meeting the requirements of farm practice demanded by the College."

Our college is somewhat unique among agricultural colleges in its number of students who have not been raised on farms. These students are usually ignorant of the common things of the farm, with which those reared on farms are quite familiar. The knowledge of these common things is as essential to successful farming as arithmetic. Neither, however, are subjects of university grade and the time spent in acquiring them should not count towards graduation. They are, rather, entrance requirements; only in the case of the farm practice the student who is so unfortunate as to come to us without it is permitted and required to secure a certain minimum amount during his course.

To have satisfied the requirements of the Farm Practice Department the student must, before leaving the University, secure not less than 60 points as scheduled below. Ample experience in the lines mentioned will secure the full credit assigned, partial experience a less number.

1. Experience in harnessing, hitching and driving horses. 10.
2. Experience in plowing and harrowing land and cultivating crops. 10.
3. Experience in planting crops (drills, seeders, etc.) 10.
4. Experience in harvesting crops (mower, harvester, corn binder, potato digger, etc.) 10.
5. Experience in running threshing machinery 4, ensilage cutter 3, wood saw 2, feed mill 1. 10.
6. Experience in orchard and fruit yard work. 10.
7. Experience in trucking and market garden work. 10.
8. Experience in milking and caring for cows. 10.
9. Experience in the manufacture of butter and cheese. 
10. Experience in managing and caring for a flock of sheep. 
11. Experience in managing and caring for a herd of swine.
12. Experience in managing and caring for a flock of poultry.
13. Experience in any other definite line of Agriculture.

Students taking the practice work offered by the Department of Animal Husbandry, Dairy Industry, Horticulture or Poultry Husbandry will have their credits in these departments raised to 10 if they make an average grade of 80 or more—less if they fall below this grade.

Opportunity will be given on the College farm so far as conditions permit to gain farm practice credits in 1, 2, 3, 4 and 5 but University credits may not be secured by such work.

It is expected that students coming from farm homes will be able to meet these requirements, but those not having had farm experience will need the work given here and it is hoped that the requirements will compel them to do actual farm work on some well managed farm during at least two summer vacations.

ADJUSTING A CROPPING SYSTEM FOR A MAXIMUM HERD

By W. J. Spillman
Agrostologist, U. S. Dept. of Agriculture

It is seldom that a single fixed rotation will produce feed in a proportion that can be utilized to advantage on the dairy farm. It will be seen in the problem below that two rotations are required to accomplish the purpose sought, and this is usually the case on dairy farms. The various systems of feeding dairy cows may be roughly classified in five groups, characterized as follows:

(1) pasture in summer, dry roughage in winter; (2) pasture in summer, hay and silage in winter; (3) siloing in summer, dry roughage in winter; (4) siloing in summer, hay and silage in winter; (5) silage and hay the year round. Root crops may, of course, be substituted for silage in any of these systems where silage is used.

Roughly speaking, 60 acres of land devoted to raising feed for the cows, when roughage only is raised, will maintain, under each of these five systems and with the ordinary cropping systems of the Northern States, approximately the following sized herds: No. 1, 13; No. 2, 13; No. 3, 18; No. 4, 18 or 19; No. 5, 20. It will be seen that by cutting out the pasture it is possible to increase the herd about 50%.

It is assumed that the pastures are rich enough so that two acres will carry a cow, with a small amount of soiling corn, for five months during the summer.

In comparing these various systems of feeding I have calculated standard rations for each period of the year for all the kinds of stock kept on the farm. From these rations the quantity of each of the different kinds of feed has been calculated. Then cropping systems have been arranged in such a manner, with certain yields assumed, as to provide exactly the amount of feed needed for the herd. In ascertaining the acreage of each of the crops, I found it necessary to develop an algebraic method, which has been exceedingly useful to me in comparing different systems of feeding and different systems of cropping, and I give below one of the problems to show the method. The yields assumed are as follows: Soiling corn, 7 tons per acre; silage, 9 tons per acre; hay, 2 tons per acre; corn, 45 bushels per acre (= 1.26 tons); oats, 40 bushels per acre (= .64 tons). It is assumed that two acres of pasture will carry one cow during the summer, with
some soiling corn the latter part of summer, that a yearling will require one acre of pasture, and a calf half an acre.

<table>
<thead>
<tr>
<th>TABLE I.</th>
<th>1 cow &amp; corresponding young</th>
<th>1 bull &amp; corresponding young</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasture, acres</td>
<td>2.375</td>
<td>2.000</td>
</tr>
<tr>
<td>Soiling corn, acres</td>
<td>.066</td>
<td>.066</td>
</tr>
<tr>
<td>Silage, acres</td>
<td>.336</td>
<td>.294</td>
</tr>
<tr>
<td>Hay, acres</td>
<td>1.085</td>
<td>4.905</td>
</tr>
<tr>
<td>Grain, tons</td>
<td>.650</td>
<td>3.880</td>
</tr>
</tbody>
</table>

Let x equal the number of cows. It is assumed that the number of young stock is equal to half the number of cows and that one bull and three horses are to be provided for. The first column of figures in the above table shows the acreage needed for one cow and the corresponding young, the last column the acreage needed for one bull and three horses. The grain is given in the above table in tons, because the two crops, corn and oats, which are grown for grain do not yield the same amount per acre. From the above table we are able to express the acreage of some of the crops as follows:

- a) Pasture, \(2.375x + 2.000\)
- b) Soiling corn, \(.066x + .066\)
- c) Silage, \(.336x + .294\)
- d) Oats, \(.402x + .360\)
- e) Timothy & clover, \(.402x + .360\)
- f) Timothy & clover, \(.402x + .360\)

The area of oats is the sum of the areas of soiling corn and silage. The corn, oats, timothy, and clover above form a four-year rotation. Since oats yield .64 of a ton of grain per acre, if we multiply the expression for the acreage in the above rotation by .64, we get the tons of oats produced on that field. This gives \(.257x + .230\) tons. The total grain needed (Table I.) is \(.650x + 3.880\). Subtracting the tons of oats from the total amount of grain needed we have \(.393x + 3.650\) tons of grain to be grown in the next rotation. As each acre of corn grown for grain in the next rotation is to be followed by an acre of oats grown for grain, and as an acre of corn and an acre of oats together yield 1.9 tons of grain, if we divide the \(.393x + 3.650\) by 1.9, we get the number of acres of corn followed by oats required to produce the additional grain needed. This gives \(.196x + 1.920\) acres. We start the next rotation, therefore, with corn \(1.96x + 1.920\) acres. Now I have found by trial that along with the corn I must grow some hay in order to have enough hay, so that in the same field with the corn I insert peas and oats. The corn is to be followed by oats for grain, and that by timothy and clover for one year. The peas and oats are to be followed by timothy and clover for two years. The general form of this rotation is:

1. \(g\) Corn for grain, \(.196x + 1.920\)
2. \(i\) Oats for grain, \(.196x + 1.920\)
3. \(j\) Timothy & clover

The combined area of fields e and f above is \(.804x + .720\). The total area of hay from Table I. is \(1.085x + 4.905\). The difference between these, \(2.81x + 4.185\), is the combined area of h, j; and k; or since h is equal to j, this combined area equals \(2h + k\). Now \(g + h = k\). Substituting this value of k in the expression above, we have \(3h + g = .281x + 4.185\). Subtracting \(g = .196x + 1.920\), we have \(3h = .085x + 2.265\), from which \(h = .028x + .755\), which also equals j. \(k = i + j\), or \(.224x + 2.695\). The second rotation may therefore be expressed as follows:

<table>
<thead>
<tr>
<th>TABLE II.</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>g) Corn for grain</td>
<td>(.196x + 1.920)</td>
<td>(.028x + .755)</td>
<td>(.196x + 1.920)</td>
</tr>
<tr>
<td>h) Peas and oats</td>
<td>(.028x + .755)</td>
<td>(.224x + 2.695)</td>
<td></td>
</tr>
<tr>
<td>i) Oats</td>
<td>(.196x + 1.920)</td>
<td>(.224x + 2.695)</td>
<td></td>
</tr>
<tr>
<td>j) Timothy &amp; clover</td>
<td>(.028x + .755)</td>
<td>(.224x + 2.695)</td>
<td></td>
</tr>
<tr>
<td>k) Timothy &amp; clover</td>
<td>(.196x + 1.920)</td>
<td>(.224x + 2.695)</td>
<td></td>
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</tbody>
</table>

We now have algebraic expressions for the area of each sub-division of the farm. Adding these together and placing the sum equal to 60 acres, we have \(4.655x + 11.525 = 60\), from which \(x = 10.4\). This means that a farm of 60 acres will support 10 cows, 5 head of young stock, 1 bull, and 3 horses, furnishing both grain and roughage for the herd. By substituting 10.4 for x in the expressions for the areas of the various fields, we get the actual acreages.
GEORGE CHAPMAN CALDWELL

By T. F. Crane
Dean of the University Faculty.

ON Thursday, September 5th, died George Chapman Caldwell, emeritus professor of chemistry, and senior professor of the Faculty of Cornell University. Professor Caldwell was a man notable in many ways and his death deserves particular mention in this journal, representing as it does interests especially dear to him who has just passed away.

After his election in 1866 to the presidency of Cornell University, Mr. Andrew D. White visited various institutions of the West in the search for professors of the new faculty and found at Antioch College, Ohio, two men who were afterwards appointed to chairs at Cornell. These men had been trained in the traditions of Horace Mann, president of Antioch from 1852 to 1859, and had taught in an institution where freedom of thought was a fundamental principle.

One of these men was George Chapman Caldwell, born at Framingham, Mass., in 1834, and educated at the Lawrence Scientific School of Harvard University where he received the degree of B. S. in 1855. After graduation Professor Caldwell studied at the University of Göttingen where he took the degree of Ph. D. in 1857, being among the first to pursue serious scientific studies in Germany. After his return to this country he was appointed professor of chemistry at Antioch, where he remained until 1867 when he received an appointment in the Agricultural College of Pennsylvania, and shortly after one in Cornell University, where he took up his labors in the fall of 1868. It will be seen that he was unusually well equipped for his chair and had had much experience in teaching. His eminent scientific attainments gave dignity at once to the side of Agricultural Chemistry which his text books and lectures widely promoted.

When the University opened in 1868 the entire chemical laboratory was contained in the basement of the middle section of Morrill Hall. The following year a wooden building near where the north end of Goldwin Smith Hall now stands was erected and for a long time housed the departments of chemistry, physics, civil engineering and veterinary science. Professor Caldwell lived to see the erection of Franklin Hall in 1883 which chemistry shared with physics until 1890, when the extensive Morse Hall was constructed to be doubled in size by the addition of the north wing in 1900. These material figures show the enormous impulse given to the study of chemistry by Professor Caldwell and his able staff, and the huge building is his worthy monument.

But I cannot dwell on his scientific attainments, but must hasten to speak of his other services to the University. He was assiduous in the performance of his duties as a member of the faculty, from the first meeting one October afternoon in 1868 in a dark little room next to the Western Union Telegraph office in the Cornell Library, to the meetings held in Cascadilla Place and later in Morrill and Boardman Halls. From 1872 to 1886 he was the secretary of the General Faculty and kept the extensive minutes in his own neat handwriting. A correction of his minutes was a rare thing.

He was equally conscientious in all his other duties, as teacher and citizen. He was first of all a scholar and tireless in his devotion to his chosen profession, and the country is his debtor for a host of professors and investigators who are increasing its resources and expanding its intellectual horizon.

As a man Professor Caldwell commanded the affection and respect of all who knew him. He was modest and retiring, but ever ready to take his part in academic or civic reforms. He had inherited the best traditions of New England simplicity of life and
noble ideals in church and state and exemplified them in his spotless life and unwearied professional labors. He was a deeply religious man and a devout and active member of the Unitarian Church, in which communion he had been reared.

His health began to fail in 1892 and in November of that year he resigned his active work and was made emeritus professor, with grateful appreciation of his services from trustees and colleagues. As long as the university lasts his memory will be cherished as a profound scholar, a devoted teacher and an upright man.

THE DEPARTMENT OF EXPERIMENTAL PLANT BIOLOGY

By Herbert J. Webber
Professor of Experimental Plant Biology.

THE Department of Experimental Plant Biology was organized but a few months ago, as a result of Director Bailey's idea of separating the experimental from the teaching departments in the College of Agriculture. The primary work of the Department is thus expected to be experimental. The general policy in all Agricultural Colleges and stations as heretofore organized has been to combine the teaching and experimental works in the same departments. Experience has shown that in this plan of organization it is common for the experimental work to suffer, as the teaching cannot be put off while if the experimental work is neglected there is no visible loss and disorganization. Again in colleges, departments are largely judged by the number of students they attract. A department being considered strong and successful in general only when it is instructing a large number of students.

Director Bailey's plan of segregating the experimental and teaching departments would thus seem to be a wise provision in an institution having the combined functions of teaching and advancing knowledge by experimentation. By this provision it is not expected that the teaching departments shall not conduct investigations or that the experimental departments shall not give instruction to some students, but the primary functions of the two grades of departments are distinctly different. The experimental departments are expected to give instruction to only a limited number of graduate students who are prepared to carry out investigations under direction and whose study will thus aid in advancing the investigations under way. Following the plan above outlined the Department of Plant Biology will thus expect to have a limited number of graduate students working on special problems for advanced degrees but the number of such students must necessarily be very limited.

The investigations of the department will be limited mainly to studies of the fundamental problems of plant breeding, which necessarily includes careful studies of heredity and evolution. From the standpoint of popularity it would be desirable to create new and startling things by the juggling of characters through hybridization, but the department officials conceive that it is a higher aim to strive to advance our knowledge of the principles. While the discovery of Mendel's principles of heredity are understood and appreciated by only a limited number of students, they are of infinitely more value to the world than the production of any new variety however novel, could ever be. Mendel's principles of heredity are as yet imperfectly understood and investigations will be prosecuted with the view of extending our knowledge of these principles and their ap-
The possibility of improving plants by breeding, lies in the fact that plants are never uniform but always more or less variable. The study of the different types of variation and their importance to the breeder is thus of great value and will form one of the most important lines of investigation prosecuted by the Department. DeVries' theory of the origin of species and varieties by large type variations or mutations requires extensive experimental study and confirmation. Material is being collected for a thorough study of mutations and the investigation will be prosecuted as rapidly as possible. Up to the present time breeders have been compelled to await the appearance of variations as they are formed in the course of natural development. There is some evidence to indicate that such variation may be stimulated by artificial means and it is expected that investigations of this nature will also be undertaken as soon as facilities can be provided. It is expected that the studies of all hybrids and mutations will be conducted from a cytological standpoint also in order, if possible, to obtain further light on the mechanism of hereditary transmission of characters.

Certain experiments of more direct practical nature will also be undertaken and some are already under way. The most noteworthy of these is an extensive experiment in the improvement of timothy. This experiment was started in 1902 by Professors Hunt and Gilmore of the old Department of Agronomy, and was placed under the writer's charge in the Department of Plant Biology following the retirement of Professors Hunt and Gilmore from the College of Agriculture. These experiments in the past have been carried on with the assistance of Mr. Fraser and Mr. Clark, and the latter remains with us to assist in the work.

New York ranks first among the states in the production of hay crops, with a yield in 1906 of 6,038,580 tons valued at $73,066,818. While first
in total yield our average yield per acre is only 1.28 tons and we rank only 34th in production per acre. It would certainly seem that there must be room for improvement somewhere and there may be some need for the plant breeder. In starting this experiment, in the summer and fall of 1902, select heads of timothy were obtained from numerous growers in various parts of the United States and foreign countries. The seed from these select heads were germinated in the greenhouse and 42 plants from weight of product through two seasons. 2. Light yielding plants. 3. Early blooming plants. 4. Late blooming plants. 5. Large leaved plants. 6. Small leaved plants. 7. Fine stemmed plants. 8. Coarse stemmed plants. 9. Long headed types. 10. Short headed types. 11. Many leaved plants. 12. Few leaved plants, etc. The seed of these individual plants of different types were carefully saved separately and planted in plats in a greenhouse. When the young plants were large enough 36 each lot transplanted to plats in the field. These plants were placed in rows 3 feet apart with the plants 3 feet apart in the rows, one individual plant in a place. When these plants had reached an age of two years they were carefully examined and individuals selected which showed in most marked degree the important variations which had been observed. Several plants of each of the following types were chosen: 1. Heaviest yielding plants, as shown by actual plants of each kind were transplanted to the field and planted one plant in a place, as in the first planting, the progeny from a certain selected plant being placed together. A careful examination of these progenies shows great variability and yet clearly shows that there is in some instances a tendency in the progeny to inherit the characters for which the mother plant was selected. As an illustration: 7 heavy yielding vigorous plants and 6 light yielding weak plants were selected
and progeny planted in the test plats. In 1906, the product of 251 plants, the offspring of selected vigorous plants, weighed 80.115 pounds or an average of 0.319 pounds per plant. In the same year the product of 132 plants the offspring of selected weak plants weighed 27.723 pounds or an average of 0.210 pounds per plant. This shows clearly the gain in vigor by taking seeds for planting from vigorous plants.

Plants which were selected as early blooming and late blooming types clearly transmitted these characters in considerable degree. While in several cases the characters were transmitted, in general the progenies were very variable and showed little indication of transmitting the characters for which the mother parents were selected. The seed from plants selected and used in the planting was not bagged and the great variation in general showed by the progeny clearly indicates that the seed was largely cross fertilized with pollen from different plants which introduced the characters of other parents. The planting of the progenies of select plants have thus demonstrated two important factors: 1, that certain characters are largely transmitted, and 2, that timothy is in general cross fertilized and that some method of isolation is necessary in the production of fixed races from any valuable variation.

What has been said above in no way indicates the extent of these timothy experiments or their great interest. When the writer took charge of these experiments last July, the plants were in prime condition and in no crop, in any place, has he seen a more extensive planting of experimental breeding stock or a breeding field showing more interesting variations and greater opportunity for making interesting and valuable selections. The fields contained nearly 20,000 individual plants, one plant in a place, planted in rows like corn. We are accustomed to think of timothy as timothy, different varieties or races never having been distinguished or established. In this experimental field however, it would have been easily possible to select out as many as 300 different plants, differing from each other by marked characteristics which could doubtless have been bred into as many stable races or different varieties. The extent of the variation was remarkable. Side by side one would find for instance, one plant past blooming and nearly ripe while the other was just coming into bloom, or one plant with the leaves all ripe and drying up while the other was entirely green and vigorous, or perhaps one plant nearly killed by rust while the next one to it would show scarcely an indication of rust. Some plants are tall, compact and upright and well suited for use as hay varieties which is the ordinary use to which timothy is put, while occasionally a plant is formed which throws a large amount of green foliage at the base, showing a tendency to stool out and spread by vegetative methods of propagation, indicating that they might prove valuable special types to use for pasture purposes. Such variations furnish great opportunities for the breeder and indicate what characters can be obtained in different varieties.

From this interesting field the writer selected about 200 plants, possessing valuable characters which will be carefully tested, and some of them, it is hoped, may be bred into new races of superior value. Considering the extent of timothy cultivation in New York, the great value which an improved higher yielding race would have, can be readily understood. All students interested in breeding should be sure to see this breeding field of timothy next June, before leaving for their summer vacations, as a very large number of the original plants will be destroyed after the harvesting of the next season's crop. A plant breeder could well afford to travel across the state of New York just to see this timothy experiment.

A second practical experiment, started under the direction of Professors Hunt and Gilmore, which is being continued under the writer's direction, is on the improvement of
clovers. In this crop two of the principal improvements desired are increased yield and greater resistance to winter killing. A considerable number of plants representing several different varieties and species of clovers were planted last year, one plant in a place as in the case of the timothy. With reference to winter killing, nature does the selecting and in many cases a considerable number of the plants were killed last winter. Those surviving would naturally be supposed to be the most resistant to winter killing, though this will require further demonstration. The breeding of clovers and other leguminous crops will form one of the important lines of work of the Department.

Careful students of New York Agriculture have come to believe that one of the important problems before the state is to increase the growth of concentrates used for food stock. At present a large percentage of such foods must be purchased by our stockmen from other states. Probably the most feasible way of doing this will be to increase the production of corn grown for grain. If, however, we are to materially increase the growth of corn it is important that we secure varieties that will give better yields under our conditions and at the same time ripen in a shorter period so that it will be more certain to mature before killing freezes come in the fall. Work on this problem was started the present season but under very unfavorable circumstances as the spring was late and good land unavailable. As a result, little advance if any, will be made the present year, unless the season is longer than usual. It is proposed to test all of the best yielding early sorts which can be found and carefully breed several of the varieties which are found to be the best suited for the desired purpose.

Considerable work has also been started in cooperation with the United States Department of Agriculture in the breeding of cereals. This year 165 varieties of hybrid and select oats were grown in small test plats. The
selections made from these plats will furnish valuable seed to greatly increase the experiments next year. This fall experiments will be started in wheat breeding and the cereal breeding experiments of the Department, it is expected, will ultimately form an important part of the work.

In the various experiments under way the writer will be ably assisted by Assistant Biologist J. B. Norton, who comes from the United States Department of Agriculture, where he has served as Assistant Physiologist for the last six years, Assistant Agronomist O. F. Clark, who has been an assistant in the Cornell Experiment Station for several years, and F. J. Pritchard, who comes to us from the North Dakota Agricultural College, where he has held the position of Assistant Professor of Botany for the last three years.

No field of Agriculture, the writer believes, presents more interesting and important problems for solution than are found in that represented by the Department of Experimental Plant Biology and if the corps of workers engaged in the investigations are able to meet the trust placed with them they should accomplish results worthy of the great institution they represent—Cornell.
WEBSTER defines a pedigree as a lineage or ancestry, or an account or registry of a line of ancestry. Thus people have for many hundred years thought of a pedigree as bearing only upon animal biology and have practically disregarded the possibility of there being such a thing as a pedigree in the plant kingdom. Strange as it may seem, there are those people who still hold to the idea that a true pedigree of plants cannot be formed by systematic breeding. The writer is willing to acknowledge that it is an exceedingly difficult matter to perfect a pedigree in open fertilized plants, but for the close fertilized plants bearing hermaphrodite flowers there is nothing easier. Yet on the face of the record, it looks wanting in some way and is hard at first to comprehend because there exists a line of figures showing the existence of one individual only. The difficulty, however, lies with the psychological training of the viewer and not with the exactness of the record; e.g., with animals we expect in a pedigree to see the names of the two parents, the four grandparents, etc., etc., while with the close fertilized plants we see only the one parent, the one grandparent, the one great grandparent, etc. Hence the seemingly incomplete form of such a pedigree.

To carry the explanation a little further, let us suppose that a certain animal (A) and a certain barley or flax plant (I) have their pedigrees expressed graphically. They would appear something like this:

Animal (A)  
\[
\begin{align*}
\text{x'} & \quad x'' \\
\text{x'} & \quad \text{x'} \\
\text{y'} & \quad \text{y''}
\end{align*}
\]

Plant (B)  
\[
\begin{align*}
\text{(B)} & \quad \text{(B)} \\
\text{(B)} & \quad \text{(B)} \\
\text{(B)} & \quad \text{(B)}
\end{align*}
\]

Thus each side of the family would diverge annually into a larger and larger number of ancestral parents.

Plant (I) \{(1)' \quad (1)'' \quad (1)'''

Thus each ancestral generation would be a single individual.

With open fertilized plants, either where the two (male and female) flowers are on the same plant or on separate plants, the working out of a pedigree is a very difficult matter. It can only be worked out, to the same degree of perfection as is done with live stock, by hand work and absolute control of the pedigree stocks. One may easily follow the maternal side of the record, but to know and record the paternal side is the difficult part. For practical purposes one can, by the selection of a number of qualified individuals, (as ears of corn), limit the range of paternal ancestry to a small number and by detasseling or some such control limit it to the several progeny of a single "mother" ear. This, however, is short of the "true" pedigree since but one side of the ancestry is exactly known.

From the plant breeder's point of view a pedigree, with one side known and the other side limited to a small number of selected parents, will be sufficient. Who can tell what the harvest may bring forth with four to ten weeks between fertilization and harvest. In other words, in this particular case, the breeding is a matter of chance in either case and Nature's chance is as safe as the eye of the breeder in selecting the male parent.

If we represent the pedigree of this character in graphical form, it would appear something like the following, if (B) is taken as the pedigree stock.
Thus the male side is not ascertained in any case, as is indicated by (B).

In this case the male in each instance is known as (B) n-? which means that the one which furnished the pollen is some one plant (? equals not known) among many resulting from selected "mothers." Again

Plant (B) \{ (B) n' \}
Plant (B)' \{ (B) n'' \}
Plant (B)''

Thus the male is confined within the limits of the progeny of one selected mother, (B) n'.

It is not a difficult problem to form a pedigree. But it is a difficult problem to make a pedigree which bears value. Let us stop for a moment to consider what makes a pedigree valuable. Is it the fact that a certain individual is sired by and is the daughter of this or that one, which in turn have grandparents so and so? Not at all, the value of a pedigree lies in the record, along economic lines, which the individuals have made. The public has too long been imposed upon by the bare record of ancestry. But breeders have awakened to the fact and are now strenuously demanding records.

Never in the history of the world has science, especially as applied to breeding, been so popular and been made the servant of man as today. The work of breeders all over the country is breeding better and more efficient individuals. At the same time the general average of the multitude is rising in value, which, after all, is the only true advance. High class individuals may come and go and accomplish much, but their influence is slight compared with that of the great average.

THE AGRICULTURAL ASSOCIATION

By M. C. Burritt, '08

"Recognizing agriculture as the first and most essential of human pursuits, and its study as one of the fundamental features of Cornell University, and hoping that its future shall evince a marked and continuous improvement on its past; we, the undersigned, in order to extend a correct knowledge of all subjects pertaining to this science and art, to incite a livelier interest in its improvement and to cultivate a clear and lucid expression of our own views, do hereby form ourselves into an association, . . . to be known as the Greeley Club of the Cornell University." Thus reads the preamble of the constitution of what later became the "Agricultural Association," the oldest society in the University. It was signed in 1877 by twenty-four persons, and minutes of the meetings for thirty years show that the most prominent and successful students of the College have been identified with the Association and active in its work. The programs have nearly always been interesting, instructive and helpful to students attending. It is the testimony of those who have been connected with the College of Agriculture for many years that every movement or interest affecting the student body of the College had its origin in the Association. Illustrations of its activities may be cited in the Agricultural Banquets and the "Honor System."

During the past few years a number of technical clubs, such as the Poultry Association and the Round-up Club besides the Lazy Club have been formed and may have seemed to interfere with the Agricultural Association. These, however, are but the natural outgrowth of our competitive and strenuous life. Each organization has its place and work and one should not interfere with the other. This Association is the more general and represents the College and the student body as a whole, while the other clubs represent only important parts. The Lazy Club is horticultural and the Round-up Club is concerned with animal husbandry, while the Association's interests extend over the whole field of agricultural knowledge.
Last year in order that the student body might be better represented a board of directors was formed, consisting of a representative from each of the Clubs and two from the Association. This board is the controlling body in student affairs, and no final action may be taken by the Association without its approval.

There are several things which the Association aims to do. The most important are:

I. To represent the students of the College in the University.
II. To transact all business which concerns the students of the College of Agriculture.
III. To give its members practice in speaking and debate and to train them for active practical public work.
IV. To keep in touch with agricultural progress and to second and support all movements toward the betterment of agricultural conditions.

The executive board aims to provide programs which shall be interesting and entertaining while at the same time practically instructive. All who attend the meetings testify to their value. The new student will find no better place to show his interest in the affairs of the College and to make himself useful in its work. Like all other organizations the power and usefulness of the Association depends on the interest and personal initiative of its members. These should, and I am confident will, in the coming year maintain and even surpass the high standard set by those who have preceded us.

THE LAZY CLUB

PERHAPS the most novel and unique organization in the College of Agriculture is the Lazy Club. Contrary to the usual meaning of the title "Lazy Club," this society seems to be bubbling over with energy and enthusiasm despite its Utopian existence. It has no officers, constitution, or dues, but under the veiled guidance of the Horticulture Department, the conduct of the members and their discussions are kept within reasonable limits.

This Club evolved out of periodic gatherings of the graduate students in a horticultural seminary under the supervision of our present Dean Bailey, who at that time was the head of the Horticulture Department. According to records, the organization first met as a club on the 19th of November, 1896, at which time the late Professor E. G. Lodeman delivered an able discussion on "Begonias." Through the widespread influence of its many members, the Lazy Club is known all over the United States and the World, even unto the Orient.

The Lazy Club meets every Monday evening at 7:30 in the Lazy Club rooms connected with the Forcing Houses. The program starts with a hasty review of the current horticultural and agricultural magazines, of which a goodly number are presented by the publishers or else the subscription is paid by some member. It is almost impossible for every one to peruse all the periodicals, so it devolves upon some person designated at the preceding meeting to read all papers and give a brief resumé of important topics. The principal event of the evening is a discussion of local conditions that surround the several students in their various homes, or else a lecture by a member of the Faculty or some invited guest. This is followed by an informal discussion participated in by all persons present. A basket of fruit or similar treat never fails to secure the appreciation of all, especially the younger members. The evening closes with the signing of the Register, by which act one becomes a member of the Lazy Club.

THE POULTRY ASSOCIATION

By R. C. Lawry, '09

THE Cornell University Poultry Association is a students' organization for the advancement of poultry interests among the agricultural student body.

It was organized in 1904 and held
its first annual Poultry Show in that year. The officers are chosen by ballot from among the members. Any student registered in the College of Agriculture may become a member upon payment of the membership fee of twenty-five cents. The Association holds meetings every two weeks for the transaction of business and the discussion of timely poultry questions. From time to time the discussions take the form of debates, either extemporaneous or prepared. This feature of the meeting is especially valuable since it is at once instructive and entertaining, and affords opportunity for the members to become accustomed to speaking in public.

Often meetings are addressed by non-resident speakers or specialists in some one line of poultry work.

It is the custom of the Association to hold at some time during the college year their annual Poultry Show. These poultry shows are conducted under the same business lines as the large poultry shows of the country and afford the members opportunity to acquaint themselves with the methods of poultry show organization and control. The show is conducted entirely by the students and all members may select and prepare and exhibit for prizes, stock from the college plant. The awards of the show are placed by an expert judge who explains the principles of judging and shows by illustrated lectures his reasons for placing the awards as he does.

It is planned to make the week of this year's poultry show, Feb. 17-21, 1908, the largest and most beneficial event in the history of the Association. During the week of the show there will be held at the College a Normal Poultry Conference under the auspices of The New York State Branch of the American Poultry Shows.

Other speakers, specialists in their line, will treat fully the subjects of scoring and judging, utility, commercial egg farming, commercial meat poultry farming, buildings, feeding, incubation, brooding, etc. Among the speakers are to be several ladies so that the woman's side of the question will also be presented.

Every agricultural student interested in Poultry should become an active member of the Association.

THE ROUND UP CLUB

By C. H. VanAnken

Assistant in Animal Husbandry

The latest organization of the College of Agriculture is the Round Up Club. It consists of students, faculty members and others who realize that animal husbandry has become one of the most important subjects taught in the curriculum of the College of Agriculture.

The students felt the need of an organization where they could meet informally to discuss matters of interest along animal husbandry lines. The Round Up Club was organized March 11, 1907, holding its first meeting in the Dairy Building. It has no officers and no constitution. At every meeting, the record book is signed by each person present, thereby making him a member of the Club. No dues of any kind are charged.

The Club meets every Monday evening at 7:30 in the Animal Husbandry Building. Certain persons are chosen at each preceding meeting, to read the current papers and select items of interest, which are read and discussed at the meeting. Often items of local interest to some member of the organization are brought up at the Club.

To give an idea of the nature of the subjects discussed at these meetings, a few of the topics are herewith given:

"The advisability of the use of thoroughbred sires that were distributed by the American Jockey Club."
"The Stock Yards at Buffalo." "A visit to breeding farms and estates near New York City."

At one meeting a debate was held with the Poultry Association on the question, "Resolved that poultry keeping offers better opportunities than cattle breeding."
The Cornell Countryman

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OCTOBER, 1907

With the present number the Countryman begins the fifth year of its existence. From a publication of thirty-six pages it has gradually evolved into a magazine of about sixty-four pages in its endeavor to carry out the plans of its founders.

In the first number, December, 1903, the editor, Dr. G. F. Warren, stated: "It is not our purpose to enter the field so well filled by the many excellent farm papers, but rather to appeal to the student of agriculture, be his work in farming, teaching or investigation. In the Cornell Countryman we hope to voice the best in agricultural training. We will present articles that deal with the larger problems of country life, the economic and social conditions, the rural school and the farm home. The results of scientific investigations and general agricultural news will be given prominence. Special attention will be given to news of former students.''

Since the above was written the policy of the Countryman has been to follow along the lines so clearly outlined, and it is the earnest desire of the present Board to get into even closer relations with the alumni, faculty and students and to induce them to make still greater use of the columns of the Countryman.

Entering students, and
Competitors any of the old students
Wanted who care at all for work
on college publications,
or who think that they may some
time drift into editorial duties, are
urged to enroll as competitors at the
Countryman office.

From now on students will be called upon to satisfy certain requirements in the way of experience in farm practice before they will be allowed to graduate.

On page 8 Professor Stone sets forth the plan for familiarizing students with the methods and practice of farming without adding to the regular curriculum. The scheme is so simple and practical and supplies such an urgent and important feature in agricultural education that it is surprising that it has not been introduced long ago.

A New Course

Another department that will appeal to all students, especially upperclassmen and graduates, is that of Methods and Practice in Extension Work mentioned on page 46 of the Program of Instruction.

If there is any one thing that a student needs besides knowledge, it is the ability to clearly and forcibly express what he has learned; and the Faculty, in establishing this course, has added to the opportunities of Cornell students for acquiring one of the
most gratifying of accomplishments—that of thinking while on one's feet.

Charles H. Tuck, who will have charge of this course, while a student, won the Woodford Prize in Oratory, the '86 Memorial Prize in Public Speaking, was president of the Debate Union and Debate Council, and editor of the Era and Cornellian.

In this issue we have endeavored to give short outlines of the several student organizations, for the benefit of new matriculates as well as for others who may not have enrolled in one or more of these societies. Freshmen cannot be too strongly urged to ally themselves with some form of student activity, for one gains a great deal in being associated with young, studious men who are working along lines identical with those in which one is himself interested.

In his speech before the Agricultural Association on the evening of May 7, Dr. Hunt referred to the small proportion of graduates that return to the farm. He said that a student from an agricultural college has his choice of the following openings: farm ownership, farm management, government employ, experiment station work, teaching in agricultural colleges and in secondary schools.

Altho it is still a little too early for last year's graduates to have found what they are best fitted for, yet it is interesting to glance over the Former Student columns and note what they have been doing during their first few months of merited freedom.

State and Farm

Director Bailey's address at Lansing, Michigan, on May 23 on "The State and the Farm" was replete with aphorisms and earnest philosophy. Some of the more striking truisms are given below:

"Abandoned farms are not necessarily to be deplored; rather they are to be looked on as an expression of a social and economic change.

"It is well enough to make great effort to sell the abandoned farms, but it is better to combine this effort with a movement to reorganize farming.

"The future of agriculture in the East lies largely in its diversification.

"The new West is still in the epoch of self-congratulation, and a man who criticises or who gives some other state or community the credit of more tons of produce is subject to popular disapproval. The East has reached a point when it is willing to look the facts squarely in the face.

"The nativeness of rural institutions has been allowed to die out, and the country has been left socially sterilized.

"We have been living in an epoch of city development, with no adequate means of redistributing or returning the energy to the regions of its origin.

"Society can be saved and advanced only by increasing the number of competent persons who stand on their own feet.

"Consolidation or centralization of power is a necessity. Yet at the same time we are pressed by the necessity of maintaining initiative and vitality.

"The great rural movement of the future is to be the evolving of a new social economy.

"One of the commonest causes of discouragement in a farming business
arises from this failure to utilize local or neighborhood experience.

"Our present greatest need is the development of what may be called "the community sense"—the idea of the community, as a whole, working together toward one result.

"The best model farms are actual farmers' farms.

"Agricultural education is in need of measuring and coördinating with education in general.

"Without the country there would be no city; without the city there would still be land.

"Our banking systems are devised for the handlers of money, whereas some of them, at least, should be devised for the workers and common users.

"Perhaps it is not too much to say that the public schools do not yet teach the essentials. The first object of any school should be to teach people how to live.

"By every legitimate means we should develop and fix local attachments.

"The real and lasting progress is to be made by those localities that first fundamentally redirect the existing schools in the interest of all the people.

"We are now interesting the child in the earth on which he stands, and as his mind grows we take him out to the larger view.

"The problem of the rural school is not so much one of subjects as of methods of teaching.

"Education is not confined to the institutions known as schools. It is the result of all experience and all training.

"The fairs are one of the anomalies of the present time. The fair should be a kind of school, and its work and influence should exist continuously throughout the year.

"There is no greater field for service than in the country church; but the pastor should have had a course in an agricultural school as well as in a theological seminary.

"I have tried to show that the rural country needs a new direction of effort; a new outlook, and a new inspiration."

GENERAL AGRICULTURAL NEWS

The new State School of Agriculture at St. Lawrence University, opened its doors to students during the month with the object to make all instruction as practical as possible. Special emphasis is to be laid on cooperation with farm, shop, dairy and home, and on teaching the pupils to properly appreciate, and to get the most out of, a healthy life on the farm. The Dean, Dr. K. C. Davis, '91 B. S., '94 M. S., Kansas Agricultural College received his doctorate at Cornell in 1900. Until 1902 he was professor of horticulture at the University of West Virginia, and then became principal of the Dunn County School of Agriculture, Menominee, Wis.

* * *

Three bulletins were issued by the College during the summer, two being by the poultry department on "A Gasoline-heated Colony Brooder-house" and "New Poultry Appliances," and the other by Dr. Hunt on "The Importance of Nitrogen in the Growth of Plants."

* * *

Many of the College faculty attended the celebration of the twenty-fifth anniversary of the founding of the Geneva Experiment Station last August. Director Bailey made one of the main addresses. The celebration was preceded by a meeting of the Fruit Growers' Association, Dr. Webber delivering an address.
The fifteenth National Irrigation Congress was held at Sacramento, California, between September 2 and 7. The objects of the organization are to preserve the forests, utilize the flood-waters, reclaim the deserts and settle people on the land.

* * *

The Association of American Agricultural Colleges and Experiment Stations met at Lansing, Michigan, at the time of the semi-centennial of the Michigan Agricultural College. Director Bailey's presidential address has been issued in pamphlet form. Some thirty-five presidents and directors of universities and scientific schools were present at the celebration, and President Roosevelt and Secretary Wilson were included among the speakers. The degree of Doctor of Laws was conferred upon Director Bailey.

* * *

In the Michigan Agricultural College instruction is given in dressing beef, pork, mutton and poultry, each student being required to dress several fowls and a steer, hog and sheep. They are also taught to cure and to divide the carcasses for table use. Simple methods are used and the farm boys become proficient in slaughtering and dressing.

* * *

The restrictions on the sale, manufacture and storage of denatured alcohol were materially improved September 1st, and with a decrease in cost its use will no doubt be greatly extended.

* * *

The State Department of Agriculture is making efforts to divert Scandinavian immigration to this state and has agents abroad and in New York who set forth the advantages of remaining in the state.

* * *

The Farmers' National Congress will be held in Oklahoma City, Okla., this year. It is to have its first session on October 17.

Seedless fruits may now be obtained by moistening the stigmas with a liquid compounded by Dr. R. Ewart of Proskau Pomological Institute. The liquid prevents the germination of the pollen on the stigma and the ovary develops through parthenocarp, or virgin fertility. His best results were secured with the pear and apple.

CAMPUS NOTES

The exhibition of the College of Agriculture at the State Fair this year was entirely different from that of former years. A large hall was provided with a lantern and at intervals every day views of Cornell and the work of the College were shown. First, a short general talk was given, and then each of the departments of the College gave a brief exposition of its work and the methods used in teaching and investigation. The department of plant pathology also displayed its instructive exhibit of plant diseases.

* * *

Work has begun on the new greenhouses for the departments of Professors Lyon and Webber. They are being placed east of the College and are to be used for work in plant evolution and experimentation. These two houses, measuring 60x28 feet, are but the beginning of the covered area that will be required as the departments develop.

* * *

Last July some 150 members of the Batavia Grange came to Cornell for a day's recreation. Prof. Pearson, as usual, was in charge of the reception and entertainment.

* * *

Prof. Wetzel has a plant disease garden east of the Athletic Field devoted to the study of this important subject. It is to be divided into small plots for illustrating the treatment of diseases and experimental purposes.
Near the disease plats, Dr. Duggar will have a tract for experimental plant physiology.

Dr. Warren and Dr. Webber will use the old alfalfa field for their experimental work.

* * *

Prof. Judson spent part of the summer in Niagara County studying the effects of Little Peach, Yellows and winter killing. He also visited the truck regions of Long Island with a view to starting a truck survey similar to the orchard survey.

* * *

It is generally regretted that Prof. J. W. Gilmore is to leave the College after the several useful years he has spent in the agronomy department. He goes to join Dr. Hunt at the Pennsylvania State College and assumes charge of the agronomy department there with the rank of professor. Prof. Gilmore's absence will be severely felt by those who were in the habit of calling on his extremely wide and apparently inexhaustible store of information.

* * *

Benjamin M. Duggar, M. S., A. M., Ph. D., formerly assistant cryptogamic botanist here, now professor of botany at the University of Missouri, and one of the foremost botanists of the country has been appointed professor of plant physiology in its relations with agriculture. Professor Duggar is not expected before the beginning of the second term.

* * *

Assistant Professors Stone and Rice have been advanced to full professorships. Prof. Rice continues in charge of the poultry department, while Prof. Stone assumes supervision of the newly modified department of farm practice.

* * *

Charles S. Wilcox, Charles H. Tuck, Bryant Fleming and Merritt W. Harper have been advanced to assistant professorships.

Leon D. Batchelor, B. S., has been made assistant in horticulture.

* * *

Donald Reddick, B. A., has left the botany department to become assistant in plant pathology.

* * *

William C. Baker, B. S. A., is assistant professor in charge of the new department of applied drawing.

* * *

Howard W. Riley, M. E., gives the course in farm mechanics this year. It is now a department by itself.

* * *

Assistant Professor Warren, Ph. D., and instructor Paul J. White, A. B., M. S. A., have been given charge of the department of farm crops, one of the parts into which last year's agronomy department has been divided.

* * *

Gilbert A. Renny, formerly of the Co-op, has been appointed superintendent of mailing rooms.

* * *

Miss Flora Rose has been appointed lecturer in home economics and to the supervision of the college work in this course.

* * *

Clarence A. Rogers, M. S. A., and Miss Clara Nixon have been made instructor and assistant, respectively, in the poultry department.

* * *

Miss Minnie Jenkins, B. S. A., is assistant in dairy bacteriology this year; and Allen Ferguson, Wesleyan University '05, in cheese-making.

* * *

Jesse B. Norton, M. S., assistant biologist in the experiment station, comes to Cornell from the Department at Washington to assist Dr. Webber in plant breeding. He has been working with oats and potatoes, and has given the scientific principles of breeding a great deal of attention.
F. J. Pritchard, assistant professor of botany in the North Dakota Agricultural College, is here to do special plant breeding work in cooperation with Washington. He is registered for a doctorate under Dr. Webber.

Prof. S. M. Babcock, of Wisconsin, visited the College in September and expressed gratification with our equipment for instruction in dairying and in the use of the test that bears his name.

The dairy department offers a course in dairy mechanics for the first time this year. It is given by H. L. Ayers.

A one-year course in poultry husbandry has been arranged to satisfy those who wish to fit themselves for practical poultry raising.

FORMER STUDENTS

'02, M. S. A.—Milton M. Underdown died of yellow fever August 13, 1907, in one of the interior towns of Brazil. He was born thirty-one years ago at Willow Creek, N. Y. After graduation he went to Sao Paulo, Brazil, to become director of the model plantation of the school of agriculture at Piracicaba, and on his return home, June, 1904, was married to Miss Josephine Prince, of Keating Summit, Pa., formerly a student in the Ithaca Conservatory of Music. Mrs. Underdown and their two children were about to join him in Brazil when news came of his death. Before his second trip to Brazil he developed the lands of the Queens Water Company at Far Rockaway, and was manager of the model farm at Sangerfield.

As a student, Mr. Underdown was prominent as a member of the Agricultural Association, Alpha Zeta, and the Andrew D. White Debate Club, also on the '86 and '94 Memorial stages.

'06, B. S. A.—David A. A. Durward was drowned in the Connecticut river near the Mount Hermon School for Boys on July 2. In company with another instructor, N. K. Green, he was canoeing in the river, when, in attempting to turn, the canoe was capsized by the ebbing tide and before

COURTESY OF THE CHURCH HELPER

MILTON M. UNDERDOWN

D. A. A. DURWARD
help could reach them both were drowned. He was born in Scotland in 1881, obtained his early education at Claremont, N. H., and entered Cornell from the N. H. State Agricultural College. At Mount Hermon he was in charge of agriculture and nature study.

'07, Ph. D.—J. E. Coit was married on August 7 to Miss Emilie A. Hanna, of Raleigh, N. C., and is now located at Tucson, Arizona. As associate horticulturist he has charge of the date, olive and citrus work of the Experiment Station. While a student here, Mr. Coit was editor of the *Countryman*, assistant in horticulture and fellow in agriculture.

'05, M. S. A.—Charles S. Wilson, whose engagement to Miss Ada L. Miller, Vassar '06, was announced last April, was married in Ithaca on Sept. 4. Following the ceremony at the church, a reception was given at the home of the bride's parents on Albany street, after which Mr. and Mrs. Wilson left for a trip to the principal cities of the East. Prof. Wilson was the second editor of the *Countryman*, president of the Agricultural Association, and is now assistant professor of horticulture and president of the Ontario County Fruit Growers' Association.

'06, B. S. A.—At a recent meeting of the "Sociedad Nacional de Agricultura del Peru," Antenor Valladares, M. E. '06, and C. Bües, B. S. A. '06, were elected consulting "Ingenieros Agrónomos"; Mr. Valladares in electricity, Mr. Bües in entomology.

'06, B. S. A.—A. S. Coelho has been appointed by the state of Sao Paolo, Brazil, to report on the rubber of the manioca tree, also on methods of cultivation, combating insect enemies, and refining the products.

'07, Ph. D.—Miss Philena B. Fletcher, '04, B. S. A., '07 Ph. D., was married to William H. Homer, Jr., '00 B. S., Utah, '06 M. S. A., Cornell. After the wedding Mr. and Mrs. Homer left for the West and are now in Provo, Utah. Mrs. Homer received the Guilford prize in 1903, and besides attending to her regular work in college, she was librarian in the Veterinary College, associate editor on the *Countryman*, and had charge of the agricultural columns of the Ithaca News. The bridegroom is manager of a fruit farm and professor in horticulture in the Brigham Young university.

'07, M. S. A.—J. N. Chakravarty traveled in the South studying tobacco, and returns home in October for college work in agriculture.

'07, M. S. A.—H. S. Dutt and S. N. Sil traveled in the South and West and Canada and return to India in the fall to assume government positions.

'07, M. S. A.—C. F. Clark, is assistant agronomist under Dr. Webber.

'07, M. S. A.—A. E. Ghosh spent summer in the West and Canada, and returns to India to teach.

'07, M. S. A.—C. F. Kinman, is assistant horticulturist at the Cuba Experiment Station.

'07, M. S. A.—R. Matheson is state entomologist in South Dakota.

'07, M. S. A.—O. S. Morgan is assistant in horticulture at Pennsylvania State College.

'07, B. S. A.—F. Aleman spent the summer traveling in Europe and expects to return to Argentina.

'07, B. S. A.—S. F. Ayer is in the dairy department at Hampton Institute, Va.

'07, B. S. A.—E. W. Cleeeves is manager of a farm in St. Lawrence Co.

'07, B. S. A.—G. D. Cooper is engaged in landscape gardening in the West.

'07, B. S. A.—D. G. Dragoshinoff spent the summer getting farm experience and will return to Bulgaria.
'07, B. S. A.—G. G. Burlingame has returned to the farm.

'07, B. S. A.—J. Goldhaar went to Kansas and other western states for farm experience.

'07, B. S. A.—H. B. Grubb and N. H. Grubb worked at landscape gardening and are to return to Cornell.

'07, B. S. A.—Miss M. Gunnison has started her farm in Pennsylvania.

'07, B. S. A.—A. G. Hammar is assistant in zoology.

'07, B. S. A.—Miss M. Jenkins was here all summer and has been appointed assistant in dairy bacteriology.

'07, B. S. A.—Miss B. Kleniewska has returned to Poland.

'07, B. S. A.—E. W. Leland worked on College farms all summer and will take graduate work this year.

'07, B. S. A.—H. F. Prince has settled on a ranch in Colorado.

'07, B. S. A.—W. J. Morse is in Washington, D. C., in charge of the grass work on the Arlington farm.

'07, B. S. A.—S. H. Perky remained in Ithaca and will take graduate work this fall.

'07, B. S. A.—H. C. Pierce has gone to Ames, Iowa as instructor in poultry husbandry.

'07, B. S. A.—H. H. Schutz traveled during the summer and returns to Texas to start his farm.

'07, B. S. A.—J. B. Shepard is manager of a farm near Philadelphia.

'07, B. S. A.—C. B. Tillson is manager of the Sanger farm at San
gerland.

'07, B. S. A.—Y. H. Tong spent the summer at Crowley, La., studying rice and rice irrigation, and will do graduate work in the South before returning to China.
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By R. W. Dunlap

Dairy and Food Commissioner of Ohio

THE first question which would naturally arise in discussing this subject, is, "Is the modern draft horse any different from the ancient draft horse, or the draft horse of a few years ago?" To answer this question, we have only to inquire what was the draft horse of former years. I am yet young, but old enough to remember the time when the draft horse was not of the same make-up, conformation or type as that of to-day. An animal called a draft horse a few years past could not properly be called a draft horse now. A short time ago any horse that would weigh fourteen or fifteen hundred pounds, awkward, big headed, lazy and good for no particular work, was classed as a draft horse by the layman, and to day in many places this same notion prevails. Men say, "I have a good draft horse, but cannot get those good prices I hear of and read about. I do not think raising draft horses pays, hence I will abandon the business and try something else." We have all heard such expressions. If we will become acquainted with the animals such men raise and force upon the market, we will find that they are not draft horses, neither are they road or coach horses, but quite likely a lot of misfits that belong to no particular class, and for which there is no market. Should not the farmer learn to produce that which the people want, what the market demands? What would you think of a merchant stocking up with a lot of inferior, low-grade articles for which there was no market? I think you would consider him unwise and would say that he would certainly fail if he continued that practice. It is not difficult for us to recognize the folly of the merchant keeping articles for which there is no demand, but it is almost impossible to get some farmers to admit that it is just as unwise and unprofitable to keep unmarketable horses. There may be some excuse for certain farmers raising what is known as the "general purpose horse," or the horse weighing 1,200 to 1,400 pounds, with no particular characteristics about him, and for which there is no popular demand.

I say there may be need for such a horse on some farms where the owner has the heart to use the same animal to draw the breaking plow, the harrow, the corn planter and the binder and mower six days in the week, and the buggy and carriage at night and on the seventh; where he does not object to working an animal all day at heavy work at which every minute of the time the animal must exert its full strength to accomplish its master's desire; or in case he enjoys taking the dust of every other driver on the road and likes to rise early Sunday morning in order to have plenty of time to get to church, and if he is willing to take a low price for the animal when he places it upon the market. I say under these circum-
stances, where we breed and raise horses to wear out on the farm, and don't mind wearing ourselves out at the same time, this horse may have a place. If, on the other hand, the owner prefers a horse that can draw the plow ten or twelve hours each day without exerting his full strength each moment of that time, and a kind that takes only four to do the same amount of work that five or six smaller ones would do, and do it easier to the animals and owner as well, the kind that the other fellow always wants and for which he is always willing to pay a very liberal price, the kind that does not take much, if any more food to produce, he must in this case abandon the misfit and seek to produce the draft horse of as near the modern type as is possible.

It might be well to describe at this time what should be the conformation of the modern draft horse. I suppose all of you have attended your State Fair and seen these modern draft horses on exhibition. If you have spent some time in the horse ring, you have observed that the up-to-date draft horse is one that stands close to the ground with comparatively short legs and broad base. The feet are well apart, with space enough for another foot of the same size to be placed between them. The back of this animal will be somewhat shorter than that of the speed horse. It is with the hind legs that he propels himself, and thus it can be easily seen that since the collar is on the shoulder the weight of the load is drawn by the back. Therefore, it must be short, broad and well muscled. The shoulder of this horse is long, well-shaped, so as to give a good base to the collar. It should be more nearly perpendicular than that of the speed horse. However, sloping shoulders are often
found in our best draft horses. The hocks of this horse will show rather a narrow angle because it is by this that a greater leverage is given and he is able to move heavy loads.

His body is massive, low set, ample, very muscular and cylindrical. He will have solid, large, broad bones and limbs, the latter well-formed and properly placed under his body. He will have large, healthy, well-formed hoofs, heels well separated, frog strong, healthy and quite hard, good physiognomy, plenty of style and action, ardor and endurance. He must have a short, rather straight pastern in order to do the heavy work required of him. His weight should be in the neighborhood of a ton. If he weighs a little more or a little less, but is good otherwise, he will not be long without an owner.

You ask what breed this animal should be. I say that he can be of any draft breed. Each has special characteristics which commend it to the admirers of different breeds. It is not necessary at this time to favor one and condemn the others, for all breeds sell alike when the animals are of the right kind.

It is quite easy to describe the animal we would like to produce, but to produce him is another thing. Why are there not more good horses on the market today? Is it because the service fees of good stallions are too high? This may be the reason, and I believe it is in many instances. I think many times the stallion owners are responsible for so many inferior horses. Often the fee asked is more than the average farmer with the average mare feels he can afford to pay. What should the fee be? This I cannot answer. In one locality where good draft mares are found a fee of $20 for the service of a good registered draft stallion to insure a living colt would be considered right and proper, while in another locality, where inferior mares are kept and farming is not so profitable, it would be considered too high. Quite often the service fee is more than $20 and a good colt is not insured. This price very often is the cause of owners of good mares breeding to inferior animals and getting poor colts. I think stallion owners are in too big a hurry, many times, to get back the high purchase price which they were compelled to pay for the stallion, and they take what is considered a short cut and charge quite a high fee.

In choosing a sire to produce a modern draft horse, I would much prefer the one that has been in service a few years to the one fresh from the importer. I would prefer the stallion which has had moderate work throughout the year when not on the stand, and is in moderate flesh, to the one that has been housed the whole year and is covered with fat. The colt is larger and stronger from the former than from the latter, and is almost sure to make a better horse.

The exact conformation of the stallion I would use to produce the modern draft horse would depend somewhat upon the mare I had to breed. If I had a rather long-limbed, long coupled dam, I would choose a sire the reverse; that is, one short-limbed and well coupled. We must not forget, as so many are prone to do, that the dam is just as important, if not a more important factor in producing a good horse than the sire.

We can not, as many hope to do, breed any kind of a broken down, crippled and diseased mare of any or no breed to even a grand champion draft stallion, and get a horse that will top the market. We must remember that like produces like, and a defect is almost sure to be transmitted to the young.

The high service fee and inferior stallions may be the cause of many worthless horses, but the mares are certainly responsible for many, many more. It is a lamentable fact that there are comparatively few good draft mares, mares suitable to produce the modern draft gelding such as our big packers, brewers, merchants and others are more than willing to buy at long prices. If we can only devise some means to rapidly improve our mares we will soon have good
horses as we have good cattle, sheep and hogs. To be sure, it costs more to produce good horses but I am sure the profit is greater, and we are well repaid for the extra expense and effort.

We must not, however, conclude that if we have good parents for our modern draft horse, that we have met all the requirements necessary to produce him. Not by any means. We have the foundation upon which to begin to produce this valuable animal, and our animal will in a great degree be just what we make him. In the first place, we must decide about a year in advance when we want the colt to come. If we are prepared for raising a spring colt, we would breed our mares so that the colts would be foaled after the spring crops are in the ground. If possible to get along without the services of the mare, we would not work her again until the colt is six months of age, the time for weaning. Unless you are prepared to shelter and take especially good care of mare and colt during winter months, I would not breed for fall colts. My experience and observation has been that it is much better to have colts foaled in spring. We are now breeding all our mares to foal in spring. We prefer that the mare be worked up to the time of foaling, but not worked after that, until the colt is weaned. The most critical time of a colt's life is the first year. Many a colt fails to become a valuable horse because of neglect the first 300 days of its life.

Some one has said the feed is as important as the breed, and this is true. No matter how well bred a colt may be, if it is not given the proper kind and proper amount of food, it can never develop into a first class horse. Commence with the colt early and teach it to eat. Feed it
plenty of good food that will make growth and not fat. Grow this feed if possible, because many will not feed enough if they must pay out cash for it. Grow alfalfa, oats, clover, corn, etc., and see to it that the colt gets a good, liberal amount of a properly balanced ration for its proper development. I want to emphasize the importance of not being stingy with the feed for the young animal. My observation has been that a small percentage of the colts get enough feed the first winter. Moreover, be always on the lookout for vermin. They are expensive boarders. Notice the colt’s feet and keep them properly trimmed.

We sometimes begin working colts at light work when two years of age. They earn their way until four, when they are fatted for the market. I underscore fatted because there is no animal upon the farm that will pay so well for the food consumed in fattening for the market, as the horse. Do not think any more about selling a thin horse than you think of selling a thin steer or hog.

We should not follow fads too far. In other words, we should not sacrifice quality for something of much less importance in order to produce a animal that might, in a few cases, command a higher price. I believe sometimes we sacrifice quality for quantity; that is, we will do everything to get size and neglect other things of greater importance. It is also a fact that some breeders have preferred to breed to a horse of a certain color, of less quality, than to a horse of another color of the same breed.

Before bringing this paper to a close, and perhaps it might be of interest and benefit as well, I will call attention in as short a space as possible to a few measurements that are usually uniform in most all the well-conformed draft horses. I am well aware that a person can not become an expert judge by the facts I am going to present, or by any amount of study or book knowledge he may acquire; nothing will take the place of artistic instinct and actual practice in judging animal conformation. However, I do know that there are some elementary principles which can be readily learned that will greatly aid the artistic instinct, and greatly help in obtaining practical experience in judging. To show the possibilities of good results in this study, I wish to call your attention to some measurements made by Mr. J. B. Crabb, of the Ohio State University, in the measurements of forty-six horses, mostly three-year-old stallions. He compared the head to other parts of the body, and found results as follows:

<table>
<thead>
<tr>
<th>Number of horses measured</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>3</td>
</tr>
<tr>
<td>Weight</td>
<td>1,803</td>
</tr>
<tr>
<td>Length as compared with length of head:</td>
<td></td>
</tr>
<tr>
<td>Height at withers</td>
<td>66.04 2.47</td>
</tr>
<tr>
<td>Height at croup</td>
<td>66.62 2.48</td>
</tr>
<tr>
<td>From point of shoulder to quarter</td>
<td>69.75 2.61</td>
</tr>
<tr>
<td>From lowest point of chest to ground</td>
<td>34.08 1.32</td>
</tr>
<tr>
<td>Circumference of arm</td>
<td>22.7 0.83</td>
</tr>
<tr>
<td>Circumference of cannon at center</td>
<td>10.76 0.38</td>
</tr>
<tr>
<td>Circumference of foot at coronet</td>
<td>18.85 0.70</td>
</tr>
<tr>
<td>Length of head</td>
<td>26.77 1.00</td>
</tr>
<tr>
<td>Width of forehead</td>
<td>8.17 0.30</td>
</tr>
<tr>
<td>Width of chest</td>
<td>20.93 0.78</td>
</tr>
<tr>
<td>Width across hips</td>
<td>25.48 0.95</td>
</tr>
<tr>
<td>From point of hock to ground</td>
<td>24.53 0.92</td>
</tr>
<tr>
<td>Circumference of thigh</td>
<td>21.5 0.80</td>
</tr>
<tr>
<td>Circumference of shank</td>
<td>11.74 0.44</td>
</tr>
<tr>
<td>Circumference of body</td>
<td>86.24 3.23</td>
</tr>
<tr>
<td>Length of croup</td>
<td>24.5 0.91</td>
</tr>
<tr>
<td>Dorsal angle of scapula to hip</td>
<td>30.9 1.15</td>
</tr>
<tr>
<td>Length of shoulder</td>
<td>27.3 1.02</td>
</tr>
</tbody>
</table>

To succeed in the draft horse business, as in any other, it is necessary to devote some time and study to it. Think how many farmers of today are raising horses that, if sold, would hardly pay for a year’s keep. Those farmers, I venture to say, do not lose much sleep in studying the market, do not spend much time in attending farmers’ institutes, and pay no attention whatever to the conformation of horses for different purposes.

The man in the draft horse business who studies the market as well as the horse and seeks to produce that which the market demands, has succeeded in the past, is succeeding at present, and, I believe, will succeed in the future.
SCIENCE and practice go hand in hand in the modern up-to-date farming. The farmer boys of today have as good a right to a practical agricultural education as the physician or lawyer has to a training along his line before he begins to practice his profession. A short course of two or three years at an agricultural school is of more value to a young man than ten or fifteen years of experience, much of which may be adverse experience and cause a great deal of loss to himself or those who are financiering his experiments.

Most of the people who are successful in America, at the present time, have received education somewhere. The more practical the education is which a young man or a young woman receives, the better it will pay in dollars and cents. The well educated and well trained farmer is constantly demonstrating today the great advantage he has over the uneducated and untrained farmer. Agriculture is coming to the forefront of the world’s attention and throughout the country Agriculture is experiencing a wonderfully intelligent uplift; it is such a forward movement as no other calling ever received and no other age ever witnessed. Only the educated farmer will have a chance in the sharp competition of the future, but he will live much better and make much more than the farmers have been making in the past.

The training to which I refer should be of such a character, and is of such a character in the New Agricultural School that the School does not resemble any other school you ever saw. The students learn by doing. The useful side of the knowledge and training given to students is emphasized. This is the principle on which the school is founded. At every point the school is made to cooperate with the farm, the shop, the dairy and the home.

The Agricultural School has several different departments. Some of these are:

1. Agriculture and Horticulture.
2. The Dairy Department.
5. Domestic Science.
8. Academic Branches.

In all these different departments practice is given on the farm, in the laboratories, in the shops and by trips to neighboring localities where valuable lessons may be learned. The Agricultural and Horticultural subjects may be considered to include soils and fertilizers, economic plants, the study of injurious and beneficial insects, diseases of plants, spraying to combat diseases and insects, market gardening, fruit raising, corn and grain studies.

Animal Husbandry includes stock judging, breeds and breeding, feeds and feeding, care of animals, diseases of animals, animal physiology, poultry raising and herd management. The Dairy Department work includes butter and cheese making, testing for butter fat, care of milk and cream, testing for acid, water, etc., use of culture and bacteria, rules and laws.

The farmer should be a good business man. Many farmers of the present time are not well up in business methods. The school will give training in farm management, farm economy, commercial law, business forms, and farm arithmetic.

The value to the farmer of mechanical training is apparent on every hand. It enables him to handle his machinery and tools and to perform all of his work with greater accuracy and precision. To train the farmer along these lines the subjects given
him are farm carpentry, farm blacksmithing, assembling new machinery, care of farm implements, planning farm buildings, and farm mechanics.

The farmer’s wife and daughters ought to be something more than mere machines. Too many of them grind out their daily tasks, calling them drudgery and hating them with all their strength, year in and year out. They should study many things their brothers study and others that their brothers do not study. This broadens their views of housework and farm life. The possibilities of their lives are opened up and a way to better, purer lives is shown them. Training is offered in cooking, chemistry of foods, home nursing, emergencies, home management, laundering, domestic hygiene, sewing, and other special subjects for women.

The Village of Canton, N. Y., has been chosen as the site for the new State School of Agriculture, which is a department of St. Lawrence University. Canton is a beautiful village, with churches and good homes where students will find a wholesome environment. The University spirit pervades the atmosphere and education is looked upon with credit by all citizens. It is the county seat of the largest country in the state and is only eighteen miles from the St. Lawrence River. And the surrounding country is a good farming region.

The main building of the new State School of Agriculture is not to be completed until next spring but the school has opened in temporary quarters, with a small class of young men, who have enrolled for the regular course of two years. Classes are held in the farm house which is fitted up for school rooms and laboratories. The chemistry class, however, uses the University laboratory in Carnegie hall. The class in land drawing is making good application of the knowledge gained, by attending to the surveying, location, and laying of tile for the drains of the University farm. The present class in Stock Judging and Study of Breeds is conducted by Dr. J. M. Payson, who spent last year in the Cornell College of Agriculture. This class is taken to nearby herds of pure-bred stock for exercise in judging and for study. It is hoped that some stock may be kept at the University farm for this and other purposes in the future.

The class in Farm Arithmetic is instructed by Prof. M. L. Fuller. Every problem handled in the subject deals with the farmer’s conditions right here in this state. The rainfall required for certain crops, the income of all fields, the cost of filling silos, the expense of harvesting, storing and marketing certain crops,—these and hundreds of other problems are worked out by this class.

The University farm is slightly rolling and has a diversity of soils. This farm adjoins the large campus on the south. The new school building is thus located in the group of college buildings and yet immediately adjacent to the farm which the School will use. Farm machinery is being provided. A fine farm team of grade Clydes is owned by the School and students will have the benefits of the most modern farm practices and management. There is a good supply of reference books, text books, charts and other apparatus for the use of the classes.

The tuition at this State School of Agriculture is free, of course, to all, only small fees being charged for text books, laboratories, etc. Pupils are received at this school from the common schools of the country and villages.

Editor’s Note—Because of the increased attention that is being given to agriculture in High and secondary schools, it has seemed worth while to present this side of agricultural education to our readers. Dr. Davis’ article will be, it is hoped, the first of a number of similar articles upon agricultural work in the intermediate schools in various parts of the country.
THE prospective orchardist, seeking advice will do well to remember that the experience of one man in a given locality may be very different from that of another man in another locality, and that two persons in the same section, but with different soil, elevation and contour of ground may be equally successful with quite different methods. This article is written from the standpoint and in the light of the experience of an orchardist in Northern Illinois and this fact should be taken in account by the reader.

Commencing with the location and the planting of the orchard, a fair elevation with a gradual slope to lower ground in the vicinity gives land drainage and also air drainage, which may mean less liability to frost in the spring. The timber soil is considered to have some advantages over the black prairie soil. If the land has been in oats or other grain crop the year previous to planting, it will give a better opportunity for the preparation of the soil. After the removal of the crop the land should be carefully measured and the exact location of the rows of trees, running in the direction in which it is desired to plow the land, preferably across the slope, determined accurately and marked somewhat permanently at each end of the rows by stakes. If this is done carefully it will save doing it over in the spring. Early in the fall, plow two or three rounds at each line of stakes, throwing the furrows out, leaving as deep a dead furrow as possible in the line of the two stakes. As late in the fall as possible, just before freezing, the plowing should be reversed and the furrows filled in, leaving a ridge or back furrow where the dead furrow was before.

Before planting time the location of each tree should be marked. The proper distance apart for planting apple trees varies some with the variety, but is generally from 30 to 33 feet. Some varieties like Duchess, Yellow Transparent and Ramsdell Sweet will do as well at 28 feet as others like Willow, Ben Davis and Domine will at 33 feet. But one variety should be planted in a row, running the way the land is plowed, and for convenience in spraying, gathering, etc., four rows or multiples of four of the same variety, and these rows may vary in distance with the variety, if so desired, but the distance apart of the trees in the rows should be uniform throughout the orchard so as not to interfere with cross cultivation.

If the orchard is a large one it may be divided into blocks by making wider spaces every 10 or 20 rows.

To mark the place of each tree, small stakes about 18 in. long may be used. To set these, first stretch a line on the rows at each end of the plot and measure off and mark for each tree in those rows, then by stretching a line for a row at a time and sighting across, the ground can be accurately and rapidly laid off. When digging the holes, use a replace so that the trees may be readily planted in line. This replace is an inch board, four feet long with a notch in the center and a hole in each end to fit the small stakes.

Trees of two or three years of age are the best for general planting and if without heavy side limbs can be much easier shaped and headed to suit. Prune off all broken roots and shorten any that are unduly long. Plant the trees a little deeper than they originally grew and lean slightly toward the southwest. Plant as early in the spring as the soil is in nice working condition, straightening out the roots and working fine earth amongst them, packing it firmly. If the roots are kept moist and the soil is in the right condition and packed very firmly, watering is not necessary.

CULTIVATION

After planting the trees the ground left between the rows may be plowed
and planted to corn or potatoes. If the trees are planted 30 feet apart, seven rows of corn, 3 feet and 9 inches apart can be planted in each space. As the trees get larger, one less row may be planted and the extra space given next to the trees. This space next to the tree row it will be necessary to cultivate with a single horse and cultivator. If the orchard is to be planted to corn it should be rowed both ways so that it may be cultivated cross-wise. In plowing the orchard the next and succeeding springs, the best plan is to use a one-horse turning plow first and turn two or three furrows towards the tree rows, on each side, going over the whole orchard in this way, then commence with a two-horse plow and back furrow around the first row until the next one is reached, then take the third and every odd numbered row in the same way. The next year plow with the small plow the same way as the first time, but when the large plow is used, commence on the second row and plow towards the even rows. This method will ridge the ground next to the trees, very slightly but will keep the rest of the orchard practically level and in much better shape than if no system is adopted. Use short single-trees having the ends protected for work next to the trees to avoid injury by barking them.

For five or six years the orchard may be cropped, but after the trees become of such size as to shade the ground considerably, this may not be profitable and then clean cultivation can take its place. This work may be done principally with the disk and the harrow, using the disk both ways of the orchard to break up the ground, the first time following with the harrow, and after that disk only as often as necessary to keep the ground loosened so that it may be harrowed at least once a week. To work close to the trees without injury, use an extension disk with two horses and when harrowing, the harrow can be spread by using two sections attached to a three horse evener, thus allowing the harrow to run in under the branches of the trees. Cultivation should commence as early in the spring as the ground is in good condition and stop from the last of July.
to the middle of August, according to the season, but it should not be kept up too late or it will have a tendency to start a late or second growth and the result may be that the trees will go into the winter with the wood in an unripened condition and then be liable to injury by severe cold. It is well to sow a cover crop of oats or buckwheat at the last cultivation, where clean cultivation is practiced and also in the corn as long as the orchard is cropped. This protects the surface during the winter, prevents the ground from packing and supplies humus to the soil. Care should be taken to clear the ground of all vegetation that may harbor vermin, for two or three feet around the trees, before winter.

PRUNING

Pruning should be attended to every year, thus avoiding the need of pruning heavily at any one time or of removing very large limbs. March is generally the most convenient time for doing this work but it is well to follow this up by looking over the trees in June and remove any water sprouts or "suckers" which may have started to grow and which can then be rubbed off with the hand and so save much work another year. Any large wounds should be painted over. In forming the head of a young tree, from two and one-half to three feet is a good height to start the first limbs. Three or four main limbs are enough and these should not all start out in a circle around the tree as they are more apt to split down and also to form a basin for water to gather in which may finally form a rotten place in the tree.

For protection where rabbits are plenty, use the veneer wood bands or protectors which are offered for sale, or apply whitewash to which some tar or carbolic acid has been added, late in the fall. The rabbits may also be poisoned, shot or trapped. Mice are not usually very troublesome if all trash and vegetation is kept away from the trees. Where they are very plenty, poison wheat with strychnine and place in their holes and runs or under some cover so that it will be out of reach of the birds.
SPRAYING

It is advisable to commence spraying the young trees the first year after setting, spraying twice in a season until they come into bearing, after that three or more times as required. Use the Bordeaux mixture combined with arsenites for each spraying. For non-bearing trees spray the first time about when they are in full leaf, the second, early in June. While the trees are small, a good hand pump in a common wagon will be sufficient but when the trees get large a power attachment to run the pump and a derrick for the sprayers is desirable if not absolutely essential. Good fruit cannot be raised with any certainty without careful attention to spraying and the planting and training should be done with this in view.

GATHERING THE CROP

With the maturing of a crop of apples comes the important work of gathering and for this early preparation should be made. Barrels or other packages should be secured and stored in sufficient quantity so that there may be no delay for lack of them, and a full outfit for carrying on the work should be ready for use. This should include two half-bushel baskets, with bails, for each picker, step-ladders and single ladders, one or more, moveable sorting tables on which to grade the apples, a good supply of bushel boxes having solid ends with hand holes for handling them, but with slat sides and bottoms, a barrel press and of course, hammers and barrel nails. The step-ladders should be 8 feet high and have a wide base and but three legs, the common step-ladder with four legs being unsafe and a nuisance in an orchard. Single ladders may run from 14 to 20 feet. Above the latter height, extension ladders are the most practicable.

When ready to commence picking, the sorting table should be placed in the center of a square of four or six trees and each picker given two of the picking baskets and instructed to turn the apples a little to one side so
as not to pull out the stems and to lay, not drop or throw, the fruit into the baskets and not to place any apples that have touched the ground with the hand-picked fruit. When his two baskets are full he should carry them to the table and empty them to be sorted by the graders who attend to the grading and packing. This work should be very carefully done making one or two grades of the best apples according to the way they run and the market to which they are to be sent. If there is a home market for them or if they can be shipped in bulk to advantage, a No. 2 grade can also be made, otherwise run all but the fancy and No. 1s into cider stock. It will rarely pay to barrel No. 2s or to place them in storage. The bushel boxes will be very convenient for handling the poorer grades. The barrels should be carefully faced and filled with as evenly graded apples as possible. No grower who values his reputation should allow the center of barrels to be filled with inferior fruit. As each basketful is put in, the barrel should be shaken and when filled and ready to head, evened up on top as well as possible and pressed firmly if to be shipped to market or for storage. If not to be shipped or if to be placed in home storage, they may be less firmly pressed, but in any event should be firm enough not to "rattle." It is desirable to keep all drops well cleaned up in the orchard, both on the score of neatness and as a precaution against insects. Apples should never be handled while wet or exposed to the hot sun either before or after barreling.

STORAGE.

The necessary buildings will depend much on how the product of the orchard is to be marketed. If to be sold outright, in the orchard or barreled, or if it is to be shipped to storage or to commission houses, but little storage room is necessary, but if it is expected to supply the local market or to ship direct to consumers and the retail trade in nearly towns, provision must be made for home storage and possibly some form of cool storage may be advisable, especially if it is expected to hold the fruit for some time, as may sometimes be necessary. The varieties planted will also depend largely upon the kind of trade it is intended to cater to, and to whether it is best to plant summer apples and then a succession through the season, ending with the late keeping varieties or to raise only winter apples.

FORESTRY AND THE PRAIRIE FARMER

By Hugh P. Baker

Department of Forestry, Pennsylvania State College

THE significance of prairie forestry can hardly be appreciated by the resident of a forested region. In nearly all the prairie states of this country, the amount of native timber is exceedingly small and one may wonder what work in forestry can be carried on. Without doubt the land owner and farmer in our prairie regions has greater need for the practice of forestry than the farmer of our forested states. In the latter region, even though the price of good lumber may be very high wood for fuel is usually low in price and there is mining of coal going on, usually close at hand, providing fuel at a reasonable figure. To the prairie farmer wood is an expensive fuel and he does not as a rule have mines upon which to draw for a cheap fuel supply. Again when fence posts and farm repair material are needed, the prairie farmer must send to the Lake States for white cedar posts or turn southward to Tennessee and Kentucky for red cedar or to Oklahoma and Indian Territory for posts of osage orange.

The settlers who first came to the middle west, almost without exception took up farms in or near belts of native timber. These narrow belts
POST TREATING TANK AT IOWA STATE COLLEGE

By this method, immersing the lower thirty-six inches of the posts, the latter may be made to take up from four to seven pounds of oil.

were quickly cut off for the building of the home, for fuel and to bring in a little income by the sale of ties and logs to the railroads, which were building through the region. As the settler pushed out on to the prairies and built his home, he felt the need of protection from drought and winds and planted windbreaks of quick-growing trees, such as the Soft Maple, Cotton wood and Box elder, the seedlings of which he could usually pull from stream banks. These trees gave quick results and served well the purpose for which they were planted, but as they are short lived species they are now beginning to die out and must be replaced either with the same quick growing sorts or something more permanent. The prairie states passed through an era of tree planting some twenty-five to forty years ago and are now beginning to realize the necessity for a second period of tree planting. This necessity yearly becomes more evident because of the rapid and constant increase in lumber values.

PRICE OF LUMBER DEPENDS ON PRICE OF FARM PRODUCE.

This increase in value of lumber is attributed by the farmer to a number of different causes and he often does not appreciate the fact that there has been a very marked increase in the price of his own farm produce. Today he can buy as much lumber for one hundred bushels of wheat or corn as he could ten years ago. There are few who would not rather receive forty to sixty cents a bushel for corn and pay thirty to forty dollars for dimension stuff than to receive nine to fifteen cents per bushel and have to pay only fifteen to twenty dollars for the same dimension material. In following up the range of prices during the past ten years, we find that averages show that the quantities of oats, corn, cattle and hogs, which ten years ago cost $100 would to-day cost $174.75 while the quantities of lumber that cost $100 ten years ago would cost to-day but $166.67. To sum up the situation
GROVE OF EUROPEAN LARCH AT IOWA STATE COLLEGE

These trees stand on well drained up-land and are thirty-two years old. Many are of size suitable for telephone poles and railroad ties. Medium sized posts of the same variety can be grown in from nine to sixteen years.
briefly, lumber must advance eight points before it reaches "the trustless altitude of oats, corn, cattle and hogs."

That something must be done, right at home to supply the tremendous need for lumber, fence post and repair material is thus forcing itself upon the residents of our prairie regions. Every resource is being drawn upon to meet the demand. Shade trees about homes and in pastures are being cut. Portable sawmills are making dimension stuff and lumber for barns, corncribs and sheds, from cotton wood and soft maple groves and windbreaks. Added to the need for wood on the home place is the great demand for walnut, hickory, ash and other hardwoods by furniture and vehicle manufacturers. Five years ago hickory was sold at $40.00 per 1000 feet in Chicago. The price for the same grades to-day is $70.

PRACTICAL FORESTRY ON THE FARM.

From a fairly thorough study of the situation there seem to be two solutions which may be worked out by the prairie farmer. There are very large quantities of valuable soft wooded, quick growing material existing to-day in the form of windbreaks and groves on our prairie farms. Could this material be utilized for fence posts it would mean a tremendous saving. A post of soft maple or cottonwood will last, when well seasoned, from two to five years, yet if this same post be thoroughly treated with some preservative it will last as long or longer than the ordinary white cedar post which is being used so extensively to-day.

Of the many antiseptic materials used in preserving wood, creosote or the dead oil of tar is the best. While it is expensive it is easily and cheaply applied and will not leach out of the wood as other preservatives will. The better the quality of the oil, as a rule, the better the results obtained. It is entirely practical for a farmer to maintain a small plant on his farm, in which posts may be treated with creosote. Such a plant can be made up of a heavy galvanized iron tank about four feet in diameter and five feet in depth set up on a brick or cement foundation so that a slow fire can be kept underneath. It can be put into active operation at a cost of from twelve to eighteen dollars. In this tank the lower thirty-six inches of the post is boiled slowly in the oil for from six to ten hours. Enough creosote will be absorbed by the post through this method to more than double or triple its life. Experiments have proven that this treatment may be given at a cost of from eight to ten cents per post. There are numerous other valuable preservatives in the form of chemical preservatives such as the chloride of zinc, but these salts can only be properly forced into the timber by pressure.

Many seek to increase the life of fence posts by merely painting the portion to be inserted in the ground with crude tar. This is good as long as the coat of tar will not peel from the post. Its cost does not seem to justify this practice when for a very little more we may give an effective treatment by boiling, which causes the wood to become thoroughly impregnated with the oil.

The second solution of the problem of wood supply in our prairie states, is the planting of quick-growing trees which will produce durable timber. If the waste portions of the farm can be utilized by this planting, so much the better, but from statistics gathered by the Forest Service during the past three years, it has been found that it is a paying proposition to plant good agricultural land to such species as the Hardy Catalpa, and European Larch for the production of posts. The Hardy Catalpa will not succeed on poor sandy soils, but on good rich soils in Illinois the Forest Service found that the present Catalpa groves of the state would yield an average return of $5.18 per acre. The European Larch is an excellent tree for well drained uplands and in Illinois has given an average return of $4.38 per acre. Ten out of fifteen Catalpa plantations whose products were com-
THE RURAL PROGRESS CONFERENCE AT AMHERST, MASS.

By Scott Henry Perky

The celebration of the fortieth anniversary of the opening of the Massachusetts Agricultural College, and the dedication of the handsome new college building, Clark Hall, formed the occasion for a remarkable conference on rural progress at Amherst, Mass., October 2nd to 5th last.

The purpose of the conference was a consideration of the leading problems of rural life. It regarded the farmer not merely as a producer, or as one whose welfare depends altogether on his products, but as one whose first need is a broad and cheerful outlook and love of the country.

The conference proved wholesome and hopeful, almost prophetic, with regard to the future of rural life. It recorded the surprising efforts that are already being made for the social, educational and moral uplift of rural communities, and agreed that more and greater work and a good working cooperation between the different forces are necessary.

On the initiative of its capable young president, Kenyon L. Butterfield, who held a similar conference at the Rhode Island State College last year, the Massachusetts Agricultural College secured for the conference the cooperation of the State Board of Agriculture, the State Grange, the Massachusetts Civic League, the Y. M. C. A., the Connecticut Valley Congregational Club, and the Western Massachusetts Library Association. Thus several important fields of socializing effort were represented.

Aside from the commemoration and dedication exercises, the program consisted, in part, of addresses by N. J. Bachelder, Master of the National Grange, on the Grange and Rural Progress; Dr. A. C. True, on the Broad Outlook of the Agricultural Experiment Stations; President Carroll D. Wright of Clark College, on the Value of Art and Skill in Industry; Professor John Craig, on Cooperation in the Marketing of Fruit Products; Mr. John R. Boardman, of the International Committee of the Y. M. C. A., on The Country Boy in Service; Mr. Henry Turner Bailey, on An Interpretation of the Civic Improvement Campaign in America; Mr. F. W. Rane, on the Forestry
The new building for the Department of Botany. Dedicated October 2, 1907.

Situation in Massachusetts; Professor J. E. Rice, on the New Poultry Husbandry; Mr. William R. Eastman, Chief of the Division of Educational Extension, New York State Education Department, on The Public Library as a means to Rural Betterment; Rev. Wilbert L. Anderson, author of "The Country Town," on The New Rural Life; Rev. J. C. Goddard and Rev. F. E. Emrich, on Light on the Problem of the Country Church; Mr. O. J. Kern, of Winnebago County, Illinois, on The New Agriculture in the Country School, and on The Front Line of Country School Improvement; Dr. K. C. Davis, Dean, State School of Agriculture, St. Lawrence University, Canton, New York, on What Agricultural High Schools are Doing; Hon. George H. Martin, Secretary, Massachusetts State Board of Education, on Some English Experiments in Agricultural Education; and several others in connection with the Round-Table of the Village Improvement Department of the Massachusetts Civic League, and the Section Meeting of the Western Massachusetts Library Association.

This long list of names and subjects has been given as the means of most briefly indicating the scope and importance of the conference, which could not otherwise be sufficiently indicated in this short notice.

It was fine to note how important to the progress of rural communities each line of effort regards itself. The grange stands, a very great power, ready to league itself with every trustworthy effort at rural betterment. The agricultural experiment stations are taking an ever broader outlook and ever increasing responsibility in regard to rural progress, and they are confident of splendid results. The foresters see a very direct relation between their science and rural betterment. The speakers on village improvement feel that such effort is an important means of improving rural taste and making farm life more congenial. The Y. M. C. A. has discovered that nearly every country organization is chiefly concerned with adult life, and that the most fruitful
field has been left untouched; and it is now beginning work right out in the country, finding and training leaders, and striving to make life in the country Christian and purposeful for young men. The churches are proud of their sons who have toiled in the rural communities, making sacrifices asked of no city minister, and they are proud of the life centering about them, which has in the past produced so many great men; but they confess to their mistakes and failures and urge the cooperation, or even unity, of rural churches and the best work of the best men for the hope and cheer and evangelization of the open country. The rural school is shown up in all its barrenness and all its possibilities, and the promise is breathed, if not spoken, that the rural school is soon to come to its own in the very fore-front of fundamental education, awakening in the receptive country boy and girl a degree of response only possible where the school can so stimulate their every day lives and at the same time be a continual novelty. The library proclaims that its most difficult and important work is out in the country, and that it is going to do it. Every community will have books to meet its needs and wishes. The library is going to take a leading part in rural betterment and its plans will be constructive and educational. The benefits of cooperation are clearly presented by Professor Craig, and Professor Rice takes up the matter of poultry raising in such a way as to convince his hearers that even in the technical subjects relating to country life a revolution of ideas is taking place and a broader point of view being achieved.

All this is but the first expression of things new and great, which are going to change the face of the open country and perfect the conditions of rural life. It is the beginning of efforts and changes promised years ago by our own director and by him striven for down to this moment.

AGRICULTURE OF OTHER NATIONS—VI

SWEDEN

By A. G. Hammar, '07

Sweden together with Norway, forms the Scandinavian peninsula, situated in north-western Europe. Due to the warm Gulf Stream washing the western shore, it enjoys over a large extent a most favorable climate. In fact, the southern half of Sweden has an average temperature equal to that of Central Europe. But the northern regions, on the other hand, are severely arctic in nature.

Agriculture is the main industry of Sweden, though possibly the exportation of timber and the mining industry figure more in foreign markets. Agriculture, however, furnishes a living for more than half the population and has, from time immemorial, gone by the name of "Mother (Staple) Industry." The real agricultural period can be reckoned from the middle of the 18th century, when, through the action of the Government, a general repopulation of the land took place. For many years when war drained the country of its resources, it became necessary to improve and promote general farming. It was of special importance to raise strong, speedy horses for the army, and in this pursuit the Government encouraged and supported to a considerable extent, the smaller farmers who, today, own the greater part of the land. In these days institutions for the advancement of agriculture are many, such as practical, technical schools, Experiment Stations, Agricultural Credit Establishments, Agricultural Societies, etc.

For purposes of agricultural education we may distinguish three types of schools; first the so-called
"Landtbruksskols," of which there are about twenty-five. These give training in the various kinds of practical farm labor and give, to some degree, instruction in theoretical principles. The pupil, after performing all kinds of (farm) labors for two years, receives the title of "Agricultural Foreman." Since the schools are supported by the Government, the instruction, board and lodging are all given free of cost. In the second class of schools, including about twenty, agriculture is taught as a continuation of the general school course. Instruction is given only during the winter months and in principle these schools are very like the Cornell Winter Courses. They differ further from the first type in that the students must here pay for instruction and provide their own board. Of a higher standard are the Agricultural Colleges of Alnarp in Skåne and Ultuna in Uppland. Candidates for entrance to these institutions must be at least eighteen years old, have had at least one year's practice as farmers, and must possess the preliminary knowledge corresponding to that required by a final examination at a technical high school. The pupil takes no part in the farm work, but merely takes notes from demonstrations. He pays his own board and, in addition, 120 kr. ($26.80) a year for instruction. The degree conferred corresponds to the B. S. A. of Cornell.

With the advance of agricultural methods, machinery has forced its way into Sweden. At first the more complicated implements were imported, especially from America, but of later years home manufacture has attained such proportions that a great export trade has resulted. With the increased use of machinery and power, the demand for hand labor decreased. Formerly, and to some extent still, the farm laborers were the "Tenents" and "Crofters" who, in return for the use of small areas of land, pledged themselves to do a certain amount of work on the "mother" farm. They are now being gradually replaced by day laborers, but though it may be cheaper for the farmer to pay for this kind of labor, it is a serious problem to obtain necessary help during the harvesting season.

Until about 1870 the production of cereals was of chief importance in agriculture, but with the opening of foreign markets, the improvement of implements and the newly discovered value of manuring on a larger scale, came a transition to an era of cattle breeding. Results of this transition are seen in the immense development of farm-stock raising, the exportation of dairy products and the extensive cultivation of root crops which occupy in Swedish dairy farming the place held by silage in America.

The principal breeds of cattle are, the Alpine race, which alone is found in the distant northern regions, and of which the animals are very
small, usually pure white, and admirably suited to the rough highlands; secondly, the Arsdale and Shorthorn breeds are found upon many estates of the central and southern parts of the country. The native Red-and-White breed is spread throughout the central region, while the Lowland cattle have adapted themselves to the plains of Skåne. Finally there exists upon the island of Gotland, a peculiar breed of the same name, native to that district.

As a rule the average farmer is a careless breeder, but in recent years a decided change has taken place and improvement both in methods and in the selection of breeds for various districts is very noticeable. The horses of Sweden are principally descended from introduced breeds, though the North Swedish and the Gotland pony are native types. In stony and unarable regions sheep and goats are very common and are of considerable economic importance.

Cereals, the staple crop of the country, though replaced in the south by the dairy industry, are, in the central part of Sweden, cultivated extensively. Great areas of land have been reclaimed by the drainage of wet meadows and the "tapping" of lakes. Through these causes and the increase of labor-saving implements the area of cultivated land has increased four times during the 19th century. While rye and wheat are commonly grown, oats are extensively produced and constitute the chief export. The black variety is found to be best for the central region, while the white variety is best suited to the south.

The climate limits the period of cultivation considerably, especially in the north. It is interesting to realize that though the agricultural season is two months shorter in the north than in the south, yet the crops ripen there also. This phenomenon depends on the fact that there, where the days are so long at certain seasons, as to exclude practically any nights, the plants take advantage of the many additional hours of sunshine and thus make up for lost time. The wheat and rye crops are planted in the fall, and the harvesting season is usually rather rainy. To meet this emergency the hay and cereals are placed upon frame-like stands to dry.

A peculiar phase of agriculture in the north is the breeding of rein-deer by the Lapps—who form a nomadic
tribe, a few thousand in number. To these individuals, the rein-deer is indispensable. It drags him across the snow-covered fells in his rude sledge; it furnishes food—both milk and flesh; clothes from its hide and thread for their making from its sinews. The number of these useful animals is, however, rapidly decreasing, there being now but a few hundred thousand.

Though it may be said of Swedish agriculture that it has to a great extent adopted the use of modern methods, yet there still exist in many places cases of primitive, simple farming. Many of the farmers of Sweden, especially in the isolated districts, are conservative and persist in making their own implements, weaving their own clothes, etc. But they are sturdy, energetic and capable, and considering the great strides made in some cases, and the general success and importance of agriculture in Sweden, the country has reason to be proud of her agricultural population.

A LAPPE'S "PULKAFARD" BEHIND HIS REINDEER

ETHER AND THE FORCING OF BULBS

By J. Taubenhaus, '08

Many experiments have been carried on in order to determine the effects of temperature upon the growth of both leaves and flower spikes of etherized bulbs, and to determine whether the etherization takes the place of the resting stage. In the May issue of the Countryman, I gave the results of work with the White Roman Hyacinth. Since that time the results of the treatment of other bulbs namely the Spanish Iris, (Belle chimaise), Fresia Refracta Alba and Narcissus Trumpet Major have been arranged, the following being a brief account of the results obtained. The methods employed were similar to those previously explained, the bulbs being etherized upon October 12, '06, and planted after different periods of rest. Group one, immediately; group two, two weeks later; group three, four weeks, and group four, six weeks later.
In contrasting these tables we see that for the Spanish Iris, the first to bloom was group four etherized in the "medium" house. This shows, that apparently the Spanish Iris needs a rest of six weeks. In the cold house the same is affirmed. In the hot house only group one succeeded in blooming, while the remainder failed, the cause being probably a fungus disease.

In the Fresia, we see that group two etherized in both the hot and the medium house were first to bloom. This serves to show that the Fresia needs to be rested two weeks, and is also evident in the cold house.

With the Narcissus, group three in the medium house and group four in the hot house are first to bloom. This apparently indicates that when forced in the hot house, the Narcissus needs six weeks of rest and when in the medium house only four weeks. In each case of the Spanish Iris however, and in whatever house or group, the etherized bulbs bloom earlier than the check.

Figure A contrasts the advanced stage of group four, etherized in the medium house to that of the check. This is the same with all the other
groups in the three different houses. Figure B illustrates the same for the Fresia, showing particularly great contrast in the foliage.

Concerning the growth of the bulbs, the etherized seemed at first to have the lead, but gradually the check bulbs caught up. The persistent difference was in the flowering spikes of the etherized bulbs, which were longer than the checks.

From what we have seen, we can conclude that the ether seems to improve the quality of the flower and its spike. It seems also to hasten the flowering period from two to eight days; that a medium house is more desirable than a hot house, because it saves us fuel and the results are almost similar in bulbs. Etherized bulbs need a rest of from two to six or more weeks. The lapse of time depending on the different kind of bulb as no two kinds show the same result. The influence of the ether is apparently not to take the place of the resting stage of the bulbs, but is either a chemical action, or of a physiological nature.

Editor's note—This article is offered as a supplement to that published in May, 1907, upon similar experiments, with the idea of presenting the different actions of various bulbs under the same treatment. These studies were likewise pursued under the direction of Professor Craig, as Course 29 in Horticulture.
Some Biological Aspects of Agriculture

I—Introduction

By Vaughan McCaughey, '08

The science of agriculture is like a stained glass window. It is essentially composite. Its highest development is attained only through the most perfect harmony of many distinct parts. In the window these parts are the bits of colored glass, in agriculture they are environment, the knowledge of arts and sciences, personal character. The good farmer has practical knowledge in diverse fields—natural science, economics, law, commerce, engineering. He has traveled many pathways, he is rich with a varied multitude of harvests. Thus, unlike other vocations, sharply demarcated one from another,—as law, medicine, engineering,—good agriculture is dependent upon the correct blending of many occupations. For this reason agriculture, in its broadest meaning, is the most difficult of arts, and the truly successful farmer, the rarest of men.

The science of agriculture is like an Oriental rug, the surface of which is crowded with intricate designs, apparently no two of them alike. A closer investigation shows, however, that these varying patterns are all made from one stuff, they are all of one woof. So agriculture, notwithstanding its compound nature, is primarily biological. Its fundamental interest is Life. All of its problems are ultimately concerned with plants and animals. The farm is really a practical biological laboratory, and the farmer's basic knowledge is that of life processes.

Agriculture includes, it is true, many “non-biological” studies—those of the atmosphere, the soil, etc. These are important, indeed necessary, and may seem, at first thought, to be of equal value with the strictly biological sciences. But a more careful inspection shows that these geologic, physical, and economic sciences are of value to agriculture only in so far as they relate themselves to the biology of agriculture. The farmer's interest in a soil is not that of pure geology, but of the plants that he wishes to grow. His knowledge of physics is along the lines of well ventilated barns for his cattle, and the best plow for his potatoes. His appreciation of the Weather Bureau depends largely upon its aid to him in planting and harvesting his crops. The more minutely we investigate the innumerable ramifications of this complex art, the more strikingly is impressed upon us the idea of agriculture as primarily the care-taking of plants and animals.

The imperative need for accurate knowledge of plant and animal life has never been so keenly realized as at the present time. “Scientific farming” is the inevitable result of the increasing crystallization of farming into a strictly business enterprise, and the concomitant increasing competition. Investigations are being made, and studies are taught, that a score of years ago were scarcely dreamed of. The laws governing climatic and atmospheric conditions; the true nature of the soil, and its relation to plant life, the principles of seed selection and germination; the best methods for preserving farm products during the period between production and consumption; the laws of forestry; the geographical and climatic adaptations of crops; the selection and breeding of plants and animals; the principles of the feeding of animals; the complicated relationships between different organisms; all these belong to the Modern Epoch of Agriculture.

It is clearly evident that agriculture is an art of many aspects, it is no less evident that these many aspects all look to a common biological center, and that among the most important problems of today, are those that have to do with the biological basis of agriculture.
I also spent considerable time in caring for the grass garden, as it is called. This is the large collection of grasses which are grown for exhibition and classroom use. The work here consisted of hoeing, weeding, harvesting and threshing for seed the various grasses, many of which I had never seen before, and was nearly as instructive as the same time spent in a laboratory and in some respects more so, for I had live plants to study instead of dried specimens.

The clover experiment likewise proved very useful in the same way and enabled me to learn something about a subject of which I knew very little. In fact the whole summer's work, though at times monotonous and even very disagreeable, was interesting and instructive for any one intending to follow experiment station work.

On the other hand, I have found that whether one works simply on the experiment plats or on the general farm this is not the best place to get a practical knowledge of farming. The first reason is that on account of the experiments being carried on and work done for the sake of instruction the University farm cannot be run on a paying basis, and a paying proposition is just what is wanted for study. In the second place, a student on the University Farm is not given opportunity to run machinery, take care of teams and do those things which must be learned and which a farmer generally requires of his help.

A NEW ELECTIVE LECTURE COURSE

By M. P. Jones, '08

The supplementary lectures before the College of Agriculture will this year be given under the auspices of the Agricultural Association. In taking the responsibility connected with these lectures, the association has assumed an important task. If properly conducted and attended, they will mean much to the association, first, in that which is of primary importance,
namely, an increased strength among the students of the College and secondly, in an increased reputation and influence outside of Cornell. It should mean a closer relationship between the students who are the College of Agriculture and the the people who own it. The duty of bringing the farmer and the College together belongs to the faculty, alumni, and students, but until recently the students have taken no organized part. Through the Agricultural Association and the Extension Work the students are now offered a share in this work.

The practical value of these lectures lies in the opportunity offered the members of the Association to become acquainted with the ideas of some of the leaders in agriculture and to meet them personally. The meetings will be so conducted that the students may ask questions or give their own views. Lectures by members of the Experiment Station staff and by members of the University faculty will be given from time to time.

It is realized, however, that while the Agricultural Association meetings must not constitute an elementary course in public speaking, they must not, on the other hand, degenerate into a mere series of lectures or approach too nearly to an Institute. With this in view, then, there will be debates and talks by students as of yore. The student speakers will be those who can bring something worth while before the members of the Association, and surely this organization has a right to expect the best from the best men. The course in Extension Work will doubtless bring out men of the proper stamp. It is hoped too, that the students will again give some original performance like last year's successful Mock Trial. The glee clubs will be called on frequently to furnish entertainment.

This, then, is something of the policy of the association for the coming year. Its responsibilities are much greater but if these are met the usefulness and influence of the association will be correspondingly increased.

THE MUNICIPAL ABATTOIR

By J. Demary, Sp.

FROM the time of the first settlement of the country, up to the beginning of the 19th century, the demand for meat was met by the local supply. When, in 1805, the first beef cattle were driven across the mountains, they formed the vanguard, of the millions of animals that have since rendered the great packing centers both famous and infamous. The Eastern farmer had no show against the ever increasing supply of free pasture afforded the ranchmen, by a generous Government, and his economic displacement as a producer of meat, followed as a matter of course, Many Eastern states suffered a great loss of valuation and in population as well. In the last decade, there has been a reaction Westward, caused by the homesteading of the ranches, and the question of producing live stock in the older states, has assumed a more hopeful aspect. The marketing of the product has been placed on a different basis, by reason of the long control of this matter, by the great packing houses. They have reduced the wastes of packing, but in turn have rendered the local retailer dependent upon them, for his daily supply, and in some cases have compelled him to use their products, or go out of the business. This has led to the abandoning of the local slaughter houses, and the handicapping of the market thereby.

With the present conditions, has been raised the question of the sanitation of these older buildings, and whether in the future there should not be some public supervision of such structures. From the point of good health, there is no reason why diseased animals of any sort, should be used for human food, though man is able to stand a good deal, and there is great need of a rule, that shall prevent some of us from poisoning the rest of us. Let it be supposed that every incorporated village or city of from 3000 to 15000 inhabitants builds a public abattoir, located in a place
convenient to the community, but not where the operations will be conspicuous; the building to be constructed of concrete or enameled bricks, so that it will be sanitary, and easily cleaned, of one story with high placed windows and skylights. Let it be divided off so that rooms for storage can be leased for moderate rental to the local butchers, and machinery installed for use in slaughtering. Furthermore let it be supposed that no animals shall be killed within certain limits, unless in this public building.

For the further protection of the public health all animals slaughtered in the building should be first inspected by a veterinarian in the public service, and all diseased ones condemned, and rendered unfit for food. There is no reason why such a plan would not be workable.

The local butchers would have the advantages of combination, without personal competition, and be able to handle local meat with less regard for the injured feelings of the Chicago wholesalers; the farmers would be able to sell more animals, since the latter could be more readily slaughtered; the public would have another safeguard provided against diseased meat; and the municipality would be benefited by the money kept in local circulation. It is not assumed that an expensive structure be provided, but one that shall furnish the accommodation suggested, and serve as an aid in the transmission of the products of the farm, to the consumer, without their value becoming impaired.
UPON the resignation from editorship of H. H. Schutz, '07, in the last of September, a vacancy was left in the editorial board. Since the October number was issued, this vacancy has been filled by the election of E. L. D. Seymour, '09, to position as Editor, M. C. Burritt, '08, being at the same time elected Alumni Editor. This action leaves, however, another vacancy which will be filled during the winter by competition. Though, in itself, this is sufficient reason for energetic rivalry, there are further opportunities offered to this year's competitors. It has been, and is, the earnest desire of the Countryman board to institute a regular system of progression, an advance, by successive steps, from freshman competitor to senior editor. Since three members of the present editorial board graduate at the end of this year, the outlook for the successful initiation of this system is bright, and its actual success depends mainly upon a high standard of competition during the ensuing months. Similarly, it is hoped to fill the business board by the same methods, so that there too, are openings for those desirous of that kind of experience. We therefore urge those members of the junior and sophomore classes, as well as freshmen, who are at all interested in magazine work, or who desire to become interested, and to acquire valuable and enjoyable training, to enter the competitions at once, and gain the advantages offered by an early registration. To those who have not thought about the subject, we should be glad to explain the work and the duties of competitors as well as to point out the available benefits which accompany the work on the board.

On October 4th the registration of regulars and specials was, as compared with that of last year:

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These figures are of course but partial, as at that time, data as to graduate students, and the division of the members into the various classes had not been procured. Nevertheless the fact remains that in the number of regulars and specials alone, there was an increase of 70 over the previous year. This increase in itself may not seem astonishingly large, but it signifies the uninterrupted growth of the College of Agriculture and its increasing importance and influence. It is hoped that in a short time a more complete and comprehensive series of figures may be offered, giving a clearer and more convincing idea of the progress of the college along this line.
Red and White Tape

With this increased registration and the accompanying possibilities for mistakes and confusion, came the necessity for a further systematizing of the process of registration, with results which may have surprised the student of past years. But the slight, if not merely suppositional inconvenience, caused by the increased "red tape" has been more than offset by the actual advantages, besides the improved arrangement of offices and methods of entering and leaving them, in the new buildings. Moreover, the introduction into this college of the faculty-advisor system has obviated many difficulties and has proven a source of much help to the students, whose schedules under the changes and increase of courses in the college, may have seemed even more complicated than did the arrangement of their freshman year, for the first week or two. The Countryman wishes to express its hearty approval of the institution, as well as its appreciation of the advice and assistance rendered, by those faculty advisors at one of the times when their regular duties are heaviest and when the organization of classes adds its cares and complications.

The Meaning of the Honor System

On October 1st, a large number of freshmen signed the articles of the Honor System, and as the signatures of last year still hold, the System has, according to its by-laws, been again put in force in the College of Agriculture. All those new students who attended the first Association meeting are now familiar with the cause, aims and nature of this measure, and by signing it have signified their approval and their intention of supporting it in the interests of the college and the student body. For those who have till now failed to become acquainted with it, we will repeat that the Honor System has been adopted as a prevention of the practice of cheating in university work, and to arouse in the entire college a spirit of squareness, a revulsion and hatred against any phase of cribbing, so that the system shall become one in name only, but shall cast its influence over every student. Where the system has been in force and is located in the hearts of all old students, those entering for the first time will find it of greatest help and benefit and it is their duty to themselves and their fellows to realize its meaning and worth at once.

When being first considered, the idea aroused some opposition upon the grounds that the reporting of offenders would lead to the development of a mean, tell-tale spirit. But this, it seems, is an incorrect view of the matter. Those men and women who have a strong, healthy contempt for the cheat, who are full of ambition to remove from their college all possible causes for discredit and the disapproval of the world, who appreciate the honor, the gratification of being known for uprightness, strength and truth, will find no cause for misunderstanding, no chance for the creation of unworthy thoughts, in denouncing and bringing to light those characters which are too low, too despicable, to be part of our college.

And, moreover, is a most enjoyable addition to the Assemblies, Banquets and other functions of the college, as has been clearly shown
in the past. It is, therefore, all the more necessary that a successful and enthusiastic Glee Club be maintained this year. This is one of the college activities in which much can be done with the actual expenditure of less time than many other forms of expression of college spirit require. Its existence, furthermore, is a benefit, at least a gratification and pleasure to many more than those who compose it; and its success reflects itself upon the college. It has been said elsewhere, that the College of Agriculture is unique in having a Glee Club of its own. Let us show our appreciation of that fact and going further, and putting our energies into efforts to support and advance it, give cause for the additional statement that "the College of Agriculture possesses a Glee Club worthy of any college and of many a university itself."

MEN NEEDED

THOSE TRAINED BOTH IN AGRICULTURE AND IN VETERINARY SCIENCE.

The Editor,
The Cornell Countryman:

Recently, in the course of a large correspondence with the officials of the State Experiment Stations throughout the country, for the purpose of obtaining data for a report to be made before the American Veterinary Medical Association at Kansas City this summer on the subject "What the Several States are Doing for the Furtherance of Veterinary Intelligence and Education," I have become more impressed with the need for men, as investigators, who have been trained thoroughly both in General Agriculture and in Veterinary Science. In several instances appeals have been made to me to recommend for positions men who are "competent to deal with questions relating to feeding, breeding and to carry on investigations of diseases of domestic animals." A letter to Doctor V. A. Moore, Professor of Comparative Pathology and Bacteriology in Cornell University, brings out the fact: that men widely and thoroughly trained in all the branches of the Agricultural Sciences usually grouped under Animal Industry, as well as in Veterinary Medicine, and therefore competent to undertake investigations in comparative pathology as well as in animal industry, as commonly understood, are hard to find. Indeed a number of positions of the kind, offering themselves, have had no candidates, though the minimum stipend would be $1,000, per annum, and the maximum perhaps $2,000 or more.

There are possibly two reasons for this—both of them having a financial root—the fact that a longer time than four years must be spent in preparation for the positions, while the remuneration offered at the Experiment...
Stations for the beginner in scientific investigations is insufficient to attract men. Yet there are men with a passion for this very kind of work. Cornell has had a number of them and will have more—men who have studied deeply both Agriculture and Veterinary Science and have later obtained both fame and fortune. Witness Drs. Cooper, Curtice, Kilbourne and Leonard Pearson, all Cornell men. To such men who can prolong their four years to six years, taking degrees both in Agriculture and Veterinary Science, the future has in store something more than the remuneration at the start would seem to indicate. The wisdom of preparation in both branches of learning, sister branches as they are, is apt to be justified by its ultimate profit to the man who is at once an agriculturist and a veterinarian.

D. Arthur Hughes,
Inspector, Subsistence Dept.,
U. S. Army.

GENERAL AGRICULTURAL NEWS

The New York State Association for the Promotion of Agricultural Science and Research, held its annual meeting in the auditorium of the Agricultural Buildings on the afternoon of October 8. Former president M. H. Olin was in the chair and the meeting was made brief and to the point. The election of officers resulted in Mr. F. D. Ward, of Batavia, becoming president, and Mr. J. D. Jaquins, secretary, succeeding Mr. T. B. Wilson in that office.

In the evening the members of the association met the students at a special meeting of the Agricultural Association, and gave them the benefit of short talks and opportunities for informal discussion.

The Syracuse Chamber of Commerce has issued a call for a convention to consider the agricultural condition of New York State, to be held at Syracuse, October 23rd, 24th and 25th. This call has been widely spread in the state by means of a small circular, which, after quoting census figures to show the decline of New York Agriculture urges all interested to attend the meeting especially farmers themselves. The problems to be discussed will be those of Labor Rates and Transportation, National and State Legislation, Markets, Education, Loans and Taxation, etc. Hon. James Wilson, Secretary of Agriculture will address the meeting.

* * *

Announcement is made that the United States Government will open to settlement during the next twelve months, 4,910,000 acres of timber, agricultural and mineral land in eastern Washington, northern Idaho, western Montana and South Dakota. This tract will provide homes for 30,000 families and will mark the most important era in the development of the Northwest since the first railroad was opened there. After government agents have assigned the Indians their allotted portions, the land will be disposed of by lottery tickets, the fortunate man paying the value of the land at from $1.25 to $4 per acre.

* * *

The Scientific American of October 5, makes note of the death of Professor W. O. Atwater, late head of the Department of Chemistry at Wesleyan University. Professor Atwater was Director of the Office of Experiment Stations from 1888 to 1891 and has since done valuable work in the nutrition investigations carried on by the United States Department of Agriculture. He was joint inventor of a calorimeter for experimenting upon metabolic changes in the human body and produced many articles upon subjects in physiological and agricultural chemistry.

* * *

The California Board of Trade has issued a double report for the years 1905–06. It is called Resources and Possibilities of California. Statements
of quantities of various products of the state are included, making a valuable report agriculturally as well as industrially.

* * *

Dr. Carl W. Gay, Associate Professor of Animal Husbandry in the University of Ohio, has been appointed Professor of Animal Husbandry in the Veterinary Department of the University of Pennsylvania. He will also have charge of the administration of the stallion law of Pennsylvania. This law becomes effective the first of January 1908; it is modelled after the plan of the stallion law that is in operation in Wisconsin.

* * *

The Scientific American of September 21st contains a communication from Cape Colony, South Africa, offering a prize of $500 for a successful lucerne cultivator.

* * *

On October 10-19th, the Greater National Dairy show was held in Chicago at the International Amphitheatre, Union Stock Yards. Leading creamery operators, breeders of pure bred cattle, dairy farmers, milk dealers and poultry and egg shippers from all parts of the country from Maine to Oregon and California, were in attendance. The National Corn Exposition met in Chicago at the same time.

**CAMPUS NOTES**

The department of Plant Pathology has just completed some very interesting exhibits at five fairs, including the State fair. It is planning to make this a permanent feature of its work and hopes eventually to exhibit at all of the important fairs of the state each season.

* * *

Professor Wing and Assistant Professor Harper returned recently from Ohio with a fine pair of 4-year old grade Belgian draft horses, weighing 3,500 pounds. They will be used both for study in the Animal Husbandry Department and also for general farm work.

The trees have been removed from the north orchard by the horticultural department, and plans have been made for starting a nursery there.

* * *

Several improvements have been made in the Poultry Building, greatly increasing their efficiency and convenience. A steam heating system has been installed in the basement, the feed bins and cooking apparatus have been more satisfactorily arranged and improvements have been made in the laboratory. The whole plant will be connected with the general sewage system for the Agricultural buildings.

* * *

Professor Wing was chosen as one of the judges of stock at the Ogdensburg Fair, during October.

* * *

Professors Craig and Judson attended the meeting of the Pomological Society at Norfolk, Va., on September 24-25. Professor Judson spent some time investigating the truck and vegetable resources of the vicinity in the interests of his class in horticulture.

* * *

An appropriation of $2,000 of the general state appropriation, has been set aside for the erection of new poultry houses, for purposes of instruction.

* * *

At the joint meeting of the Society of Horticultural Science and the American Pomological Society, held recently at Norfolk, Va., Director Bailey resigned the presidency of the former organization and was succeeded by Mr. W. A. Taylor, of the Division of Pomology at Washington.

* * *

Mr. W. H. Griffiths, who last year was gardener in the Horticultural Department has registered in the college as a special student. Mr. More, of the Royal Gardens at Kew has been appointed to succeed him.
The Department of Horticulture has been carrying on extensive experiments at Romulus for the control of Black Rot of grapes. The experiments involve a little over ten acres and very good results have been obtained from spraying.

* * *

Messrs. E. Wallace and O. S. Morgan have been carrying on orchard survey work in Orange County for the Horticulture Department. This is the beginning of a survey of the Hudson river region.

* * *

The publication of the Junior Naturalist Monthly has been discontinued by the College of Agriculture. Another publication, the Cornell Rural School Leaflet has been substituted in its place with Miss Alice G. McCloskey as editor and Professors G. F. Warren and Charles H. Tuck as advisors. The new publication promises to be a successful one and without doubt be appreciated by teachers in the rural schools of the state. Director Bailey in his article, The Point of View, published in the September number, states that the purpose of this leaflet is to aid the teacher in the rural school to work out the practical daily problems of teaching agricultural subjects. In connection with this leaflet a supplement is published in the interests of the pupils. Each month the latter are asked to prepare a composition on some one of the subjects found in the leaflet and to forward them to the University. During the past year the Junior Naturalist Monthly was sent to 18,966 children in New York State, and in return 20,115 letters or compositions were received. These compositions covered a wide range of country life subjects. In addition to these, copies of the Leaflet were sent to about 3,000 persons, including teachers. Hundreds of teachers applied for the leaflets after the fund which provided for their distribution was exhausted. From these figures it can be seen that a great deal of benefit is being derived from the nature study department through these leaflets.

* * *

Dr. Webber has gone South to complete his work in cotton breeding and investigations for the Department of Agriculture. His work will be confined chiefly to South Carolina. After completing these investigations Dr. Webber is going to Florida to look after his work in relation to tropical fruits. He expects to be gone during the month of October.

* * *

The College of Agriculture has engaged a painter and decorator by the year, beginning October 1, to keep the buildings, floors and furniture of the new building in good condition. He will work permanently for the college.

* * *

Mr. M. B. Cummings has been appointed Assistant in Horticulture, and will give instruction to the Winter Course students. Mr. Cummings received the degree of B. S. A. from the University of Vermont in 1901. From 1902 to 1904, he was Assistant in Horticulture at the University of Maine, and in 1904 received the degree of M. S. A. from that institution. He was then appointed Instructor in Botany which position he held until the close of the last College year. During the summers of 1904 and 1905, Mr. Cummings was a student at the Brooklyn Institute of Arts and Sciences, and for the past two months has been engaged in the horticultural survey of Niagara County. He has registered for the degree of Ph. D., at Cornell, taking his major credit in Pomology.

* * *

To stimulate interest in debates between the various Winter Course clubs a cup, to be known as the James W. Morrison Inter-Winter-Course Debate Cup, has been donated to the College of Agriculture. The cup will remain for one year in the pos-
session of the departmental club winning it, and will have engraved upon it each year the names of the successful contestants.

* * *

On the evening of Tuesday, October 1, the Agricultural Association held its first meeting of the year—and also the first in the new buildings—in the auditorium. The attendance was exceptionally good and besides suggesting an active, enthusiastic entering class, augurs well for succeeding meetings. M. C. Burritt, '08, president of the associations introduced the speakers, the first of whom was Dean Bailey, who gave a clear and comprehensive talk upon the position, responsibilities, and opportunities of the association—together with an outline of the relations that should exist between it, the students and the college. Brief explanations of the various college activities—the Countryman, the Glee Club and the Honor System were then given by E. L. D. Seymour, '09, P. O. Wood, '08 and W. H. Alderman, '08. After a short business session, the meeting adjourned to give the new students a chance to join the association and to sign the articles of the Honor System in accordance with the rules.

* * *

The initial Assembly of the year was held on Thursday evening, October 3, in the auditorium of the Agricultural building. The program was limited to the usual talk by Dean Bailey, but was nevertheless, as expressed by the chairman, “a fine one.” Immediately after this part of the evening, the members of the three upper classes assembled in different rooms to elect the members of the Committee on Student Honor—as provided by the articles of the Honor System. The election resulted in the following committee.

Sophomore—V. J. Frost.

Following the business session the usual social hour was enjoyed in charge of a reception committee, composed of Mesdams Bailey, Stone, Rice and Charles Wilson, assisted by Messrs. Anderson, Arnold, Shepard, Chase and Young.

* * *

M. C. Burritt, '08, has been appointed assistant in Agronomy, and W. H. Alderman, '08 in soils.

* * *

Miss Ethel B. Gowans, who has been on a leave of absence from the Hampton Institute for two years has resigned her position there as instructor and having already completed a special course in Agriculture at this University, will now enter the regular course which she expects to complete this year. She intends to then work for a Master’s degree, her work being chiefly confined to the Department of Plant Pathology.

* * *

The various Departmental Clubs of the College are now affiliated with the Agricultural Association to a certain extent, and are under the control of a board of directors. This board is made up of the President of the Association, two members of the Association, elected by that body, and one member from each Departmental Club.

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**FORMER STUDENTS**

'02, M. S. in Agr.—Miss Julia E. Roger’s present address is Teneck Road, Englewood, N. J.

'02, W.—Henry Truckell was married on April 17, 1907, to Miss Pearle M. Robbins, of Lacona, N. Y. Mr. and Mrs. Truckell will reside at Vorden, California.

'03, B. S. in Ag.—H. A. Hopper has resigned his position as Assistant in Dairy Husbandry in the University of Illinois, and has been appointed Assistant Professor of the same subject in Purdue University, Indiana.

'03-'04, W.—F. B. Sawyer is now employed on the Tarbell Farms at Smithville Flats, N. Y.
'04-'05, W. P.—Osborne E. Britton was married April 27, 1907, to Miss May Marie Brownell at Syracuse. Mr. Britton is running a very successful poultry farm near Syracuse.

'04-'05, W. P.—C. L. Opperman is poultryman at the Maryland Agricultural Experiment Station, College Park, Md.

'05, W.—Walter G. Phillips is working on his father's farm at East Bloomfield, N. Y. The principal crops he grows are beans, corn and oats, and he also goes into live stock raising quite extensively.

Ex. '05 (for Ph. D.).—Professor T. C. Johnson, head of the Botanical department of the West Virginia Station, was married August 28, 1907, to Miss Laura May Boughton of Norwalk, Ohio. While in Cornell, Professor Johnson was elected the first editor of the Cornell Countryman, but never served; the editorship devolving upon Professor Warren who was originally elected business manager. Professor and Mrs. Johnson will be at home at Norfolk, Va., after November 1st.

'05-'06, W. P.—A. E. Boicourt is now assisting in the Poultry department at Cornell University.

'06, B. S. A.—C. W. Mann has been working on the soil survey in North Dakota and Idaho during the summer. Mr. Mann has been making a survey of the reclamation tracts of those states. This work is being done cooperatively by the Bureaus of Soils and Plant Industry.

'06, B. S. A.—M. W. Evans has had charge of field investigations in Washington, Idaho and Oregon during the summer. His address for the coming winter will be Washington, D. C.

'06, B. S. A.—John Barron is the author of a bulletin, which has been issued by the Pennsylvania Station, "Varieties of Wheat in Pennsylvania."

'06, B. S. A.—G. W. Tailby, Jr., who has been with the Bureau of Soils since graduation, returns to Cornell as Stockman and Instructor in Animal Husbandry.

'06, M. S. A.—C. J. Lewis is Horticulturist at the Oregon Agricultural College. The announcement in the Countryman of last May to the effect that he had accepted a similar position at Washington was incorrect.

'06, W.—W. G. Crumb has accepted the position of Superintendent in the Poultry Department at Cornell.

'07, Sp.—W. W. Basset is Assistant Superintendent of the North Florida Pecan Co., of which Professor Craig is President. Mr. Basset has direct charge of the company's farm of 1300 acres at Monticello, Florida, and is at present engaged in erecting barns and other buildings on the plantation, and in preparation for the winter and spring, planting and setting out operations.

Ex. '07.—Miss V. R. French intends to return to Cornell during the second term to complete her course, and will probably register for a Master's degree the following year.

'07, B. S. A.—Harry H. Schutz, who was elected Editor of the Countryman last spring, has returned to his home in El Paso, Texas, where he expects to take up practical farming at once. He has registered for a Master's degree in absentia and will conduct experiments for his major work, on the farm during the next two years. During the summer Mr. Schutz visited England, Norway and parts of Germany and Belgium, returning to Ithaca in the fall where he got out the October issue of the Countryman, before being compelled to resign his office.

'07, Sp.—A. C. Spencer left for the Channel Islands shortly after the close of the college year, and spent most of the summer in Jersey, Guernsey and Holland, studying the various types of dairy cattle. Since his return he has been at his home in Fayetteville, and has recently been appointed Official Tester for the Dairy Department.
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**The Cornell Countryman**

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Address, COLLEGE OF AGRICULTURE, ITHACA, N. Y.
FOOD CONTROL

By Robert McDowell Allen

Head, Division of State Food Inspection, Kentucky Agricultural Experiment Station. Secretary, Association of State and National Food and Dairy Departments.

THINK of the result if a man’s food were always simple, nourishing and pure, and, as far as possible, without going too much into theory or giving too much thought, the right food for the right season, work or age. Many influences contribute continually to prevent such a result—appetite in luxury, want in poverty, fraudulent adulterations, problems in the food industry, and a wide-spreading ignorance or carelessness among all classes of people as to what food to select, how to prepare it and protect it from spoilage or contamination. Food adulteration and misbranding is the initial work in the pure food issue, but the honest problems in the manufacture and distribution of food products, and the ignorance and carelessness on the part of the people will have to be studied and controlled before good food becomes an every meal fact.

The first operation of pure food laws is to bring about a plain and correct labeling—a label which will tell in readable type and simple English the name of the manufacturer or producer, the place of production, the date of packing or preservation and the true nature and substance. Yet, as fair as this requirement seems to be, it is opposed by many manufacturing interests, for the reason that the people might be in error in their preferences, and that the discriminations arising would lower prices and lessen the demand, or, in fact, annihilate an industry altogether. But the busy lithographers, crowded with orders, will tell you that labels are being changed. A can of lard labelled “Pure Leaf Lard” is either dumped and refilled with the genuine, or the old labeling is treated to a coat of paint remover and a new label pasted over stating “Beef Stearine and Cotton Seed Oil.” Many of the “Quince,” “Plum,” “Currant” jellies are being re-labeled “Compound Glucose and Apple Stock Jellies.” Syrups made in “Vermont” are either now made in “Cincinnati” or “Chicago,” or the syrup makers of Quebec and Vermont are taxed to their limit to fill the millions of bottles and cans which have been labeled with some well advertised brand of “Maple Syrup” and which were filled with the imitation. Think of the wreck of the terms “Claret,” “Tokay,” “Burgundy,” “peach,” “apple,” “blackberry,” “10 years old,” “aged in wood,” “sour mash,” “bourbon,” “rye,” “Kentucky,” “Maryland,” “California,” “French,”—which appeared without restriction in the labels on adulterated or sophisticated wines, brandies, whiskies and other liquors. The labeling storm struck, according to the laboratory of Paris, sixty per cent of the wines, and will, according to the General Counsel for the National Wholesale Liquor Dealers’ Association, strike ninety or more per
cent of all the "whiskies." Add to this the fear that the labels on proprietary medicines will not be such as will in no way deceive or mislead consumers, and there is some idea of the effect upon investments and what it means to win, and enforce with intelligence, fairness and without prejudice, laws requiring every substance intended for human consumption to be "exactly what it is represented or is supposed to be."

Manufacturers ask for a uniform label. There is some honest trouble in arranging the label of a wholesome compound to meet the varying provisions and rulings of State and Federal laws. But as much or more misbranding practices if they qualify with the terms "Style," "Flavor," "Brand." This concession was an error; and if, following the precedent, Syrup, Maple Flavor, Preserves, Quince Style, Extract, Vanilla Flavor, and Lard, Leaf Brand, are permitted, the food laws will be of little value to consumers. The prices will go up, with the change of quality, to suit former labels, and the manufacturers will tell the dealer, and the grocer, the consumer, "The pure food laws did it," instead of saying frankly: "I can still sell you a syrup of ordinary sugar, hickory bark and caramel; a freezer of frozen milk, colored and gelatinated to look like fresh ice cream, at the old price and still make more money than I get out of the pure."

It was an offense at common law to sell unwholesome provisions. Later, excellent health codes were enacted, and the State, municipal and County boards of health, without appropriation and with little knowledge of chemistry, were charged with the enforcement. These health laws were more or less dead letters except in dangerous instances. Then the food industries, permitted without restraint to adulterate or to prepare foods out of all classes of inferior material and in unsanitary surroundings, were eventually supplied the chemical means to cover up a deficiency and lead the consumer to always suppose that the things offered for consumption were fresh, or aged and ripened, pure and of standard quality. Science was asked by the trade to invent means whereby inferior material, substitutes and careless handling would never show in the finished food, and science, without other opportunity, and dominated by the demands of helpless trade, supplied the means to remedy instead of the means to prevent. But the profession of chemistry which supplied these means has discovered the imitation color, the antiseptic and the artificial flavor in the food supply, and has given expert testimony that these substances indicate adulteration and inferiority. The enactment of State
laws, municipal ordinances, and, finally, the National pure food law, has followed, and soon the pure food issue will resolve itself into a work of seeing that only wholesome materials are packed and that sanitary practices are strictly followed throughout in the preparation and distribution, questions which should have been studied and controlled at the beginning.

Oleomargarine was among the first imitations. Its sale as butter caused an unequal competition against the dairymen. Glucose went into the market as honey or New Orleans molasses. Spirit vinegar went into the market as apple vinegar. Many of the States instituted State dairy departments to control these adulterations. Laboratories were added, and the chemists in charge analyzed and collaborated extensive information concerning adulteration in other foods and in drugs and liquors. The State dairy laws were amended to include all products intended for human consumption, and a system of State and municipal legislation spread over the country in lieu of the vague health laws. In the enforcement of the State and municipal legislation there developed early the need for uniformity and the need for some power to punish the manufacturer responsible for the adulteration living in another State. The work, too, showed the need for scientific standards and the State officials early joined in an appeal to Congress for a law which would provide a remedy for these needs. Congress acted by degrees; in 1890 an inefficient meat inspection law, made more thorough in 1906; in 1896, an act to put certificate stamps on bottles of genuine whiskey; in 1897, a law prohibiting the importation of inferior teas; in 1896, an act taxing and labeling filled cheese; in 1885, a law taxing and labeling oleomargarine; and again in 1902, an act taxing oleomargarine colored in imitation of butter practically out of the markets; in 1902, an act prohibiting misbranding as to the State or territory of production. In 1903, the Secretary of Agriculture was authorized to put into ef-

fect the laws of 1890 against the importation of adulterated foods.

Food adulteration was first brought to the attention of Congress on February the fourth, 1881, in a report from the Committee on Epidemic Diseases which had under consideration a bill "authorizing the President to appoint a commission to examine into and report upon the adulteration of food and other articles in the United States." The Committee said in its report:

"That they have investigated, so far as they could with the time and opportunities they have had at their command, the injurious and poisonous compounds used in the preparation of food substances, and in the manufacture of wearing apparel and other articles, and find from the evidence submitted to them that the adulteration of articles used in the every-day diet of vast numbers of people has grown to and is now practiced to such an extent as to seriously endanger the public health, and to call loudly for some sort of legislative correction. Drugs, liquors, articles of clothing, wall-paper, and many other things, seem to be subjected to the same dangerous process."

The Committee "derived" it says, "much information on the subject from Mr. George T. Angell, of Boston, who has devoted many years to its study and investigation, and to the collection of a large number of facts and statistics connected with it which he embodied in a paper submitted to the committee." The collaboration which Mr. Angell read was astounding, and he quoted as his authority such men as Professor S. W. Johnson..."
of Yale, Dr. Kedzie of Michigan, Dr. H. W. Wiley, Dr. C. G. Wheeler of the University of Chicago, the reports of the Massachusetts State Board of Health and the writings and statements of a long list of microscopists, chemists, physicians and health officers. The glucose and oleomargarine industries, in later years the proprietary medicine, adulterated whiskey, artificial color, antiseptic and other interests forming the opposition, were active in delaying action by Congress. And, too, there was the usual disagreement among the friends of the pure food issue. The National Board of Health believed Mr. Angell too radical as to the effect of these adulterations upon health. Along with Mr. Angell's efforts, Mr. Thurber of New York City, a member of the National Board of Trade, and said to have been a large dealer in oleomargarine, offered a thousand-dollar prize for the best essay on food adulteration, and the legislation needed to control it. The prize measure resulting from these essays was modified to some extent and introduced into Congress. Its general definitions as to what should constitute adulteration were good but only provided a penalty not exceeding fifty dollars for violation.

The executive officers of the National Board of Health were charged with its enforcement. The committee which examined the essays and awarded the prize had as its chairman the executive officer of the National Board of Health. "The report of this Committee," Mr. Angell says, "signed, and perhaps, as is common in such cases, written by its chairman, sets forth among other things:

1. That none of our staple articles of food or drink are so adulterated as to be dangerous.
2. That one of the main objects of legislation should be to nullify the operations of ignorant and sensational alarmists.
3. That adulterated drugs are more dangerous than adulterated foods.
4. That it is much better to do too little than too much.
5. That it would be unwise to attempt to secure uniform State laws.
6. That the law should not attempt to define in detail what is adulteration.
7. That the Board of Health should have power to exempt any article from the penalties.
8. That care should be taken not to make penalties excessive.
9. That under no circumstances should fees or moieties be allowed informers."

Mr. Brosius, a Member of Congress from Pennsylvania, introduced years later a splendid measure, prepared with the assistance of Dr. H. W. Wiley. These efforts in the House were followed by Mr. Hepburn of Iowa, always uncompromising against the arguments and influence of food and drug adulterators, and by the very extensive investigation made by the Committee on Manufactures of the Senate in 1899. Following this, Senator Porter J. McCumber of North Dakota, succeeding as Chairman of the Senate Committee on Manufactures, made food adulteration a special feature of his legislative work; and his fairness and firmness, during the investigations and in pressing the bill, brought the question to the attention
of the Senate and to the manufacturing interests in such a way that those who objected to the bill before the Committee or those who prevented its consideration in the Senate were compelled to give specific reasons, and this policy soon won new enough indisputable principles to form the basis of what was then known as the McCumber-Hepburn Bill. Senator Heyburn of Iowa succeeded Senator McCumber as Chairman of the Senate Committee on Manufactures; and Congressman Mann of Chicago, and Richardson of Alabama, gave Mr. Hepburn strong support in the House Committee and before the House. The measure passed the House but failed in the Senate. It was taken up as a new measure in 1905 and passed the Senate, went to the House where it was delayed until June, 1906, and only finally passed after a storming pressure of public sentiment and an unofficial message from President Roosevelt to the leaders of Congress that there would be a special and continued session of the National Congress if adjournment was had without the enactment of the meat inspection and pure food measures into law.

There has been no enforcement of this measure in the courts—as yet—and the conflicts from its enforcement will perhaps bring up the question of State and Federal jurisdiction more prominently than it has been brought up since the Civil War. Many reasons were advanced for the passage of the law, many reasons perhaps which were unnecessary and which could have found remedy in the State laws; but its passage by the National Congress won the pure food issue with the American public, a good illustration of the truth that local evils go on as a rule unchecked until they become a National disgrace. As a measure to apply to any violations which cannot be reached by State courts, to inspect the sanitary conditions and wholesomeness of material in plants like the packing houses—a task too large and costly for the State alone in which such an industry may be located, and of too much concern to the consumers in other States—and for the purpose of providing the most authoritative means for detecting and estimating adulterations, it will bring uniformity among, and needed support to, State and municipal laws. But as a National police measure, seeking through executive interpretations, large appropriations and numberless inspectors to guard the food supply of every community, it will bring about a conflict, and, in the end, fewer results than when each State and city guards carefully the purity of its own food supply.

There are States in the South which stand at the head in the amount of State appropriation to public schools, and at the foot in the amount supplemented by the countries and towns. Such States also stand at the bottom with a per cent of population who can read and write. The National government provides a dairy division to do missionary work among the cheese and butter factories and the city's milk supply; but, it is only as Wisconsin controls the supply, tests, sanitation and output of her own creameries that the standard of butter is raised, and only as Rochester investigates and daily inspects her own milk supply that there is any decrease in infant mortality. And by reason of long, efficient and honest State and city food control work there are ten or more States whose laws, knowledge and system for handling adulterations, and food, are ten or more years ahead of the work in other States, and will remain so, notwithstanding the National law, until all the States act and enforce their Acts. This is not meant to reflect upon a necessity for the regulation of interstate commerce in adulterated foods and drugs, but to emphasize the doctrine of State and municipal duty, and that no reform, like the pure food issue, ever goes into every day practice until the State, the city and the individual citizen assume their duty.

Tasteless and odorless preservatives and artificial flavors are the means through which consumers are deceived into purchasing adulterations. The
enactment of food laws cannot be too prohibitive regarding artificial colors. Some colors are poisonous in character but it is their fraudulent qualities which is the more reason for their entire prohibition. Caramel, the least harmful of them all, in fact, in itself a food, is the sheep's clothing which covers up some of the most wolfish practices. "Harmless caramel" is the cloak of adulterated whiskey, of imitation apple vinegar, and of artificial vanilla. Some of the aniline dyes are harmful, some are not; but a pinch of either class adds all the color which it takes a tree or vine a year to produce. The natural fruit is refreshing and invigorating, while the aniline, whether harmless or harmful, is without food value, lifeless and dead. Genuine color and flavor are the truest representations of quality and purity, and the artificial color or flavor is per se a deception. Imperfect food bears its own condemnation in its unpalatable flavor and inferior color, and must, therefore, be supplemented and disguised by the added artificial before it will sell. With artificial color to depend upon, there is little need for selecting the best suited feeds and treating and culturing cream in such a manner as to produce a delicious butter with sufficient natural color. Little attention has been paid to the growing of fruits and vegetables uniform in color and quality and to the treatment of the wholesale lot so that it will be uniform when it leaves the processes of preservation since no care in production or preservation can produce a color which can compete with that added by the aniline dye. In each and every instance whether in an oleomargarine or butter, in vinegar, jellies, jams, meats, and in the majority of candies and confections artificial color deceives consumers as to the quality and substance of the product colored.

Antiseptic preservatives like formaldehyde, boracic, salicylic and benzoic acids and sulphites are substances to be restricted, if possible, prohibited. This is the conclusion reached by all who have studied the subject impartially. It may be true that the general methods of gathering, storing and preparing fruit and vegetable pulp, the sanitation of the factories and the careless manner with which consumers handle prepared foods presents a danger greater than would be the effect of these antiseptics upon health, as some of those who defend antiseptics, no doubt honestly, contend. But it should be the continued and not impossible purpose of science to study and control the conditions which necessitate antiseptics, rather than to acknowledge the conditions as necessary and provide an artificial or possibly dangerous remedy. Already boracic acid has been taken out of meat, formaldehyde out of milk, salicylic acid out of beer and bottled fruit juices and jellies, and those who employ antiseptics to aid in the preservation of other foods do not defend the use on account of wholesomeness but because of conditions in the production and sale of soda fountain syrups, tomato catsups and similar articles of food put up ready to serve, and which remain open for a week or longer until the contents of the package is consumed. And in this defense the reason comes more from the market—rough handling and shipping, the hot grocery shelf and the careless consumer—than from problems in production. For the present the food laws are permitting this part of the problem to solve itself in requiring the label to state whenever antiseptics have been used in such foods. And even here, there is a difference of opinion among manufacturers. One firm states:

"All of our products are packed from absolutely pure, raw material, without coloring, preservative, or antiseptics of any kind whatsoever. We notice from some reports in regard to Catsup without preservative that it will not keep after being opened. This is entirely wrong; Catsup can be packed without preservative so that it will keep in splendid condition for an indefinite time, and we are so packing — Catsup."

"We will be very glad indeed for
the time to come when your Department will rule absolutely against all coloring matter and preservatives of any kind or description in any foods offered to the people.'"

Another very extensive packer of fruit and vegetable products stated before the Eleventh Annual Convention of the Association of State and National Food and Dairy Departments this summer at Jamestown:

"I assert from personal knowledge that there are no food products made of fruits and vegetables which the manufacturer cannot put on the market without artificial preservatives. Those manufacturers who today say that their business would be ruined if preservatives are eliminated will not say so—a few years hence. A few years ago some of them held that if coloring matter were prohibited it would ruin them. All of those men get along without coloring matter today, and I believe that the majority of them would not go back to its use even if it were permitted.'"

Another manufacturer looking at the matter from the standpoint of price says:

"Each and every one of us would naturally feel like we want to turn out the best goods at a reasonable price for the masses, as well as the classes, and if the use of preservative were eliminated the price of goods would be so high that the masses certainly would suffer and many articles of food which they now enjoy and which we believe to be produced today in a commercial way by the aid of Benzoate of Soda would have to be eliminated, or put up in such small individual doses that they would be beyond the purchasing price of the working classes, who compose the masses and where a few manufacturers in the United States can cater exclusively to the classes, the rest of us must take care of the masses.'"

There is something in this last contention, but not altogether as much as one might suppose. The staple foods like flour, meal, meat, sugar, syrups, dried fruits and canned vegetables, coffee, tea, butter, lard, pepper and other spices, and so on, have been more or less standardized, and adulteration in any of these is not only not economy but the added tax of fraud. The products in which antiseptics are now used are not absolutely necessary in every day consumption. Besides, if this is only a question of price there is a strong possibility that three-fourths of a quart of pure catsup or jelly in a smaller package be more economical and bring more pleasure and relish to the meal of the man who must practice economy, than would a full quart of a second grade product at the same price. It is from this line of foods that the retail grocer receives most of his profit. In fact, it might be said that the profits on fancy groceries finance the cost of distributing most of the staples.

There is now a system of municipal, State and Federal legislation throughout the country, imperfect still in some respects, but comprising sufficient authority to annihilate any adulteration which can be proven a fraud or an injury to health. The enforcement of these laws depends upon expert evidence which necessitates a standard method for determining the presence of adulterations and judging of the true qualities of substances. The Association of Official Agricultural Chemists early appointed a committee for this work and the Association of State food control officials appointed a similar committee from the State analysts. By arrangements these two committees are now working together and have for several years. The appropriation act for the United States Department of Agriculture contained authority for the conduct of this work under the authority and at the expense of the Federal government. Naturally those interests which opposed the passage and enforcement of pure food legislation oppose as well any organized attempt to discover and collaborate the truth, and from the influence of such interests the food standard clause in the agricultural appropriation act was thrown out on the objection of one member as being added legislation at the last session of Con-
gress, and although the Secretary of Agriculture himself has authority under the pure food law to continue this committee's work, nothing has been done. The committee, however, has the strong backing of the State food control officials and of the Association of Official Agricultural Chemists, and whatever these two bodies ultimately determine as the standard will carry the weight of authority. For the hearings before the Standards Committee have been so extensive and thorough and prolonged, their collaborations have been so extensive, and their final conclusions given after so much deliberation, and the standing of the members of the Committee of such high character that any disagreement to the standards which they have recommended to the States and the Federal Government will either have to be founded upon the influence of special interests or upon argument and discovery which has not heretofore been presented.

Among the questions which are now prominently before the food control officials are antiseptics in certain condiments and soda fountain syrups, the purity of jellies and other foods made from the by-products of canning and preserving factories, the sulphuring of wines and bleaching of canned and dried fruits, the bleaching of flour, bacteriological investigations and sanitary inspections, color in butter, and the entire prohibition of color where it is used for the sold purpose of deception, the regulation of cold storage, city milk supply inspection, inspection of bakeries and of local slaughterhouses, standards for tin in canned foods, the effect of processing and hermetical sealing on vegetable bacteria and upon the food value of a product, the education of the food profession regarding the principles upon which the production and sale of wholesome food depends and the education of the consumer as to the care, preparation and nutritive value of what to eat and drink.

With the winning of the fight, in the passage of the National law, the pure food issue passes from a period of agitation to a work of construction. For this work the cities and States need inspectors who will go out, not only for the purpose of collecting samples, but who, with a knowledge of chemistry, bacteriology and proper sanitation, will be able to determine whether or not a product is being produced under wholesome conditions, inspectors who can not only criticise but will be able to suggest a practical remedy. In the cities there is needed and will soon be a large demand for men trained in the chemistry and bacteriology of milk and what is necessary to insure its wholesome production and delivery. There is needed and there will soon be, in each of the fifteen thousand or more food manufacturing industries throughout the country, a chemist closely in touch with the every day factory problems, and these industries will soon learn that they will be supplied with better raw material if the production is put in charge of men trained in the sciences of horticulture and agriculture. And there is needed besides an extension of the work of the State Experiment Stations so that in addition to the wealth building investigation given to the production of the grain, berry and pig, they will also study how to make the raw product into food. And through the constant and constructive cooperation with the legitimate food industries of the country, the people will have better things to eat, the industries will have more public confidence and more sale for their products, and it will bring as well an enlarged market to the producer.
IN the rich corn and wheat belt of the northern part of Cecil county, Maryland, a country school of agriculture has been established. The school is the result of the efforts of the citizens of that part of the eastern shore to give their boys and girls a high school education with an agricultural trend that will better fit them for their life work as farmer citizens.

The course of study comprises regular work in the high school studies of mathematics, history, languages, literature, composition, science, etc., coupled with agricultural studies of a scientific and practical nature. These agricultural studies are as follows,—First year, plant studies and soils; class room, laboratory and field prac-ticums; second year, field, orchard and garden crops, including cereals, forage and soiling crops; fruit studies of varieties grown in the vicinity, spraying, pruning, grafting, budding, etc.; garden crops adapted to the soil and climatic conditions; third year, domestic animal studies, including scoring, judging and care of live stock with special attention to the dairy industry; fourth year, farm management, care and marketing of produce, relative profits from various types of farming, introduction of new crops, etc. Farm and business arithmetic, farm book-keeping, botany, chemistry of plant and animal life and of soils, and field surveying are also included in the course.

Laboratory work and field practicums are made special features of the school work. Inexpensive apparatus is used for all experiments, most of the materials being brought from the homes of the pupils. Tin cans, plates, saucers, tumbliers, pans, etc., are found useful in many ways. When an experiment needs a specially constructed piece of apparatus this is made by the boys themselves. Nearly all of the experiments outlined in Bulletin 186 of the Office of Experiment Stations, United States Department of Agriculture, have been demonstrated in the laboratory of this school. Last year when a representative of the Department of Agriculture asked the pupils which phase of the work they remembered and enjoyed the better, laboratory or class room exercises, they readily answered, "the laboratory experiments".

Use is made of nearby farms for the purpose of studying field operations, viewing live stock, examining farm machinery, etc. It is hoped, when added land can be secured, to have plat experiments of special interest to the farmers of the region cared for by the pupils of the school.

The school has been a direct benefit to the community by doing something for the farmers. Orchards have been sprayed, seed corn selected and tested, soils tested for acidity, fertilizer mixtures selected and clover seed tested for germinating power and adulterants contained. As the institution grows,
more of this work for the farmers will be done. A Babcock milk tester will be installed and any milk brought to the school will be tested free of charge, oats and wheat will be treated for smut with formaldehyde, more spraying demonstrations will be given, potatoes will be treated for scab, and rations for farm animals will be computed. Such work it seems cannot fail to be of much use to the farmers.

Much interest has been aroused in the school by public meetings held from time to time at which such men as Professors Spillman and Crosby of the U. S. Department of Agriculture, President Silvester and Professors Taliaferro, Symons and Porter of the Maryland Agricultural College, and Superintendents Stephens and Purdum of the State Educational Department have been the principal speakers. The good ideas carried away from such meetings have had the effect of bettering farming conditions in the neighborhood.

A corn show is to be held by the school in the near future. Ten ears of seed corn selected according to a score card will be a sample. Prizes will be given for the best samples shown; first, by competitors from the county, second, by competitors from the elective district in which the school is situated, and third, by competitors who are pupils of the school. Such a show no doubt will get the farmers more interested in better seed corn selection.

Thus we see that such a country agricultural school can be made a direct benefit to the community, not only in giving instruction in agriculture to its pupils thereby making them more interested in farming, but also by bringing practical studies home to the parents.
The Cornell Countryman

CABBAGE RAISING

By C. L. Allen
Floral Park, N. Y.

The first requisite for a good crop of cabbage is good plants, the importance of which is but little understood and sadly neglected, excepting with the trucker or market gardener. The old truckers of Long Island fully understood this matter, and were so thorough in their methods that failure of crop did not enter into their calculations. Experience had taught them that, with properly grown plants, the crop was as sure and as profitable, in fact more so, than any of their other productions.

At the start, let us say, that for a successful crop, from the time the plant makes its appearance in the seed-bed until the crop is ready for the harvest, it should never receive the slightest check in its growth. This is particularly true with the early Flat Dutch varieties, of which the "All Head" and "Early Summer," are the best types. When the growing of cabbage from cold-frame plants was the common custom these varieties could not be grown, as they would, almost invariably run up to seed, instead of making heads, which was wholly due to the check received in transplanting, while the wakefield types would perfect their heads without loss, but by no means as satisfactorily as when grown by the present methods which are as follows:

For an early crop the seed is sown in a green-house, which is used at other seasons for the growing of lettuce, cauliflower and radishes. The seed is sown during the first week in February, in shallow boxes, or flats, two and one half inches deep, filled with finely prepared soil, made friable with thoroughly decomposed vegetable compost, such as would be taken from an old hot-bed. This soil is all sifted through a quarter-inch seive, and is not rich, but light and fine, permitting the roots to spread in every direction. The seed is sown thinly in drills one inch apart, thinly covered, the depth of soil not to exceed the diameter of the seed, the soil being firmly pressed over them, and then sprinkled gently.

These boxes are placed near the glass where the young plants can have plenty of light and air, which will give them health and strength of growth. The temperature is not allowed to go higher than 65° by day, and lower than 42° by night, which is necessary for vigor of plant. Germination will be quick and rapid growth will follow. Within two weeks from the sowing of the seeds, the second leaves of the plants will be about one quarter of an inch in length, at which stage the young plants are pricked out and set in other flats filled with soil of the same character, and prepared in the same way, and set in rows one inch apart and one half inch apart in the rows.

When the third pair of leaves are about one inch in length the plants are again pricked out as before, but set one inch apart each way. The same character of soil being used, and the same attention in every way given them. The boxes are kept as near the glass as convenient to prevent the plants from being drawn up, and full ventilation is afforded, whenever the conditions of weather will permit.

The plants are thus grown until time for setting in the field, which is usually about the middle of April, but never until the soil is in a condition to work up fine and there is encouraging warmth in the atmosphere. The plants are now strong and compact, about as broad as tall. In removing them from the boxes care is taken not to disturb the roots, which are a compact ball or mass of fibre. The ground is marked out in drills thirty inches apart, and the plants are set 15 inches apart in the rows, which gives about 11,000 plants to the acre.

The farmer formerly planted about fifty acres of early cabbage annually.
If the weather is favorable these fifty acres are now planted very quickly, as sufficient help is employed on this farm of 260 acres, to accomplish any piece of work in a short period. The last work in transplanting is to sprinkle a handful of powdered shell-lime around each plant, care being taken not to have it come in contact with the plant. The lime is used as a preventive of club-root, and for the destruction of the grub, which is so destructive to the cabbage. The value of lime for all crops, but more especially for the Brassicas, is highly important, and where the land is continually yielding two or more crops in a season, it can scarcely be over-estimated. The unwritten law of agriculture is that two or more crops of any of the Brassicas should not be grown in succession on the same field, as club-root would result. But where shell lime is freely used there is no danger. This is clearly shown by the fact that the farmer of whom we are speaking, gets a crop of cabbage every year from the same acres, by following his crop which is marketed in June, with either beans or squashes; and where early potatoes are followed by late cabbage which is a common custom of our Long Island truckers. On this farm a car-load of shell lime is used annually and club-root is unknown.

LATE CABBAGE.

In some respects the late cabbage is a more difficult crop to grow than the early. In Spring it is easy for plants to grow, it is their time. It is not so from mid-summer to autumn, or, we should say to early autumn. The seed starts slowly, insect enemies are active and abundant, the weather is more unfavorable for transplanting, and uncertainty seems to follow every step. On the other hand mother earth tenderly cares for every seed intrusted to her care, and, if the farmer will act well his part, Nature will do the rest.

The preparation of the seed bed for late cabbage plants, should be undertaken as soon as the soil is sufficiently dry to work up as fine as possible. After the plowing, use the harrow, and make the soil fine to as great a depth as it has been plowed. After the harrow has finished its work, put on the roller, making the surface as smooth as the house floor, then cover the surface to the depth of four inches with course litter from the stable, or sea-weed if procurable, or any convenient mulch that will prevent evaporation.

The benefits arising from this method are manifold. First, the work will be done on time and the bed will be in readiness when wanted. Second, the soil will at all times be moist underneath the mulch, so that the seed can be sown at the proper time, no matter how dry the season may be; and there will always be sufficient moisture in the soil to carry the plants until they are sufficiently large to transfer to the field. We find it advantageous to cover the bed, after the seed is sown, with excelsior or some light mulch, taking the same off as soon as the plants are fairly up.

The time for transplanting arriving, whether the weather is favorable, or the reverse, the work must be done. If the soil is in the proper condition, if the principle of tilth has been respected, and sufficient amount of plant food furnished to feed the hungry plants, then, with one other precaution, the crop is assured. That necessity is to puddle in the plants. If properly done, it matters not how dry, or hot the weather may be; success is certain. Cabbage plants should, if possible, be set before a storm, and never immediately after one.

This may seem inconsistent, as it is contrary to old established customs, none the less it is a fact. We have given this subject much attention, as we must needs do in growing annually several hundred acres for seed purposes; our experience has taught us conclusively that the most unfavorable time for transplanting is immediately after a heavy rain, the time usually selected tor the work; while the most favorable time is just before one. As this cannot always be determined, the safest, hence the most economical plan, is to put out the plants on a cloudy
and not very hot day. If the plants have been properly grown they will be about four inches high and very stocky.

When the ground is marked off, one person (a boy will do the work as well as a man) goes ahead, makes a hole with a dibber and drops the plant in it. In this work there should be a guide on the dibber to prevent making the hole too deep. The second person pours into the hole about one-fourth of a pint of water, and the third packs the wet soil, or mud as it should be, firmly around the roots, then covers the surface with loose fine soil to prevent evaporation.

We have tried this method repeatedly; in fact, for the last twenty years have employed no other, never losing a plant, except it be by insect or accident. What is still more important, since the plants are in nowise check ed, growth commences immediately and success is assured.

We are often asked what is the best soil for cabbage? This is an arbitrary question, and the only answer is, the best you have. Because you cannot change it if you would. Clay will be clay, sand—sand, and loam cannot be other than loam. It is not the character of soil but its condition that makes the crop. Tilt is the means to the end. Make your clay as fine as your sandy soil, by systematic tilth; make your sandy soil as rich in plant food as your loam or clay, and your results will be equal. We find in our seed growing districts, that it is the man, the horse and the plow, working together in harmony of purpose, not the soil, that gives us a crop.

Wherever we find a farmer that keeps the plow constantly at work, whenever there is an opportunity, we find the man that gets the largest crops. Better by far to plant cabbage on a field that has been plowed and harrowed six times, and plant without manure, than to plow but once and put on a ton of fertilizer to the acre.

ONE OF DEAN BAILEY’S IDEALS
A DISTRICT SCHOOL AGRICULTURAL FAIR
By Helen L. Richards, Sp.

EARLY in October came the following invitation to Uncle John Spencer, the farmer who started the Cornell Farmers’ Reading Courses and the Children’s Nature Study:

The ‘Seneca Sharp Eyes’ request the pleasure of your presence at the Agricultural Fair and Festival on the afternoon of Friday the Fourth of October from three o’clock until half after five o’clock At Number Eleven.

He could not go and asked if I would for him. Now as this is just along the line I am working to see what can be done on the social side of rural education, Dean Bailey gave me the permission to go and Uncle John the written directions. The directions were to go to the hotel in Geneva and arrange for the afternoon drive to Seneca which is about five miles beyond. This I did, then went to the State Experiment Station.

Dean Bailey had given me a message for Director Jordan, and, after a little visit in his office, we went to see Mr. Heddrick, who is getting out a beautiful book on the grapes of New York State.

Now Mr. Heddrick is alive to the social side of life as well as the intellectual, and when he found what my plans were for the afternoon, asked if he might cancel my livery order, and would I drive out with Professor Beach and him, as they were going out a mile or two beyond the district school. Soon after we started out. On the way Mr. Heddrick told me much
about the neighborhood, of historical interest. It has been occupied by white settlers since the Revolution. Owners not tenants, live on the farms. There was established a hundred years ago a Scotch Presbyterian church—called No. 9—where they have ninety-nine covered horse sheds and use them.

The school house we found was set back one hundred and fifty feet or more from the road. A number of young trees have been planted about, and the flag was flying from the top of the newly painted building. It was a little after three when we arrived. The children, in their best clothes, were going in and out, and inside the room was a very gay holiday spirit. Miss Moore, the teacher, "Heavenborn" as Uncle John well said, came forward to meet us. She was an Irish woman, with a strong, kindly face and hearty manner; and that Uncle John had thought it worth while to send someone, when he could not come, pleased her very much.

Mr. Heddrick was so much interested in the exhibit that he brought in Professor Beach and they were both taken in a picture showing the children's exhibits. Then, promising to call about five, they went on their errand.

First, let me tell you about the school room,—it was the regulation district school room, rectangular, two doors at the rear opening into a vestibule, raised platform for the teacher's desk. But the walls were not regulation. They were freshly painted in two good greens, and over the blackboard and around the sides of the room a beautiful frieze had been made for the occasion of mountain ash and red haw boughs. In the rear of the school room the exhibits were arranged on boards laid across the desks, and on the little flower stand of several shelves. Each door was guarded by bunches of tall corn stalks and between were hung ears of golden corn, of white, black, red, Flint, Dent, and Popcorn. The stove was garlanded with heads of Brussels sprouts. Among the exhibits were cabbages—fine solid ones; tomatoes, large and small, red and yellow; quinces, pears, prunes, plums; many kinds of apples and nuts, and some flowers.

There was no set program, but first photographs were taken of the exhibit indoors, of the children's pets—dogs, cats and ponies—outside, then, one of us all on the steps and then one of the Dahlia Club. This is composed of the older girls of whom the
teacher is very proud, and who have gone on now to High School. One day, before there was a club, when a friend offered some fine dahlia tubers to Miss Moore, she asked that they be given to the girls instead; but the friend objected, saying the girls would not care for them. Said the teacher, "Some girls might not, but just try these." So the girls were given the dahlias and are growing great, beautiful ones.

There were in all some thirty or more visitors and twenty-eight school children. Fathers and mothers and wee little ones, the school trustee, the country doctor, Mr. Allen, and the dear pastor, Mr. Temple, were there.

While the girls were singing and playing "Old Lang Syne" and the songs that go with it, the teacher showed us a giant waterbug that one boy brought in with a "guess I got all the fellows beat on beetles." Then the trustee showed me the sea shell collection in the oak cabinet with glass doors that stood on the platform, and told me how much they thought of their teacher and her work, how interested the children were in finding out about all these things from out-of-doors, and wished that he had had a chance to when he was a boy.

Then Mr. Rupert and Mr. Hazlett, two of the fathers came up and explained how some six years ago they decided they wanted their children to have a better teacher and had some exciting school meetings. But they had their way,—they had to keep some one reading School Law for about two hours one night while some of the others fetched in more folks for they hadn't a vote to spare that night. Then they got Miss Moore. They paid her $12 a week, not as much as they should have, but, more than most districts did.

Well, after they got her, there was some ugly opposition, but the boy from the worst family brought in one day a new bug that they couldn't de-
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cide about, some thinking it was one kind and some another. "Well," the teacher said, "let's write and ask Uncle John." The boy did. Uncle John took no end of pains to find out about it and wrote back. "Well, do you know, there wasn't one bit more trouble there; that family, too, thinks it's all fine."

After some one asked us to please sign in the Visitors' Book, the doctor and I in looking over some of the children's treasures on the other side of the room, found a big fungus ten inches across, and like an old-fashioned bouquet, and a pint of empty cicada shells. "Well," the doctor said, "it all just makes you feel that you'd better be waking up to see what you can do to help. Now, I've got a bust of Grant that I am going to bring down."

"We're all here now, I guess, and if you'll take seats, please," the teacher said, "we'll have some refreshments." I had forgotten to say that in the alcove at the back, where the girls usually hang their coats and hats, the shelves had been cleared and were full of pies, cakes and cookies, and that on the little oil stove coffee and tea had been made. It was good to see boys and girls, two in a seat, eating all the cake and pie they wanted. And how, how shall I tell you about the spirit abroad in the room—how many a hostess would give much to be able to have it at her reception or party. It was an alive affair; they were all glad to be there; their social natures, their souls, were truly being fed, along with the generous quarters of pie we were eating. Two cakes had been brought for competition, and after careful judging, both girls were given prizes of boxes of candy the same size.

We had roamed around, visited, and now were called to our seats again, and each of us older children was asked to speak. The teacher asked me first because I represented Uncle John. I only tried to tell them how glad I was to be there, and how glad Uncle John and Dean Bailey would be when I told them about it—and they were. Then the doctor and the trustee and other fathers spoke, telling stories and praising the work of the pupils. And then three cheers were given for the teacher.

About this time Prof. Beach and Mr. Hedrick came back and were asked to say a word. Their word was very good; they had both grown up in a district school, had taught district school as young men, and now told these boys and girls, fathers and mothers about it. As one mother said afterwards "it's so good for our children to hear such things from these men. They'll not forget it. It may help them to try." At some time during the afternoon nearly every child came up and asked me about Uncle John, and gave me something to take to him, and when it was time to go they sent me away with my arms full of fruits and flowers and a box of cakes, pies and cookies for him. It was a happy day.

MAKING GOOD ON THE FARM—Ill.
By D. E. Carley, Sp. '04
Lisle, N. Y.

As the Countryman comes to me month by month, I eagerly scan its pages to find out what my old school-mates and friends are doing.

As I look down the list of former students, I find that this one has secured a position with the Department of Agriculture at Washington, that one is teaching at some Agricultural College, another has settled on a ranch in the West and still another has gone back to the "Old Homestead." How wide and diversified
are the duties of the Agricultural College. It must train the young men and women not only to be expert teachers and experimenters but to be expert farmers as well or the college has failed in its mission.

Of all the lines of work that the college student takes up after leaving the University, none are so closely watched by his old neighbors and friends as the one pursued by him, who goes back to the old homestead to make good on the farm. They are the "sample goods" sent out by the college to the people of the state to prove to them that an Agricultural education is of the greatest importance to the ambitious lad who intends to remain on the farm. How much it behooves us (for I am one of the number) who have gone back to the farm, to make good.

How we are to make good is a question which each of us has to solve for himself and should depend largely upon our personal likes and dislikes in choosing the line of work which we are to take up.

Let us each take up some line of work and do it better than anyone else in our neighborhood. It it be the raising of potatoes, strive each year to get a bigger and finer crop than anyone else and you will soon be known as the champion potato grower in your locality. And so it will be with all of the different lines of work that may be taken up.

In my case being brought up on a dairy farm and being a natural lover of animals, I chose their breeding as my chief line of work. Believing that the breeding of pure bred animals was the highest type of agriculture and that the Holstein-Friesian cow was the best and most profitable cow under all conditions, I made her my choice. My ambition was to become the owner of the finest herd in the old county of Broome and I believe that purpose has been accomplished. White Spring Farm has never been in as fine shape,
or the herd of dairy cows that roam its pastures as good, as at present.

Starting in a small way with four heifer calves purchased of E. C. Brill of Broadway, N. J., I have bred up until at present, with the exception of a half dozen grades, our herd is composed entirely of pure bred Holsteins. The demand for pure bred stock has been very good and sales numerous. White Spring Herd is headed by a son of Prince Ybma Spofford whose dam made an official record of 30.38 lbs. of butter in seven days, and gave 100 lbs. of milk in one day. She was purchased by Mr. Field of Massachusetts, for the sum of $6000. Our sire is a brother to the one recently purchased by Professor Wing to head the University herd.

I believe the breeding of pure bred stock, whether it be cattle, sheep, swine or other farm animals, to be a good line of work for the college student as he goes back to the farm. He will find a chance to use all his skill and energy, and will always have something that he can take pleasure in showing his neighbors and friends. Moreover the better class of animals will always find a ready sale at good prices, while the poor animals are often bred and reared at a loss.

Perhaps we cannot all become successful breeders of animals or growers of potatoes. Perhaps some of us will not make as good farmers as some of the best who have never had a college training, but quoting from Prof. H. E. VanNorman in the Indiana Farmer:

"Not every colt trained on the track becomes a prize winner, though every one may make a faster mile than he could have made without the training. Not every boy who seeks the benefits of an agricultural education will outshine all the farmers in his county as a result of it, but it is reasonable to expect every one of them to be better farmers, better men and better citizens by reason of the opportunity offered by a term or more at an agricultural college, not the least of which is the meeting of scores of other young men from various parts of the state who have ambition and push enough to break away from the routine of the farm and seek that which shall aid them to have better farms, better stock and a larger measure of enjoyment from their labor, because these things are better."

"The most active period of all the world's activities is now waiting—as near as this busy world can wait about anything—peering anxiously into and along the ranks of all young men for those who know how."

Fred M. Rankin.
THE basis of farming is the care-taking of plants and animals. This well known aphorism was discussed in the introduction to this series; it is now purposéd to consider more particularly the farm animals.

It is obvious that the animals on any farm may be divided into two classes—domesticated and undomesticated. The domesticated animals,—horses, cattle, poultry, and the like,—familiar to all, have been under the direct care of the farmer for hundreds of years. Exact and detailed knowledge of them has accumulated during this long period, and has reached, especially in its practical applications, a high degree of perfection, as evinced by the modern methods of producing beef, milk, eggs, wool, etc. The economic value of these animals to man has constantly increased, and will doubtless continue to do so.

The undomesticated animals on the farm,—wild mammals, birds, insects, salamanders, etc., those not usually controlled directly or consciously by man,—are, however, in quite another category. These wild creatures, many of them very tiny, many very shy, many nocturnal, are largely unfamiliar or unknown to the farmer. His knowledge of them is always decidedly fragmentary, and frequently inexact. They do not appeal to him as being of particular economic interest, except in occasional instances, such as scale on his fruit trees, or crows in his corn. Thus this vast host of undomesticated animals, whose number is veritably legion, and whose economic value is very far from zero, has hitherto been generally overlooked and unrecognized by all save the scientist.

Many of these undomesticated animals have a very decided value to agriculture. Perhaps the best instances of this is the much-abused toad, usually thought of as an ugly, humpy, disseminator of warts, but in fact an exquisitely beautiful and cunningly devised machine for the wholesale destruction of noxious insects. A careful study of its food has revealed many such striking facts as these,—55 army worms found in the stomach of one toad, 65 gypsy moth caterpillars in another, 37 tent caterpillars in a third, and so on. Cutworms, snails, white grubs, ants, wireworms, grasshoppers, etc., make up the larger part of the toad’s food, and its value as an insect destroyer has finally become so well recognized that European gardens are reported to pay twenty-five dollars per hundred live toads, to set free in their gardens.

Earthworms are not commonly thought of as of great importance, yet Darwin’s extensive experiments have conclusively shown that they are the great makers of good soil, that the lands of the temperate regions had been plowed and reploved, turned and returned, many times before there was either man or plowman, and that profitable agriculture rests to a very considerable extent upon—earthworms.

We find, naturally enough, among the “undomesticated” animals, many
whose status in relation to agriculture has not yet been determined. A small crustacean, commonly called "sow bug" or "pill bug" is found abundantly in dark, damp places, and yet but little is known either of its life history or habits. In summer time the fields and woodlands are alive with many species of ants, but it is difficult to speak with certainty concerning their agricultural value.

Other "wild" animals are evidently detrimental. Numerous insects, the wild mice, woodchucks, etc., belong to this class. These need, not "domestication," in the common usage of the term, but efficient control. Such control marks a high development of knowledge of natural laws.

The ideal agriculturist should therefore take into account, not only the domesticated animals personally under his care, but also these other equally interesting creatures, whose economic importance is concomitant with the degree of control that he should exercise over them.

PEAS FOR CANNING
By F. S. Hayden, '08

WITH the present scarcity of labor and the other unavoidable circumstances which interfere with farm management, the farmer is often faced with the problem of obtaining a profitable substitute in his rotations. Whatever local difficulties may arise in the management of canning factories, they are of great agricultural importance to their communities. Peas is, perhaps, the most significant crop in the problem of farm management.

The raising of peas for canning has three elements of economic importance to the farmer. First, it offers a very quick and fairly large return. The crop is planted at intervals for five or six weeks after the earliest possible sowing. It is harvested and marketed in the same operation before the middle,—usually before the first of August. At one and three-quarters cents per pound for the shelled peas, the returns range from $30.00 to $75.00 an acre with possible yields worth from $100.00 to $150.00 per acre.

The second factor is the economy of
labor. A thorough preparation is necessary but after sowing no attention is needed except perhaps two or three cultivations with a weeder to destroy weed seedlings and make a mulch. Harvesting may be carried on under any weather conditions permitting a team on the field, and is the only part of the operations requiring prompt and continuous concentration of labor.

The third important feature is the value of peas in a rotation. It may follow almost any crop and precede any except grass. It has the beneficial qualities of all legumes making it an excellent crop to precede wheat. This is, perhaps, the most important feature from the broader agricultural point of view, in offering a not exhaustive crop suited to a wide range of circumstances.

Raising peas is no gold mine. It has its difficulties, but with its quick and considerable return, its economy of labor, and its value in farm management, the possibility of raising peas for canning is a valuable asset to any locality.

**REFLECTIONS OF A SENIOR**

*By Royal Gilkey, '08*

A MAN'S college course is a period of awakening. The average freshman enters college a bundle of possibilities which are waiting to be made into actual ability. The senior leaves college wishing he had the four years in front of him again in the light of what he has learned from his altogether too brief college experience. He knows if he were to start in again he would make a much better college record. It is an important question to consider whether the experience of the senior cannot be made of some advantage to the freshman.

The opportunities are wide open in the College of Agriculture for the upperclassmen to become advisors and examples and in other ways to help the underclassmen become better able to make full use of their opportunities. We have here a feeling of interest in each other because we are all comrades in a common life work. A stranger has only to say that he is interested in agriculture and we have something to talk about. What interests one interests all, and the gain of one lifts up agriculture somewhere. Furthermore, we have the social spirit, or the desire to get acquainted with each other. This has been fostered by the Assembly. Few college customs bear such good results as does this one where everyone loosens up his serious look and comes out of his shell to shake hands with, and talk to, his neighbor. Most important of all, we have the student organizations, some of which are the Association, Lazy Club, Round Up Club and Poultry Association. These give us a still greater community of interest and stimulate the making of friendships. They contain in themselves the most practical means of cooperation with the underclassmen.

The great opportunity to increase the value of an undergraduate experience at our college is open to the upperclassmen through the student organizations. Let them all come out and get acquainted with all the underclassmen. Let them show greater interest in the welfare of the underclassmen. As soon as they do this they will have as great an opportunity as they are willing to embrace to do good to the newer members and their influence will be great in the degree that they are good examples of what several years of college training can do for the individual.
Again the Countryman extends a hearty welcome to the entering class of Short Course students who soon will form another class of students of Cornell while here in the College of Agriculture. It can, this year, welcome them to the new building in all the departments and to manifold improvements, conveniences and opportunities equaling if not surpassing those offered to similar classes anywhere in the country. A brief consideration of these opportunities may both prove of interest to the students themselves, and give a clearer idea of the work of the college. You Winter-course students are given the chance to hear, to learn from, to meet professors who are specialists, and authorities in their lines, comprising the highest steps in the ladder of school-teaching—university instruction. Laboratories, equipment, apparatus—everything is offered you, together with the sincere good wishes and encouragement of the college. The Assembly, held on the first Thursday of each month, is the place to meet each other, to find new comrades and friends, and one and all are invited and urged to join in its activity. The Agricultural Association and the various clubs are open to you with an invitation to enter into their debates, discussions and every form of student life. The Countryman offers its services in any way and will be glad to receive visits, suggestions and criticisms from you.

And perhaps the idea occurs to you, as it seems that it should at least to some, "What do we do to get this? In what way can we feel and show an appreciation of what the State and the College are endeavoring to do for us?" The answer is in itself simple and clear—while you are Cornellians be Cornellians in every sense. Become students of the College of Agriculture in more than name. Live up to the standard at which you wish to be placed as University men. Coming from your farms and homes, you are entering a new life, one that will back you up in the future, and mean much to you wherever you may go. In your future work, in your efforts to increase and promote agriculture, it must be a power behind you, a strength and a help to your every attempt to be of use to the world. I am a Cornellian! Remember that, live up to it, be proud and worthy of it always, and whatever obligation you may feel toward those who, wishing you well, are trying to help you, will be repaid in full.

A Word of Appreciation

With the desire to give recognition to those acts which are especially grateful and kind, we wish to express in behalf of the College and ourselves, our appreciation of the courtesy and true, generous kind-
ness of the Brazilian Government in regard to the late M. M. Underdown, who, remembered as a devoted Cornellian and a friend, became a worker in that country. We have heard with much gratitude of its efforts and action since his death in dealing generously with his family in a financial way, and in providing for the return of his body to his home. It is such acts as these, slight, perhaps, in international relations, but great in their own meaning, that bind two peoples closer together through ties of personal gratitude, friendship and sympathy.

Our College has grown and is growing—wonderfully—and on every side we find cause for increased pride in its activity and the promise of further development and possibilities. We have at last a building of our own, and such a building as can be placed among the very foremost of its kind. We have our clubs, our associations, our teams, all our activities, and with each one the unity, the solidarity, the strength of the College is emphasized and intensified. Take, for example, one week, beginning November 4 and consider the opportunities of various kinds offered in that time. On Monday a meeting of the Round-Up Club, and the Chrysanthemum Show at the Lazy Club; on Tuesday an Association meeting with a talk on Jamaica; on Thursday the Assembly, on Friday an important address on plant breeding. This may be exceptional, but nevertheless it is, in its significance typical, and simply shows that the College is alive and very much so.

But just here arises a thought, a precautionary idea, concerning a possible outgrowth of this condition. We strive for unity, for strength, for accomplishment as a College, but we must not allow even a hint of separation from the University activities to creep in. We are but a part of Cornell, and while indeed, it must be our aim to make that part as large, as important, as strong in itself as possible—yet it must still remain that part and as such contribute to the success of the University. It would be very easy, now that we have a home, a seat here on the highest and finest point of the grounds, to lose track of some of the lesser activities that are associated with the campus in its strictest sense. It would be easy to fail to mingle at times with the students of the other courses from whom we can derive benefit, the broadening, liberal effect of association and the exchange of ideas. We pride ourselves on belonging to a college which gives a broad, a full education, one that develops all sides of the character and increases its capacity for satisfaction and gratification, and we must keep it so by keeping in touch, in the closest way, with the University as a whole. And that means in many ways,—through debate clubs, athletics, class politics, and all the student activities as well as through an occasional course or lecture or concert that is not agricultural. Perhaps this point of view is unnecessary; let us hope that it is and will remain so. Indeed the College is at present well represented in practically all the fields that have been mentioned. But let it be rather a point to be kept in mind and avoided, and in building up the New
York State College of Agriculture, in widening its sphere of influence, let us remain in the broadest sense students of the University and in that way effect the best of all results—mutual advantage.

Light or Darkness

Until a short time ago, the student body deplored the absence of lights along the approaches to the building. At last a certain amount of illumination has been furnished, but the question arises in our minds whether darkness, which at least is artistic, might not be preferable to the clusters of electric bulbs supported by antennae like brackets which grace (?) the western corners of the agronomy building. Consistency, if nothing else, and architectural beauty which cannot be suppressed, both call for something at least in keeping with the remainder of the buildings and bearing, if possible, some little touch of artistic thoughtfulness. In contemplating the wiry supports as one approaches the building, the related idea occurs to us—whether, if expense is a factor, certain or all of the substantial but hitherto futile flower-pots, along the top of the loggie might not have been spared, to provide for a series of lights embodying both artistic merit and undeniable usefulness.

GENERAL AGRICULTURAL NEWS

The Scientific American for October 12, contains an artical entitled "A New System for the fixation of Atmospheric Nitrogen" by F. S. DeBrazza. The time is not far distant, the author tells us, when the present sources of nitrogenized products will be entirely exhausted. This fact has led to attempts to fix the nitrogen of the air which occurs in a practically unlimited amount. For this two processes have been found industrially promising. The first makes use of an electric spark; the second is the fixation of nitrogen upon carbides heated to very high temperatures. The second method, which has proven the more satisfactory economically, is based upon the property of calcium carbide to fix nitrogen at a temperature of about 1000° C. The result is calcium cyanamide, CaCN₂. When the nitrogen in this product is united with water under high pressure, it changes into ammonia. CaCN₂ + H₂O = CaCO₃ + 2NH₃. This gives the long sought for solution of the problem of producing ammonia and ammoniacal salts from atmospheric nitrogen. "It remained, however, to make this process economic, practical and industrial." To obtain pure nitrogen directly from the atmosphere it is necessary to separate it from the oxygen with which it is combined. After several experiments it was found economically possible to do this by liquefaction of the air and fractional distillation of the gases; the boiling points of liquid oxygen and liquid nitrogen being different. This process can be employed on a large scale. At Piano d'Orte, Italy, where the first factory in the world for the fixation of atmospheric nitrogen has recently been established, the carbon is ground into a very fine powder and placed in special iron retorts. It is then heated up to from 800° to 1000° C., and at the same time powerful pumps blow over it a continuous current of nitrogen which has been obtained from liquid air as mentioned above. The carbide fuses in the intense heat, and in about two hours is changed into calcium cyanamide. Calcium cyanamide is a very dark mass composed of extremely small crystals, free carbon and a small quantity of calcium carbide that has
not been transformed. The whole mass must be finely ground and exposed to the air for some days, in order that water vapor in the air may remove the calcium carbide. Calcium cyanamide contains 14 to 24 per cent of nitrogen, 40 to 42 per cent calcium and 17 to 18 per cent carbon. In agricultural practice it has proven itself equal, if not superior, to various other mineral fertilizers. Its manufacture, however, demands very great electric power, and will only be profitable where this can be obtained at a small cost.

* * *

Reports indicate a marked shortage in all crops for the year 1907. The total wheat yield is estimated at 625,-000,000 bushels, or 100,000,000 less than last year. The corn crop shows a falling off of about 16 per cent from 1906, and will aggregate approximately 2,500,000,000 bushels. The total production of standard cereals (corn, wheat, oats, rye and barley) will this year be about 4,046,000,000 bushels, as compared with 4,840,000,-000 bushels last year and 4,520,000,-000 bushels in 1905. The cotton crop will be about 12,000,000 bales which is as good as the average for the last four years, but which is one million bales less than last year. However, prices for all kinds of farm products are unusually high, and the decrease in the quantity of the output will in no way limit the income of the American farmer.

* * *

Nowhere are the increased prices for all farm products more strikingly indicated than in the case of the apple, which shows a shortage in crop of 11 per cent from last year. Mr. Vanderbilt, of Hood River, Oregon, sold forty burlap boxes of the Winter Banana apple to a Portland dealer for $8 a box, and the dealer in turn sold them to a New York buyer for $12 a box. Prices like these mean that the New Yorkers will pay over twenty cents each for fancy apples. The Hood River Apple Growers' Union has marketed its crop of Spitzenbergs at $3.27½ per box, and Newton Pip- pins at $2.75 per box. Dr. A. E. Miller of Austin, Colorado, has obtained a crop of 15,000 boxes of fancy apples from forty acres, and expects to sell them for at least $3.00 per box. Dr. Miller last year refused an offer of $40,000 for this orchard.

* * *

Statistics gathered and compiled by the Spokane Chamber of Commerce show that the Inland Empire, embracing 150,000 square miles in eastern Washington, northern Idaho, western Montana, northeastern Oregon and southeastern British Columbia, will produce this year, exclusive of manufactures and imports, $267 per capita of the estimated population of 500,000 or more than $1,200 for the average family, as against $119 per capita, including agriculture, manufacture and imports, of the entire United States, according to government census reports. The figures follow:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Production</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat, 50,000,000 bushels, 75 cents</td>
<td>$37,500,000</td>
<td></td>
</tr>
<tr>
<td>Lumber, 1,250,000,000 to 1,300,-000,000 feet</td>
<td>17,000,000</td>
<td></td>
</tr>
<tr>
<td>Minerals, estimated output of district</td>
<td>32,000,000</td>
<td></td>
</tr>
<tr>
<td>Apples and other fruits</td>
<td>14,000,000</td>
<td></td>
</tr>
<tr>
<td>Dairy products of district (estimated)</td>
<td>5,000,000</td>
<td></td>
</tr>
<tr>
<td>Live stock and poultry products (estimated)</td>
<td>14,000,000</td>
<td></td>
</tr>
<tr>
<td>Farm products (not included in foregoing)</td>
<td>14,000,000</td>
<td></td>
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</tbody>
</table>

Total $133,500,000

* * *

The November Review of Reviews contains an account of the Macdonald College at Ste. Anne de Bellevue, Quebec. This is an Agricultural College which has just been built by Sir William Macdonald, of Montreal, at a cost of $2,000,000, and which he has endowed to the extent of $2,000,000 more. The College has three Departments—the School for Teachers, The Agricultural School and The School of Household Science. In addition to the regular courses, it offers short courses in all these branches.
Dr. W. H. Jordan, Director of the New York State Experiment Station, in an address at the recent convention called by the Syracuse Chamber of Commerce endeavored to show by statistics that Agriculture in New York is not decadent. He considered the decrease in agricultural population as the result of a readjustment of the country to meet new conditions caused by the invention of machinery, and the rise of great manufacturing centers. He believes the abandoned farms to be nothing more than an outgrowth of the existing conditions. Dr. Jordan heartily approves of the laboratory style of school house, and would have it the center of all interest in a community.

"Cider and Vinegar Making as a Means of Preventing Waste in the Orchard" is the title of a suggestive article in Green's Fruit Grower for October. A first class cider mill, according to the author, would be a valuable adjunct to every orchard, and if cleanliness and business methods were employed, it would be possible, at a profit to the operator, to turn out a much higher grade of cider than can now be secured. For the average farmer and fruit grower, however, vinegar making is not a paying proposition, as it can be manufactured more cheaply in large distilleries.

The good results of the Bureau of Animal industry in controlling sheep scab are now becoming apparent. On the 15th of October, Secretary Wilson ordered the quarantine removed from the states of Idaho and Wyoming, for it appears that the disease is entirely eradicated in those regions. Good headway is being made in other states, and the men in charge of the work are confident that in a few years this dreaded pest will be a thing of the past.

The American Carnation Society will hold its annual exhibition at Washington, D. C., January 23-30, 1908. Among other prizes, is one offered by Peter Fisher, the originator of the Beacon carnation, of $12 for the best fifty blooms of that variety, $8 for the second and $5 for the third.

The National Grange met at Hartford, Conn., November 13-23. A plan for life insurance was submitted, and the biennial election of officers was held.

The November number of the American Poultry Advocate contains an interesting article describing the electrically operated incubators and brooders of the Cyphers Incubator Company. This latest step in the heating of incubators and brooders attracted considerable attention at the Thirty-second Annual Convention of the American Poultry Association held at Niagara Falls, N. Y., August 13-15, 1907. Professor Rice examined the electrical devices and became deeply interested in them. He hopes to have a sample of each of these incubators, installed in the incubator cellar at the New York State Agricultural College and operated for the benefit of the students and visiting public.

**CAMPUS NOTES**

The leveling and grading of the grounds surrounding the building, especially to the south, is rapidly being completed and already gives a good idea of the fine appearance that will result. Ten thousand crocus and tulip bulbs have been planted in the oval bed directly in front of the building, and eventually shrubs and other flowers will be set in other parts of the lawn.

During the Experimenters' League and Farmers' Week beginning February 17th, several important meetings are to be held here. A three days' poultry institute will be combined with the annual meeting of the New
York State Branch of the American Poultry Association and will be but one of several interesting gatherings. It is hoped that there will be a reunion of regular and special students by classes, and of short course men by clubs, and all class secretaries are requested to communicate with the members of their classes. "Vital statistic" blanks will be sent to former students from the college in the hope of increasing the size of the reunion. Headquarters for the various classes will be provided in the building and it is hoped that a bureau of information will be instituted, with a chief, orderlies and guides to register and assign visitors to rooms in the city, to check baggage and to show new comers the grounds and buildings. A souvenir room will probably be provided for the flags, banners and trophies of various classes. Moreover some plan in regard to a "labor exchange" is also on foot.

During the week exhibits will be shown by the different departments, one evening will be devoted to a grand assembly of all the students, with a suitable program, and the end of the week will be given to the Experimenters' League Meeting. Results of experimental work will be given, and $100.00 in prizes will be distributed for the best essays on this subject. As usual lectures and discussions will be given by men prominent in agriculture. It seems almost unnecessary to urge the students to do all in their power to make the whole week a decided and rousing success.

* * *

Professor Stocking spent some time in Binghamton in November, and lectured before the Monday Afternoon Club on the milk supply of cities, and allied topics.

* * *

The official Dairy Instructors' Association decided at their meeting in Chicago during October, to hold their next meeting at Ithaca during the Graduate School of Agriculture. Professor Pearson was elected president of the organization.

The department of Dairy Bacteriology is working on the question of bitter milk and cream which is causing considerable trouble in the State. It is probably due to bacteria and the department is trying to locate the source of the trouble.

* * *

A part of the milk used in the dairy department during the winter will be obtained from a milk station on the Lehigh Valley railroad. The amount of milk supplied by patrons is increasing each winter.

* * *

The frontispiece presents a view from the dairy building, of the new Judging Pavilion which is also to be made the headquarters of the department of Animal Husbandry. Practically all the work inside has been completed and the main judging room will shortly be open for use. Already the classes are using the lecture room at the northern end of the structure. This room will accommodate 154 students, and being well lighted and convenient to the judging ring, offers many advantages. Directly over this is the office of Professor Wing and his assistants and the special laboratory for the investigation work of the department.

The office in the dairy building formerly occupied by Professor Wing is now used by the Poultry Department, and Professor Rice's former office has been turned over to the instructors in Dairy Industry.

* * *

In the extension course being conducted by Professor Tuck it has been planned to have each student who has elected more than one hour, take charge of some County in the State with reference to looking up and reporting on the agricultural conditions existing there. Twenty-one counties have already been chosen by the students. The first hour for credit will be devoted to practice in public speaking only.
The Library, at the south-eastern corner of the first floor of the main building was opened for students' use November 4th. It is in charge of Mr. A. J. Lamoreux.

* * *

Mr. Nikola Kaumanns, Imperial German Agricultural Attaché to the United States, whose office is in Chicago, visited the College on October 29th.

* * *

On October 26th, W. H. Griffiths, Sp., who last year was in charge of the forcing houses, sustained a serious accident on Percy Field. In jumping over a fence after the Princeton game, he landed on one foot in such a way as to fracture two bones in his ankle. He was taken to the Infirmary and soon regained his old time cheerfulness, but has undergone a long, wearisome confinement since, and the students will be glad to see him in classes once more as soon as he is able to get around.

* * *

On the evening of October 25th, Mr. and Mrs. H. B. Fullerton of Long Island having consented to lecture at that time, a special meeting of the Association was called. The opportunity was taken advantage of by a large number of students and others interested in the work which is being done in the "pine-tree barrens" of the island. Mr. Fullerton began the lecture and with the assistance of a large number of lantern slides, gave a clear, interesting and optimistic account of what the Long Island Railroad Company has accomplished at its Experiment Stations at Wading River and Medford. After covering the more strictly agricultural phases of the work he gave way to Mrs. Fullerton, who, dealing with the more domestic and home-life at the station, concluded an instructive and interesting evening.

* * *

Considerable interest is being taken in the Round-Up Club this year, and already the membership is nearly forty. Excellent meetings are held every Monday evening, and lively and instructive discussions are maintained on topics of interest to Animal Husbandry students. For the meetings in November different members of the instructing staff gave reviews of Professor Davenport's recently published book, "Principles of Breeding." This work is something new, and embodies the latest ideas on that subject. Any one who is at all interested in Animal Husbandry cannot afford to miss these meetings.

* * *

The Pomological Division of the Department of Horticulture will hold its first fruit exhibit November 20-23 inclusive. This exhibit will be of great interest and educational value to the students as it will familiarize them with the different varieties of fruits from this State and many others, as well as give them some idea of the different methods of judging. Two sets of ribbons will be awarded, one for sectional exhibits and one for the best entry of a variety considering the country as a whole. The judges will be Professor Craig, Mr. T. B. Wilson and Mr. C. E. Hunn. The exhibit will be conducted entirely by the students under faculty supervision, though the department is defraying the expense of securing the fruit and enabling the committee to get a large assortment of various kinds of fruit from this State and other fruit sections of the country. Though many fruit growers have already disposed of their fruit, yet early indications point to a large exhibit.

The chairmen of the different committees chosen were, Fruits, L. A. Toan; Exhibit, Miss Salton and C. J. Hunn; Package, R. R. Robb; Arrangements, W. R. Salisbury; Awards, W. J. Sowder.

* * *

The affairs of the musical organizations of the College are rapidly increasing in importance and success. Early in November, there was a consolidation under a single constitution
and one set of officers, resulting in the formation of the Cornell Agricultural Glee and Mandolin Clubs. At that time the membership was about fifty-five, thirty of whom were in the Glee Club. By means of a strenuous but successful canvass of the student body at the November assembly, generous and essential financial assistance was secured.

* * *

On Friday evening, November 8th, the student body was extremely fortunate in being given the opportunity to hear Dr. Webber lecture on the work that has recently been done in Florida upon the improvement of hardy orange varieties. Having conducted most of the work himself, besides being in the foremost rank of plant-breeders in America, Dr. Webber was able to explain most clearly and completely the methods, results and significance of the work, giving detailed descriptions of the hybrids, and the parent forms, some of which may henceforth join the many organisms that have produced present types, while they themselves become gradually extinct. Having brought from the south a collection of the different varieties, he was also able to furnish concrete illustrations, and the “ade-making” qualities of several were tested in a way that appealed in more than one sense to the audience.

* * *

The annual Chrysanthemum Show, held under the auspices of the Lazy Club at its meeting on November 4th, and continuing throughout the week as an exhibition, was again a distinct success. In the enforced absence of Mr. Griffiths who had been in charge of the chrysanthemums, L. D. Batchelor, Assistant in Horticulture, made arrangements for the show, and succeeded in presenting a fine display. The great majority of blooms were from the forcing houses, and were unusually beautiful in color and form, comparing favorably with the exhibits sent from some of the out of town growers.

* * *

The second Assembly, on the evening of November 7th, was even more successful and enjoyable than the first, and was full of a spirit of geniality and activity that was most gratifying. It marked the first appearance this year of both the Glee and Mandolin clubs, who received, most deservedly, enthusiastic applause and commendation.

After opening the Assembly with Alma Mater, they gave two numbers and an encore, and were followed by a piano duet by Messrs. Rubinow and Sturgis. Dean Bailey then brought out many beauties and inspirations of November with its rain and drear—reading the sentiments of various “Nature-poets” in regard to it, and closing with a recitation of his new, long-awaited poem on “The Rain.” Succeeding his address, some ideas were expressed in behalf of the Glee club, and with the assistance and impetus of Professor Whetzel a collection was taken from those present for the maintenance of the clubs. As if in appreciation, the two clubs then gave admirable renditions of more numbers, after which the social hour was enthusiastically enjoyed. The matrons of the evening were Mesdames Craig, Cavanaugh, Troy, Mann, H. Riley and Ayers.

* * *

On November 8th and 9th, Professor Rice addressed an enthusiastic Poultry Institute at Oneonta, where endeavors are being made toward improved agricultural conditions. With him went also M. P. Jones, ’08, this being the first instance in the development of the idea which led to Professor Tuck’s course in Extension Work. It is hoped that with the training which this course affords many students will be enabled to address institutes and bring the farmers into closer touch with the college through channels of mutual benefit.
At a regular meeting of the Agricultural Association on November 5th, part of the business enacted was the presentation of shingles for intercollegiate athletic work.

FORMER STUDENTS

Editors’ Note—We want to make the “Former Student” news one of the most interesting parts of the paper. To do this we are dependent on those who have graduated or left the college sending us news of their whereabouts and of what they are doing. We try to write each personally but this is a difficult task. You can save us time and expense by voluntarily sending in items of interest frequently. Won’t you cooperate with us in making this the best part of the paper?

'98, M. S. A.—Horace Atwood was born in Cayuga County, N. Y., on August 1, 1868, his parents having come from New England some time before. Entering Cornell in 1887, he took the regular course and was graduated in '91 with the degree of B. S. A. He accepted a position as Instructor of Agriculture at Pratt Institute, Brooklyn, but remained there but one year, entering the University of Wisconsin as a student in '93. After a year there he took a position in the creamery business and continued in that kind of work until chosen for Assistant Agriculturist at the West Virginia Experiment Station in 1897. Before taking up his work in that capacity however, he spent another year at Cornell, receiving his Master’s degree. Since joining the staff of the Experiment Station, Mr. Atwood has been active in agricultural work and has joined the ranks of “making-good” Cornellians, though not “on the farm.” He is author of “Lectures on Poultry Culture” and joint author of sixteen bulletins on various agricultural topics. Besides his position in the Station, he also holds that of Poultryman of the West Virginia State Board of Agriculture, and is a member of the Committee on Education of the American Poultry Association, the West Virginia Grange, the State Live Stock and the American Breeders’ Associations. In 1900 he married Miss Susan Davies of Arden, N. Y., and now has his home at Morgantown, where we wish him every success and prosperity in his future work.

'06, M. S. A.—We learn that Professor Claude I. Lewis is still at the head of the Department of Horticulture in the Oregon Agricultural College at Corvallis. The department has been reorganized. Whereas formerly (May, 1906) there was but one member of the staff, there are now seven, and whereas courses in Horticulture were given only in the senior year, they may now be taken from the freshman year throughout the course. A horticulturists club, patterned after the Lazy Club, has been organized and students are enthusiastic over the work. Extensive experiments are being carried on under the Adams Fund. Professor Lewis was offered the Directorship of the Experiment Station at Puyallup, Washington, in August, but inducements of such a nature were offered him to remain at Oregon that he has decided to do so. He delivered a paper at the recent meeting of the American Pom-
The Cornell Countryman

The Cornell Agricultural Society at Jamestown, on "Features of Fruit Growing at Hood River, Oregon." Last but not least, Professor Lewis is the proud father of a daughter born October 14th.

'92, M. S. A.—Irwin D. Aldrich, who did some postgraduate work here in 1892 in the agricultural department, and was elected president of the Agricultural Society, is near his former South Dakota home, publishing a newspaper at Big Stone, and looking after the rentals of several farms which he owns in the vicinity. He has served the state as Regent of Education, and has been secretary of the board of Regents of Education for more than six years. This is a board of five members, which has entire charge of the seven state schools, the University, the State College of Agriculture and Mechanic Arts, the School of Mines, (in the Black Hills), and four Normal schools. He is married and has four children.

'06, B. S. A.—M. W. Evans writes us from Pullman, Wash., that he is still working on forage crop problems throughout the northwest as Agronomist of the U. S. Department of Agriculture. He also has charge of a grass garden which the Department maintains there, in cooperation with the State Experiment Station. He says, "Washington State College is one of the best colleges in the northwest, but it has a long road to travel before it can compare with Cornell. It does me good to see what a reputation Cornell has. I have talked with at least seven or eight students, who are expecting to go to Ithaca for postgraduate work after completing their course here." We note that Evans has not lost the Cornell spirit.

'06, B. S. A.—Since January 1, 1907, Wilfrid G. Brierley has been connected with the National Farm School, Pa., as Horticulturist. He teaches Botany and Horticulture, and is Superintendent of the grounds and orchards. The school has a large modern greenhouse 100 x 43 feet, and grows carnations and tomatoes for the Philadelphia market.

'06, B. S. A.—H. L. Westover was appointed to the United States Soils Survey in April of his Senior year, and took up the work immediately. Since then he has been working in various parts of the South, particularly in Alabama. He has recently been changed from Eastern Maryland to Corpus Christi, Texas. Before going to his new location Mr. Westover was given a vacation and improved a part of it by calling on his old friends at Cornell. He was greatly pleased at the progress made in the college since he last saw it.

'05, B. S. A.—S. M. Herrick came to Cornell to specialize in Agricultural Chemistry, and shortly after graduating was appointed First Assistant Chemist at the State Experiment Station, Blacksburg, Va. This position he now retains.

'88, B. S. A.—G. D. Brill formerly of Lake Placid Club is now superintendent of the Broad Brook Farm at Bradford Station, N. Y.

'06, B. S. A.—J. H. Barron was in town for a few days last month. He is still Assistant in Agronomy at Pennsylvania State College, State College, Pa.

'06, B. S. A.—We were pleased to receive a visit from C. F. Shaw, Assistant Professor of Soils at State College, Pa. He enjoyed the Princeton game with us.

'05, B. S. A., '07, M. S. A.—L. G. Dodge has been Scientific Assistant in the Bureau of Farm Management, Wash., D. C. He is working on Farm Management problems in New York and New England. We were glad to see him in town a few days in the early part of the month.

'05, M. S. A.—A. W. Gilbert is taking advanced work here with intentions of taking up teaching work after obtaining his Ph. D.

'05, Sp. Word reaches us that F. H. Cardozo resigned on September 15, 1907, as Horticulturist at the Tuskegee, Ala., Agricultural Experi-
ment Station, to accept a better position in a larger field of work. He is now Director of the Agricultural Department in the Florida State Normal and Industrial School, for colored students, at Tallahassee, Florida. Mr. Cardozo is very successful in his work at this school. We acknowledge his subscription to the "best agricultural journal in this country, The Cornell Countryman. Please don't let me miss a number as I feel lonely without it." A daughter was born to Mr. and Mrs. Cardozo on June 8, 1907.

'06, Sp.—Ernest Kelly has resigned as Sanitary Milk Inspector at the Fairfield Farms, Caldwell, N. J. He is now testing for this station, being at present engaged in testing the University herd. Mr. Kelly spent four years at Cornell, specializing in dairy work.

'03, Sp.—F. H. Richards has resigned as farm superintendent for Dr. R. F. Brush at Mount Vernon, N. Y. He was in town for a few days last month.

'03, Dairy. Burt Bell has for some time been manager of the McDermott Creamery and Shipping Station at Smyrna, N. Y. Some time ago he was married to Miss Stella Wilbur of Upperville, N. Y. In the spring of 1907 he went to Canton, N. Y., to take charge of A. McDermott's ice plant at that place.

'06, W. P.—Walter L. Lyon was married to Miss Anna Lwettgerott, at Kilbourne, Wisconsin, on Oct. 29, 1907.

'05, W.—A. M. Gillespie was back for a few days recently and attended the November Assembly.

BOOK REVIEWS

FORAGE CROPS. By E. B. Voorhees, Director New Jersey Experiment Station, Professor of Agriculture, Rutgers College. Illustrated. 5½x8 inches. 400 pages. Cloth. The Macmillan Company, New York. Price $1.50.

This new addition to the Rural Science Series, though full of interesting and practical information for the general farmer, should be of special interest to dairymen. While primarily a discussion of the value and growing qualities of the common varieties now used for soilng crops, it also serves as a complete guide in the choice of new kinds. Much emphasis is placed upon such rotations as shall give, among other things, a continuous supply of forage throughout the growing season. By considering forage crops as roughage, the author includes not only the crops used in soilng systems but also those used for pasture, hay and silage. Thus after mentioning the general, and relative values of succulent and other kinds of feeds, he takes up in regular order the different forage or roughage crops—as for example, millet, corn, alfalfa, the clovers, root-crops, etc. In each of these divisions—which are well illustrated throughout, he enumerates the conditions under which the different crops may be grown, and discusses their relative advantages and disadvantages. In short this book would seem to fill an important place in the library of the dairymen and farmer.


In this volume we find an extensive and important subject comprehensively treated in a convenient and interesting manner. It may be roughly divided into two general divisions, the first discussing the broader side of the subject, the second taking up specific crops and their particular insect enemies and the methods of combating them. The first part of the book is subdivided into considerations of entomology in general, the effect of ordinary farming methods on insect pests, mechanical preventive measures, and a brief treatment of spraying apparatus and mixtures.

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his insect enemies in a not too technical way, this book will prove a "find." Yet it is in no wise elementary, as much of the material is compiled and practically all the illustrations are taken, as the author says, from bulletins, government investigation and other authentic sources. The illustrations are profuse and succeed in giving a very good idea of the pests described.


The very name of the author would call attention to this new book and the reader would not be disappointed after further investigation. As both a manual for the use of bacteriological students, and a reference and instructive book for the dairyman and up-to-date farmer this volume fulfills its mission. As Dr. Conn remarks the time has come when every dairyman must have a knowledge of bacteriological principles, and just such a knowledge can be gained from this treatise.

It is divided into two distinct parts, the first and larger, being devoted to a consideration of general bacteriology, an enumeration and description of all dairy organisms, an explanation of their relation to all phases of dairy industry and advice as to the necessary precautions in obtaining clean, healthy products. The second division is in the form of a laboratory manual, and while it is especially designed for student readers, it also offers information and instruction that can be made use of by the practical agriculturist. The book is profusely illustrated throughout, the cuts showing the various kinds of bacteria and views of conditions, etc., elucidating the more general portions of the text.

Note:—All books reviewed in this column may be obtained through the Countryman at net prices, as noted above.

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FARMING IN THE ARID WEST

By W. M. Jardine

Agronomist in Charge of Experiments with Dry Land Cereals U. S. Department of Agriculture.

THE term, arid West, as used in this paper refers to that section of the United States lying west of the 100th meridian W. longitude, and includes the states of California, Wyoming, Montana, Washington, Oregon, Colorado, Nevada, Utah, Arizona and New Mexico, as well as the western part of the Dakotas, Nebraska, Kansas, Oklahoma and Texas. With the exception of a narrow strip along the Pacific coast, this entire area lies within a belt having an annual rainfall of less than twenty inches, with an average of about fifteen inches. The agriculture of this region depends largely upon irrigation. There lie within this belt, however, millions of acres of land equal in fertility to any in the world, which for two reasons can never be irrigated; first, because of the scarcity of water; and second, because a large proportion of it lies above the water line. Until within recent years the land above the water line was used entirely for grazing purposes, but gradually the large stock ranches have been supplanted by homesteads. This gradual change has occasioned the development of the system known as "dry farming." We have then in the Arid West two kinds of farming, irrigation farming and dry farming.

The Irrigation System is essentially an intensive system of farming. The large holdings have, for the most part, been divided into small farms; and the amount that any one person may "enter" has been limited, under the Reclamation Act, to from forty to eighty acres. It is safe to say that forty acres will be the average sized farm in the future. Such an area, if properly handled, is large enough to support one family comfortably.

The crops usually grown are sugar beets, potatoes, tomatoes and alfalfa for forage and fruit. These crops require considerable attention and consequently the cost per acre for producing a crop is high. However, under the irrigation system, where there is an abundance of sunshine, as in the West, it is possible to grow abnormally large crops, resulting in considerable profit over and above the high cost of production. Thirty tons of sugar beets per acre, eight hundred bushels of potatoes, and other crops comparatively as high, are not uncommon yields.

The kind of crops best adapted for an irrigation farm, depends largely upon the location of the land and the training and ability of the farmer.
Usually, however, one or the other of the three following agricultural industries, all of which are flourishing in the West today, will afford the best opportunities; sugar beet growing, fruit production and dairying. All of them when properly handled can be made very profitable.

The capital necessary to begin a farm of forty acres will vary considerably. Well improved farms under irrigation are selling today for from $80 to $1000 per acre, according to location and improvements, while undeveloped lands, now ready for the plow, can be bought for from $40 to $50 per acre, payable in ten equal annual payments. One should have at least $1,200 to $1,500 with which to meet the necessary expenses previous to harvesting the first crop on an average farm of forty acres. These expenses may be estimated in a very general way as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
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<tr>
<td>1st payment upon land (40 acres)</td>
<td>$160</td>
</tr>
<tr>
<td>1st team horses</td>
<td>$400</td>
</tr>
<tr>
<td>1st set harness</td>
<td>$50</td>
</tr>
<tr>
<td>1st plow (sulky)</td>
<td>$60</td>
</tr>
<tr>
<td>Harrow, cultivators, seed, etc.</td>
<td>$100</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$200</td>
</tr>
</tbody>
</table>

Total: $1070

This amount will obviously cover only the cost of those implements absolutely necessary to do even very crude farming. Assuming a capital of $1,200 to $1,500 in the beginning there will remain a margin of $200 to $400 with which to provide for unforeseen expenditures. The income from
crops grown the first year, where 20 acres are put under cultivation, should be about as follows:

**Wheat, 10 acres (seeded with alfalfa), 400 bu. at 60 cents per bu. $240**

Oats, 5 acres, 300 bu. at 35 cents per bu. ........................ 105

Barley, 5 acres, 250 bu. at 50 cents per bu. ........................ 125

**Total ........................ $470**

This money, together with what a man can make at odd times, especially during the winter months, should be sufficient to meet all expenses of the second year. The 40 acres cropped the second year should produce an income of from $1,500 to $2,000, providing that such crops as sugar beets and potatoes are grown on the land seeded to oats and barley the first year.

Irrigation farming has developed to a wonderful extent during the past few years, due in greater part to work carried on by the Reclamation Service of the United States government. Its present extent and possibilities are brought out by the following extract from a recent paper read by Professor Samuel Fortier, (Chief of the Office of Irrigation Investigations, U. S. Department of Agriculture,) before the National Irrigation Congress, held at Sacramento.

"It is sixty years since Americans first began the practice of irrigation. Their efforts in that time have resulted in the settlement and cultivation under irrigation of something like eleven million acres. Of this total about ten million acres are to be found in the arid states and territories. The conversion of so large an area of barren sands into productive farms and orchards and the establishment of the many industries which these fields and orchards foster and maintain has not proceeded with any great degree of regularity. There have been decades when little progress was made and these have been followed by periods of the wildest expansion. In no period of the past has such progress been made in the construction of irrigation works as has followed the passage of the Reclamation Act of 1902. At no other period in the history of the West has so large an area been thrown open for settlement."

Dry farming has come into prominence only within the past five to seven years, although for many years previous some farming without irrigation was practiced in various places on dry lands. Since no definite system was followed, however, the results were only occasionally recorded. In recent years, however, considerable light has been thrown on this subject as a result of investigations in dry land agriculture, carried on by the state experiment stations located within this territory and by the Department of Agriculture in cooperation with these states. The information thus obtained together with information collected from successful dry farmers has aided materially in placing dry land agriculture on its present basis.

Up to date the energy of the dry land farmer has been directed largely towards the production of a single crop, wheat. Such a system is bad and should always be discouraged, especially when a variety of crops can be grown, as is the case here. Any of the following crops have been found to do well on the dry lands and should therefore be grown in rotation with wheat: Oats, barley, corn, rye, emmer, alfalfa and grasses.

There is today sufficient land of the dry land type in the Far West to supply thousands of homes for new settlers. There are perhaps fifty acres of dry farming land to every acre that can ever be irrigated. But under the dry farming system more than under any other system of farming, success or failure will be measured by the knowledge and ability of the man. A farmer who has succeeded under humid conditions is just as likely to fail under arid conditions as is any other man, unless he has made a study of conditions previous to beginning operations.

In order to make dry farming profitable, it must be handled on an extensive scale—the average sized farm
should not be less than 320 acres. This will make possible the use of large machinery and the cost of operating will be reduced to a minimum. The two horse hand plow must give way to the six or eight horse team and the gang plow. With all other farm operations handled on the same scale, one man will be enabled to operate a large tract of land.

Each year thousands of homesteaders are settling in the West, and as a result of this movement, land in desirable locations yet open for entry is becoming scarce. At present large tracts of land are held by railroads and other companies, most of which is on the market and is selling for from $5 to $15 per acre, usually payable in ten equal annual payments.

The amount of capital that will be required to start a farm of 320 acres will be a little more than that necessary to start a forty acre irrigated farm, or from $1,500 to $1,800, assuming that one-half of the 320 acres is put under cultivation the first year. At least $800 will be used up in buying horses. If only 100 acres are cultivated the expense will be considerably less. One hundred and sixty acres of land, seeded to wheat the first year, should yield an income of $1,500 to $2,000 or twenty bushels of wheat to the acre at 60 cents per bushel.

That there are splendid opportunities for dry land agriculture in the West today cannot be disputed. Notwithstanding this fact many men are becoming over-enthusiastic, owing to a series of wet seasons, which have temporarily transformed the arid West into a semi-humid condition. Many people are beginning to believe that the climatic conditions are permanently changing, which of course is not the case if we are to believe the records of the past. All data extending back for many years, indicate that there have always been alternating cycles of wet and dry seasons. We are now enjoying a wet cycle in the arid West and excellent crops have been grown by the unskilled farmer as well as by the man skilled in farming.

Many others are being made over-enthusiastic through the effort of un-
scrupulous promoters. The West today is overcrowded with "Get Rich Quick" real estate men—men who are in this business only temporarily. They have no interest in the permanent development of the country. Their only object is to swindle the public out of its money. When this is accomplished they move to new localities and repeat their operations. They leave the land in the hands of clerks, school teachers and others—a class of people absolutely without agricultural training, either theoretical or practical. As a result, many of these are bound to fail, unless they have sufficient capital to carry them over the first few years.

In conclusion, the writer would therefore advise any prospective settler not familiar with arid conditions to spend one year studying them and observing the methods used in farming in that part of the country wherein he expects to locate. Time thus spent will never be regretted, as it will mean a saving of time and money, and possibly avoid a complete failure in the long run.

THE BEGINNING OF A HOME ON THE OPEN PRAIRIE

THE COST OF PRODUCTION IN FRUIT GROWING

By S. W. Fletcher
Michigan Agricultural College

THE rapid development of commercial fruit growing within fifty years is one of the most notable features of American Agriculture. The Twelfth census reports that on 1.4%, or 86,094, of the 6,149,584 farms in the United States, fruit growing is the leading industry. These farms included 6,064,877 acres of fruit plants which produced, in 1899, 212,866,646 bushels of fruits, worth $83,751,840. In value of the product, fruit growing was eighth, the crop of corn being worth $828,000,000; hay and forage, $484,000,000; wheat, $369,000,000; cotton, $323,000,000; oats, $217,000,000; vegetables, $113,000,000; forest products, $109,000,000; potatoes, $98,000,000; fruit, $131,000,000. According to the same report, there were $404,000,000 invested in fruit farms, as compared with $5,493,000,000 invested in hay and grain farms and $5,691,000,000 in the live stock industry.

These figures reflect the rapidly in-
creasing commercial importance of the fruit industry. Unquestionably the next census will show that 25% or more has been added to the amount of capital invested in fruit growing. The business of fruit growing is expanding more rapidly than most other lines of crop industry.

The rapidly increasing production of fruit has set in motion certain economic forces which the fruit grower of today may well consider. As the area in fruit becomes larger, competition becomes stronger and the prices received for fruit are correspondingly lower. In most cases, the larger demand for fruit, due to the increase in population and the more common use of fruit as a staple article of diet, have not, fully offset the increasing competition. In general, the prices received for fruit are lower now than they were fifteen years ago; that they will go lower still we have no doubt.

To illustrate the fact that prices received for fruit are tending lower because of increasing competition, and also that this general tendency is continually upset somewhat by fluctuations in the relation between the supply and the demand for fruit, I quote the following market reports on Baldwin apple, Bartlett pear, Concord grape and "fancy" quinces. These quotations were taken from the files of The Rural New Yorker from 1880 to 1905 and are for the general market of New York City. The market quotations taken were those for the week nearest the middle of each month. The price given for the year was secured by averaging the prices quoted for the several months. In all cases the quotations are for "fancy" fruit.

<table>
<thead>
<tr>
<th>Year</th>
<th>Baldwin per bbl.</th>
<th>Bartlett per bbl.</th>
<th>Concord per lb.</th>
<th>Quince per bbl.</th>
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<tr>
<td>1880</td>
<td>$1 55</td>
<td>$10 50</td>
<td></td>
<td>$5 00</td>
</tr>
<tr>
<td>1881</td>
<td>3 50</td>
<td>6 00</td>
<td></td>
<td>6 00</td>
</tr>
<tr>
<td>1882</td>
<td>3 50</td>
<td>11 65</td>
<td></td>
<td>5 00</td>
</tr>
<tr>
<td>1883</td>
<td>3 94</td>
<td>5 87</td>
<td>4 7/8</td>
<td></td>
</tr>
<tr>
<td>1884</td>
<td>2 05</td>
<td>6 66</td>
<td>6 1/8</td>
<td></td>
</tr>
<tr>
<td>1885</td>
<td>1 80</td>
<td>4 00</td>
<td>4 7/8</td>
<td>4 25</td>
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<tr>
<td>1886</td>
<td>2 75</td>
<td>8 50</td>
<td>4 7/8</td>
<td>9 00</td>
</tr>
<tr>
<td>1887</td>
<td>2 50</td>
<td>4 25</td>
<td></td>
<td>4 50</td>
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The average price received for Baldwin apples from 1880 to 1895 was $2.77 as compared with $2.80; the average from 1895 to 1905, for Bartlett pears, $6.56 as compared with $4.04; for Concord grapes, 4c as compared with 2½c; for fancy quinces, $4.61 as compared with $3.78.

The fruit grower of today need not view this descending scale of prices for some fruits with alarm. Reduced prices have been met, and probably will continue to be met for some time to come, by a lower cost of production, so that the profits may still be as large as in earlier years, though the prices received are smaller. But it is evident that he must look forward to the time when fruit growing will be profitable only to the man who can put superior fruit on the market at a very low cost of production. This means congenial climate, favorable soil, varieties that are perfectly adapted to the climatic and soil conditions and to the demands of the market, and skill in all the details of culture and marketing. In every trade and industry the man who can produce the goods a trifle cheaper than his competitors has a tremendous advantage over them. So it is in fruit growing.

There are, of course, other things to be considered besides the ability to produce fruit cheaply; nearness to a good market, for example, may be worth more to the grower than a low
cost of production. But it is undeniable that there is increasing necessity for the fruit grower to figure on the cost of production as accurately as he can, and to reduce it to the lowest point consistent with market returns. It is not possible for him to estimate the cost of producing his articles with anything like the accuracy of the manufacturer. The raw materials of the fruit grower are sunlight, air, water, soil, and these are manufactured into fruit under such varying conditions that it is impossible to assign values and predict results accurately. But a fairly reliable estimate can be made, and I urge the necessity for such a calculation in view of the increasing competition in the fruit business.

**COST OF LAND**

The main items which enter into the cost of production in fruit growing are land, capital and labor. When the fruit grower buys land, he is really buying its fertility, or its power to produce crops. He is buying nitrogen, potash and other plant foods, soil water, soil texture, the heat and light shed upon that soil by the sun. He is buying, not mere dirt, but all the energies and forces above the soil, as well as in it, that are needed to transform or manufacture plant food into apples, peaches, strawberries. The value of different soils as fruit factories varies greatly; the fruit grower learns that this often depends fully as much upon their texture as upon their chemical composition. He learns, moreover, that while man can do much to improve poor soils, and so increase their productivity—by tillage, green-manuring, irrigation, etc.,—yet Nature does more to provide a soil with desirable qualities than man can ever do. It is for his interest to get land that already has a large productive capacity, if it can be procured. The need of under drains, for instance, may increase the cost of producing fruit several cents a bushel. There is much fruit planted on land that is so poor, in such bad heart, or so poorly drained that it has not the power to produce fruit economically.

The amount of capital that the fruit grower invests in land is large. The average size of the fruit farms of the United States is 74.8 acres as against 159.3 acres for hay and grain farms and 226.9 acres for live stock farms. But the average fruit farm is worth $71.55 per acre, while the average hay and grain farm is worth $30.34 per acre and the average stock farm but $21.14 per acre; so that the value of the average fruit farm is $5,374, of the hay and grain farm $4,834 and the stock farm $4,797. The census shows that 72.4 of the value of the average fruit farm is land, and this constitutes 72.3 of the value of the hay and grain farm, and 59.9 of the value of the stock farm. So it appears that the fruit grower usually has as large an investment in land as other husbandmen.

**COST OF CAPITAL GOODS**

Under this general heading are included such items as machinery, implements, buildings, farm animals, fertilizer, spraying materials, cash capital and other things that are needed in growing and handling the crop. Here again the fruit grower has a heavy investment.

A machine or implement that does work formerly performed by hand, and does it cheaper, lowers the cost of production. The fruit grower who uses the most improved cultivators, sprayers, pruning tools, so that the work is done cheapest, produces his fruit for the least money and, to that extent, has an advantage over his neighbor who uses tools poorly adapted for the work. One should not begrudge the price of a new tool, if it will do the work in less time or with greater thoroughness.

The fruit grower is a specialist in agriculture; hence he requires more tools than the general farmer. The value of the implements and machinery on the average fruit farm of 74 acres is $175 or $2.34 per acre; on the average hay and grain farm of 159 acres, $166 or $1.04 per acre; on
The Cornell Countryman

The average livestock farm of 227 acres, $151 or $.66 per acre.

The point of view of the fruit grower regarding the amount of capital that he can afford to invest in implements should be this: he cannot afford not to have an implement that will enable him to produce fruit cheaper. The investigations of the Labor Bureau have led to the conclusion that in the last twenty years, by the aid of machinery and the substitution of horse, steam and other power for hand labor, the effectiveness of human labor on farms has been increased one-third. The cost of producing a bushel of choice fruit is certainly lower than it was fifteen years ago. Has the fruit grower estimated how much the use of a power sprayer decreases the cost of protecting large orchards from pests, as compared with a hand sprayer?

The amount of capital invested in buildings, machinery and live stock on the average fruit farm is 27.6% of the total investment, as compared with 27.7% on hay and grain farms and 40.1% on stock farms. The investment in fertilizers is usually much higher, being at the rate of 30 cents per acre for all the fruit farms of the country, while hay and grain farms invest 4 cents per acre and stock farms but 2 cents. There is, of course, much variation in this point. Most of the fertilizing for fruit is done east of the Mississippi; a very large proportion of the western fruit farms have never been fertilized. In addition to these items of required capital goods, a certain amount of cash must be kept on hand to run the farm, varying from $4.00 to $30.00 or more per acre, according to the valuation of the land and the intensity of culture.

COST OF LABOR

The labor problem enters into the fruit grower’s budget of expense quite heavily, especially if he grows small fruits. According to the twelfth census there is but one hired farm-hand to every three farms. This shows that most of the work on the average farm is done by the farmer and his family. On the large fruit farm hired labor is usually necessary, especially at harvesting. The expenditure for labor is $2.46 per acre on the average fruit farm as against 47 cents per acre on the hay and grain farm and 29 cents per acre on the stock farm. Although the average fruit farm is only one-half as large as the average hay and grain farm, it requires more labor, largely because it is cultivated more intensively. One of the increasing difficulties in fruit growing, as in other lines of farming, is to get sufficient reliable help. The grower of perishable fruits is most concerned about this phase of the business.

The man who is locating a fruit industry should consider very carefully where he can get labor and what it will cost. There is much difference in localities in this respect. In general, the nearer to a city or town the fruit farm is located, the more easily the labor problem is solved. This advantage may help to offset higher valuation of land. Human labor is the most expensive item that enters into the cost of producing a bushel of fruit. The effort should be made to reduce the amount of hand labor that is needed by using improved machinery and tools.

FRUIT ZONES.

Besides these three primary factors in the cost of producing fruit—land, capital goods, and labor—several other points bear a very important relation to the problem. The adaptability of the fruit or variety to the location, the site and the soil in which it is grown may have more influence than all the other points that have been mentioned. Fruit growing is bound to become more and more segregated, for increasing competition will make it impracticable to grow a staple fruit except in the locality and on the soil where it thrives best, and so can be grown cheapest. The demands of a nearby market, however, will offset this to some extent; and market conditions, cost of land and other factors
may sometimes make it expedient to grow a fruit outside its most congenial clime.

What is true of fruits as a whole, is true also of varieties. Certain varieties thrive best in certain localities or on certain soils. It costs less to raise a bushel of fruit if the variety is happy in its environment than if it is not. This one point may have more to do with the cost of production than all others. The man who tries to raise Baldwins in a locality where a tree as hardy as Wealthy is needed, is sure to fail; the man who tries to raise Warfield strawberries on heavy land, better adapted for Parker Earle, must expect the cost of producing his berries to be a little more than if he had fitted the variety to the soil more skillfully. The varieties that succeed best can usually be grown the cheapest; and usually, but not always, they will pay the best.

The expense of fighting insects and diseases is a large item in the cost of producing fruit, and this expense varies widely in different sections. There are irrigated valleys in the West where it costs 40 cents per tree to protect apples from codling moth; and there are other areas where apples can be protected from the same pest for 10 cents per tree. Likewise, it costs 15 cents per year to protect a peach tree from San Jose scale in some sections and nothing in others. Fire blight may ruin half the pear trees in one locality; another locality may be exempt. So one of the important points for a prospective fruit grower to look after is the probable cost of fighting pests and diseases and the probably unavoidable loss because of them. He may find that one locality offers great advantages over another in this respect. This point is of large and growing importance in estimating the cost of producing fruit.

SINGLE CROP OR DIVERSIFIED FARMING

The cost of producing fruit will be influenced to a large extent by the kind of farming; whether only fruit is grown or mainly fruit with other crops or stock as a side issue. Seventy-five years ago, when most of the population lived in the country, the aim of the farmer was to produce the articles that were necessary to supply the needs of the family. He produced small amounts of all the corps that would grow at all on his farm. Now the farmer grows crops for market, not for his household. The growth of cities and increasing competition have made it necessary for the majority of farmers to specialize along some line and to grow only the crops or raise the stock that succeed best on their farms, and to purchase those necessities that they can buy cheaper than they can raise them. Agriculture is becoming more and more specialized.

The business of fruit growing is one of the most specialized lines of agriculture. It is usually conducted on small farms under intensive culture and but a few kinds of fruit plants are grown. Many fruit growers have no other business. There are economic advantages in this arrangement, but there are also great disadvantages. In many cases fruit could be produced cheaper if a certain amount of other crops were grown, or some stock kept. It is all right for the manufacturer to produce but one article, for he can work on it all the year. The crop of the fruit grower, however, occupies his attention but part of the year. There is much loss in unused capital, labor, teams, tools and other capital goods during the remainder of the year.

I believe that there is a tendency to specialize too highly in fruit growing and that in many cases it would be more profitable to the fruit specialist to grow a certain amount of other crops, or keep a certain amount of live stock. He should, of course, make fruit growing his main business, and select such other interests as will most effectively fill in the gaps that appear in all kinds of specialized farming. Even though the crops he selects may not be nearly as profitable in themselves, as fruit, yet the total profit from the farm for a series of
years may be greater, since machines, labor, and capital goods are kept in use. In short, the fruit grower should endeavor to have supplementary work which will not compete with the fruit crop; that is, which will not need a large amount of care at the time when the fruit crop demands attention. Certain lines of stock husbandry in which the animals are fed in winter and pastured in summer are practicable in some cases. Remember also the value of the manure for fruit. Dairying, of course, would come in competition with the fruit crop. In most cases some line of farm work can be found which will not encroach seriously upon the fruit crop and which will make use of the capital goods and labor of the farm that otherwise would be idle. To that extent it will cheapen the cost of producing fruit.

Added to the cost of producing the fruit is the cost of placing it on the market. Here, also, are many points that make for profit or loss. The cost of harvesting and packing, the cost of packages, the distance of the orchard from the railroad or shipping point, the character of the roads between the orchard and the shipping point, the cost of transportation and commission, these and other points should be figured on. Every mile that an orchard is distant from a shipping point adds to the price at which the grower can put fruit on the market at a profit. The cost of placing fruit on the market is as fluctuating as the cost of producing it, and is not within the province of this article.

THE PROFITS IN FRUIT GROWING

The profits in fruit growing depend upon the cost of production, the cost of marketing and market conditions. There is more variation in the income from fruits than from most other farm crops. The average income, however, is higher than the income from other common lines of husbandry.

The last census shows that the average incomes in different lines of farming are: Fruit, $915; live stock, $787; dairy, $787; cotton, $430. But the gross income means nothing, it is the per cent received on the capital invested that counts. Census statistics show that the average fruit farm returns 9.6 per cent interest on the investment. Very much larger returns than this are common. On the whole, the returns in fruit growing are apt to be larger than the returns in general farming, provided the same degree of intelligence, energy and capital is invested in each case. The fact that 83 per cent of the fruit farms of the country are owned by the men who own them, as compared with 48 per cent of hay and grain farms and 68 per cent of dairy farms, is further evidence that the fruit growers of the country are making their business pay. The census says: "Fruit farms have a value above the average, and a higher per cent of them are owned than of farms of any other class."

I have purposely left until last the most important item in the cost of producing fruit. This is the personality and skill of the man. This counts more than all else, for the right sort of a man can over-ride obstacles, avoid mistakes and make fruit plants respond where a less skillful or less energetic man would fail. The fruit grower is so closely dependent upon physical conditions, which are unstable, and upon soil and market conditions, which change from year to year, that it is not possible for him to do his work by rules or estimate his expenses with the mathematical exactness of the manufacturer or merchant. It is constantly necessary for him to adjust himself to new commercial and physical conditions. There is, of course, an element of chance in the business, but this is very small as compared with the almost unfailing regularity with which success follows energy, skill and judgment.
TO anyone contemplating the breeding of high class cattle, I would say, "Have you a natural love for animals, an enthusiasm for the business, and a willingness to learn and not plod on in the same old ruts." I was very ignorant of the dairy business when we began some years ago, and many mistakes, and costly ones were made. Now I can say that such success as I have had has come from the fact that I have been a willing learner from those who have trodden the path before me, coupled with attention to detail and a sincere effort to put good methods into practice.

It seems to me that three important requisites to dairy success are, first, suitable food and an abundance of it; second, good care and comfortable surroundings; and third, the good dairy cow to respond to these conditions.

To anyone starting a herd I would emphasize the necessity of the Tuberculin test, applied by a careful man; and with good Tuberculin, such as is furnished by the Veterinary Department of the University of Pennsylvania. Much of the commercial Tuberculin is quite valueless. It is useless to hope to make a success of the high class cattle business with tuberculous cows, and I believe in the yearly test for this dread disease, even if no reacting animals are found from year to year. I would also lay stress on placing at the head of the herd a bull of fine individuality, and with excellent milk and butter records behind him. For myself I want one whose ancestors are very near the top.

Some years ago in speaking to Charles L. Hill of Wisconsin, I asked what grain he fed his cows, to obtain his good records, and he said "generally bran and gluten." Since then, these two grains have usually formed the basis of my ration. We mix them...
half and half by weight, and at times add 100 pounds of cerealine to 400 pounds of the bran and gluten, to give greater palatability. We also buy fresh home ground bran for the same reason, it is so sweet and clean, while Western bran so often is caked, dry and tasteless. Corn meal may be substituted for gluten in the summer months. I avoid all distillers grains from principle, and a wish to avoid giving any assistance to that business.

I was told that one of our successful Guernsey breeders, fed only a moderate grain ration seldom exceeding 10 pounds per day, but his cows never wanted for good roughage, plenty of silage and hay in winter, and green food in summer.

This appealed strongly to my common sense, and I have endeavored to act on this plan in my herd. I think many dairymen fail in the matter of providing good succulent rough food. They may supply grain, of sufficient quantity, but how often are the poor cows turned out to forage on scant, sun dried pastures, unsupplemented by any other succulent food.

I soon learned the folly of such a procedure, and our good Experiment Station suggested some valuable soil ing crops. We feed them nearly all summer using Canada peas and oats, crimson clover, Alfalfa, corn and cow peas, opening our silos early to prevent shrinkage in milk. We do pasture partially, and I would be very glad if we had enough to make the cows do their best.

Cabbage is a valuable succulent fall food, which we feed in the stable, as we do our other soil ing crops, where each cow has her own share, unmolested.

Our winter rations consists of about 10 pounds grain to the heaviest milkers, decreasing so those giving a smaller amount, 35 to 40 pounds corn ensilage, corn fodder, and usually some clover or alfalfa hay. At noon our "test" cows, and many of our large milkers get a lunch of sugar beets. I would be glad to cheapen this ration and hope to have more alfalfa hay in the future, cured under Governor Hoard's hay caps.

We removed the stanchions from our stable and installed Governor Hoard's Model Stall, which is cheap
enough for any practical farmer. The cow is fastened by a chain and snap hook in a ring on a broad leather collar, and it is a delight to see how clean they keep. Scarcely ever a soiled udder, and they can turn and lick themselves, and lie down with the head turned on the side.

We spray the feed boxes, gutters, and part or the stalls with a strong solution of formalin nearly every week to keep down the ever present "germ."

There may be better methods than ours. I am glad to learn, but under our present regime we have had, at least, a fair share of success. I have had seventeen cows qualify for the Advanced Registry, with records varying from 353 pounds of fat for a heifer with first calf, to considerably over 700 pounds for a mature cow. Fourteen cows averaged over 489 pounds of fat and 9419 pounds of milk. Stanford's Princess 111,740, A. R. 199, I believe holds the world's record for a cow under a two consecutive years' test.

We do not feel that our cows are forced unduly, the grain food being so light, and much of the bulky food of good quality. The calves come strong and sturdy, and receiving separator milk until a year old. They grow to a good size, with plenty of bone, some of the heifers promising to exceed their mothers in height and weight.

It is gratifying and interesting to see the heifers we have raised, coming into milk, and entering the Advanced Registry. Atlantis of Pinehurst, No. 14,525, A. R. 182, and Kitty Cooper 2nd, No. 14,568, A. R. 265, both daughters of Mainstay, 3789, A. R. 11, made respectively 389 and 353 pounds of fat, after the birth of their first calves.

There is no easy road to the top in this, as in other lines of work. Daily, painstaking, intelligent care is the price of success.

DOMESTIC SCIENCE IN THE RURAL SCHOOLS
By Anna Barrows
Boston, Mass.

EARLY systems of education generally dealt with subjects remote from the daily life of the people, but the great-educators of recent times have endeavored to put into the schools whatever was desirable in national or individual life. Formerly it was assumed that objects near at hand would speak for themselves, while the methods of the Supreme Being, the courses of the stars, the intricacies of higher mathematics, the history of wars and languages not longer spoken by mankind, were considered suitable and essential subjects for the school room.

To-day we are beginning to realize that in common things there is beauty and dignity worth our attention. Perhaps the earlier methods of education were necessary to prepare young people to investigate the uttermost parts of the earth, to civilize the heathen, to dig up buried cities and to settle new countries. But many an army has been defeated, many an exploring party has failed to reach its goal, and teachers and missionaries have been short lived because of lack of attention to the food supply and sanitary laws. We are learning that a good physical foundation is essential, and that until we know how to feed and clothe ourselves more wisely, we shall be unequal to the stupendous enterprises already outlined for the coming generations to do. The boy or girl who has been taught nothing of the composition of foods or of the principles of right-living is not fit to help build the Panama Canal, or to teach the little Cubans or Filipinos. Nor are such young people competent to sustain themselves comfortably in either city or country in their own land.

Hence our schools in country or
city should aim to make our young people capable of selecting foods wisely and preparing them in healthful, palatable fashion, even more earnestly than the teachers now strive to make their students facile in the use of pen or typewriter, or in counting or caring for such money as they may have to handle. So much stress has been laid upon clerical phases of education, that occupations of that order are overcrowded. Perhaps authentic problems dealing with large numbers have been subtle factors in inspiring the prevalent desires to accumulate millions. Certainly we need more thrift in family and national life, and it is our weakness in this direction which often prevents the starting of new homes. Too little is said in our schools about the home life and the happiness secured through mutual effort, and the disadvantages of the strife for many possessions. We may well question whether greater attention in our schools to the details of daily living would not do more than law-making or the discussion by pulpit or press, toward overcoming intemperance and reducing divorce.

How can such instruction be given in the average country school under present conditions? While we urge the desirability of having science in the schools, we must also grant that the average teacher has more than she can do under present requirements and the taxpayers and school committees do not seem to be able to find more money for new departures. Hence it is obvious that this group of subjects, known variously as domestic science and household economics, must be handled by bringing forward new aspects of the rural school, and without the costly appliances that are admissible where hundreds of children can be reached. Let every country school teacher have a copy of a little book by Mrs. Ella H. Richards, "The Art of Right-living."

Several years ago Miss Dora M. Morrell thus reported her own experience in the Kitchen Magazine:

"Cooking can be taught in a country school and made to combine a certain amount of instruction with suitable lunches, and that without any interruption of the school course. The children came from half a mile to three miles, in all weathers. Most of them could not afford to pay even five cents a day for their dinners.

"The school committee and teacher discussed the possibility of preparing warm lunches, the children doing the actual work, the teacher serving as buyer and steward. There were three objects in view—the health of the children, their instruction in cooking, and also such instruction in table manners as might be given without hurting their pride or feelings.

"The teacher estimated that one warm dish each noon could be provided at a cost of two cents a child each bringing in addition bread and butter. Children who had not the money could pay for their dinner by doing some work for the teacher, the other children knowing nothing of this arrangement. The plan was received by children and parents with enthusiasm. Ready money is scarce with farmers but they are generous according to their means and often sent offerings which made the expense less for the experiment. One father supplied milk as wanted at four cents a quart.

"Each child brought two napkins, a knife, fork, spoon, plate, cup and saucer. This was the introduction of some of them to napkins. Two were needed because each child had to use his desk as a table, and tables must have tablecloths.

"The equipment was given by various persons, the committee man sending a kerosene stove. Other articles received were dishpans and towels, large kettle, spoons, frying pan and boxes for supplies. The boys made a cupboard for these with doors to keep out dust, and their knives served as kitchen knives.

"Unless a girl had her lessons she could not serve as cook and there were others always glad to serve in her stead. The cooking force consisted of one big girl who knew something about it and three helpers. The force
was changed each week. The week's bill of fare was given to the big girl, whose duty it was to see that everything was prepared before ten minutes of nine, that the room was neat, that food was put on the stove at a proper hour, served properly, the dishes washed and all tidied again.

"Economy was an object in teaching, though it was not known to be such by the children. They learned to prepare delicious soups, or rather stews, croquettes, griddle cakes, creamed codfish, creamed potatoes, etc. They cooked rice with fruits, boiled potatoes as many cooks cannot, and made chocolate so that not a globule of oil floated on the top. The cooking done by these children between eight and fourteen years old was a revelation to the teacher who had seen some of that done by their elders.

"It did not surprise the teacher when the question box, opened on Fridays, began to hold such questions as, 'What is the white, that falls to the bottom, when sliced potatoes are left standing in water? Why does cold water draw out the juices of meat better than hot water?'

"Economy in the use of time and materials, neatness, attention to one's work regardless of that of others, are good lessons to learn, and they will all come through the country school where cooking is taught, even without a modern improvement.'"

In the Boston Cooking School Magazine for January, 1906, a good cooking equipment for a district school was illustrated as arranged in some of the classes at Teacher's College, Columbia University, New York.

The total cost of this as estimated at average prices would be about ($15) fifteen dollars. Any teacher who has experience in camp life, or light housekeeping, will devise ways and means to give many helpful food lessons with such appliances as may be obtained anywhere.

The Farmers' Bulletins, issued by the U. S. Department of Agriculture, may be used as supplementary reading books in any country school, and such as "Sugar as Food", "Eggs and Their Uses", etc., etc., will prove interesting and arouse much profitable discussion among intelligent children.

The arithmetic lessons or number work often may be based on the cost of living in the average home and the variation in the price of necessities of life from season to season or in different years.

Systematic instruction in the preparation of foods for human use appears to be the legitimate rounding up of a series of lessons in nature study. The school garden is quite as desirable a feature for country as city school yards and when the vegetables are grown, the proper methods of cooking, as well as of cultivation, may be considered in the school room.

But if it is not wise to undertake any actual cooking, it is possible to try some simple experiments to show the composition of foods and the way they are affected by fire and water. Many fruits and vegetables may be dried and the loss of weight estimated and thus some idea of the amount of water in such foods be gained; or dry beans, peas or fruits may be soaked in water and food as we eat it, be compared with its marketable form.

A ten cent grater will give a rough analysis of a potato; by squeezing this grated pulp on a bit of cheese cloth, the larger part of the water may be separated—then the starch washed out and cooked while the fibrous portion remaining indicates what needs to be accomplished by cookery. Other vegetables may be experimented upon in the same way.

Valuable lessons in cleanliness may be given where teacher and pupils together are responsible for the care of the schoolroom, though many of the older country schoolhouses are almost beyond the possibility of sanitary cleaning. Any teacher who sees an opportunity and is ready to improve it by giving such instruction, often may secure helpful books from the State Library. Some special travelling libraries on household economics were made up at the New York State Library several years ago.
AGRICULTURE AT WATERFORD
By H. F. Button
Waterford High School, Pa.

W HILE we know that the whole question of agriculture in high schools is in its infancy, yet we cannot but feel that this school is a pioneer and a leader in the work of agricultural education. This was the first, and until this year has been, the only high school in Pennsylvania to teach agriculture as a part of its regular course.

Waterford is situated near the center of Erie County, about fifteen miles south of the city of Erie. It is in an unusually fertile and prosperous region where the staple farm crops are raised and dairying is an important source of income. In the year 1800 the first school in Erie County was opened here and in 1822 the present high school was erected out of cut grey stone found in the vicinity. So well did the early builders do their work that in the 75 years which have elapsed since its building, the walls have not settled an inch out of their original straight lines.

In 1903 an agricultural course was added to the curriculum. This was done in recognition of the needs and interests of the community and in order that the children be not deliberately educated away from the farm. It was also clearly seen that the sciences relating to agriculture had pedagogic value equal to the classics; for some students even greater value. From the first, the course has been a success. Its popularity may be judged by the fact that 95 per cent of the boys take agricultural work. We have received flattering tribute from parents as to renewed interest in the farm as well as to greater profits resulting from a knowledge of better methods. The local Grange has always given us its unqualified support and the county Grange passed gratifying resolutions of its approval.

Agriculture is given throughout the entire four year course one period each day. While there are several points in the course which are open to improvement, it has the merit of having stood the test of three years of successful teaching. Throughout the three terms of the first year, Plant
Life is given a place beside the "classical" subjects of Grammar, Algebra, Geography, Literature, Arithmetic, etc. In the second year the study of Field, Orchard and Garden Crops is taken up—giving the students an opportunity to cover all phases of the subject at convenient and appropriate seasons. The other work of this year is also naturally of a more advanced type and courses in Zoology and Physiology are pursued. With the third year come Physics and Chemistry as sciences, and Animal Husbandry in the first and second terms. In the Spring, Botany is inserted and the agricultural work is along Soil Physics lines. The senior year brings Soil Chemistry in the Fall term, and the Chemistry of Plant and Animal Life throughout the Winter and Spring.

Besides regular laboratory and recitation work, the students are required to prepare special papers on interesting topics. A few of these are: Soil Exhaustion, Plant Diseases, Uses of Plants, Soil Fertility, Uses of Silos, Feeding of Animals, Dairy Practices, Beef and Dairy Types, Fruit Culture, Percheron Horses, etc. Frequent farmers' meetings are conducted by the agricultural department to which all interested in agriculture are invited. The students in agriculture are required to appear as part of the program at these meetings.

Although the school has no live stock of its own, we are able to secure nearly as good results by visiting nearby flocks and herds whose owners have always been willing to show their animals for the benefit of our classes. In a like manner grains are studied and all farm operations observed.

An eight bottle Babcock tester has been recently added to the equipment. This is used not only in teaching, but also in testing samples of milk sent in by parents, cheesemakers and others. This has proven one of the most satisfactory methods of interesting the parents in the school work. We are fortunate in that all the students are directly from the farms and familiar with farm operations, thus obviating...
the need of laboratory work on elementary subjects.

A public spirited citizen recently donated the use of three acres of excellent farming land which is close by the school house and which will be used for experiments in crop growing. A part of this land is covered by a neglected orchard which will be cared for by the students. It is hoped that this orchard will meet the great objection to school experimental gardens, inasmuch as the largest part of the work will fall in school time. The pruning will come in the late winter; most of the spraying in the spring; and the harvesting after school opens in the autumn. Other practical experiments will be undertaken from time to time in the hope of benefiting not only the students but the community.

We make a special point of supplementary reading. All of the principal agricultural papers are on file in the class room where they are read and reviewed by the students. Bulletins from the various states and the United States Department of Agriculture are freely used in the class room work. We are endeavoring to make the material in these bulletins and reports more available by the use of filing cases and indices.

One of the most satisfactory features of the work is the pleasant and sympathetic relationship which it establishes between teacher and parent. The parents send their farm problems to school, feeling that it is a part of, and not alien to, their farm life. The school has become an essential part of the social life of the community, sharing with church and grange in providing a meeting place for town and country on a ground of common interest.

Here at least the success of agricultural teaching is assured. Although many details of "what and how" are yet to be settled, the main facts remain; that here, at least, agriculture is successfully taught in the high school, that it has pedagogic value similar and equal to any of the natural sciences, and finally that it does fit boys and girls for better and broader life in the country.
THE FIRST ANNUAL FRUIT SHOW

By Andrew W. McKay, '08

The fruit exhibition of the Department of Horticulture, which was held at the College of Agriculture, November 20–23, marks the beginning of an entirely new line of instruction and interest in that Department. The idea of a fruit exhibition was conceived by Professor Wilson, and was presented to the students in a meeting held the latter part of October. It was Professor Wilson's plan that the students should assume full charge of the show, and in accordance with this principle Committees on Fruit, Packages, Arrangements, Exhibits and Awards were selected from among their number.

The show proved to be unusually successful; the number and variety of the exhibits exceeded even the expectations of those in charge. Many of the experiment stations sent exhibits and many more were entered by nurserymen, fruit growers and students. In all very nearly one thousand plates of fruit were displayed, including apples, peaches, pears, quinces, grapes, nuts, dates, oranges, citranges and pomelas.

Probably the most interesting exhibit of fruit from a single state was that from Colorado, which took first prize for the best general exhibit. This fruit showed very plainly the remarkable differences in varieties produced under different methods of cultivation and conditions of climate. The Colorado apples, grown under irrigation and in a dry climate, were uniformly larger and higher colored than those grown in the more humid climate of the North Eastern States. Baldwins weighing twenty ounces, Rome Beauties weighing thirteen ounces, and thirteen ounce Bellflowers give some idea of their striking development.

The Arizona exhibit, which unfortunately did not arrive until the third day of the show, was from an educational standpoint of equal value with the Colorado exhibit. Its most conspicuous feature was a Pound pear, weighing, not one pound, but two pounds and two ounces. The exhibit also included Kieffer pears weighing twenty ounces, dates, olives, twenty ounce Rome Beauties, Black Ben
Davis apples grown under irrigation and in dry land and showing remarkable variations, grape fruits and oranges.

Director Bailey exhibited apples grown on dwarf stocks, and the results of plant breeding were shown in two hybrids of McMahon White and Scott's Winter exhibited alongside of the parent varieties. It was noticeable in each case that the hybrid resembled the female parent. The various products manufactured from fruit were included in the show. An interesting exhibit along this line was a cider mill on which practical demonstrations of cider making were given from time to time. The ladies of the Department displayed a very attractive table labeled "Apples as they sometimes appear." This included apple pie, apple jelly, apple fruit jelly, apple sauce, apple cake, apple blancmange, brown betty, pomme bouillie, apple butter, apple salad, cider, vinegar and baked apples.

Several of the students of the Department of Plant Pathology made exhibits of bacterial and fungous diseases. These were grouped according to hosts and included diseases of the apple, pear, grape, stone fruits, flowers and a special exhibit of apple scab and Bordeaux injury. Other exhibits were grape roots and cuttings, methods of packing grapes, seeds of small fruits, citranges by Dr. Webber, over one hundred rural books by Orange Judd Co., agricultural papers and catalogues, injurious insects by the Department of Entomology, fruit packages and wrapping paper, and barrel and box cushions.

The exhibition was formally opened on the evening of November 20th, when addresses were given in the Auditorium by Director Bailey and Professors Craig and Webber. Director Bailey spoke on the development of Horticulture at Cornell in the early days, and interestingly sketched the various phases of the Department's development up to 1888, touching on the separation of Horticulture from Botany, the beginning of distinct Horticultural work, and, what was perhaps of most interest to his hearers, the founding of the Lazy Club. Professor Craig who followed spoke on an "era of progress," from 1888 to 1903, at which latter time Professor Bailey gave up the chair of Horticult-
ture to assume the Directorship of the College. He divided his subject into: first, the accomplishment of things, and second, the making of men. The progress in the first division, he said, is indicated by the Department's bulletins, which are divided into five series,—Pomological, Garden, Forcing House, Extension, and Miscellaneous, a total of ninety-five. The success in making men is shown by the fact that men who studied in the Horticultural Department during this period are located and are doing work in Horticulture in eighteen states of the Union. Professor Webber's address was devoted to the development of American fruit and fruit growing. He called attention to the Western fruit as representing the response of varieties to environmental conditions. The great need of the fruit growers today, Professor Webber said, is more local varieties and varieties resistant to disease and other untoward conditions. The production of such varieties seemed to him entirely possible.

On Thursday morning the classes in Pomology were addressed by S. D. Willard, of Geneva, T. B. Wilson, of Halls Corners, and Professor Hedrick of the New York Experiment Station. Thursday afternoon, fifteen minute talks illustrated by lantern slides were given by the students on various phases of fruit growing. The show was brought to a close Saturday afternoon.

By anyone who took part in preparing the show, the question, “Was it worth while?” would be unhesitatingly answered in the affirmative. And there are several reasons why this is the case. In the first place, the interest and enthusiasm in affairs Horticultural aroused by the exhibition will remain with many through life to the mutual benefit of them and the science. Furthermore, it was most valuable as a means of interesting the fruit growers of the country in the work of the College, and it was equally valuable in calling the attention of the students to the work of the fruit growers. Lastly, and perhaps most important of all, is its direct educational influence. It was impossible for anybody even to glance casually at such a display of fruit and not learn something. The points of similarity and differences in the many varieties, the influences of factors of environment and cultural methods, these and many other facts combined to teach the observer in a practical way things which before he had known only in theory, or perhaps not at all.

SOME BIOLOGICAL ASPECTS OF AGRICULTURE III—UNCULTIVATED PLANTS
By Vaughan McCaughey, '08

The desirability of greater familiarity with the undomesticated animals of the farm was briefly discussed in the last paper. The same two reasons,—economic importance, and the interestingness of their lives, should attract the farmer towards a richer acquaintance with the uncultivated plants. There are five chief classes of uncultivated plants on every farm—bacteria, plant diseases, weeds, "wild flowers," and trees.

Among the most interesting of these plants are the trees, to which this paper will be confined. And who can think of trees on the farm without finding, closely associated therewith, the mental picture of a woodpile? So, if one is decided upon beginning, in January, a study of the uncultivated plants of the farm, let him start from—the woodpile.

All of the little ratty windows were wide open, and the one griny door stood ajar, but still the school room was very "stuffy." It was a country school and, like others of its kind, possessed a huge stove of many moods. A fire, kindled early to dispel the morning chill and dampness, now refused to be subdued, and shed fitful spurts of unnecessary heat. The
clock ticked listlessly towards three. The children were hot and restless, and the master, seeing these things, said:—"Come, children, put away your books, and we will go out into the school yard." The monotone of crooning lessons changed to glad acclamations of surprise, and wonderingly they followed him to a mountainous woodpile, just hauled that day. "Now," said the master, "we are going to explore this pile of wood." "O-o-h," said the little girls, thinking of probable mice at the bottom of the pile. "Hurrah," shouted the little boys, thinking of the capture of these same probable mice. And so they all sat down, at the base of the woodpile mountain, and the master perched himself on a great, knotty, hickory chunk, and these are some of the things they learned there together, as the master told them to me long afterwards:—

The woodpile is a wonderful country, hiding within its rough hills and valleys many marvelous secrets, and worthy of much careful exploration. These irregular billets,—some with a strip of bark, others clear heartwood,—from how many kinds of trees were they cut? Sometimes the woodpile country is all of a kind, beech, hickory, or hemlock, just as islands are often of coral, or sand, or granite. Sometimes the woodpile country contains scarcely two mountains alike, here a butt of resin-fragrant pine, there a piece of straight grained ash, and yonder tough fibered oak. So, at the woodpile we study trees from a fresh and interesting viewpoint. Instead of concerning ourselves with leaves and flowers and seeds, we must have sharp eyes open for differences in wood texture, grain, bark, knots. It is as if, after studying the external features of mountains, we should then slice them up and look at their insides.

The points to notice, in identifying a piece of "cord-wood" are these:—weight, color, sap and resin, odor, texture, bark. Some woods are light in weight, white pine, willow, catalpa; others are heavy, walnut, elm, ironwood. Color is important. The sapwood of most of our common trees is whitish; but the heartwood varies greatly, basswood is white; tulip tree, a rich yellow; sugar maple, light brown; walnut, dark purplish brown, etc. Wood from any of the cone-bearing trees, pines, spruces, etc., is easily told by the resin ducts, as no other trees have them. These are long, narrow tubes, running lengthwise with the grain, and filled with resin. Resin is not sap. The sap is the tree’s great River of Food. The resin is the River of Healing. Different woods have distinctive odors—pine, walnut, cherry, etc. Perhaps most important of all, however, is the texture and the bark, soft, close grained basswood, almost free from knots; twisty ironwood, very hard and tough; splinterly hickory. And then, besides mere identification, there are many, many fascinating stories to be read from these billets, for every knot and every knot hole has its story, and the sapwood and the heartwood has a story, and every lichen scrap upon the bark and bit of moss. The tale of the sinuous “wormholes” in a stick of firewood, is as breathlessly interesting as the building of the catacombs of Rome.

"I would have my boys and girls," said the master to me, concluding, "and their fathers and mothers know and love not only the ripened corn and fields of timothy, but also the ‘wild’ plants on their farmsteads."

"And so," said I, "you teach from a woodpile."

"Yes," said the master.

THE CONFERENCE OF RURAL SCHOOL TEACHERS

By O. S. Morgan

A CONFERENCE of rural school teachers of Tompkins County was held in the main building of the Agriculture buildings, Saturday, December 6. It was at the instance of Director Bailey that Mr. Spencer informed the teachers and commissioners that a conference would be held here
at the above date. It was called for the purpose of acquainting the school people with what we are attempting to do to help them, and to acquaint the Normal Department of the College of Agriculture with the concrete problems that confront the rural school teacher.

Director Bailey, acting as chairman, opened the session, introducing at the close of his talk Dean Hill. Then the commissioners and teachers gave their views freely for an hour and a half. The other speakers were chiefly those connected in some way with the Extension Bureau in the Normal Department.

It is impossible in dealing with any phase of Education not to deal with many of the fundamental ideas underlying the whole process of Education. There were however three phases of the problem presented by rural education that occupied the attention of the conference most of the time. (1) What the College of Agriculture is doing through its Normal Department for the rural school. (2) What are some of the practical difficulties encountered by the teachers in putting into practice the materials offered by the College? (3) What more can be done by the Normal Department to make its work more useful, and still more than it now is for the best interests of the country child?

The work that should be done that as yet has not been actively presented is work for the country girl. It was conceded that some of the lessons offered in the "Rural School Leaflet" and the "Home Nature Study Course" should bear on Home Economics. Furthermore if we can judge by the attendance and the interest manifested, it is important that we call these Conferences regularly for the sake of the teachers and for those in the College who are trying to do something to help them.

Mr. Spencer, "Uncle John," will convene the next Conference for teachers, and plans will be formulated for making Spring Picnic Day the conference day for the rural school pupils.

SULPHUR TREATMENT FOR POWDERY MILDEW

By J. Taubenhaus, '08

One of the most common flower diseases, particularly affecting the Rose and the Perennial Flax, is the Powderly Mildew. The disease occurs in the form of two species, that of the Rose being Sphaerothecapannosa, which appears early in the spring and persists until late in the fall, and that of the Flax, Erysiphe cichoracearum, which appears late in the summer. Powderly mildew is a fungus disease, the vegetation living on the surface of the leaves and stems. It can easily be detected through the appearance of white mealy patches which spread rapidly and soon cover the whole area of the leaf and stem.

The fungus robs the host of its food by sending suckers (haustoria) into the cells. It occurs both in damp and in very dry seasons, and the leaves affected soon begin to shrivel and fall off if nothing is done to combat the pest.

It is a very easy matter, however, to get rid of the trouble. The disease spreads mostly during its conidial or vegetative stage. As the mycelium lives on the surface of the leaves it may easily be killed, and with the destruction of the mycelium the disease is checked.

There are two remedies. One is to spray with potassium sulphide (Sulphurated Potassium) using one ounce to two gallons of water. This is very effective, but it is too costly. Moreover, I found that if I did not spray every three weeks, the disease reappeared. The best and cheapest method is the sulphur treatment. This is by no means new, but it is important to know how to make the applications. It is a common practice to dust the sulphur on early in the morning when the leaves are wet with dew. This checks the disease somewhat, but it does not get rid of all the trouble. Moreover, the operation has to be repeated every three weeks, for the reason that at each application an in-
sufficient quantity is applied. To get good results, I found that the leaves should be thoroughly coated with sulphur on both upper and lower surfaces. To accomplish this I sprayed the whole plant with water, using a hose or sprinkler, and then, while the leaves were very wet, applied a heavy dust spray of flowers of sulphur, which, as a result, adhered closely to the leaves.

Having two rose beds, I treated one according to the above method, and the other with only a dusting of sulphur in the morning, while the leaves were wet with dew. The bed which received the heavy coat of sulphur (early in the spring) showed no signs of mildew during the whole growing season, while in the patch which received only a light dusting the mildew was very persistent, and the operation had to be repeated often.

I obtained similar results with the Perennial Flax. This plant was in full bloom early in August, and in the middle of that month I cut off the flowers hoping to get a second crop by the middle of September. This expectation was fully realized, but before the second crop of flowers opened the mildew appeared and spread very rapidly. I applied a light dust-spray of sulphur, and it seemingly checked the disease for a week. At the end of that time however, it reappeared with increased vigor, and spread still more generally. I therefore wetted the plant thoroughly and applied a heavy coat of sulphur, as I had done with the roses.

The accompanying figure shows the result of the treatment. The plants grew side by side, and were equally badly affected at first. The plant upon which the fungus was killed by the abundance of sulphur, made rapid headway, while the other was dwarfed produced few flowers, and its leaves failed to fully develop.

This shows that sulphur is a good remedy for the powdery mildew of these two plants. It also shows that only a copious application does the work well and that this should be applied when the plant has been thoroughly wetted. It pays better to do it well once and get good results than frequently with but temporary improvement.
The Cornell Countryman

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W. H. Alderman, - Associate Editors
A. W. McKay,
E. L. Baker,
L. A. Toan,
E. G. McCloskey, - Business Manager
S. F. Willard, Jr., - Assistant Managers
R. H. Dayton,
G. H. Miller.

JANUARY, 1908

The Countryman takes pleasure in announcing the election of L. A. Toan, '08, to the Editorial Board. This election fills the vacancy which has existed since the beginning of the year, and must not be misunderstood to be the close of this year's competition. Once more the Countryman urges more men of the Sophomore and Junior classes to compete, and get an insight into the activities of the board before the annual elections in April.

After considerable interest had been aroused and various opinions advanced, the plan of having a grill or lunch room in the basement of the buildings was conclusively disposed of by the action of the Trustees. It is beyond our province to question their action, and we can feel satisfied that the decision was carefully and justly arrived at. Nevertheless the whole question is the result of a series of conditions which cannot be overlooked and is a problem that will continually reoccur with increasing importance until it is definitely solved. Taking the winter course students alone, they offer a sufficient reason for some convenient method of obtaining board. Many of them live down town and are unable to return to their boarding places at noon. Others, unable to find room at the cheaper tables and financially unable to take advantage of other vacancies, are forced to eke out an unsatisfactory and restricted existence with the aid of the familiar "dog-wagon." Many of the long course men suffer some of the same inconveniences from living down town or being kept at the buildings until after meal hours. And there are many in the various staffs of the college who would greatly value a means of getting a lunch in or near their work. The possibility of conflicts and friction between student and landlord (or lady) must not be forgotten nor the hygienic suggestion that the walk to and from lunch is the sole exercise afforded to many. But the classes in the college are growing yearly; they must obtain rooms and board and at such prices as are fair and reasonable, and until the long thought of "Commons" becomes a reality, some plan must be evolved as a solution of this prosaic but very vital problem.

On another page is found an account of the Fruit Exhibit which was held November 20-23 under the auspices of the Horticultural students of the College. The report, however, and even the illustrations which supplement it give but a hint as to its unqualified success and the interest it aroused—not only among the students of the College, but throughout the University and city. It was extremely gratifying to watch the many visitors, to notice the enthusiastic and interested remarks made, and
to run through the many names inscribed in the visitors' book, accompanied by addresses involving all sections of the country. The exhibit itself was excellent and did not even need the explanation that it had all been planned and executed in a remarkably short time. In fact the specimens were of a very high class and represented practically all varieties of nearby sections as well as many from far distant territory.

The advent of this exhibit is of considerable significance and import in the life of the College. It is still another way to bring the farmers and the students closer together—not mentioning the instructive value that it possesses. With the growth of the College in many other ways, this new development has been instituted with a great degree of success and it is now the logical duty of the horticultural students to make it an annual event, with a standard to maintain and always an ideal in view. This year the project even when first considered, was worthy of hard work and endeavor; and the spirit that was shown, the efforts that resulted were worthy, in every sense, the plan which they developed. Great credit is due the originator of the scheme, and all those, both students and faculty, who helped it toward its eventual success. And we thank those fruit-growers and horticulturists in all parts of the country whose courtesy was of such assistance, for their cooperation in a work which brings credit alike to them, as farmers, and to the students, to whom we extend our heartiest congratulations.

Taking—
and Giving

At a recent farmers' meeting a motion was made, which impresses us with its straight forwardness and the commendable spirit which it seems to reflect. It was in regard to the work which the college is endeavoring to do for and with the farmer—the broadening, raising of agriculture by means of disseminated instruction, advice and assistance and the speaker rose up and moved "that we take all we can get." That community, if the maker of the motion voiced its sentiments—as seems very probably the case—that community has the right spirit, and one which we can all do well to think about and keep before us in regard to many things. "To take all that we can get," of education, of advice, of the concentrated results of experiments and investigation, is a worthy and desirable aim, and one that we should foster and emphasize at every point. But as we continue to think of it, that aim is but a part of what we should make our goal, the furthermost point of our endeavor. Let us take all we can get, by all means, but let us apply all our strength and thought and power towards making the best and highest use of all that is given us. Let the newly acquired idea, the recently developed thought not die away again, having caused merely a ripple of interest, a break in the clouds of indecision, of indefinite ambition, but let it continually grow, ramify, create in our minds and then our bodies, the capability of still further and even greater action. All the combined knowledge of history, books, science and experience, if enclosed in a selfish, self-centered brain, or an unworthy, lifeless mind, is absolutely useless as far as the world and its activities are concerned. Education must circulate. And with each transaction the receiver should determine to produce just a little more
than he received, to make a little better use of what he was told, to help a few more people towards the light that has been granted him. "He has achieved success, who . . . has looked for the best in others and has given the best he had." And in no interpretation or application can this thought mean more, though it sound the note of a sublime and universal truth—than in the determination to accept gratefully, to seek unceasingly for the knowledge, the aid that may be offered, and to so use and profit by, that aid, that it shall, at once, be of value to mankind and be handed on, increased and uplifted, to throngs of the hungry ignorant.

Forestry

It is interesting to note that the forestry question as an economic problem of national importance, is at last being considered in a tangible way by others than members of the Forest Service, and natural lovers of trees, who even yet are deplorably few. Resolutions were recently passed by the National Grange, and a Conference of Forestry Boards at Saginaw to the effect that "We recommend that a liberal portion of the income from the National Forest Reserves be appropriated by Congress to the several states and territories for instruction and experimentation in forestry in the agricultural colleges and experiment stations." While this is of course but a recommendation, it can prove of considerable weight if such a plan as is mentioned be actually evolved. The approval, the widespread influence of such an organization as the Grange, would tend to arouse greater interest, greater concern in those districts where the problem of the forests is not, at the time, vital. Students, and agriculturists generally, of regions where the disastrous results of the destruction of the forests are so evident, need cooperation and assistance as well as suggestions rather than any further realization of the existing conditions. It is therefore, to be hoped, that this movement will continue to grow, absorbing every factor that can add strength and effectiveness, and that it will become a question both of federal law, and of the realization of all that it means, coupled with a deep desire in Americans to protect and care for the forests, in the light of all that they have been and must be in the future.

GENERAL AGRICULTURAL NEWS

The ninth annual Normal Institute was held at the College of Agriculture on November 25, 26 and 27, and besides being well attended and successful from the Institute workers' point of view, offered opportunities to students to hear most interesting addresses and discussions.

The Institute under the Directorship of Mr. F. E. Dawley, was taken part in by some thirty-two lecturers from various parts of the state, as well as several of the instructing staff of the college. Among those who attended were: Drs. W. H. Jordan, L. L. Van Slyke, K. C. Davis, E. M. Santee; Professors U. P. Hedrick, P. J. Parrott, F. C. Stewart, H. A. Harding, E. H. Thomson; Honourable G. L. Flanders, Honourable G. A. Smith, Honourable D. P. Witter; Messrs. T. B. Wilson, J. Van Wagenen, Jr., James Wilson, H. E. Cook and others.

The opening session was held Monday morning in the Agronomy building and addresses by Dean Bailey, Mr. Dawley, Doctor Webber and Professor Stewart made up a general
introduction to the Institute and reviewed conditions and recent work. In the afternoon agronomy was the main subject and discussions followed talks by Professor Lyon and Mr. W. Pearson and Stocking and Mr. Ross, together with Professor H. A. Harding and Mr. G. A. Smith discussed all the principal phases of the subject.

The consideration of the tuberculosis situation aroused considerable interest and keen discussion brought out many significant views and ideas. Horticultural problems were taken up in
The afternoon by Professors Hedrick and Parrott and members of the Horticultural department, so that with the completion of the afternoon's program one could feel that an unusually complete and comprehensive survey of agricultural knowledge had been accomplished. The more strictly educational aspect was touched upon on Tuesday evening when Dean A. R. Hill of the College of Arts and Sciences and Dr. K. C. Davis discussed various phases of agricultural instruction. Hon. G. L. Flanders, Asst. Commissioner of Agriculture, then gave an interpretation of the Food Laws, which covered a most timely and important subject.

The Institute continued on Wednesday, more general and supplementary topics being reviewed, and various questions considered and discussed. On the whole the Institute was a distinct success and impressed one with the real spirit of investigation of agricultural activity and instruction that was reflected at all the sessions. It was the spirit that animates the College itself, and its impetus must be along the lines on which the Institutes and the College can cooperate to further agriculture and assure its progress and an ever increasing prosperity.

* * *

The Thirty-first Annual Convention of the New York State Dairymen's Association was held at Malone, N.Y., December 10-13, 1907. Cash prizes amounting to $330.00 were offered for the best exhibits of dairy products, and the program included addresses by some of the best known agriculturists in the State. Three Cornell men spoke on various phases of the dairy industry, Dr. V. A. Moore on "The Cause and Prevention of Infectious Diseases With Special Reference to Anthrax and Tuberculosis," Dr. H. J. Webber on "Breeding Corn With Special Reference to Its Value as a Dairy Food," and Mr. W. E. Griffith on "The Propagation and Use of Starters in the Manufacture of Dairy Products."

The question is sometimes asked whether there is danger of an oversupply of fruit which will be raised in the near future on irrigated lands. W. H. White, a prominent apple buyer of New York, after a stay of two months in eastern Washington expressed himself on the subject in part as follows: "In answer to the question as to whether or not there is any danger of over-supply, let me say that the demand is constantly increasing—increasing in a greater measure, perhaps than the supply. Anybody who can put two and two together and find that it makes four may easily figure out that there is no occasion to begin to back up on the increase of your acreage. Keep on improving the quality—the size and attractive appearance of your apples, and you will never lack for eager market demand for them."

* * *

The November Crop Report of the United States Department of Agriculture makes some interesting comparisons of the yield and quality of the various farm products this year and other years. The yield of corn this year, though from three to four bushels per acre less than in 1905 and 1906, is somewhat higher than the ten-year average. The quality, however, is 7 per cent lower than last year. Buckwheat is slightly lower in yield than the average for the last ten years, and the quality is also somewhat lower. Potatoes show a yield of 95.3 bushels per acre, seven bushels less than last year, but almost ten more than the ten-year average. Their quality is fairly good. Apples show a decided falling off in yield, giving only 32.1 bushels per acre as compared with 69.1 bushels in 1906 and 52.5 bushels for the ten-year average. Grapes show a slight and pears a decided decrease in yield. In the production of corn, Illinois leads in total amount with 342, 756, 000 bushels, and Indiana in yield per acre with 36 bushels. Last year, Ohio was first in yield per acre producing 42.6 bushels, and also leads for the
ten-year average with 34.9 bushels per acre.

* * *

The East Tennessee Poultry Association will hold its Third Annual Meeting in Knoxville, Tennessee, January 7-11, 1908. Several hundred dollars in cash and special prizes, ribbons and cups will be offered. The American S. C. Brown and White Leghorn Clubs will meet in Knoxville at the same time.

* * *

A recent Scientific American contains an article on electric incubators which marks one of the latest applications of electricity. Coils of heating wire are strung uniformly throughout the lid, and in consequence all the eggs are submitted to the same temperature no matter what their location in the drawer. Another advantage is the free circulation of fresh air which this method allows, a condition which is very favorable for the development of the germ, and is usually one of the most difficult problems of incubation. The incubator can be connected up with any ordinary electric light circuit, and three different degrees of heat can be obtained by a regulating switch.

**CAMPUS NOTES**

The Pomona Grange of Tompkins County met in the buildings on Saturday, December 7. The morning session was behind closed doors, but in the afternoon the students and townspeople were given an opportunity to listen to addresses by men prominent in agricultural affairs. All three speakers developed the subject, "What the farm offers to the farm boy," which was indeed of interest to the audience of some five or six hundred persons.

Professor Pearson, as chairman of the meeting, first introduced Director Jordan, of the State Experiment Station at Geneva. Dr. Jordan said that he knew of no other institution which reached its constituency as well as the New York State College of Agriculture. He said that the farm offers to the farm boy just what he wants to get out of it, as all lies with the individual himself. The professions, business, etc., have their difficulties as well as farming. Farmers not well informed in the modern methods of farming cannot compete with the wide-awake, up-to-date farmer. Good management and proper regard for the value of labor-saving on the farm, makes agriculture one of the healthiest of occupations. Dr. Jordan advised the farmer to choose good literature for his farm library.

Dean Bailey, the next speaker, gave statistics showing that the farms of Tompkins County have increased in value in the last twenty-five years. He said that though receiving, perhaps, more help than any other class of men, the farmer should not look upon the work of the farm as drudgery but as a means of producing good crops, and doing other forms of good work. A boy should have a definite ambition, and then try to fulfil it. The land will be worth just what he makes it worth.

Mr. Godfrey, Master of the Grange, in his development of the topic, said that knowing how to make the farm boy solve the problem of how to keep the boy interested in the farm.

During the intermissions between the speakers, the Glee and Mandolin Clubs added to the success of the meeting.

* * *

The registration in the college at this time, is indicated by the following interesting tables:

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<td>Regulars</td>
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**WINTER COURSES**

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<td>Poultry</td>
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<td>Home Economics</td>
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<td>Horticulture</td>
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General Agriculture :- 102
Total -------------- 264
Grand total ------ 592

These figures show conclusively a growth of the student body. It will be noticed that some of the short course classes are smaller than last year's—notably the poultry course. But this in no way reflects upon the spirit of the farmers. Many applications for admission had to be refused on account of lack of facilities and room for a large number. In several of the other courses, the accommodations are being stretched to their utmost.

* * *

At the meeting of the Agricultural Association on December 3, Harry B. Winters, of Smithboro, gave a very interesting lecture and discussion on "How to Make the Farm Pay." Mr. Winters explained the system by which he determines the cost of producing various commodities on his 800 acres of dairy and live stock farms, and also his methods of facilitating the management of farms. A general discussion of farm management, crop rotation and production, and the marketing of milk followed.

* * *

Dr. Otto Schreiner, of the Bureau of Soils, lectured here November 19 and 21, under the auspices of the Agricultural Association. In his first lecture he outlined the work of the Bureau of Soils in determining the essential elements of soil fertility, and showed experiments with soil solutions which led to the revival of the old theory of toxic principles. In the succeeding lecture he discussed the more recent work of the Bureau toward establishing the theory of toxics in effecting soil fertility. Both lectures were of particular interest to graduate students, and those specializing in soils work, but the good sized audiences were by no means limited to these classes.

* * *

Professors Wing and Harper, Messrs. VanAukcn and Tailby together with nine students from the Agricultural College attended the International Live Stock Exposition at Chicago, during the week beginning December 1. Professor Wing exhibited six Cheshire hogs.

* * *

Course 51 in Farm Machinery will be repeated during the second term. It is desired that all students intending to take the course at that time should signify such intentions to Mr. H. W. Riley, who is in charge of the department, as soon as possible, that he may make arrangements for the course accordingly.

* * *

Edward R. Minns, B. S. A. Ohio State University, has been appointed Assistant Farm Manager to Professor Stone; Mr. Elmer S. Savage Assistant in Animal Husbandry and Frederick W. Storrs Assistant in Agricultural Chemistry.

* * *

The Dairy Bacteriology Department presented an exhibit during the Normal Institute consisting of microscopic slides showing bacteria in milk, cultures of bacteria and various other interesting phenomena with which the department deals.

* * *

Tiling has been purchased for the purpose of draining the Preswick farm meadow where the heavy, dense soil has impeded its use for experimental purposes. A considerable amount of the tile will be laid close and shallow, the depth not exceeding 2 feet.

* * *

A new poultry building for instruction purposes is being built by the Poultry Department. The building, which it is expected will be finished by January 1, will consist of 23 pens, 12x12 feet holding from 30 to 35 hens each or a total of about 700 hens. It is being built after the plans of the new laying house described in Poultry Reading Course Bulletin No. 33 and will cost $2000, which sum was re-
cently appropriated by the State for the department.

* * *

Experiments are being carried on in the new hot house, east of the buildings, with clovers, stramoniums, mangel wurtzels and sweet peas with a view towards determining if variations in the form of mutations can be produced by chemical stimulation. Experiments are also being carried on in the application of Mendel's law to hybrid carnations. Dr. Webber has general supervision of the experiments.

* * *

The members of the Winter Poultry Course held their first regular meeting: Thursday evening, December 12. At this meeting they perfected their organization, which is to be called the Winter Poultry Club, elected officers and had a social good time. The following officers were elected:
- President, W. A. Lippincott.
- Vice-President, A. S. Chadwick.
- Recording Secretary and Treasurer, Ella W. Hays.
- Corresponding Secretary, E. G. Phillips.
- Program Committee, G. S. Faries, R. A. Chittenden and W. E. Coleman.

* * *

On December 5th the Short Course students were formally welcomed to the social life of the college at the third Assembly of the year which proved another huge success. The floor of the auditorium was completely occupied, and many sat in the balcony from necessity rather than choice. The meeting was opened by the Glee Club which rendered, first Alma Mater, then several other selections. President Burritt then welcomed the new students and explained the various activities of the College. Miss Bessie Stern gave an enjoyable piano solo, and was followed by the Mandolin Club which brought more laurels upon itself by its admirable work. Dean Bailey's talk was as interesting, inspiring and fascinating as ever, and brought to a fitting close the first part of the enjoyable evening. The social hour, though not accompanied by refreshments as usual, was enjoyed by all and the congestion in the halls and auditorium was forgotten in the face of the singing, conversation and general social intercourse, into which all entered with enthusiasm. The next Assembly will occur on January 9th, as the Christmas vacation will prevent its being held on the first Thursday of the month.

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Professor J. B. Norton left for Washington, December 11, where he is conducting some special work in oat breeding, started by the Department before he left to come here.

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**FORMER STUDENTS**

**EDITOR'S NOTE**—We want to make the 'Former Student' news one of the most interesting parts of the paper. To do this we are dependent on those who have graduated or left college sending us news of their whereabouts and of what they are doing. We try to write each personally but this is a difficult task. You can save us time and expense by voluntarily sending in items of interest frequently. Won't you cooperate with us in making this the most complete part of the paper?

'02, M. S. A.—J. A Foord is now Associate Professor of Agronomy at the Massachusetts Agricultural College, Amherst, Mass. He is a graduate of the New Hampshire College of Agriculture and Mechanic Arts and came to Cornell in 1898 for graduate work. The following year he accepted a commercial position in Western New York but returned to Cornell in 1900 to become Assistant to Professor Wing who at that time had charge of the work in Dairying and Poultry Husbandry as well as in Animal Husbandry. In 1903 Mr. Foord went to Delaware College as Professor of Agriculture which position he held for three years. He left Delaware to become Associate Professor of Agronomy, in charge of work with field crops, at the Ohio State University. While in Ohio he was active in the work of starting the first
"Agricultural Special" run in that state and was one of the speakers on the trains run over the Pennsylvania, B. & O., S. W., and Big Four railroads.

Mr. Foord began his work at the Massachusetts Agricultural College in September last, his appointment being the first official recognition in that institution, of Agronomy as a separate branch of Agriculture. He writes us that "after nearl yten years' residence in three other states, I find New England just as charming as ever, and I fail to see why farming here should not be just as successful financially and otherwise as in many other states often considered more fortunate in agricultural prospects. This of course presupposes the application of scientific principles and business management. The Massachusetts Agricultural College is growing rapidly in the appreciation of the people of the state, and has a ten per cent increase over last year in the number of students in attendance."

'06, Ph. D.—Martin J. Iorns, who is now Horticulturist at the Government Experimental Station Mayaguez, Porto Rico, is finding some pretty difficult horticultural problems to solve. The Island had been given up almost entirely to cane and coffee production. Large orange groves had been cut down and citrus fruit growing nearly abandoned. Mr. Iorns has the problems of restoring and adding to fruit culture on the Island. The pineapple and orange industries present the chief problems according to Mr. Iorns, but he is also attempting to introduce new fruits as the Papaya, the Avacaelo, Mango, Guava, and others, into Northern markets. Another innovation being made is the establishing of "Planters' Reading Courses."

Mr. Iorns met with a street car accident recently compelling him to use crutches. We wish him a speedy recovery and success in his work.

'07, Ph. D.—J. Eliot Coit who is now Horticulturist at Tucson, Arizona, writes us that he finds a very large field of work in that state. He has just completed a citrus survey of Maricoba County, similar to our own orchard survey of Niagara County. He reports 641 acres of oranges there. Mr. Coit sent us a splendid exhibit of Arizona fruits for our First Annual Exhibition, giving us a fine idea of the fruits he has to work with.

'06, M. S. A. '04, B. S. A.—W. F. Fletcher is still with the Field Investigations, in Pomology, U. S. Department of Agriculture. He has purchased a little home on the banks of the Potomac where his father and mother, Mr. and Mrs. John Fletcher are now residing with him. Many of the older "Domestic Science" readers will remember Mrs. Fletcher, (Lydia Adeline) as being enrolled in that course in 1906.

'06, M. S. A.—J. C. Hogenson is now installed as Professor of Agronomy at the Utah Agricultural College and also as Agronomist at the Utah Experimental Station, at Logan, Utah. He reports a large and enthusiastic class of Agricultural students, the largest that the school has ever had.
'06, M. S. A.—T. C. Tan, who enjoys the distinction of having been the first Chinese student to graduate in Agriculture at Cornell, as well as in America, is now in China. He recently passed a special Imperial examination receiving therefore his native M. A. degree. He intends now to take up practical agricultural work, probably with the government at Canton.

'06, M. S. A.—J. Eaton Howitt is Demonstrator in Botany and Entomology at the Ontario Agricultural College. He was married last spring and with his wife spent the summer at Cornell, taking courses in the Summer School. Mr. Howitt writes us that he has a most cordial welcome ready for any Cornellian who may visit Guelph.

'00, Sp.—Henry H. Albertson is at present located on a dairy farm in Burlington County, N. J., owned by himself and sister. Mr. Albertson moved to his present location from Taughannock Falls, N. Y., where he still owns a small fruit farm. He likes his new location better as the "season is longer and the weather less cloudy."

'97, W.—C. L. Barnes has been connected with the Veterinary Department of the Kansas State Agricultural College, at Manhattan, for the last five years, as Assistant Professor of Veterinary Medicine. In addition to his regular teaching work he is a member of the Experiment Station and is conducting work along the line of animal diseases especially in Farmers' Institutes. A full four year course in Veterinary Medicine has been established at the State College and a $70,000 Veterinary Building is now being erected.

'99, W. D.—Edgar A. Barnes has been for the past two years, in charge of the Butter Department of the Dairy Products Co., Bainbridge, N. Y. During the past year his department made 565,357 lbs. of butter, mostly in prints. Mr. Barnes wants to hear from the '99 dairy boys. So do we. Write us.

'04, '06, Sp.—Henry Jennings has been connected with the U. S. Soil Survey for the past year. He is now engaged in a soil survey of Baldwin Co., Alabama. He was in Ithaca for a few days last fall.

'06, W. P.—W. B. Somers has been appointed Assistant in Poultry to have charge of incubation.

'03, W.—Durfee E. Olin is now managing his mother's farm near Perry, N. Y. He conducts a general farm, raising wheat and beans as specialties. He married Miss Daisy Toal of Perry, in June, 1906.

'05, W.—Howard Olin is located at Perry, N. Y., as manager on his father's farm. He is also practicing general farming, but becoming more and more interested in the growing of apples.

'67, W. P.—Morris Sixby has a position as clerk in the Lafayette Hotel, Buffalo. He expects to buy a farm in the spring and commence poultry raising.

'07, W. P.—Russell E. Crego was married during the summer.

'07, W. P.—Urban Chaffee is in charge of the Poultry Department of the Wawa Farms, Wawa, Pa.

'07, W. P.—Mrs. Stockdale will return to Cornell for the 1908 Short Course in Horticulture.

'07, W. P.—James Tyler is Assistant Poultryman at the University of Tennessee at Knoxville.

'07, W. P.—Miss Ava Hooker has started a poultry plant at Geneseo, N. Y.

'07, W. P.—Ralph Mosley, of Cambridge, is making a specialty of turkey raising. At the recent Cambridge Fair he took firsts and seconds in nearly all classes.

'07, W. P.—Taylor Pendleton is in charge of the Poultry Department of the State Hospital at Columbus, Ohio.

'07, W. P.—H. H. King has returned to assist in the Poultry Department.
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Then, as usual, DE LAVAL BUTTER HAS MADE A CLEAN SWEEP OF ALL FIRST PRIZES AND HIGHEST HONORS AT THE 1907 STATE FAIRS, reports to date giving chief winners and best scores as follows:

<table>
<thead>
<tr>
<th>State</th>
<th>Winner</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wisconsin</td>
<td>O. R. McCormack, Bancroft</td>
<td>98</td>
</tr>
<tr>
<td>Minnesota</td>
<td>M. Sonderegard, Hutchinson</td>
<td>97</td>
</tr>
<tr>
<td>Iowa</td>
<td>L. C. Peterson, Story City</td>
<td>97½</td>
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<tr>
<td>Kansas</td>
<td>Mrs. W. H. Coberly, Hutchinson</td>
<td>97½</td>
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**Copyright by The Cornell Countryman**
ONTARIO, while not the oldest fruit growing province in the Dominion of Canada, undoubtedly holds first place as the greatest producer of commercial fruits, both for home and export trade. With a population at once large and wealthy (2,200,000 in 1901), she offers unexcelled opportunities for the grower who caters specially to these home markets. As yet, the commercial peach orchards and vineyards of Canada are confined almost entirely to her boundaries, and surrounding her are immense and populous territories that are dependent upon her for these and other tender fruits. By care in the handling of the apples from her countless orchards, she has won for herself a reputation in the markets of Great Britain that is yearly bringing in millions of dollars to her farmers. Taking everything into consideration, the prospect is bright and alluring to the Ontario boy who intends to make fruit growing his life work.

Many of our friends in the United States who have never closely studied the map of this continent will be surprised to learn that the southern limit of Ontario is below the 42nd parallel of latitude: the northwest boundary line of the United States is the 49th. The southern parts of the Province are further south than Boston and Chicago, while practically all of our two millions of inhabitants are south of a straight line drawn from the Soo to Portland, Maine. This territory has been settled largely within the past 100 years, while commercial fruit growing dates back probably 50 years. What apple trees existed in 1850 were still largely seedlings, and the product was measured, not as now in barrels of delicious apples, but in gallons of cider. However, a beginning was made, and in the returns from the exhibition of the old Upper Canada Agricultural Society in 1855, there are mentioned as being shown, the well known varieties, Northern Spy, Greening, Pumme Grisé, Baldwin, Seek, Spitzenburg, Bellflower and Roxbury Russet.

During the next 25 years, planting was carried on vigorously all over the Province, and while, fortunately, the standard winter varieties predominated, yet, there were too many summer and fall varieties mixed in, and all the trees were set too close. In the West, orchards were numerous but small, while in the East the growers planted on a larger and better scale, and have consequently reaped greater profits. As these orchards came into bearing, the supply of fruit exceeded the local demand and in years of plenty, the waste, especially of fall fruit in the western parts of the Province, was enormous. As profits decreased, the farmers neglected their orchards and turned to other crops for their living. Along the Lake Erie shores and in Niagara peninsula, the lure of greater returns from the tender fruits such as peaches
pears, plums and grapes, led the growers to cut down their apple orchards and plant largely of these fruits.

Today with an area of 13,931,437 acres under cultivation, Ontario devotes 380,332 acres to the production of fruits of all kinds.

There are approximately, ten and one-half million apple trees, one-half million peaches, one million pears, two million plums, three-quarters of a million cherries, three million grape vines, while small fruits hold the balance of 10,000 acres. It is estimated that the yearly increase in apples amounts to 2%, the greater portion being along the north shore of Lake Ontario. The increase in the acreage under tender fruits is almost altogether in that part of the Niagara district extending from the New York boundary at the Niagara River to Hamilton at the end of the lake and north of the height of land running through this district.

Running rapidly over the Province from east to west we find certain well defined fruit districts, determined largely by the proximity of the land to the lakes and rivers. The front of the counties bordering along the St. Lawrence River, from the Quebec boundary westward to Kingston is the home of the famous McIntosh, the Scarlet Pippin, and the Brockville Beauty and bordering so closely on the home of the Fameuse that this famous dessert apple also succeeds to perfection. It is distinctly a dessert apple country though the Milwaukee, Scott, Winter, Baxter and other hardy winter apples are gaining in favor.

From Bellville west along the north shore of Lake Ontario as far as Toronto are the large commercial apple orchards of the Province. Passing through on the Grand Trunk railroad from Montreal, the traveller is at once struck with the immense acreage here planted to this fruit. Large storage and packing houses are seen at every station, and during the shipping season cars of all descriptions are loading on the tracks. The orchards of this section are of all ages and no better evidence need be given of the prosperity of the fruit industry than is shown in the large and increasing plantings of the standard winter export apples. The varieties here largely grown are the Spy, Baldwin, Ben Davis, Stark, Greening, Wealthy, Wagener, Fameuse and King.

This district is comparatively free from scab in ordinary seasons but suffers from the codling moth and the oyster shell bark louse. The latter insect is causing some alarm owing to its tremendous increase in the past few years. Spraying has become more general the last two seasons and a large number of power machines are now in operation there. Five co-operative shipping associations operate in this district.

From Toronto around the lake shore to the Niagara River is the largest tender fruit belt of the Province. Of the counties here, Halton and Peel besides having large acreage of apples and pears raise immense quantities of strawberries and other small fruits for the eastern and local markets. Wentworth county boasts of the grand total of 1,347,000 fruit trees within its boundaries. Seen from the edge of the mountain the narrow northern section of this and the adjoining county of Lincoln seems like one continuous orchard of cherry, peach, pear, plum and apple interspersed with the long rows of the vineyards. Lincoln claims the greatest acreage in vineyards (4940) and is probably the centre of the canning industry.

From the stations at St. Catharines and Grimsby in Lincoln County and Winona in Wentworth County are shipped hundreds of carloads each year to the maritime provinces in the east and clear through to British Columbia in the west. While the western provinces have always provided a market for a considerable quantity of our apples, only of recent years has the trade increased so rapidly for our grapes, pears, tomatoes and other tender fruits. The effect has been to prevent, to a large extent, gluts in the markets of Ontario and Quebec and to considerably increase the prices
The Cornell Countryman

12 YEAR OLD APPLE ORCHARD IN (TRENTON) BAY OF QUINTE DISTRICT

have suffered severely and have been rooted out in many instances to make way for peaches and grapes on which these and other diseases can be more readily combated. The steam or fire cooked lime sulphur mixture with a formula generally of from fifteen to twenty pounds of sulphur and twenty pounds of lime to the barrel is almost universally used and where properly prepared and applied keeps the San Jose Scale in check.

Passing on to the west, we find apples again predominating along the Lake Erie shores and some distance inland. The orchards are almost all over 25 years old and comparatively little planting has been done of late years owing to the causes given in the preceding paragraphs. Within the past three years, the co-operative packing and shipping associations have infused new life into the growers in this and other parts of the west and today the orchards are being rejuvenated, pruned and sprayed, manured and cultivated as never before. With wholesale prices per barrel ranging from $2.50 to $3.50 f. o. b. at sta-
tions for winter stock, this year promises to be a record one in the annals of apple growing in Ontario and will go a long way toward awakening the growers to the value of their trees.

In the extreme western peninsula, the most southern section of the Province, conditions have probably changed more than in any other part. A few years ago grapes, peaches, pears and plums were raised in immense quantities, one grower in Essex having over a hundred acres in peaches alone. The rot quickly cleaned out the grapes before a remedy could be found for it, while three bad frosts in a period of seven years, together with the inroads of the San Jose Scale, played havoc with the other fruits. Today these growers have turned their attention to truck crops and tobacco, and will probably never go in for tender fruits again on the same scale as in the past.

North along the Lake Huron shores and back inland for many miles are to be found numerous and good apple orchards, while as we come around to the shores of Georgian Bay we come across a section of the country eminently suited not only to apples but also to plums and the hardier peaches. The European plums of all varieties are in evidence everywhere. Large orchards of this fruit were planted some years ago but owing to over production and lack of facilities for proper distribution of the crop, neglect has ruined many thousands of fine trees. The apples of this section have received special praise and good prices have been netted the growers for many years. Here as in other sections co-operative associations are doing excellent work among the apple growers.

The inland counties in the west, owing largely to a higher altitude, have never made a success of fruit growing in any of its branches. Probably the only exception is the land around Lake Simcoe, a large shallow body of water due north of Toronto. Here the prospects are more favorable and a considerable acreage is being planted yearly to best northern varieties of apples. The balance of the Province northeast and northwest can raise only the hardiest of tree fruits and then only in favored locations. The commercial orchards are confined altogether to those portions of the Province already briefly described.

Perhaps the one thing in the Province which has awakened most interest among fruit growers, especially the apple orchardist, is that of co-operation in the packing and marketing of fruit. This has touched the right spot—cash, and more of it for the grower, not the dealer. Through the Provincial Fruit Growers' Association and the Department of Agriculture, a considerable number of such associations have been formed and are working successfully. Their by-laws are more or less uniform, and a central organization keeps them in touch in regard to market conditions and prices. Supplies of all kinds, including spraying machinery and chemicals, fertilizers, and packages are purchased in wholesale quantities at correspondingly low prices. Some associations run their own cooper shops, evaporators, power sprayers, etc. Many have erected commodious packing houses while all have more or less stringent rules governing the conduct of their members in regard to spraying and picking their fruit.

Educational work in horticulture along this and other lines has been carried on by the Agricultural Department assisted by the Provincial Fruit Growers' Association. A number of fruit experiment stations started ten years ago largely through the efforts of Prof. Craig of Cornell, then Horticulturist at the Dominion Experimental Farm, Ottawa, have done excellent work in determining the varieties best suited to various parts of the country and in weeding out hundreds of varieties much advertised in various quarters as being profitable sorts. The results of the ten years of experimental work has been summed up in an excellent report entitled the "Fruits of Ontario" which is now being distributed to all commercial fruit growers in the Province.
The Fruit Growers’ Association of Ontario, together with some thirty or more district and local associations, has also performed valuable service in the past fifty years in guiding legislation, seeking and obtaining improved transportation rates and facilities, holding exhibitions of fruit, etc. The Provincial Department of Agriculture has spent hundreds of thousands of dollars fighting the San Jose Scale, spreading the gospel of good spraying by means of timely literature, orchard meetings, etc., aiding in the purchase and distribution of power spraying outfits and chemicals, supervising the fumigation of all nursery stock sold in the Province, and in other ways too numerous to mention.

Looking at the older apple orchards of to-day, one regrets that first, fewer varieties, especially of tall fruit were not planted; second, that greater distances were not allowed between trees, at least 35 feet and preferably 40; third, that trees were not headed lower, and with fewer crotches; and fourth, that greater care was not exercised in their subsequent pruning and general care. Profiting by these mistakes, we have again resumed the work of setting out large acreages in fruit, and indeed are already in many counties beginning to reap the harvest,—4,000,000 apples under fifteen years old in the Province but whole blocks of these just coming into bearing. Think of the reward now awaiting those who had faith in the future of Ontario fruit growing!

CERTIFIED MILK

By Ernest Kelly, Sp. '06

PROBABLY the most important advance made along dairy lines recently has been due to efforts all over the country to purify and control the market milk supply; important, because of its strong influence on the decrease of disease and mortality percentages, especially among infants and small children; recent, because it was only a dozen or so years ago that the term “Certified” was first applied to milk. Even now the vast importance of the subject is not as generally realized as it should be; the vitality and the very existence, really, of each succeeding generation, depends upon a proper supply of healthful, nourishing food while the infant is in the most critical stage of its growth. Milk is this food furnished by Nature, and every practical measure, no matter how drastic, should be taken to insure the purity and cleanliness of the market supply.

What is “Certified Milk” and how does it differ from the milk which the majority of us have on our tables? It is milk produced by the best known methods of sanitary dairying, according to rules laid down by some Board of Physicians or Health Board who “certify” the product to be pure and clean. These precautions are taken not so much in regard to the chemical composition of the milk, which remains fairly constant, but to insure the greatest possible cleanliness. The object of this paper is not so much to discuss “Certified milk” in general, as to describe how the subject is profitably handled at one large dairy with which the writer is familiar. The chief obstacle in the production of pure milk is the difficulty encountered in obtaining a price for the product commensurate with the increased cost of production. Many certified milk farms are being operated at little or no profit, while others are operated at an actual loss. There are some however, which stand out clearly as profitable commercial enterprises, and it is such a one that I intend to describe.

Situated about 25 miles from New York, on level, friable land, this farm comprises about one thousand acres, the bulk of which is operated under the most intensive cultivation—a necessary arrangement in view of the fact that between 700 and 750 cows in
milk are kept the year around. Perfect roads reduce the transportation problem to a minimum, and a strong local market in three neighboring towns within eight to ten miles of the farm enables the delivery of the 6,000 quarts of milk produced daily, from one central depot.

First of all in interest and importance comes the herd itself. It consists of cows of every known shape, size and color, the only requisites being that they are absolutely healthy and give a sufficient flow of milk to make them profitable. To insure the former, all cows are tuberculin tested before coming to the farm and after their arrival they are put in the “detention barn” and re-tested. As to dry cows or low producers, the dairy has no place for those who are not paying their board bills, and so they are fattened and sold for beef, being replaced by fresh cows which are bought in the market.

All of these animals must be housed in comfortable, light, airy quarters, and to provide for this there are three large wooden barns and a new concrete structure holding 100 animals. The wooden buildings, which are slate-roofed, are bank barns and the cows are on the second floor, thus allowing a driveway beneath the barn for the removal of manure. The disposal of the waste is at once sanitary and economical; the cement gutters behind the cows are cleaned out three or four times a day and once at night, the manure going through a trap into a large watertight iron box which hangs in the cellar. A similar tank on wheels is used to convey the manure to the fields.

The cows head in, facing each other across an eight foot feeding alley. In front of each section runs a long cement trough the top of which is flush with the floor and it is in this that the cows are fed and watered. The animals stand on wooden floors and are bedded with pine and spruce shavings which beside their cheapness and absorptive power, are most desirable from a sanitary standpoint. No feed is kept on the floor where the cows are all being stored on the floor above.

The dairy house is constructed of stone masonry work and is two stories high. On the upper floor where the milk arrives from the barns by trolley, is the ice plant which has a capacity of about ten tons a day. Downstairs is the cooling and bottling room, separated from the rest of the dairy by a concrete wall. In an outer room are the arrangements for cleaning the six thousand bottles which pass through the bottler daily; they are first soaked in a hot solution of sal soda and then are washed on rapidly revolving brushes, after which they are rinsed in two waters and are ready to go into the sterilizer. This is a large, round, iron receptacle into which the bottles are rolled on trucks, its capacity being about 500 bottles. When the doors are closed steam is turned on and the bottles are sterilized for 20 minutes under five pounds steam pressure. In this sterilizer the cans, pails, strainer and everything which touches the milk are steamed just before each milking.

How are so many cows kept on such an acreage? Well, in the first place, all of the grain feeds used, and practically all of the hay fed is bought outside. Then too, the pasturage area is smaller than on most dairy farms, the cows having their green food cut and brought in to them. The first thing in the spring they have green wheat and after that, oats and peas grown together. When these crops are cut the land is at once broken up and planted to corn, so that two crops a year are raised. On land that is cleared too late for corn, turnips are sown. Most of the corn goes into the silos but some is fed green.

The cows are not fed until after milking on account of the dust attendant on the former operation. In preparation for milking the cows are groomed with a curry comb and brush long enough before the milking hour to allow the dust to settle; the manure gutters are cleaned; all floors and walks are swept and sprinkled with water; stanchions, walls and ceilings are brushed with a broom and clean shavings are put under the cows and in the gutters. Once a week the
floors and walls are thoroughly scrubbed with water. About half an hour before milking time all milk pails and cans are placed in the sterilizer and steamed until the milkers are ready to use them.

On first entering the barn, one steps into the preparation room where the men wash, and don their white suits and caps before passing the inspector and going upstairs to milk. Each milker is supplied with a sterilized pail and an iron stool. These pails are constructed so as to allow the least dirt to fall into the milk; the tops are covered, with the exception of a six inch opening which is fitted with a hood, so that the milk must be drawn into the pail on a slant. Just ahead of the milkers goes a corps of men whose duty it is to put the cows in final shape for milking; the cows, which are all clipped around their udders, flanks and bellies, are brushed with a whisk broom to remove any loose hair and dust; then their udders and teats are washed with two separate waters and then dried with a clean towel. These cow cleaners are in charge of a man whose duty it is to watch their work.

There is also a superintendent over the milking gang, which numbers some 30 to 35 men. The milkers milk dry handed; when their pails are full, they carry them to a small room where they hand them through a window to a man inside, whose duty it is to wipe the pail carefully with a damp cloth and then pour the milk into cans which are sent to the dairy on a wire cable.

When the milk goes into the dairy on the second floor, it is poured into a strainer consisting of cheesecloth and two thicknesses of sterile cotton. This strainer protrudes through the ceiling below and delivers the milk at the top of the cooler. The cooler consists of a series of horizontal pipes about ten feet long, through which ice-water is pumped while the milk runs in a thin stream over the outside; in this manner the milk is cooled from about 75 degrees F. to 38-40 degrees in a few minutes. From the tank at the bottom of the cooler, the milk runs into the receiving tank of the automatic bottler and capper where twelve bottles are filled at once and the sterilized paper caps put on. Outside caps of tinfoil are then put on by hand and the bottles are boxed, iced and sent on three horse trucks to the central delivery station.

Milk produced in this manner will keep a remarkably long time; in fact the dairy just described sent milk to the Paris Exposition, won the Gold Medal with it there, brought it home, and found it perfectly sweet upon its return.

THE WINONA AGRICULTURAL INSTITUTE

By W. C. Palmer

Professor of Agriculture and Agricultural Chemistry

The Winona Agricultural Institute is an evolution. Starting in 1902 as an academy with an agricultural department, in 1906 it changed into a purely Agricultural school.

The work in agriculture was given a practical turn in 1904 when Professor E. J. Hollister took charge of the Agricultural department. He provided a poultry plant, developed a dairy, ran a market garden, started an orchard and carried on general farming, the students doing the work in the different enterprises. The students became so interested in agriculture that they wanted to devote the greater part, in fact all of their time to agricultural work and study, instead of taking up one or two subjects in agriculture and the rest along academic lines. The board of directors also realized that there was need of a school giving practical instruction in agriculture wherein a student could devote his whole time to it. In reor-
ganizing the school in 1906 the course of study was made to cover two years of nine months each.

In the first year the following subjects are taken up, the figures referring to the number of recitations and laboratory periods: Agricultural Chemistry, 168; Soils, 48; Breeds of Live Stock, 84; Poultry, 36; Agricultural Botany, 36; Dairying, 36; Farm Crops, 60; Economic Entomology, 36; Vegetable Gardening, 36; Climatology, 12; Farm accounts, 24; Bible, 72. Second year's work, Agricultural Chemistry, 56; Forestry, 48; Dairying, 72; Farm Engineering, 36; Farm Law, 36; Feeds, 60; Fruit Growing, 92; Agricultural Physics, 48; Breeding, 24; Farm Economics, 48; Farm Management, 24; Veterinary Physiology, 48; Stock Judging, 36; Botany, 24; Parliamentary Practice, 12; Bible, 72.

The instruction is given through class room recitations, laboratory and field work and field trips. Laboratory and field work are given in all subjects that can be taught in that way. In Agricultural Chemistry two recitations and three laboratory periods are given per week. In the study of breeds of live stock, the classes have a good many recitations at the barns using the school herd for demonstration work, and frequent trips are made also to nearby stock farms. In studying soils laboratory work is given in soil physics and trips are also made to the fields, hills and lowlands, to study the soils in relation to plant growth. In the study of poultry incubators and brooders and their workings are studied as well as the breeds of poultry, feeding and management; trips are also made to nearby poultry farms. In dairying the work is nearly all in the laboratory, the students getting practice in the operating of different makes of separators, in milk and cream testing, in cream ripening, in butter making, packing and marketing. In Entomology most of the work is done in the orchard, garden and field, studying the insects at work. In vegetable gardening each student has to plant and care for a 30 by 60 foot garden in addition to class room recitations. In forestry about half the time is given to study and work in the woods and in visiting commercial forests. In farm engineering most of the time is given to drainage problems, surveying, taking levels, establishing grades and finally laying the tile and estimating the cost of the whole operation. In Agricultural Physics a study is made of barn and silo construction, machinery, engines, concrete work, etc.

Whenever possible trips are made to nearby farms, orchards, gardens and dairies in addition to the practical
work that can be given with the school's equipment, the better to familiarize the students with the actual, practical farm problems and to get them to really use their agricultural science. The school has a set of grass and clover plots where some twenty-five of the best clovers and grasses are grown. On another set of plots some fifty of the different agricultural crops are grown. A set of rotation plots are maintained to show the value of rotating crops. The value of different combinations of fertilizers and manures are being determined with corn, potatoes and soy beans. Variety tests are carried on with corn, cow peas, soy beans, oats and barley. A set of plots have been set aside for a weed garden where the different weeds of the country will be grown so that the student can study them first hand. These plots are especially valuable in the study of farm crops, botany and farm management.

The class room work is based on and related to the practical work as far as possible. The sciences are simplified and taught from the standpoint of the farmer. In Agricultural Chemistry the aim is to make such a study of the soil, of fertilizers and manures, of plant growth, of animal growth, of feeds, as will be of practical value to the farmer. Then again the subject is presented in such a way that the student can take it up without having studied elementary chemistry. One difficulty in giving practical instruction in Agriculture is the lack of text books written from that standpoint and to overcome this difficulty the writer has prepared his own lecture and laboratory notes on Agricultural Chemistry, Bacteriology, Climatology and Parliamentary Practice. The aim of the school is to prepare its graduates for becoming farm managers, dairymen, gardeners, etc., and not for taking up the professional or technical side of agriculture, as the land grant colleges are so ably doing.

The work of instruction is divided into three departments, (1) Agriculture and Agricultural Chemistry, (2) Dairying and Animal Husbandry and (3) Horticulture and Forestry. The Dean gives his time wholly to the executive and financial work of the school. The school is open to young men sixteen years of age or over who have had at least as much as the eighth grade work, though a high school or college training enables one to get more out of the course. Most of the students at present in the school have had high school training. But from the practical nature of the work eighth grade preparation enables one to get a great deal out of the course. During the year 1906-7 a young man with eighth grade preparation stood highest in his class. At present our students are enrolled from ten states and the Hawaiian Islands.

After a year and a half of trial it is very evident that there is a demand and a place for a purely practical school of agriculture. The proof appears in the interest taken in the work by the students and in the appreciation shown by practical men of affairs. The low average yields of crops in this country and the onward march of the number of abandoned farms, point very emphatically to the need of men to run our farms, who are versed in the science and practice of agriculture.
ANY are the students who every summer cross the Atlantic, that they may enjoy, each in his own way, the phases of foreign life which most interest him. I dare say we all return with countless ideas and impressions of foreign life, which require time and reflection to systematize into such form as will prove valuable to us in our work.

It was during the latter part of a perfect summer afternoon that I stood upon the deck of an ocean liner and longingly watched the gilded dome of Boston’s state-house fade away in the distance, while my mind was filled with the imaginative pictures of the scenes I was shortly to enjoy among the people of another land. As I stood straining my eyes that I might make indelible in my memory that last picture of my native city, the feeling slowly crept over me—that should fortune favor my safe return, then would I strain my eyes again to renew the picture which I felt that I would appreciate as never before.

This one thought proved to be but the forerunner of an hundred others which traced my brain as time passed by and more impressions were once and forever packed safely away within that storehouse of the human mind. Among others, the one great fact which appealed strongly to me was the attitude of the people towards, and their appreciation of, the works of art with which the continent is so richly supplied; I shall confine my remarks almost wholly to the Villas of Italy.

After the traveler has wearied of visiting cathedrals, art galleries and museums—all of which so abound in such a wealth of masterpieces done by world famed sculptors and painters, he may turn to sunny Italy for a sojourn among the grand old villas and gardens for which that country is known. There he must be prepared to meet with many surprises and even disappointments. Italy is pictured as being a land of gardens and sunshine; it is both. During the heat of midsummer the landscape presents a very deserted appearance which is made doubly interesting by the great areas of olive trees whose foliage blend so beautifully with the atmospheric conditions. Sunshine from a cloudless sky is everywhere; but the villas and their gardens are quite hidden; so much so that many a traveler has departed from this sunny land feeling that these beautiful old landmarks are the exception rather than the rule.

Wait and let us look! Snugly situated in the hills bordering the Roman campagna, overlooking the city of Florence, skirting the shores of the blue Mediterranean and dotted among the Alps of Northern Italy and Switzerland one may find an almost endless
variety of interesting villas. Here, away from the heat and suffocating atmosphere of the city, the occupants enjoy nature as Italian artists have seen it.

When we have gained access to these beautiful old monuments to the emperors of the golden days of Rome, either by means of a "permisso" which we have tramped hours in order to find the proper place to obtain, or by means of a few "soldos" given as a tip to the custodian in charge, we meet once more with unexpected surprises. In some instances there stands before us the skeleton, as it were, of a villa which was the pride of a Hadrian or of a Tiberus in the days when Rome was the idol of the world. A masterpiece of any age, and yet of such what remains to-day after all of the emperors, kings and popes of Italy have satisfied their desires to plunder! Scarcely a thing, except such parts as no one would or could take away. And still even these are most valuable to one who can let his imagination play freely upon the features which are suggested by the ruins. Here stands a fine old Greek theatre, there an old Cypress alley winding around the hilltop and lined on its inner side by a brick retaining wall which was once covered with marble and contained fine statuary at intervals, and there we can see the ruins of what was once a marble canopy where the Emperor sat and enjoyed the games of the young Roman athletes. Off from the coast of Southern Italy and under the shadow of Vesuvius lies the small island of Capri. On the extreme end of this island there are the ruins of the historic Villa of Tiberus, a villa dating from the first century and one the study of whose ruins is invaluable to the students of art. The hand of fate has been upon it, until to-day the villa site consists of a number of vaulted rooms, which are now used for stables and quarters for laborers, and a small chapel together with the cell of an old Franciscan monk. Here, as at Hadrian's Villa, the devastation had gone so far before the government realized its obligations, that what remains today is but a faint intimation of that which really existed.

At Pompeii, a city whose gardens are the direct result of the Greco-Roman influence, one may see a very successful attempt at a restoration. Thanks to some lover of art, this ground has been controlled by the Italian government, and it is here that the traveller finds the best preserved statuary that is to be seen anywhere among the ancient gardens of Italy.
This much I have said for the ancient villas and gardens of Italy; now let us look to those gardens which were designed and constructed during the great period of the Italian Renaissance, or in the period when, after centuries of internal warfare and great depression, Italian art began once more to assume a concrete form. Once inside of these, the student comes face to face with much that stands for the high art of this Renaissance period; beautiful fountains, grottoes, pleached alleys and statuary are presented to the wondering eyes and receptive minds. All of these villas are owned by counts, princes, cardinals and people of similar rank and I might say that not a few are now owned by wealthy Americans either privately or as syndicates.

The one great point which I desire to bring before the mind of the reader is the fact which shows, in the majority of cases, how little appreciated by the owners are these magnificent possessions which, as a whole, are to Italy what Niagara and the Yellowstone are to us. Here during the hot months of the Italian summer these people enjoy, and apparently make little or no effort to preserve, what is and must be the envy of the world. The whole value of these old gardens with their elaborate systems of water-works, and the beautiful alleys of cypress and oak lays in their preservation, and not in their restoration and reconstruction in years to come. Nature’s laws must be obeyed, and the disintegrating processes of time will surely perform their work. This cannot but be felt by the lover of art as he visits these fine memorials to wealth and artistic awakening, such as exist in no other country, and such as can never exist except in a country of Italy’s physical character; and it is not a little disappointing to look forward to the time when these too may possibly take their place among that ancient class which have been ruined by years of reckless preservation and plunder.

Already do many show the serious effects of time, while others owned by men with the interests of Italy’s future at heart are finely preserved. The American, I think, cannot but feel this apparent lack of appreciation as shown by the unkept and listless appearance of a few of these fine old villas. In one of the most typical villas of this great period—the Villa d’Este, situated at Tivoli in the Sabine mountains and overlooking the great Campagna—the lover of Italian gardening may pass hours in looking with silent admiration upon the wonderful creations of the sixteenth cen-
tury. At each turn of the path and from the base of each terrace some new and inviting feature is presented to the eye. After walking through every corner of the garden and seeing all, the weary observer sits by the side of an old ruined statue and there comes over him the feeling that here is a great landmark of a time when ornamental gardening was the pride and ambition of Italy, all left to practically care for itself as the deserted house of the snail,—now dead. It is but a question of time when we shall return and find but a trace of what marks another grave, where once stood the living illustration of that which is now slowly but with great certainty being obliterated.

While the duty of the American citizen lies first with the interests of his own country, I can readily appreciate the steps which some few citizens have taken in order to preserve for students of future generations some of these old gardens which have fallen from the hands of titled families, and which would soon lose their identity were they not cared for and preserved.

**A ROMAN GARDEN**

*By Florence Wilkinson*

"Down yonder velvet alley
Floats Daphne like a feather,
A finger bidding silence,
The dark and she together.
Look, where the secret fount is misting,
Apollo, thou shalt have thy trysting;
For where a ruined sphinx lay smiling
The wood-girl waits thee, white, beguiling.
All night above that garden the rose flushed by moon will sail,
Making the darkness deeper where hides the nightingale."

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**THE RUINS OF THE VILLA TIBERUS**

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**THE SHORT COURSE ASPECT**

The Short Course student has become a large and important factor in the College of Agriculture, and in planning developments and considering changes in the College, he is taken account of to very nearly as great a degree as are the other students. This is shown to be a just and necessary state of things by several facts. The Short Course man is, as it were, "finishing off" in many cases before starting out to enter into agriculture and make a success in it. He comes from the farm, from the school, the university or the city—with but a few weeks for work ahead of him—and he must study intensively in that time if he is to...
receive real benefit and enable the College to fulfill its task. For these and many other reasons the Short Course men are an important unit, and as such it seems fitting that their sentiments,—the "Short Course Spirit" —be presented in the Countryman as well as the ideas and opinions of other students. With this in view the impressions, more or less personal, were solicited from various members of the different classes in the Short Courses, and the following phases of the "spirit of the Short Course" were prepared.

WHY I CAME TO CORNELL

By A. G. Steer, Dairy '08

When first asked to write for the Countryman the reasons "Why I came to Cornell" it seemed a very easy matter, for the decision was so clear and decided. But when it came to writing it down, my experience was very much as it always is on examination day, when a fellow knows the answer to every question perfectly and yet his book comes back marked about 75 per cent. My reasons as a salesman of dairy supplies are no doubt different from those of the average man who comes from a butter or cheese factory.

The dairyman is beginning to recognize competition, and near our larger cities this is forcing him to utilize every asset and to care for his patrons to the best possible advantage. The ways of his father will not do, when his competitor, by using scientific methods is able to command a higher price for his finished product, and therefore to pay more for his milk.

There is a constant demand on the part of the butter and cheese maker, as well as on the part of the factory owner, for knowledge of better methods and improved machinery. The successful salesman must keep himself fully abreast of the times, not only in order to explain the latest machinery, but many times he is consulted regarding proposed changes. If he can assist his customer to more profitable methods, he will get all of that customer's business, which is what he is after.

If the creameryman has never used a commercial starter then why should he buy a pasteurizer, or a separator-can or a ripening vat, why should a market milk man buy a steam boiler, or bottle his milk, why should a cheese maker buy a separator for his whey? These and a thousand other questions the salesman must not only answer, but often ask as well. You must sell goods and build up your trade constantly for the Boss sits in the home office and once a month coldly compares your profits with your expense account. If you did not sell the goods that your customer needed then you would soon need to look for new territory and some one else would be lugging your grip.

It had long been my desire to take a course in dairying but it never assumed definite shape until one day last summer when a better informed competitor secured a $5,000.00 order over my head and for inferior goods at that. That settled it.

Then came the difficult part, which college? As it meant, not only the expense of the course, but the losing of a good salary for three months, it was a matter to be carefully considered.

It has always been my policy to work as little as possible to secure desired results—some men call that laziness—or to put it in a more popular form, to get as much as possible for my money.

The circulars of several of the best dairy schools were carefully compared; then the work of the men over my territory from these schools, also the attitude of my trade toward the different ones. All this resulted almost unanimously in proof that the best value to me would be three months spent at Cornell.

THE WINTER COURSE AS THE FARMER SEES IT

By W. A. Lippincott
President of the Winter Poultry Class

The greatest drawback to the win-
ter course from the standpoint of this brief article, is the fact that the majority of farmers do not "see it." Most of them perhaps know there is such a course. They have seen the name "Winter Course" in the paper. But as for having a really intelligent understanding of the opportunities thrown open by the various short courses,—the average farmer is yet to be educated up to it. By educating him we do not mean putting before him in print alone, the excellencies of the courses, great and numerous as they may be. The farmer deals constantly with concrete objects. His reasoning is from concrete to concrete. If he is to "see" the Winter Course it must be shown to him in some concrete form.

Our scope is therefore limited to those farmers who have gained a true idea of what the Winter Course offers. That these few form a progressive and intelligent minority we are glad to admit. That, for this progressive minority, "The Winter Course" spells an opportunity not found elsewhere, is shown by the way farmers and their sons are seizing it. But is it not also true that it is the farmer who is not so progressive that we want to make more progressive?—that it is the man who has his attention and his intelligence narrowed upon the production of one or two kinds of raw material, year after year—that we are anxious to raise to that higher plane of Agriculture, where he will offer a highly finished product as the result of his thought and effort?

The Winter Course as the farmer sees it before he enters, and after he has completed his course, differs somewhat. The drawing cards of the short course are, in most cases, two. First, it offers an opportunity to become acquainted with new methods. Second, a certain prestige is given to one who has completed the course, enabling him to secure a position where he may obtain experience along the line of the newly suggested methods. The man who thinks generally agrees with the "Self-Made Merchant" that "new methods are better than old ones, even if they are only just as good, which" he adds "is not so Irish as it sounds." The new is better because a man is very liable to throw himself into it with a greater abandonment and enthusiasm. This is nowhere more true than on the farm.

What the farmer sees after completing the course that he did not see before is a new light shining on the old farm, transfiguring it,—a new occupation awaiting him though called by the old name,—a new life stretching on before. For drudgery he may now exchange thoughtfulness, for isolation and loneliness, a common sympathy and interest with his fellowmen, for the wearing struggle to gain a livelihood, the privilege of living a life, with the result that he will probably gain a better livelihood.

**HOW A COLLEGE GRADUATE REGARDS THE WINTER COURSE**

_by A. G. Fletcher, Harvard, '07_

President of the Winter Dairy Club

The Winter Course forms one of the most important factors of the modern education. It enables men, both young and old, to fit themselves in the shortest possible time with the least expense and under the best of guidance for a life in which, to say the least, they are deeply interested. The Courses offer one of the best opportunities for the student to get a general view of the whole field of agriculture in a short time. The men can, if they choose, specialize in any one of five different but related subjects. Apparatus, laboratories, specimens and libraries are at the service of men taking the Winter Courses as well as those taking the longer courses. In fact these short courses are the outgrowth of the longer ones. As an economic problem, it would not have been advisable to build all these beautiful structures, equip them with apparatus and hire competent men to instruct, if they were to be useful only three months of each year. They were primarily intended to be used throughout the college year and the
Winter Course men get the results of this vast investment on the same basis as do the men taking longer courses. The men taking the Winter Courses also have the privilege of being candidates for positions that are made known to the Agricultural Department. In a word the Winter Courses offer to the students the same opportunities to fit themselves for their chosen work as do the longer courses.

A disadvantage of the short course is that the men do not get as much routine work and drill as the long course men. But a great advantage is gained in the amount of time required. This latter is twofold in effect. While the majority of men are studying they are not earning money and at the same time they are spending a good deal. This expenditure without income is a serious problem to most young men, but Winter Courses on account of their short term make the solution of this problem less difficult.

The value of one of these courses is "measured largely in new ideals, fresh enthusiasm and a broader outlook." This applies just as well to a college man as to the man from the farm. To the former everything is new; ideals, enthusiasm and outlook. He perhaps has never been closely connected with farms or country life. He is somewhat at a disadvantage, in not being familiar with the ordinary processes of his chosen work. But he has had an advantage in that college has trained his mind to grasp quickly the facts and often times the courses of common phenomena. Books, lectures and the theoretical side of life are old friends.

With the farm lad the case is different. He is sort of "getting his second wind." He has always been connected with farm life and is looking for a newer and better method of carrying on the work he has been doing more or less mechanically. He is thoroughly familiar with the practical side of farm life, but has very little of the theoretical.

These courses come at the best possible time. During the winter work is "slack" on the farm, and men can most easily leave it and give up their time to studying. And again, men feel more like working hard and like being "in doors" than they would at another period of the year. Nature has not so many attractions to divert the mind at this time. These Winter Courses might well be called a "catch crop," coming as they do at a period when a man's mind is least concerned with other things. They are one of the most profitable "crops" I know of. The results of the brightest thinkers of all times are gathered together and are expounded as fully as possible, in the short period of three months.

**MAKING GOOD ON THE FARM—IV.**

*By Harry Mason Knox*

St. Lawrence County, New York.

When I came home from Cornell it was to continue my life of a farmer, applying those principles that I had learned in my practical work to a business advantage. Of course it is up to every graduate to "make good," not only as a duty to his college; but to his fraternity. It is stimulative spirit that helps one to "make good," and there is enough of it here among the prosperous and enlightened farmers of St. Lawrence County.

My aim was to be one of the leading...
THE LARGE DAIRY BARN

Showing the Outlet of the Ventilating System, and the Entrance to the Silo, in the Roof

farmers of the locality, and have a farm practicing methods that would be looked up to and copied by my neighbors. It was necessary for me to do as they had done, that is, in the main to follow their general methods, and at the same time to put into operation some of the principles that I had learned at Cornell, such as saving up moisture by frequent tillage and the like, to the advantage of the crop. I have done this, and have told of these things through our county papers (at one time I edited a farmers' column in one of them) and in this way have helped to "make good."

Now about our farm and our present methods. It is one of the good farms amid the foot hills of the Adirondacks in one of the best natural dairy regions of the world. It has been in our possession for some sixty years, but a good part of the time a large share of it has been rented. My aim is to make it a great dairy farm. I named it Success Stock Farm for an inspiration, and an ideal to aspire to. It is not a success at present, but we are getting things shaped so that in the near future we may say in a measure it bears out its name. The farm lacks in having the best fertile stock land; but this is but a difficulty that I feel I can clear away.

To carry out our aim it was necessary to stock the farm with thoroughbred stock. I was a student of dairying at Cornell, and those capacious Holstein-Friesians headed by Earl Korndyke DeKol, owned by the College appealed to me. So we began with the purchase of three thoroughbred, but unregistered Holstein-Friesians. Then came the registered ones, and today every animal in our herd is registered. At the head of the herd stands Korndyke of the Adirondacks. He is a son of one of Belle Korndykes' sons, and Belle Korndyke is probably the greatest dairy animal alive today as shown through her progeny. Earl Korndyke DeKol, mentioned before, was one of her sons. Our herd now numbers thirty, mostly young cows to be put in the official records of the Holstein-Friesian Association. Two have official records better than twenty pounds for seven consecutive days. Our herd has for a herd name "Adirondac," and the trade mark of the farm is SUCCESS STOCK FARM.

To house our thoroughbred stock, and carry out our plans it was necessary to build a modern, practical, up-
to-date dairy barn, equipped for intensive dairying. It was erected in the years of 1904-1905 and is ninety-four by forty feet. The basement is devoted entirely to the herd of Holstein-Friesians and has a solid concrete floor properly graded for thorough flushing, and drainage. The cattle stand in one continuous row the entire length of the barn facing the feeding alley, box stalls, and silo. The light enters through spacious windows from all sides of the barn. The box stalls are partitioned off with wire netting so as not to exclude any light. The stable and ventilator chute is properly insulated and ceiled with choice pine that grew on the farm. As a result there is a perfect working of the King System of ventilation. All window and door jams are beveled to prevent the collection of dirt. The silo is centrally located, and opens up into the feed alley. It will hold 150 tons of silage, and has an arrangement so that it can be divided into a winter and a summer silo. The root cellar is at one end of the feed alley. The water system is complete, being supplied by a 30 barrel reservoir, piped from there by galvanized pipes to all parts of the barn. The cattle are tied by flexible chain hung stanchions attached to movable Ds between a top and bottom gas pipe rail. This method of fastening obviates the collection of dirt and dust to be found about most stanchions.

In addition to the barn we are building a combination engine, ice, laundry, refrigerator, and dairy house, with the piggery closely connected. These buildings are separated from the barn proper by a short alley. When they are completed we feel that we will have an ideal set of buildings to carry out our purposes. In building we have always kept in mind practical methods, convenience in doing our work, light and sanitation, which mean health of the herd, and pure products. To appreciate these essential points you should see our buildings, and realize how they serve our purposes in view.

Our pure products are:

**VITALITY MILK.**—This is a product of well bred Holstein-Friesian cows. They are clipped and groomed. We milk them with a power milking machine when giving a good flow of milk. At other times with our “ideal sanitary milk pail,” a pail that we studied out and had manufactured here in Canton. Under these conditions we produce a clean pure milk of life giving qualities.

**SUNSHINE CREAM.**—This is a by-product of “vitality milk” gotten by separation with a Simplex separator. We put it up in quarts, pints, and half-pints in two grades a 40 per cent and a 20 per cent, selling it through a local grocery store.

**THE GOLDEN BUTTER.**—A by-product of “Sunshine Cream” put up in jars and prints at our customers’ orders.

**THE PURELATED BUTTER MILK.**—A by-product of the “Golden Butter.”

**DUTCHLAND COTTAGE CHEESE.**—A by-product of the “Sunshine Cream” and the vitality skim milk.

To carry out our “ideals” with regard to the dairy farm, we decided that we must have a thoroughbred herd of swine. Swine and dairy cows go hand in hand, and they are profit givers. We had had Berkshire swine up to the time we began going to our local condensory, and we wanted a herd of swine that had in the main the same characteristics of the Berkshires but which were white and prolific. The small Yorkshires seemed to be the kind that would carry out our ideals. So we bought of the noted breeder A. H. Cooley, two sows and a boar as a foundation herd. They were from the State Fair prize winning stock and extra good individuals. The herd is headed by Adirondac Chief. He is a strong thrifty fellow, and we are confident that his get will make prize winners as well as our choice by-products in the form of “Little Pig Prize Packages.”

Our farm is to be an intense dairy farm. The acres will be made to produce all they possibly can nothing being sold off the farm except in the form of a by-product such as the
"sunshine cream" or "golden butter." We are at present using, in the main, clover in our seeding, for it makes a great dairy food. Not only is it a healthful food; but it is a food whose energy can be transformed easily into milk and a plant that is at all times during the period of growth and decay enriching the soil. We are trying alfalfa, and expect to make a success in growing it though we have had a series of failures. We are looking to the time when our cows will be stabled the whole year, and at the most let out only at night in small paddocks adjacent to the barn. We are to use the summer silo, and forage feeds keeping our milking machines at their capacity during the lactation period. Our swine we pasture in small plots of oats, peas, clover, rape, etc., adjacent to the piggery.

The advertisement of our product has been local up to the present time. We entered into a new undertaking last April in the form of a publication known as the "Success Stock Farm Journal and Holstein-Friesian Advocate." It has had good support, and we shall continue it. We advertise in the form of circulars, in grange programs, and shall soon branch out to the agricultural journals. This selling of our products is one of the most important factors of our business, and it will be carried on on a practical basis.

In brief, ours is not fancy farming, in any sense of the word but rather doing things a little differently from our neighbors. Competition arises thereby, and we are all spurred on in this active American life to always try and do a little better, to "make good" in other words.
SOME BIOLOGICAL ASPECTS OF AGRICULTURE

IV. CONCLUSION

By Vaughan McCaughey '08

AGRICULTURE, for long ages, has been considered, both theoretically and practically, largely in terms of its economic efficiency and significance. This old idea, however, is a milestone which has now been passed. There is a growing appreciation among all classes of people that the things of the farm, and the labor of the farmer, have many other interesting aspects,—social, aesthetic, humanitarian,—as well as this dominant economic phase,—and that prominent among these other viewpoints is the biological or life aspect.

Weeds are an excellent example of an agricultural subject which may be approached on this biological basis. We commonly think of weeds just as the people of the past thought of agriculture, largely from the enonomic standpoint. Weeds grow where we do not wish them; they disfigure our lawns; untidy our sidewalks and gardens; crowd out our crops; rob the soil and cultivated plants of plant food and moisture; harbor injurious insects and plant diseases; grain mixed with weed seed is greatly depreciated in value; the abundant pollen of some kinds greatly augments "hay fever;" the fruits of many cling tenaciously to our clothing; and it is thus natural that we should think of weeds largely in terms of ourselves and our interests.

But biologically there is no such a thing as a "weed." It is an artificial word and represents not a natural object but man's development. There were no weeds before man became civilized. Indeed, in some respects, weeds are very good indicators of the civilization and the food producing ability of a people. The Indians subsisted on many plants which the farmer of to-day scorns as "weeds." We have better food plants.

Looked at from its own standpoint, a "weed" is simply a plant fitted wonderfully well to fight the Battle for Life. Ages of struggle and elimination have given to the weed three significant powers. (1) Tenacity to life, non-killable-ness. (2) Enormous productive energy. (3) Great versatility in adapting itself to widely varying and often adverse conditions. The weeds are the "intellectual giants" of the plant world. Among them we find some of the most efficient devices for ensuring pollination and seed distribution, and the most clever adaptations for all of the necessary life processes. The weeds represent the brawn and sinews of the plant world. They succeed where all others fail. It is Anglo-Saxon, aggressive, indomitable. No more fitting symbol for the coat-of-arms of the White Man can be found than—a dandelion blossom. Think for a moment 'ere you pluck the silver seed-globe of the dandelion.—It has succeeded in its life work—Have you?

"Weed" is like "dirt"—a relative term, standing for an opinion, and not for an intrinsic quality. From the
human standpoint, we may well think of "weeds" as plants with enormous latent possibilities that have not yet been adopted by man for his benefit. "Purslane" or "pusley" is one of the most common and most persistent of weeds, and an eyesore in any flower bed, yet the improved purslane or "portulaca" the rose-moss which ranges in color from pure white to deep purple, rejoices the heart of any flower lover. The ox-eye daisy and black-eyed Susan are veritable pests in many an Eastern meadow, yet the cultivated "Susan," or "rudbeckie," adorns, in large banks, our gardens. The successful garden has often thus transformed "weeds" into fine looking well paying plants for the garden, as Mr. Burbank won money and fame with the Shasta daisy. Thus, much has been done along the line of ornamental plants, and who can predict the results of selection and breeding for other purposes. Looked at from its broader aspects, the larger part of the work of the farmer down through the centuries has been the gradual transmutation of weeds into useful plants. To primitive man most plants were weeds—useless. Only those plants that had edible parts,—at first those that bore fruit or nuts; later, those that possessed cookable portions,—were useful to him. Fiber plants, etc., for a long time were weeds, and not until man domesticated certain animals did the "forage crop" appeal to him. The history of the sugar beet strikingly illustrates the grand march of the plant world from the file of the useless to the rank of the useful. Man is just now in the infancy of knowing the "usableness of things." Heaven will be weedless not by extermination, but because each plant will have its definite use and function. (Rev. 22-2). The weed, therefore, deserves attention, because of its interestingness; study, because of its marvelous possibilities; and respect, because of the success that it has already achieved.

This white daisy in my window epitomizes the whole history of man. Ages ago it began—selfishly—but has now reached the plane where, to use the words of One, it "ministereth unto others."
The writer has been very much interested during the past few weeks in carefully observing the developments in the formation of a proposed connection between the main campus and the College of Agriculture buildings. In the carrying out of this scheme it has evidently been the intention of someone to design a diagonal path directly across the beautiful bit of turf lying in front of the Veterinary College. This has seemed to many quite unnecessary, and far from indicative of a spirit desiring to enhance or preserve one of the few beautiful bits of lawn which the University now possesses.

We are led to believe that such a path must eventually be a natural result of constant usage. We feel that under the existing conditions there can be no other solution of the problem. A student coming from the College of Agriculture will very naturally follow the solid cinder path; but he soon comes to the end of it and where does he find himself? In the middle of the walk, one-third of the distance from the Veterinary College to the street. He desires to reach the sidewalk at the southeast corner of the lawn, and unconsciously he does what all of us would do under the circumstances,—he goes directly across the lawn.

The writer seriously believes and expresses his sentiments only after having carefully studied the situation, that were the cinder path to be terminated at the southwest corner of the building by suitable plantings, the traffic, thus dropped, would follow the natural course and keep on the walk already provided. For a short time a neat sign could be displayed at the southeast corner of the lawn asking students not to cross that way. Human nature will forever tend to follow in the beaten paths, and though we can in no way criticise those who have made constant use of this new path, yet we congratulate those who have, day after day, kept to the stone walk in spite of the fact that they have been directed across the lawn by an ill designed scheme. We hope that, in the near future, the proper authorities may carefully consider the condition of affairs and take steps to remedy the evil which all so much regret to see growing with each day of usage.”

The Countryman was extremely glad to receive the above communication, primarily because it deals with a matter that is close to the College, but also because it is gratifying to receive this kind of assistance in trying to get expression of ideas and sentiments from those interested in agriculture and the College. Inasmuch as the path system involved was designed mainly for the use of agricultural students, it is fitting that they should determine the direction in which developments will proceed. As students
of Nature and of outdoor life, we can justly be expected to appreciate good taste in landscape design, and to endeavor to maintain the beauty that remains about the University. This is certainly not being done in regard to the Veterinary lawn, although as the writer remarks, it is not surprising that, under present conditions, a line of traffic should have started, as it has, over the grass. The whole plan, however, can be remedied without permanent injury to the lawn if it is taken up before the warmer weather brings thaws and the removal of the protecting snow. The improvement suggested above, is a good one and the time that would be lost in keeping on the flagging would be insignificant. Without the right spirit, however, it seems probable that no array of signs would turn the current of pedestrians, but should merely act for a time as a reminder. It remains, therefore with the students who are to use the path and enjoy the lawn to express their opinion and desires, and by a further concerted expression of their sentiment to largely determine the nature of future developments.

TH E acquisition of such a man as Professor B. Duggar for the position of Professor of Plant Physiology is another cause for congratulating the College. Not only does his coming mark the institution of this department, upon a level with others of similar nature, but it brings into our faculty a scientist, investigator and instructor who has already shown his ability and worth in various parts of the country. Professor Duggar is, however, no stranger in the College, coming as both a former student and a former member of the faculty of the Botany Department. So we, therefore, re-welcome him most heartily, with a genuine pleasure and appreciation, and the expression of the sincere good will and good wishes of the students.

A Notable Victory

It is a considerable time since the Agricultural Cross Country team carried off the honors in the Intercollegiate race, and brought to the College the Ehric Trophy—the first prize of its kind to mark the increasing prowess of the College of Agriculture in athletics. It seems none the less fitting, however, that a word of congratulation and appreciation be expressed for the members of that team, even at this late date. Their work is far from being forgotten, and with the cup in view in some appropriate place about the building, the significance of the victory will be still more clearly kept before our minds. Besides having run a good race and been victorious, the team set another standard for later teams and those in other sports to come up to. The spirit of clean athletics seems to be a desire to contest fairly and closely, to develop continuously, and to win as often as can be, with fair and square methods and through sheer superiority. Let this, then, be the impetus behind the teams, crews and all organizations of our College.

On the 17th of February the Farmers' Week will begin a week that will be, or should be another significant and important step in the growth of the College of Agriculture. The relations between the farmers and the
college have been continually growing
closer and more advantageous to both
parties, and in a way Farmers' Week
will mark the culmination of the in-
crease of these relations. Of perhaps
chief interest to the students them-
selves will be the various exhibits,
shows and meetings that will be con-
ducted by different departments dur-
ing the Week—for with these will
they find themselves most directly
concerned. Most important among
these activities will be the annual
Poultry Show which promises more
than ever before. This will involve
considerable work and time on the
part of the students interested in
Poultry Husbandry, even though its
management is cared for by the Poul-
try Association. In connection with
the show will be the Poultry Insti-
tute which will offer unusual oppor-
tunities along instructive and inter-
esting lines. The exhibits planned
by the other departments will also re-
quire the cooperation of students, and
it is needless to say that every effort
should be made to develop this co-
operation to its highest extent.

The Alumnus' Part

It will be for the stu-
dents to prepare and
carry out a series of
programs that will be
instructive, enjoyable and of benefit to
all concerned, but the alumni are not
without an obligation, the perform-
ance of which can mean a great deal
to the success of the week. For it is
their part to return to Ithaca—as
many as can be—to make the reunion
of classes enthusiastic and of great
proportions, and in every possible
way to show an increasing interest
and appreciation in the work and ac-
tivities of the College. This week
comes at the time when, if ever, the
farm can safely be left for a few days,
and with the transportation rates that
are being arranged for, unusual in-
ducements and facilities are given for
renewing and strengthening former
connections with the University.

A foreword for the
The Banquet
fourth Annual Banquet
should not be forgotten
inasmuch as this func-
tion has become one of the most im-
portant of the year. The committee
for this banquet has before it, how-
ever, a more momentous and serious
question than has confronted any pre-
vious committee. A year ago the
capacity of the Armory was comforta-
bly taxed to accommodate the five
hundred and two participants. This
year, while the exact date has not
been decided upon, it is natural to
suppose that if at any time during or
near Farmers' Week, the numbers
even will be increased. So that it de-
volves upon the committee to either
place the banquet at a time when the
probable number of guests could be
welcomed with the space heretofore
available, or to formulate some plan
whereby the event could be made pro-
portionate in size to the numbers
which we hope to greet during Farm-
ers' Week. The latter would, if pos-
sible, be by far the more desirable
plan, but only time will show whether
or not it is practicable.

Retrospec-
tive and
Otherwise

Once upon a time it
seemed necessary to im-
plore and almost force
Short Course students to
enter into debates, clubs and the vari-
ous activities of a university commu-
nity. Their college lives became mo-
notonous, unenjoyable; and without
the stimulus of active interest, their
stay here lost many of its latent possibilities. But all this is of the past. The numbers of the short course students have increased, their work has become more systematized and greater possibilities for study can now be offered them. But more to be approved of, and exulted over, than this, is the awakening of the men to the appreciation of the broad life of a university, the "social education" and all that is not purely didactic. And this is no mere turning over in the midst of slumbers, but a distinct and decisive awakening. This new spirit is showing itself in many forms. The Winter Poultry, Dairy and General Agriculture classes organized soon after their arrival, and clubs which are brimming over with enthusiasm and results soon developed. Already a glee club has been formed from the whole list of students, and, besides, a double- quartette in the Dairy class. These energetic dairymen have not even stopped here but are organizing a basket-ball team. And so it goes throughout the classes, each new activity adding far more than appears on the surface. It is good, also, to see the short course men come out to the Assemblies, the Association meetings and supplementary lectures; and thus in many ways they are both justifying the attempts of the student body to make the life of the college full of interest, enjoyment and improvement, and are themselves gaining that which will prove of inestimable benefit in future days—the inspiration of contact with others.

The gift from the Briarcliff School of Agriculture, which is mentioned on another page, is one for which we can well be grateful. Like the Roberts Scholarship Fund, it provides for a most worthy and philanthropic action and having thus started such a fund, it has gone a long way towards its increase in the future. The student who, in the face of financial difficulties, makes his way to college and manages to both support himself in the present and educate himself for the future, shows the kind of spirit that does things, that deserves assistance and which can conscientiously and fairly accept that help. Such a man is a safe investment and he can feel confidence in himself to the extent that such aids as scholarships and the above fund will appear not as obligations, but legitimate rewards and the recognition of the right kind of ambition.

GENERAL AGRICULTURAL NEWS

The denudation of the American forest has long been a source of anxiety to those interested in any extent in agriculture or forestry, and so far attempts to prevent the great waste that is annually going on have been not successful on a large scale. Believing that more than mere preventative measures are now necessary, the Atchison, Topeka and Santa Fe Railroad company has started an industry, which, with the growing scarcity of timber is sure to become widespread. This is nothing more or less than what we may call timber culture. The company has purchased an estate of 10,000 acres in California, with the intention of planting 7,000 acres of it to Eucalyptus trees which they will grow for cross ties, and devoting the remaining 3,000 acres to experiments in the growing of timber. The Pennsylvania railroad has also purchased a large tract, and will grow its own timber for
cross ties. The fact that these two companies have gone into the growing of forest trees as a business proposition shows that radical reforms are imperative in the present methods. Their action will doubtless serve the purpose of bringing this home to the people in a way that scientific demonstrations alone could not do. We may expect in the near future to see other large companies engaging in this enterprise, and timber culture will doubtless become a prominent industry.

* * *

As the result of the recent experiments, the Storrs (Conn.) station has published a bulletin describing a substitute for the lime-sulphur wash as a remedy for the San Jose scale. This wash is a soluble oil which may be prepared entirely upon the farm. It is composed of two parts, the emulsifier, which may be made up in large quantities and kept indefinitely, and the complete oil, which is composed of the emulsifier together with other materials. The formulae are as follows:

1. **THE EMULSIFIER.**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbolic acid (crude liquid</td>
<td>100%</td>
</tr>
<tr>
<td>Fish oil (pure Menhaden or</td>
<td>2 qts</td>
</tr>
<tr>
<td>whale oil)</td>
<td></td>
</tr>
<tr>
<td>Caustic potash (granulated)</td>
<td>1 lb</td>
</tr>
<tr>
<td>Heat the acid, oil, and caustic potash to 300°F, then remove from the fire, and immediately add</td>
<td></td>
</tr>
<tr>
<td>Kerosene</td>
<td>3 1/2 qts</td>
</tr>
<tr>
<td>Water</td>
<td>5 1/2 qts</td>
</tr>
</tbody>
</table>

2. **THE COMPLETE SOLUBLE OIL.**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emulsifier</td>
<td>8 parts</td>
</tr>
<tr>
<td>Crude petroleum</td>
<td>18 parts</td>
</tr>
<tr>
<td>Rosin oil</td>
<td>4 parts</td>
</tr>
<tr>
<td>Water</td>
<td>1 part</td>
</tr>
</tbody>
</table>

This last can be made up at any time without heat. The materials should be added separately, and in the order named. For spraying there should be added to 1 gallon of the oil 15 gallons of water. This brings the cost of the mixture to about 1 cent per gallon as compared with 1 1/2 cent for the lime-sulphur. In tests it has proven a very effective spray for the scale.

The seventh annual meeting of the New York State Fruit Growers' Association was held in Empire Hall, Syracuse, January 8th and 9th, 1908. The programme included among other addresses the following: "Address of Welcome," Hon. Allan C. Forbes, Mayor of Syracuse, "The President's Address," J. R. Cornell, "Glimpses of Peach Growing in Various Parts of the United States," Professor John Craig, and "A Successful Organization and its Lessons for Fruit Growers," Professor S. A. Beach. The programme contained a list of seventy questions which had been proposed by members for discussion. These aroused much interest, and were instrumental in bringing out many opinions of and experiences in fruit growing matters. Several prizes were awarded for exhibits of fruit.

* * *

The 1908 meeting of the New York State Fruit Growers Association for the Hudson River Valley will be held at Poughkeepsie, Feb. 13th and 14th. The object of this Association, as stated in its announcement, "shall be to encourage the cooperation of the fruit growers of the State of New York for the protection and advancement of their common interests."

* * *

The fifty-third annual meeting of the Western New York Horticultural Society will be held in the Eureka Club Building, Rochester, N. Y., January 22nd and 23rd. One of the greatest attractions of the meeting will be the mid-winter exhibition of choice fruits, which will occupy 1000 square feet of of floor space, one-half to two-thirds of which will be used by the State Experiment Station. The programme will include addresses by Dr. Jordan, Professor Hedrick, Dr. Van Slyke, and Professor Craig, Professor Judson and Mr. Burritt of Cornell. A large number of questions are proposed for discussion, and are arranged under the headings of the different fruits, (apples, pears, etc.) insects pests and miscellaneous.
The final estimate of the Crop Reporting Board of the Bureau of Statistics of the Department of Agriculture (in which certain necessary corrections have been made in the earlier preliminary estimates) based on the reports of the correspondents and agents of the Bureau, supplemented by information derived from other sources, indicate the acreage, production, and value, in 1907, of the farm crops of the United States named in the following table to have been as stated therein:

<table>
<thead>
<tr>
<th>Crops</th>
<th>Acreage</th>
<th>Production</th>
<th>Value Per Bu.</th>
<th>Farm value December 1, 1907</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Bushels</td>
<td>Cents</td>
<td></td>
</tr>
<tr>
<td>Corn</td>
<td>99,931,000</td>
<td>2,592,320,000</td>
<td>51.7</td>
<td>1,340,446,000</td>
</tr>
<tr>
<td>Winter Wheat</td>
<td>28,132,000</td>
<td>409,442,000</td>
<td>88.2</td>
<td>361,217,000</td>
</tr>
<tr>
<td>Spring Wheat</td>
<td>17,079,000</td>
<td>224,645,000</td>
<td>86.0</td>
<td>193,220,000</td>
</tr>
<tr>
<td>Oats</td>
<td>31,837,000</td>
<td>754,443,000</td>
<td>44.3</td>
<td>334,568,000</td>
</tr>
<tr>
<td>Barley</td>
<td>6,448,000</td>
<td>153,317,000</td>
<td>66.6</td>
<td>102,058,000</td>
</tr>
<tr>
<td>Rye</td>
<td>1,926,000</td>
<td>31,566,000</td>
<td>73.1</td>
<td>23,068,000</td>
</tr>
<tr>
<td>Buckwheat</td>
<td>800,000</td>
<td>14,290,000</td>
<td>69.8</td>
<td>9,975,000</td>
</tr>
<tr>
<td>Flaxseed</td>
<td>2,865,000</td>
<td>25,851,000</td>
<td>95.6</td>
<td>24,713,000</td>
</tr>
<tr>
<td>Potatoes</td>
<td>3,124,000</td>
<td>297,942,000</td>
<td>61.7</td>
<td>183,880,000</td>
</tr>
<tr>
<td>Hay</td>
<td>44,028,000</td>
<td>✠698,126,000</td>
<td>11.68*</td>
<td>743,507,000</td>
</tr>
<tr>
<td>Tobacco</td>
<td>821,000</td>
<td>✠1,340,446,000</td>
<td>10°</td>
<td>76,234,000</td>
</tr>
</tbody>
</table>

* Tons.  † Pounds.  ° Prices of cigar types nominal.

The average weight per bushel is shown by reports received by the Bureau to be 56.9 pounds for spring wheat, 58.9 pounds for winter wheat, and 29.4 pounds for oats.

**CAMPUS NOTES**

Dr. B. M. Duggar, who enters upon the work in Plant Physiology as Professor, at the beginning of the second term, has been for six years Professor of Botany in the University of Missouri. During this period he has devoted much time to the organization and general development of the work. The progress achieved is shown not only by the fact that the enrollment in general courses has increased from about thirty-five in 1902-3, to nearly two hundred and fifty in 1907-8, but especially by increased interest in graduate work and research as well as by material equipment and the recognition and appreciation of the work as a basis for the more technical courses in plant industry.

Dr. Duggar was born in Gallian, Ala., in 1872. After attending the University of Alabama, he was graduated from the Mississippi A. and M. College in 1891, studied botany with Professor G. F. Atkinson at the Alabama Polytechnic Institute in '92-'93, receiving the M. S. degree, and subsequently attended, for two years, the
Graduate School of Harvard University receiving his A. B. in '94 and his A. M. in '95. After a year as Assistant at the Illinois State Laboratory of Natural History he came to Cornell and was successively Assistant, Instructor and Assistant Professor in Botany with special reference to plant physiology; and at the same time was Plant Pathologist in the Experiment Station. Dr. Duggar received the degree of Ph. D. in '98 and then studied at the Universities of Leipzig, Halle, Munich and Montpellier, and at the Naples Biological Station in 1899 and 1900, and in 1905. He was plant physiologist in the Bureau of Plant Industry in 1901-2.

At the International Congress of Arts and Sciences at St. Louis in 1904, he was the American speaker in the section of Plant Physiology. His chief research work, as well as that of his students, has more recently been directed towards the nutrition of plants, and the relation of plants to toxic solutions. He has also studied the physiological principles of mushroom growing and has established new methods in this field making possible notable advances in the practical side of the work.

The College of Agriculture has received from the Trustees of the Briarcliff School of Practical Agriculture and Horticulture, a gift of $208, being the funds remaining after the closing of the affairs of that school. This gift has been accepted by the Trustees of the University as the nucleus of an Agricultural Student Loan Fund, the interest to be loaned to aid students, who are working their way through the College of Agriculture.

Professors Lyon, Stocking, Riley, and Messrs. Hammar, Bradley and Reddick were among those from this institution who attended the American Association for Advancement of Science at Chicago recently.

On the evening of December 17, the Agricultural Association meeting was opened by an explanation of the Agricultural Library and its workings, by Mr. Lamoreux, the librarian. Rev. W. L. Anderson, of the Amherst Agricultural College then spoke upon "New Rural Life." After this the Ehrich Cup, which had recently been won was presented to the college. This cup, the trophy of the Intercollegiate Cross Country Race will be held by the college for a year, and the question is before the college as to where, in the buildings it shall be displayed. Suggestions and ideas upon this subject will be gladly received by the officers of the Association.

On the first of February, Professor Craig and his family will leave for the East to be gone until next September. He expects to spend the winter in North Africa and Egypt, and the summer among the agricultural schools and experiment stations of Germany and France.

The New York State Fruit Growers' meeting at Syracuse, Jan. 8th and 9th was attended by Professors Craig, Judson, Wilson and Mr. Wallace, '08. Professor Craig delivered an illustrated address on the peach growing industry in the United States and Professor Wilson gave his experiences in treating the black rot of grapes. We anticipate the Western New York meeting at this place next year.

Special lecturers on horticultural subjects this winter are Mr. O. S. Bishop, Pontiac, Mich., on plant breeding; W. C. Barry, of Rochester, on amateur fruit growing; George T. Powell, Ghent, N. Y., on dwarf apples and J. H. Hale, South Glastonbury, on peach growing in New England.

At the meeting of the Agricultural Association on January 7, the five members of the Agricultural Cross Country Team to finish first in the recent Intercollegiate race were presented with cups which the College had
donated. These men and the places which they took in the race were: H.
P. Berna, '11 (3), Capt. N. C. Peet, '10 (6), M. C. Burritt, '08 (9), J. A.
The election of officers for the second term resulted as follows: Presi-
dent, M. P. Jones, '08; vice-president, E. I. Bayer, '09; secretary, E.
H. Thomson, '09; treasurer, H. C. Young, '10. The committee for the
annual banquet was announced and various matters of business were trans-
acted or brought up for consideration. Of particular interest was the vote to
appropriate money for prizes to be awarded to the winner of a declama-
tion stage, to be held under the auspices of the Association, but partly in
reference to the Extension Methods course in speaking. Another interest-
ing feature was the report given by L. Lewis, of the meeting of American
Federation of Agricultural Students at Chicago. Mr. Lewis was one of the
three delegates representing Cor-
nell at this meeting.

* * *
Professor K. C. Graham, of the
Poultry Husbandry Department of the
Connecticut Experiment Station lect-
tured before the students in Poultry
courses in the latter part of December.
Professor Graham has devoted much
time and careful investigation to the
raising of pigeons and squabs, and
gave the students some direct, inter-
esting and useful statements concern-
ing the industry.

* * *
The University Poultry Association
will hold its fifth annual show Feb-
uary 17-20 in the Judging Pavilion
Extensive efforts are being made to
bring this year’s show to an even
higher standard than heretofore. Cash
and special prizes will be offered for
winning birds as well as the customary
ribbons. The advertising displays
and the book, circular and magazine
booth will not be wanting—but in-
creased and enlarged. During the
week of the show will be held a Poul-
try Institute, in connection with the
first annual meeting of the New York
State Branch of the American Poultry
Association. The Institute, however,
will be under the auspices of the
Bureau of Farmers’ Institutes and the
College of Agriculture.

* * *
The Assembly of January 9 was
marked by a commendably good at-
tendance of the Short Course men and
an unusually enjoyable program. This
was begun by the Glee Club, which
offered more of its repertoire in a very
pleasing manner. After a solo by C.
J. Hunn, Professor Karapetoff, of Sib-
ley College, gave piano selections
which were received most enthu-
asically and deservedly so. The Man-
dolin Club then added to the music of
the evening and preceded Dean
Bailey’s address, which included read-
ings from Wallace. Following this
the social hour and light refreshments
were enjoyed, this part of the even-
ing being under the direction of the
bachelor members of the Faculty.

* * *
The Department of Horticulture
has received a bill for the shipment of
a new apple packing machine, in-
vented by Mr. Hall, of Rochester.
The machine holds and packs a barrel
of apples automatically, and it is
claimed, works very satisfactorily.
A more detailed description of the ma-
chine will be given in a future
number.

* * *
New appointments in the Poultry
Husbandry Department are P. W.
Kimball, Sp.; L. F. Boyle, '10 and
B. W. Somers, W. '06.

FORMER STUDENTS

EDITOR’S NOTE.—We want to make the
‘Former Student’ news one of the most
interesting parts of the paper. To do this
we are dependent on those who have grad-
uated or left college sending us news of
their whereabouts and of what they are do-
ing. We try to write each personally but
this is a difficult task. You can save us
time and expense by voluntarily sending
in items of interest frequently. Won’t you
cooperate with us in making this the most
complete part of the paper?
'02, Ph. D.—Professor Leroy Anderson grew up on a New York farm and prepared for college at the Waterloo Union High School and the Mynderse Academy at Seneca Falls. After teaching for two years in the public schools of the state he came to Cornell in 1892 and received the degrees of B. S. A. in '96 and M. S. A. in '97. From 1897 to 1900 Professor Anderson remained at his Alma Mater as Assistant in Dairy Husbandry. In 1900 he was appointed Instructor at the University of California, in the newly organized department of Animal and Dairy Husbandry. The dairy school was under his charge for two terms and met with marked success. In fact his executive ability in organizing the new work in connection with the University was so well recognized that it resulted in his loss to the institution after less than two years service. In 1902 Professor Anderson returned to Cornell where he received the degree of Ph. D. in that year. But he was immediately recalled to California, this time as Director of the California Polytechnic School at San Louis Obispo. This position he held until January, '08 when he was elected Professor of Agricultural Practice and Director of Farm Schools at the University of California.

The Pacific Dairy Review has this to say about Professor Anderson's new work:

"In developing the usefulness of the university farm at Davisville to meet the expectations of the people of the State, and also carry out the plans for developing the large estate donated to the university by the late Theodore Kearney near Fresno into an institution for agricultural research and education, for which he amply provided, the regents recognized that Professor Wickson would need the assistance of a man of Professor Anderson's proven executive capacity, and his recall to Berkeley has been freely prophesied for some time: It is understood that his duties as professor of agricultural practice will consist of being in charge of and directing the instruction in the short courses in agriculture to be given at Davisville and the experimental work to be carried out at the various sub-stations in charge of the university. The position, which pays a salary of $3,000 a year, carries more authority with it than any other in the agricultural department except that of the dean and director."

'07, M. S. A.—Word reaches us through Dean L. H. Bailey that the Indian students, S. N. Sil, J. N. Chakravarty, A. E. Ghosh and H. S. Dutt, all of whom took their M. S. A. degrees here last year, have safely arrived at Calcutta, India. S. N. Sil has been appointed Assistant Professor of the Bengal Agricultural College in West Bengal. Both Mr. Ghosh and Mr. Dutt have been given charge, as superintendents, of Experiment Stations in West Bengal. The nature of Mr. Chakavarty's work is not yet fully known but he will go to East Bengal. We are glad to see these men in responsible positions in their own country and we wish them the best success.

'89, B. S. A.—G. Howard Davidson graduated from the Yale Scientific school in 1888, and in the following year came to Cornell from which he received the degree of B. S. A. in
1889. After taking a year's work in the American Veterinary College he assumed the management of the Alamont Stock Farm at Mill Brook, N. Y. Introducing the most modern methods and appliances in his work he began the breeding of Guernsey cattle for which he has since become quite noted. At the World's Fair his Guernseys won twenty-one prizes amounting to $1,000. He afterward won seven herd prizes at seven state fairs. Soon after this he began to import Shropshire sheep. So extensively did he go into this work that he is not only the largest importer of Shropshires but the largest breeder of sheep in America. Of 1200 imported Shropshires last year 300 found their way to Alamont. Mr. Davidson is President of the American Shropshire Association and has been secretary of the National Association of Exhibitors of Live Stock since its formation. He is also a Director of the International Live Stock Exposition.

'05, B. S. A.—Ora Lee Jr. has been with the U. S. Bureau of Soils, Washington, D. C. since his graduation two years ago. He is at present engaged in a soil survey of Monroe County, Miss. This is the fifth area Mr. Lee has helped to survey, the others being Madison County, N. Y., Laredo, Texas, Brownsville, Texas, and Montgomery County, Va. He enjoys the work, but says he is looking forward to meeting all the fellows again at the 1908 reunion. While in college Mr. Lee was Business Manager of the Countryman for one year.

'06, M. S. A.—Wm. H. Homer, Jr. is located at Provo, Utah, where he is at the head of the Department of Agriculture in the Brigham Young University. He is also engaged in practical fruit growing being part owner and manager of the Timpanogos Fruit Co. which is engaged in commercial apple growing.

'07, B. S. A.—Miss M. Gunnison is occupied in raising chickens on her farm at Harbor Creek, Pa., where she has been since graduation. We learn that her scientific agriculture is inspiring things out that way and we doubt it not.

'07, B. S. A.—John J. Deshon, better known as "Nick," the famous baseball pitcher of '06 and '07 is at his home in Chenandega, Nicaragua. He intends to return to Cornell for the second term in 1908.

'08, B. S. A.—Chester J. Hunn has been appointed an Assistant Horticulturist and Gardener at the Federal Experiment Station at Honolulu, Hawaii. He has already completed the work necessary for obtaining his degree, and left for the islands January 23, to begin work immediately upon his arrival, February 5.

'08, B. S. A.—Vaugha McCaughey has also completed his course and left with Mr. Hunn for Honolulu on the 23rd. He is to teach the Biological and Natural Sciences in the Normal College and the High Schools of that country. The Countryman wishes both men the best of success and prosperity in their newly undertaken work.

'05 Sp.—G. T. Allen after leaving Cornell acted as official supervisor of Advanced Registry under the direction of Prof. Wing, until March last, when he became dairyman at the Woodcrest Farm, Rifton, Ulster Co., N. Y.

'06 Winter—H. W. Spears, President of the Bailey Club '06; and President and Manager of the Conesus Lake Creamery Co., has purchased a small farm near Rochester, N. Y., where he will put into practice the principles taught by the Poultry and Horticultural Departments of Cornell.

'04 W. D.—W. L. Markham who has been on a dairy farm at his home near Jamestown, Chautauqua Co., has received an appointment in the Nursery Department of the State. Under leave of absence he came to Cornell this winter as Assistant in Farm Dairy. Mr. Markham was also a student in the General Agriculture Short Course of '99.

'06 W. D.—Earl Fisk is a successful butter maker on Commissioner Gerry's Farm, at Delaware Lake, N. Y.
'04 Winter—R. R. Gould is engaged in general farming, working for his father, on his farm two miles east of Jamestown, N. Y.

'99 Winter—R. E. Briggs since leaving Cornell has acted as a traveling salesman for the Fostoria Glass Specialty Co., of Fostoria, Ohio.

'05 W. Geo. Whelock is Farm Superintendent at the George Junior Republic at Freeville, N. Y.

'06 W.—E. F. Canthen is teaching in an Agricultural High School at Wetunka, Alabama.

'07, W. Fred E. Tyler has a position on the 115-acre farm of Edward M. Sheldon at Martinsburg, N. Y.

BOOK REVIEWS


Written by several men all in the front rank of the various branches of agriculture, and, as Professor Bailey says in the preface, "A book of principles designed to aid those that know how to use their eyes," this book aims to present the theory and practice dealing with the soil, the plant and the animal. And throughout runs the idea that successful work in agriculture must be a matter of personality rather than of circumstances. Among its pages of instruction are embodied such ideas as not to worry about weeds; they are the incidental difficulties which are disposed of if work is carried on properly. In regard to chemistry, Professor Cavanaugh shows how to buy commercial fertilizers, and when. Professor I. P. Roberts treats of the land, its preparation and care; Professor Law shows "How the Animal Lives;" and Professor Wing discusses the feeding and care of farm animals. These are but hints at the practical information contained in the volume, which makes it a valuable part of every farmer's library.

Beef Production. By Herbert W. Mumford, Professor of Animal Husbandry, University of Illinois. 5\(\frac{1}{2}\) x 8 inches. 210 pages. Illustrated. Published by the author, Urbana, Illinois. Price $1.50.

In dealing with such a subject as beef production, which as an industry has attained such immense proportions in the middle west, a writer finds an almost endless array of points worthy of note and which may be treated either in a hasty general way, or discussed at length—giving rise to a treatise of alarming proportions. Professor Mumford, however, has in his new book covered a very large field, and has included many points of view and phases of the subject that might easily have been overlooked. And each one he has discussed briefly and specifically giving definite, concise, information and advice, which is valuable both to the student and the commercial stockman.

The larger portion of the work is given up to the subject, Fattening Cattle for the Market—which is thoroughly and carefully dealt with. As the author remarks, the treatment is partly along economic relations but nevertheless includes a great variety of topics such as common diseases, dehorning, feeds, wintering, etc. The second division of the book is devoted to the raising and breeding of beef cattle in contrast to merely fattening them for a time. In this connection the theories and principles of breeding are not taken up—but definite results and conclusions of investigations are presented as guiding and instructive advice. The remaining two chapters go more carefully into feeding problems and principles and discuss balanced rations, feeding standards, etc.

As a whole Professor Mumford's book impresses one with its concreteness, conciseness and lack of wasted words and discussions, and should offer unusual advantages to the cattlemen who desires to get clear, straightforward pointers in the most direct form.

Note:—All books reviewed in this column may be obtained through the Countryman at net prices, as quoted above.
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FARMING IN THE GULF STATES.

By S. M. Tracy

Bureau of Plant Industry, Biloxi, Miss.

WHEN the editor of the Countryman asked me to write something on "Farming Conditions in the South" I do not think he realized that he was asking me to cover a region which includes the Gulf Coast with its fifty or more inches of rainfall, the South Texas country which is almost rainless, the mountains of the Carolinas and the rice lands of Louisiana, the hemp fields of Kentucky and the orange groves of Florida, and all to be described in one short letter. The country is too large and too varied, and I shall write only of the extreme southern portion of the country east of the Mississippi river.

The climate is, to me, much more pleasant than that further north. The winters are mild, the temperature seldom falling as low as zero in northern Mississippi and Georgia, while twenty-five degrees is regarded as very low along the Gulf Coast, and from Central Florida southward frosts are very rare. The summer temperature averages higher than in New York, though it never reaches the extremes which are often seen in the North; 100° is rare in any part of the Gulf States, and near the coast 95° is very unusual. Sunstrokes never occur here and the nights are always cool. The summers are long and sometimes one wishes for a breath from the mountains, but the heat is bearable when one is always sure of a cool night to follow. The rainfall varies from about fifty-five inches near the coast to about forty inches in northern Alabama, or, roughly speaking, it decreases about four inches for each 100 miles removed from the coast. This is quite evenly distributed through the year, so that long drouths are unknown. The mild climate with the abundant and well-distributed rainfall makes it possible to cultivate the ground at any season and to have crops growing and maturing through the entire year. The ground, even in the northern part of the region, is never frozen so as to interfere with plowing more than two or three days, and as soon as one crop is removed another can be planted, so the fields need never be idle. In fact it is the common practice to grow at least two crops, and often three, except in fields used for growing cotton. In other words, the climate here is such that ten acres can be made to produce as much as twenty acres in regions where only one annual crop can be grown.

The soil is extremely variable in quality. Probably there is no other equal area in the world which has a more fertile and productive soil than that of the Yazoo Delta region which covers about 8,000 square miles, though the river and creek bottom lands in all parts of the South are nearly as good. The hills in the pine woods region extending from Georgia westward to Louisiana, are less fertile and are inclined to wash in heavy rains, but with proper management they produce excellent yields of cultivated crops, and are among the best of pastures. Immediately along the
coast and in the larger part of Florida the soils are generally sandy, though in many places they are very fertile, and all are easily worked. Many who do not understand the conditions regard southern soils as being poor and unproductive because of the large amounts of commercial fertilizers used here, but that is a mistaken judgment. All good farmers in the North use manures, and all good farmers in the South use them when they are available, but the supply is not sufficient in a region where stock raising is a minor industry, and where the larger part of the fields are in cultivated crops, so we use commercial fertilizers, finding them as profitable as manures, and the cost per acre no greater. I know of fields which have been planted in cotton every year for more than fifty years and which are still producing good crops, though they have never been fertilized in any way.

Cotton is the staple crop in nearly the whole of this region. The expense for cultivation is about the same as for corn, though the gathering of the crop is more expensive, usually being from ten to fifteen dollars per acre. The standard yield is one bale (500 pounds) per acre, and the price is usually $50 to $75 per bale, though cotton of extra quality commands double those prices. The better the quality of the cotton the more skill is required in its production, so that intelligent work is as profitable here as elsewhere. A yield of a bale to the acre is as good a crop as is thirty bushels of wheat, and a price of ten cents per pound for the cotton is as satisfactory to the grower as is one dollar per bushel for wheat.

Grain crops are grown less extensively than further north, and the yields secured are not usually as in Illinois and Iowa, but the prices are so much higher that they are fairly profitable. Most farmers grow enough oats and corn for their own use, though wheat is seldom grown except for hay and for winter grazing. Corn grows well and its cultivation might be increased almost indefinitely, but the grain is somewhat difficult to keep through the winter in good condition on account of the insects. The largest yield of corn on record, 256 bushels per acre, was made in South Carolina, and the Census Report for 1890 gives the largest average yield from any county in the United States as having been made in Issaquena county, Mississippi. I know of no line of farming which would be more surely profitable here than the breeding of varieties of corn which would be suited to our climate and conditions. I do not know a single professional corn breeder south of the Ohio river, and there is an unlimited demand for good seed grown in this section.

Hay of some kind can be grown on all soils. While we do not have the Timothy meadows of the North we have crops which make equally good hay. Alfalfa does well on all heavy, lime soils, often yielding six tons of dry hay per acre. Red clover does well on the same soil but seldom lasts more than two years, a common practice being to sow it in September, make three cuttings the next year and one in April or May of the following year, which takes it off the ground in time for planting corn. On the more sandy and less fertile soils cow peas can be grown during any two or three months of warm weather when the land is not needed for other purposes, and will make from one to two tons per acre of a hay which is fully as valuable as that from red clover. Johnson grass and Bermuda are the common hay grasses on heavy soils, the former making a very heavy yield of a hay similar to that from very closely planted sorghum, and that from the latter resembling Kentucky bluegrass or redtop hay. The Yearbook of the Department of Agriculture for 1906 gives the average yield of hay per acre in Georgia, Florida, Alabama, Mississippi and Louisiana as 1.79 tons per acre against an average of 1.35 tons per acre for the whole country, and this has an average farm value of $23.68 against an average of $13.95 per acre for the whole of the United States. Such figures tell their own story.
Owing to the very long grazing season the raising of live stock, especially cattle, hogs and mules, is very profitable, as the supply of animals either for food or for work is not equal to the demand. While thousands of cattle and hogs are grown with absolutely no feed except such as they can find for themselves on the open range, such animals are always "scrubs" and must be sold for scrub prices. By planting a succession of crops it is easily possible to have good grazing during the entire year, even through the winter. Milk sells at high prices, usually ten cents per quart, and butter for from 30 to 40 cents per pound so dairying is quite profitable. Mules are the best animals for negro laborers; they can be grown almost as cheaply as steers and fairly good ones are worth $150 to $200 each. Hogs can be grown very cheaply on the constant supply of green feeds, and pork can be put in the barrel at a cost of not more than two cents per pound. I have seen this done repeatedly.

The cost of building is much less in the South than in the North. Lumber costs only about two thirds as much per thousand feet and much less is used, as double floors and wall are not needed. For barns and stables we need only a shelter from sun and rain, as stock never suffer from cold. Living expenses are also less. Prices for food are about the same, but clothing costs much less as we do not need the expensive wraps and furs which must be worn in northern winters. Heavy carpets are commonly replaced by rugs, and fuel costs little. The country roads are not usually as good as those in regions where stone is more abundant, but they are being improved rapidly, and during the last five years more railroads have been built in the Gulf States than in any other part of the country. Of course the price of land varies greatly with its character, distance from railroad and other conditions. In many localities wild lands from which the best timber has been cut can be bought for from two to four dollars per acre, while cleared lands of better quality and in more desirable locations often bring fifty dollars or more. Values are increasing rapidly but there are still many opportunities to purchase good farms for from fifteen to twenty-five dollars per acre.

The labor question is always a serious matter, but is no more troublesome here than elsewhere. Negroes are almost our only laborers, and while not generally as intelligent and reliable as good white laborers from
northern Europe, they are less expensive and will accomplish about as much for the same amount of money. They put in long days, always board themselves and can be called upon at any time for any work or personal services.

Some time ago I had occasion to quote, from the Report of the Eleventh Census, a few facts regarding farm values and profits in Mississippi, and some of the figures given then may be interesting here. According to that report the average value of farming lands, including both improved and unimproved, is $25.55 per acre for the whole United States, and only $9.50 per acre in Mississippi. In other words, $1,000 will purchase 39.1 acres of average farm land, but will purchase 105.3 acres in Mississippi. The average value per acre of farm products is $6.88 for the whole country, but $10.70 per acre in Mississippi. The gross earnings of the capital invested in farms and farm equipment is 15.4 per cent for the whole country, but is 43.8 per cent in Mississippi. I do not have the figures at hand for a similar comparison for other States, but those given above are fairly representative of conditions in all the Gulf region. Any section where so little capital is needed in making a start, and the returns on the investment are so large is the place for which every young man of moderate means is looking. I do not advice any one to come here blindly, for he will find many things not to his liking and will have the discouragements and difficulties which every new settler in any country is sure to meet. In no case should he decide to locate here until after he has seen the country and can judge conditions for himself. Correspondence can give little information about definite localities.

For the young man who has a willingness to work, an ambition to make a pleasant home and a place for himself in the world, and sufficient pluck to carry him through, I know of no better openings than can be found in the region bordering on the Gulf of Mexico.

PRACTICAL SURVEYING

By Elmina T. Wilson, C. E.

LINEAR measurement is the basis of all surveying, whether made to determine areas, fix boundaries, or to secure data for the making of maps, and all measurements of length are supposed to be made on the horizontal. The distance between two points is not only a straight line but a level line. The surveyor’s chain (66 feet long) is often used because of its relation to the acre and to the mile, one acre being ten square chains and one mile being eighty chains. This chain is divided into one hundred links and distances measured by it are recorded as so many “chains and links.” The engineer’s chain is similarly constructed but is one hundred feet long with one hundred links and the distances measured are recorded as feet and decimals. On account of the large number of wearing surfaces a chain should be frequently compared with a standard length. The error of chain measurements is usually estimated to be about one foot in five hundred feet, or, with care, one foot in one thousand feet.

When greater accuracy is desired a steel tape should be procured, those most commonly used being fifty and one hundred feet long and divided into feet and inches, or, feet and tenths of a foot, as desired. The error of tape measurements, if carefully made, is estimated at about one foot in five thousand. The pull exerted on either tape or chain should be great enough to make the stretch balance the shortening due to the sag.

Two men with a tape, or chain, a plumb line, a color-pole, and a set of eleven pins are required in measuring horizontal distances. The head-chain-
man carries the front end of the chain and starts with ten pins; the rear-chainman takes the other end of the chain and the eleventh pin is used to mark the starting point. The rear-chainman must keep the head-chainman in line by sighting ahead to a fixed point or the color-pole set up for this purpose; for distance, the “lining in” by the eye is accurate enough. The head-chainman, after being lined in, stretches the chain taut, puts in a pin and calls “all right;” the rear-chainman takes the pin at his end of the line and they proceed to the next chain length. Just before reaching the next pin the rear-chainman calls out “chain” to warn the man ahead that it is time to stop. After ten chains the head-chainman will be out of pins and the rear-chainman brings forward ten pins, which are counted by both men and recorded by both in their note-books. There is always one pin in the ground which is never counted.

When the ground is not level care must be taken to keep the chain horizontal. The plumb line is used by the head-chainman, when going down hill and by the rear-chainman in going up hill, to transfer the measurements to the ground. If the slope is steep the chain is stretched its full length but the measurements are made in sections, the length of which will depend upon the steepness of the slope. All pins used at these intermediate points must be returned at once to the head-chainman to avoid errors in counting.

A complete survey can be made by use of the chain alone if a point, as P in Fig. I, can be selected from which all corners of the plot may be seen. The four sides and the four dotted lines should be measured and from these lengths the area of the four triangles can be computed and the boundaries can be plotted. No matter how many sides the figure has, this method can be used. If the lengths of the three sides of any of these triangles be represented by “a,” “b” and “c” and the sum of these sides be represented by “p,” then the area of the triangle, “A,” can be computed from the formula,

\[ A = \sqrt{p(p-a)(p-b)(p-c)}. \]

The sum of the areas of all the triangles will give the area of the entire plot.

If it is desired to run a line at right angles to a given line advantage can be taken of the fact that if the lengths of the sides of a triangle are in the ratios 3:4:5, one angle of the triangle will be 90°. A triangle can be constructed with the chain and having the sides 15, 20 and 25 links long, or, 24, 32 and 40; the longer the sides of the triangle, the more accurate the right angle. A steel tape cannot be bent to sharp angles like a chain, so from the point P, Fig. II, of the given line where the right angle is to be constructed, measure thirty feet along the line to the point A; place the zero end of the one hundred foot tape at A, holding the other end at P, bring the fifty foot and the sixty foot marks together and stretch the tape taut, this will locate the point B and the line P B will be perpendicular to the given line P A. By fastening the ends of the tape at the two points on the given line, one man can do all the work.

A line can be run through a given point P, Fig. III, parallel to a given line A B by dropping a perpendicular from the point to the line and from
any other point, as B, on the given line erecting a perpendicular B R of equal length to P A; or, assume a line A O through the point P and make O B = O A, then measure off O R = O P and the line P R will be parallel to the given line A B.

An angle can be laid off, by means of the tape and a table of natural tangents, with considerable accuracy. Begin at the apex A, Fig. IV, and on one side of the angle measure off any length A B, say one hundred feet, as a base, at B erect a perpendicular to the line A B. The length of this perpendicular B C will be equal to 100 times the natural tangent of the required angle. Join C with A, and the angle C A B is the required angle. If the angle is greater than 90°, erect a perpendicular to get the 90° and lay off the balance of the angle by this tangent method.

The surveyor’s compass is an instrument for determining the direction of a line with reference to the direction of a magnetic needle. The needle is balanced at its center on a pivot so that it swings freely in a horizontal plane. This pivot is the center of a horizontal circle which is divided into degrees and half degrees and numbered from two opposite zero points each way to 90°. The brass frame which holds this graduated circle has two vertical sights so placed that a plane through them also passes through the pivot and the zero points of the circle. This frame is attached by means of a ball and socket joint to a tripod or to a Jacob’s staff. Two levels, at right angles to each other, are attached to the frame and are used to keep the graduated circle in a horizontal position. As the magnetic needle points in a fixed direction the angle between this meridian and a line located by means of the vertical sights can be determined by the graduated circle; this reading is called the “magnetic bearing” of the line. By means of the bearings of two lines the angle between them can be determined. Bearings are read from 0° to 90° from the north or south points, the quadrants being designated by the letters N E; S E; S W; or N W. The pocket-compass is a small hand instrument by which these same bearings can be obtained but not with such accuracy.

In calculating the angles between these same lines from their bearings it is necessary to keep in mind the relation the lines have to the meridian, i.e. the angle A O F (Fig. V) is found by taking the difference of the bearings; the angle A O D, by taking the sum of the bearings; the angle A O C, by subtracting the sum of the bearings from 180°; the angle A O E by subtracting the difference of the bearings from 180°.

Great care should be taken that no iron or steel is left near the compass as even a bunch of keys or the wire in a stiff hat will appreciably affect the needle.

The level is an instrument used to determine the relative elevations of different points. A telescope, to which a spirit-bubble is attached, is supported on a plate with an adjustable head to be screwed on a tripod. By means of the adjusting-screws of the head the plate is made horizontal and the intersection of the cross-wires in the telescope will sweep out a horizontal plane for each position of the instrument. The level-rod is divided into feet and inches, or, feet and decimals of a foot, and is provided with a target, carrying a vernier, which can
be clamped in any position with a thumb-screw. All readings are referred to a fixed datum or "bench mark" (B M) the elevation of which is known or assumed. The instrument is set up, leveled, the rod is held on the B M, the target carefully set and read by both rodman and levelman and recorded by both. This rod reading added to the elevation of the B M gives the height of the instrument (H. I.) and all intermediate readings of the rod when subtracted from the H. I. give the elevation of the ground at that point. In taking a line of levels for drains or any such purpose the rod is held on the surface of the ground, read to the nearest inch only and these readings recorded only once for all intermediate points; but at all "turning points," those points where the instrument is to be changed to a new position, a stake is driven for a solid support to the rod, the target is set carefully and read as closely as possible, this reading being recorded by both men. When the work is finished the second set of readings is used to check the elevations of all H. Is. In selecting the turning points and the new position of the instrument some errors of adjustment will be eliminated if the new position of the instrument is about the same distance from the turning point as was the old position.

The transit is an instrument for measuring horizontal and vertical angles. It is usually provided with a compass as the magnetic bearings are often useful in locating errors if any are made. The horizontal circle is graduated to half degrees and a vernier is provided which will read at least to minutes of the arc.

Several reliable instrument makers are putting out light instruments at moderate prices with which all the problems arising in Farm Surveying can be solved with sufficient accuracy. Such a one is manufactured by Bos trom and Brady, of Atlanta, Ga. The level may be used on foundations, settling floor timbers, laying out drains, irrigation ditches, etc., and the compass for use in relocating boundary lines, measuring angles, or, subdividing tracts of land.

AGRICULTURE IN PUBLIC SCHOOLS

By A. D. DeWitt

Superintendent of Schools, St. Louis, Mich.

As we were the first high school in Michigan to offer a full course in Agriculture, we are called upon to state the results of three years' work along this line and will describe our course of study with our methods of applying it, etc. Let me state at first that our city has about 3,000 inhabitants, is situated in a fertile farming region, and has a school fairly equipped with chemical, physical, and botanical laboratories.

The business world has long looked to our institutions of education for its telegraphers, physicians, accountants, stenographers, engineers, lawyers, teachers, etc. To whom is the greatest industrial interest of our country to turn for its leaders, skilled in its particular line? Educationally, has
our farmer had a square deal? We think not. One-half of the pupils in
the public schools of the United States are in the country schools. Nine-
tenths of this great army of American youths finish their education in these
rural schools. Where can the farmer's son learn to produce two blades of
grasse where one formerly grew? Who is to teach him to avoid the mistakes
of his fathers? Where will he learn love and respect for this, the grandest
of all work, and the work upon which the weal or woe of our country de-
pends? Let him once realize the importance and dignity of his father's
vocation and he will not be so anxious to leave the broad and beautiful fields
of his father's home and confine himself to the crowded, unhealthy shop or
factory of the city.

In our experiment of placing a good agricultural course in our school we
hoped to answer, in our mind at least, some of the above questions. We
have been more than pleased with the results. In our high school of about
eighty pupils, the first year seven elected this course, the second year
seventeen, and this year thirty-two. It may be of interest to note that the
city pupils are as anxious to know about the agrarian interests of our
country as are the farmers' boys. A majority of every class has been com-
posed of young ladies.

Now as to what we try to teach. We teach some of the mechanical and
chemical properties of the soil, soil-water, saving soil moisture, draining,
etc. We try to teach the pupil to discriminate between good and poor soil,
the adaptation of different soils for different purposes, the reclaiming of pine
barrens and worn out soil, rotation of crops, the value of the leguminous
fertilizing plants (especially clover), and how plants feed and grow. Most
of this work is done by experiments carried on either in our laboratories or
out of doors. Our Board of Educa-
tion has recently purchased a piece of
land near our high school building
and we hope to introduce the school
garden very soon. Germinating, se-
lecting and testing seeds have proved

of great interest to our pupils. We
might say that this work is done in
the course only after the pupil has had
one year's work in botany and nearly
this amount of work in chemistry.
We have aimed to interest our pupils
in floriculture, and many a home and
its surroundings in and about our city
prove that our efforts have not been
altogether fruitless. The vegetable
garden has received some attention as
to what to plant, when to plant, how
and when to cultivate, and how it can
be laid out to be cultivated cheaply
and effectively. The orchard, its
planting, pruning, grafting, cultivation,
spraying, etc., we have tried to
teach thoroughly. The insect and
fungus enemies of the orchard and the
most common crops have been studied
by use of the compound microscope.
The latest approved methods of coping
with these pests have been learned by
our pupils. This work has been done
largely by the laboratory method of
teaching.

Here we present our course of study:

First Year: 1st semester  Hours

<table>
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<th>Hours</th>
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<tbody>
<tr>
<td>Physiology</td>
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<td>Bookkeeping</td>
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Second Year: 1st semester

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<td>English Composition</td>
<td>4</td>
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<tr>
<td>Botany</td>
<td>6</td>
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<tr>
<td>The Soil; Origin, Drainage, Capillary Action</td>
<td>4</td>
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2nd semester.

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<td>English Composition</td>
<td>4</td>
</tr>
<tr>
<td>Zoology</td>
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| The Plant; Food, Propaga-
  tion, Diseases         | 4     |

Third Year: 1st semester.

<table>
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<tr>
<td>Physics</td>
<td>5</td>
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<tr>
<td>English Literature</td>
<td>4</td>
</tr>
<tr>
<td>Orchard, Garden and Field</td>
<td>6</td>
</tr>
</tbody>
</table>
2nd semester.
U. S. History and Civics 5
Chemistry 5
Review Algebra 5
Farm Animals, Farming.
Gardening 5

We invite suggestions and criticisms of the above course.

So much as to what we do; now as to how we do it. As has been stated above, this work is done largely by experiment and in the open field. We use a text-book to some extent which could be used in any country school, and which is one of the many excellent books on this subject. It is the text of Stevens, Burkett, and Hill and is published by Ginn & Co. Any teacher in any school of the country can make this work a success if he will buy three or four good books on the subject and read it up carefully. He will become fascinated with this very practical subject. As this article is intended to be useful to the teacher we will here suggest a few books and the names of the publishers. There are many others equally as good. Goff and Mayne—First Principles of Agriculture, the American Book Company; Jackson and Daugherty—Agriculture through the Laboratory, Orange Judd, New York; Lyon and Montgomery—Examining and Grading Grains, Ginn and Co. ; Bailey—Elements of Agriculture, the Macmillan Co. ; Roberts—The Farmstead, the Macmillan Co. In these books many simple experiments are suggested.

We are indebted to President J. L. Snyder and Professor Clinton D. Smith, of the Michigan Agricultural College for many helps and suggestions along this line of work. The above gentlemen have put themselves on record as standing ready at any time to help any teacher in this work, and we have found their assistance of the greatest value. Our State educational paper, the Michigan School Moderator, published last year a series of simple, inexpensive, but very interesting experiments along this line, furnished by the professors of our most excellent Agricultural College.

Mr. Dick J. Crosby, our government expert in agricultural education and Dr. A. C. True, both of the Department of Agriculture, will lend all the aid possible to teachers of this subject and agricultural reports are published for distribution by the above department. These may be had for the asking and are of great educational value. We have used with profit the bulletins of our state experiment stations which also are free.

Many other suggestions could be made but space forbids. Suffice it to say that any teacher in any school (country district schools included), if he goes at this work with earnestness of purpose and determination, can make it one of the most fascinating subjects in his curriculum.

With Nature Study, Experimental Botany, School Gardens, Manual Training, Domestic Science, and Agriculture in our American schools, we can teach that love of nature and home, that respect for honest labor that is necessary for the perpetuity of our beloved American nation.

"Come out into the light of things,
Let nature be your teacher
One impulse from the vernal wood
May teach you more of man
Of moral, evil, and of good
Than all the sages can."

Much more could be said upon this subject, but as we were asked to relate our experience in teaching agriculture we will not enter other fields. In conclusion, let me say to my fellow teachers that this paper comes from one on the "firing line," who believes most thoroughly in the importance, feasibility, and practicability of teaching agriculture in our country schools as well as in our high schools. The writer would be pleased to answer any questions, or aid, in any way he can, his fellow teachers in this work.
RANCH LIFE IN THE FOOTHILLS

By M. W. Evans, '06

Bureau of Agrostology

COTTON, BUL. 75, BUREAU PLANT INDUSTRY, U. S. DEPT. OF AGRICULTURE

A MOUNTAIN MEADOW BEFORE BEING SOWN TO TIMOTHY

DURING the latter part of June, 1907, I spent two days in one of the broad irrigated valleys of central Washington, located just east of and within sight of the snow-capped ranges and peaks of the Cascade Mountains. While there I had occasion to go up to one of the smaller mountains situated to the northward within a distance which could be driven over and back in one day. The irrigated lands of this vicininity lie in a broad, basin-like valley, which was originally too dry to support much vegetation except a growth of sage-brush. At present, however, this sage-brush has been cleared away and the land put under irrigation. This soil, an almost barren waste until supplied with water, now produces immense crops of timothy and alfalfa hay.

After driving perhaps twelve or fourteen miles through this flourishing farming region, I came to where the land begins to rise, and irrigation ceases. At the last house on the outer limit of the irrigated valley, the people informed me that the Westbar Ranch, for which I was bound, was some ten or twelve miles farther up the mountain, and that I could find it by following the wagon road or trail which led that way. There is no house along this road for the entire distance, and I was told that it would be only a chance if I should find any of the ranchers at the ranch house when I arrived there.

To one who is accustomed to the comparatively uniform local climatic conditions of the East, the changes passed through in ascending the mountain were interesting. Down in the valley, where the elevation is about 1500 feet, the rainfall is sufficient to support only a semi-arid vegetation. As I drove up the trail, the first change I noticed was that the sage-brush disappears and its place is taken by wild bunch grass. Not far up the mountain are groups of yellow pine, small and scattered. Farther up the ascent the trees become larger, closer together and the forest occupies a larger proportion of the ground. In the open prairies, which alternate with the stretches of timber, were several wild flowering plants, the most conspicuous ones at that season being wild lupines. I remember several patches, some of which were perhaps
nearly a quarter of an acre in area, profusely in blossom, showing every gradation in color from white to dark blue. A little farther on, the road passed over the summit, at an elevation of 5250 feet. Here the rainfall was so much greater than in the valley, 3500 feet below, that instead of a semi-desert condition, the open stretches of meadow between the forests were as beautiful and green as any lawn; and all this change within less than twelve miles.

I had no trouble in finding the corral and ranch house, and was still more pleased to find that three of the herdsmen happened to be camped at this place, and had not yet left for the range after eating their noon meal. I unhitched the team and fed them in the log stable, while the man who acted as cook kindly prepared for me a dinner of fried bacon, cold soda biscuits, syrup and coffee. As he was anxious to be after the cattle, he soon rode away and after eating, I walked over to another portion of the range about one-quarter of a mile distant.

Soon after I had left the ranch house it began to rain and by the time I had secured the desired information and returned to camp, I was quite wet. I hunted up some wood, made a fire in order to dry out my clothes before starting on the long drive back to the station, and soon was joined by two of the rangers, who, also, had returned to wait until the shower should end. As we sat there, watching through the open door, the gray clouds which seemed to almost hang on the higher slopes, and listening to the raindrops pattering on the shingles above, we easily fell into a mood for conversation. I was soon an interested listener, while the two herdsmen told me of the business they follow and of the life they live.

It must not be understood that the type of ranching here is typical of the ranch life in the open range on the Great Plains east of the Rockies. Different conditions exist there. However, great numbers of cattle, sheep and horses are produced west of the vast grazing region of the Plains, in the valleys and on the mountains which are not heavily timbered, or are not too rough or inaccessible to utilize for grazing purposes. Conditions as found on the Westbar Ranch would be more or less typical of the stock raising business as carried on throughout the mountain regions. On this ranch, fences enclose quite a good many square miles, or sections of range. To the east, the land slopes down toward the Columbia River. Down in the valley, where the climate is warmer and where fodder crops are grown by irrigation, are the winter headquarters. The log-house where we stopped is one of the several camps scattered over the summer range.

As soon as vegetation has made some growth on the lower foothills, the sheepmen start out, gradually taking the flocks a little further back toward the mountains. After the sheep have been on the range for some three weeks, the cowboys come with the cattle, which are kept about three or four weeks behind the sheep. The sheepmen or cowboys will stop for a short time at the camp nearest the place where the stock is feeding, then will move to the next camp as the flocks or herds move further up. During the spring when the soil is moist from the frequent showers, particularly up in the mountains, the growth of grasses is very rapid indeed. When I was there the sheep had been grazed on that part of the range near this particular camp nearly a month earlier, while the cattle had just recently reached this location. The wild grasses and a species of clover resembling White Clover were several inches high and of an unusually fresh, green color. Three or four miles further back and higher up in the mountains, the grazing was shorter because of the cooler climate. One of the men told me that the day before he had come over snow three feet deep on the north slopes a few miles farther up in the mountains.

The cattle are kept in this enclosed area all summer. The sheep, however, are taken out on the open range early in July, and graze westward
through the Cascades or northward for a hundred miles or more toward British Columbia. As this open range is now included within a forest reserve, the stockmen must comply with certain regulations in order to use it for pasturing their stock.

Notwithstanding its loneliness, there is a great deal that is pleasant and attractive in the life these cowboys and sheepmen live. Mountain trout are abundant in the streams, and there is some game in the woods, one of the men had killed a black bear a few days before my visit. The outdoor life, the varied scenery, and the bracing mountain air, are reflected in the ruddy complexion and the clear eyes of the herdsmen. These men are close observers, and understand a great deal that is going on in the forest and range. Those whom I met appeared to be intelligent, trustworthy men, as the nature of this work demands.

Almost unnoticed, the rain had ceased, and the gray clouds had given way to patches of blue sky. We had talked until after five o'clock and the cowboys were anxious to be back with their herds while I wished to be over the lonely mountain road before dark, as well as to catch the 9:20 train at the station twenty-five miles away in the valley below. It was with regret, that I had to decline the invitation which the men gave me on leaving, to come back sometime and spend two weeks in hunting, fishing, and riding with them, and learn more of the forests and mountain range.
ADVANTAGES AND DISADVANTAGES OF POULTRY CULTURE

By Arthur A. Brigham

Brookings, South Dakota

At the close of the last century, the annual yield of poultry in the United States was reported by the statisticians to be nearly $300,000,000. That was a long time ago. Today we need have no doubt that the value of the annual poultry production is over $400,000,000. America’s business hen is not a large bird but, judging by her works, she represents a very important branch of agricultural industry. We shall not be straying from the truth if we say that she represents a calling as much and as well as the cow or the sheep.

Since the first American poultry school was started in Rhode Island ten years ago, college after college has taken up the work of poultry instruction, and farmers’ institutes have, more and more, called for lectures and demonstrations in modern poultry keeping. Now comes report of the successful course of a special poultry instruction train, run over the railways of a western state, carrying typical specimens of fine fowls, samples of modern poultry appliances and teachers to instruct the farmers, gathered at the stations along the route, in the best methods of poultry management.

Poultry culture is already classed as an important and productive industry and the possibilities of its future development are just beginning to be understood. If, then, there are to be numerous openings for poultry culturists it may be well to consider some of the advantages and disadvantages of the calling.

First is healthfulness. Men and women, in these strenuous times, are coming to realize that the gaining of wealth at the expense of health is on the whole a losing proposition. That poultry keeping under reasonable, sensible conditions is a healthful occupation may be considered settled because of the fact that many individuals in a poor state of health, have taken up this work and made it a means of gradually regaining and increasing their health, strength and vigor.

Secondly its attractiveness. When dealing with fowls we have to do with living creatures. They appeal to our liking for something which has activity, movement, life, and therefore are interesting to us. Is there anyone in this great world who does not find a fluffy lively little chick beautiful and attractive? How could the poetry of Eastern tide be expressed were there no eggs or downy chicks? If additional evidence of the attractive quality of our birds is desired, let the searcher after proof go to some great poultry show, like that in New York at Madison Square Garden, and watch the crowds of people who come to the exhibition for the sake of seeing the beautiful plumage, symmetrical forms and graceful movements of the fine fowls. If further proof is needed, let the doubting one sit down before the glass door of an incubator when the chicks are hatching and then try to tear himself away, while the eggs are snapping and cracking and the little chicks are breaking channels around the shells, bursting their bands and rolling out and about. The person who never had the hen-fever has not really been properly raised. Something is lacking in his training and education. He is not complete. The human who early develops into a chicken crank and remains one for life which (which necessarily follows) secures at least one source of enjoyment, which is satisfying and tends to perennial peace.

This subject has indeed a sociological side. Many a man, choosing poultry as his hobby, has been thereby kept from seeking recreation and excitement in questionable ways and places. Many a lad, becoming inter-
ested in chickens and their culture, has been saved through these home attractions from the allurements of the saloon, fast companions and other temptations. More than one country boy has been held by his flock of fowls upon the farm and finding pleasure and profit in them, stays there and follows farming—the best calling on earth. Many a woman in the country has gained peace and pin-money raising chickens and turkeys and no one can do this work quite so successfully and satisfactorily as she. Poultry is irresistible to the great majority of people and its popularity is finally proved beyond a peradventure by the lonely, exceptional persons who “hate hens.”

Poultry products are readily transportable even for long distances. Being perishable products as well as valuable, they will bear considerable cost for careful carriage and prompt delivery in fresh condition, to cash purchasers. If the location is favorable for the delivery of eggs and dressed fowl to families not too widely separated, a retail route may be established and middlemen’s commissions avoided.

The poultry industry lends itself to specialization to suit the peculiar local conditions, the market demands, the qualifications of the producer and all the other circumstances of a given place and person. Actual cases may be cited in illustration of this important feature of poultry culture. In one section the raising of soft roasters is the main business on farm after farm and a nearby city takes the product at paying prices. These poultry farmers do it differently from ordinary poultrymen. They are hatching chickens by the thousands when other poultry keepers are letting their chickens get ready for the fall market. They are growing their autumn hatched chickens when others are killing and marketing their poultry. They are finishing and selling their plump roasters in the spring months when most poultrymen are hatching chicks.

Other specialties include squab broiler chicks which, hatched and raised in winter and killed at eight to ten weeks old may never know what it is to be out of doors, running by fast route from inside the egg to inside the brooder to inside the epicure; selling incubator chicks just after hatching, sending them by express, perhaps a thousand miles to the buyer, in safety and saving the latter all the trouble of hatching.

Poultry keeping may be carried on advantageously in combination with other kinds of business, for example—fruit culture, dairying, bee keeping or almost any branch of agriculture or horticulture. In these days the saving of the wastes and utilization of the by-products has changed more than one struggling enterprise into a profitable undertaking. In some of the combinations of poultry keeping and other branches of farming, by-products and would-be-wastes are used by the fowls and made into valuable, saleable poultry products. Rightly managed the fowls improve and enrich the land. Their excrement, if taken care of properly, is a valuable manure of special utility in fruit orchards, for grass land, garden vegetables and foliageous crops of all kinds.

Wherever poultry is kept in large numbers there is illustrated the biblical saying “In the sweat of thy face shalt thou eat bread, till thou return unto the ground.” If fowls do not perspire, pushing practical poultrymen do. There is plenty of hard work in running a poultry plant, which may be considered a disadvantage by some people.

There is no scheme of life insurance covering poultry risks and sometimes, in spite of every precaution, epidemic disease sweeps through the poultry yards leaving death and destruction in its wake.

Uncle Sam’s census enumerators have never taken account of the little flocks kept in the back yards of thousands of homes in city suburbs, towns, villages and rural dales. Even the tax assessors usually pass them by. Their products are mostly consumed in the home with which they are connected. The advantages of this kind
of poultry keeping must be great when so many families practice it. Clean, fresh, limpid eggs in constant supply and an occasional tender chicken or plump fowl for the table, all for very little outlay of money and labor, are inducements that lead numerous householders to "keep hens." The wastes of the household may supply a large part of the food required by the fowls. If, happily, there is a garden connected with the home, its surplus crops and even its weeds may be used to help balance the poultry rations.

When the head of the household is interested sufficiently to take the charge of the fowls wholly upon himself, several things are gained. He usually secures pure-bred fowls of good quality and takes pride enough in his flock to provide neat attractive quarters for them, manages them systematically, feeds them properly and gains good results. Thousands of sensible men are doing this and they are better men in many ways because of this interest and effort. Their homes have thereby added attraction and comfort. Sometimes the housewife is the family poultry keeper, in which case the fowls are sure to do well. They feel compelled to show their appreciation of the womanly care and management which untiringly, patiently and conscientiously supplies their wants and seeks to keep them comfortable.

In case neither of the parents choose to care for the fowls, this duty may fall to the lot of the son or daughter. Some of the nicest family flocks in the land are in charge of the boys and girls of our country and they are showing what young Americans can do with hens.

Disadvantages:—About all of the advantages just named turn to disadvantages if the appointed keeper of the family flock is not interested in the birds, dislikes to care for the new and fails to attend properly to their comfort. Carelessness and neglect allow filthiness to prevail, parasites to prosper and disease to enter the flock. The birds and their faithless overseer both go from bad to worse.

Another thing that will defeat the good purpose of the poultry keeper, even if he is interested and earnest in the work, is the lack of adequate, convenient, comfortable quarters, including properly fenced yards. Otherwise crowding and discomfort, extra and useless labor, and small returns, change the birds into a burden and a plague. Sometimes seeds planted in the garden come up too promptly if there are fowls about. Further if fences are lacking the hens may prove a nuisance to the neighbors and cause no end of trouble. Poultry keeping certainly tests and sifts human character.

Advantages:—Breeding fine pure-bred fowls is the quintessence of poultry culture and hath advantages peculiar and particular. To its enthusiastic devotee it yields so great pleasure that, oftentimes, he forgets to consider whether it pays a financial profit or entails a loss. It is his hobby and he rides it hard. It appeals to his intelligence and calls for the best brain work of which he is capable. In striving to produce an improved strain of one of the standard breeds or in creating a new variety of fowls, there are called into play, or into work, the finest talents of man and such studying as Lavater referred to when declaring "It is the depth of study and not the extent of it that gives mental power". The poultry fancier is dealing with the forces of life! The results of his earnest efforts to win perfection according to the standard, if successful, embody wonderful beauty of plumage, splendid symmetry and gratifying gracefulness, a harmonious whole to fill the eye and heart full.

Many of the readers of The Cornell Countryman will remember the grandson and namesake of the founder of Cornell University, Ezra Cornell, whose untimely death some years ago, in the prime of manhood, came with a terrible shock and brought sadness to numerous friends. Ezra Cornell was, in his lifetime, the tallest man in Ithaca and the highest and best example of a true fancier that I have ever known. He was intensely interested
in the beautiful birds which his genius had developed. He brought to the developing of his feathered pets the highest qualities of mind and heart, the closest concentrated thinking, and the most thorough understanding of the life forces to be manipulated, that it has ever been my lot to witness. The Cornell strain of White Leghorns and the new variety of Wyandottes which he named the Golden Penciled and Silver Penciled, give striking proof of his power to produce, may I not say, create, beautiful as well as useful types of our domestic fowl.

Disadvantages:—The main disadvantage of the fancier’s fad is the liability of failure, even after strenuous endeavor, to obtain the object of his ambition. Life is too short, sometimes, to allow of success in reaching a standard of perfection even in feathers, but the fancier’s efforts are often rewarded in a most satisfying manner. In any case and whatever the outcome, the true fancier never cries “quit”.

The complete Cornell countryman is born and reared on a good farm. He enjoys all the advantages of a childhood in the country. As a boy he is the pleased possessor of many farm pets and his feathered friends especially win and hold his affections. The rural school and the high school lay the foundation for his education and the natural surroundings of his home life help to round out his character. A regular course in Cornell University prepares him for the special study of poultry culture and marriage with the “best girl in the Empire State” perfects his preparation for poultry practice. He becomes a progressive, practical poultryman, the owner of a model poultry farm and proceeds to raise standard chicks and children—the two best American farm productions—in large numbers. What could be more complete?

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SOME FIELD EXPERIENCES WITH BLACK ROT OF GRAPES

By Donald Reddick, G.

According to the Census Report for 1900 New York State ranks second in the production of Grapes in the United States. In that year the total number of grapes produced for market was 247,698,000 pounds; this was exceeded only by California where the yield was nearly three times greater. An examination of the accompanying map, in which the black numbers represent million pounds, will show that we have very definitely localized grape regions within the State. This is due to soil, or climatic conditions or both.

Once the vineyardist finds a favorable location he is at considerable initial expense in getting the vineyard started and into bearing. However, by proper viticultural methods, vines brought into bearing should continue to bear for a long time or indeed practically for an indefinite period. By proper renewals and adequate attention a stock 100 years old should bear as many pounds of large berries as it did when it was ten years old.

A vineyard then is a relatively permanent investment and one engaged in such business can not transfer his operations to a more profitable field, or substitute a more profitable crop if this fail to pay. It is therefore of utmost interest and importance to the viticulturist to know “what to do” when some morning, usually early in July, he finds the fruit of his vines a blackened and shriveling mass, which the day before was plump and green and apparently in thriving condition. Such has been the experience of a great many growers in the State. Beginning in 1902 and increasing each year, a great number of growers have experienced very serious losses until, culminating in 1906, many of them
suffered a total loss of their crop. Every one in the neighborhood of a vineyard knows just the day that the berries turned black and began to rot, and are pretty well agreed that it is the "Black Rot." As to the nature of the Black Rot however, there are nearly as many explanations and conjectures as there are individuals.

The question on all sides is, not "what is Black Rot?" but rather "what do you do for it?" The question implies the hope that there may be some great cure-all or universal remedy, the application of which would restore the dying berries to their normal healthy condition. No such happy solution is at hand however, and indeed at the present time it is only in rare cases that a plant once diseased may be restored to health and vigor. We must look to a means of prevention rather than to a cure.

It is only in rather exceptional cases that we have been able to prescribe preventive or curative measures for diseased plants, without first knowing the life history of the specific organism producing the disease or at least facts about some of its critical stages. Thus, in order to answer the question, "what do you do for it?" it is first necessary to learn something of the life history of the disease-producing organism that we may single out the critical stage or vulnerable point of attack. This leads to a sane method of approach rather than the haphazard method frequently employed.

It must not be inferred that nothing is known of the life history of the Black Rot fungus for indeed a great deal is known about it. However, from the fact that the application of preventive and remedial measures, suggested by former experimenters, have not proved entirely successful,
BLACK ROT ON THE FRUIT

the Department of Plant Pathology has undertaken a thorough investigation of this disease-producing organism in order to become entirely familiar with all manifestations of the malady, to find out if some vulnerable point or malignantly infectious stage has not been overlooked, and to learn if there may not be some condition peculiar to our region which favors the spread of the disease. The writer was placed in charge of this investigation and at the outset it was decided that the best place to become familiar with these facts would be in the vineyard itself. This necessitated the establishment and equipment of a field laboratory where microscopic examinations could be made, cultural investigations carried on, and permanent records in the way of photographs, notes, drawings, etc., obtained.

Thus early in June 1907, the Field Laboratory was established in a two hundred acre vineyard of Niagara White Grapes near Romulus, N. Y., operated by Mr. G. G. Lansing. The loss had been total in this vineyard in 1906 and for that reason would have been an excellent place for investigation had not Mr. Lansing been so actively engaged in fighting the rot. However certain rows beside the laboratory were allotted me for experimental work and in connection with another vineyard of two hundred acres, less than a mile away, which was not sprayed and in part not cultivated, I was able to carry on infection experiments and at the same time observe the method of natural infection over a large area.

Some very interesting facts were noticed during the season. Perhaps the most important of these is the fact, that, contrary to general opinion, the winter spore or ascospore stage is not confined to a limited period in the spring but is active throughout the summer. These winter spores are borne in cylindrical sacs, eight in each sac, and these sacs in minute flask shaped cavities in the surface of the mummied berry of the previous season. When a small quantity of water is

MUMMIED GRAPES

It is from this source that most of the infections take place.
placed upon a portion of such a mummy, examination with the microscope shows that the mature sacs swell, push to the exterior, and there discharge the contained spores with some violence into the air. The spores do not all ripen at the same time and I was able to obtain cultures from this source as late as August 15th.

It will thus become apparent that with each rain there will be a discharge of these spores into the air and if such rains are followed by cloudy or foggy weather the appearance of a new infection may be predicted with certainty in from 8 to 14 days. The first three infections of 1907 were almost entirely from such a source.

An ascospore falling on a stem, leaf or fruit will, if moisture and atmospheric conditions are right, produce a germ tube which penetrates the tissue. This branches and grows by the absorption of nutrient materials, sap, etc., thus forming the mycelium of the fungus. In the course of three weeks this mycelium fruits, i.e., bears an enormous number of summer spores or propagative bodies. These are capable of reproducing the disease and are the chief source of the widespread and general infection. In 1907 they were of little avail owing to the continuous extremely dry weather.

Another interesting fact in regard to these summer spores was observed. Very frequently stems and tendrils as well as leaves are attacked and in due course of time bear a crop of the summer spores. Curiously enough these spores are not always discharged but lie dormant over the winter. The following spring they are still capable of germination and may produce infections at that time. Most of the infected wood is removed in trimming but it is a difficult task to remove the tendrils from the wire.

One very vexing but withal most interesting problem presented itself. Although several thousand artificial infections, both of summer and winter spores, on leaves of all ages and fruits of various sizes and under various conditions were made, not a single, definite, positive infection was obtained. From the literature however, I find that I am not the only unfortunate along this line, and there is some satisfaction in that.

The following season is to be spent in the field where former observations will be duplicated and new or unfinished experiments completed.

THE COUNTRY ROAD AND THE PATH MASTER

By J. Demary, Sp.

The papers and magazines at the present time are full of great schemes to be worked out on our highways both local and national: they are to be for the benefit of the auto, the pleasure seeker, the pedestrian, the city man and the fellow who uses them three hundred sixty five days in the year—the farmer. With all this glamour it seems ungrateful to suggest that the present generation must worry along with present conditions and that the sanest thing is to make the best use of them without, however, being bound by tradition to put up with unscientific treatment, no matter how "orthodox."

There are roads and roads, pitch-like clays, where the wheels grind on solid rock and hopeless sand. It is useless to formulate any definite treatment suitable for all, but each in its location should be studied and its drawbacks avoided. The State may enact road legislation and issue bonds galore but in the majority of cases it is "up" to the people of any given locality to build or maintain the highways as we find them, say at eleven p. m. in the month of April.

The road question is a local one. No amount of "thoughtful consideration" given to the subject in a comfortable hotel with a paved street and a trolley outside will remedy "that big mud hole on the creek road" like a hundred loads of good gravel. Scarcely ten per cent of the highways of New York State will be macadamized in the next ten years and with
The present conditions it would seem very practical to give some training in the most efficient use of the ordinary materials as we find them along or near by the country roads.

While it is perfectly feasible for the State Engineer to map out a road system with First, Second or Third class highways, taking the macadam road as the standard and its construction more completely under his jurisdiction, when you remove from the people of a locality their responsibility and authority and attempt to direct matters from a crowded central office you destroy their personal initiative and moreover are attempting to kill a cat with an eleven inch gun. When it is “up” to the people of a township to wade through a mudhole of their own suffrance it takes them where the harness is worn.

Therefore let us consider the township road. In New England where the writer was reared, the road commissioners are elected each spring for a term of one year, in number proportionate to the size of the town. Politics and the candidate's capacity for furnishing teams are leading factors in his selection; civil engineering cuts no figure and a rough and ready treatment of the highway results: no itemized account of expense per mile is kept or specific repairs made but these are lumped with the general account. There is no record whether the roads are in better condition or worse by years and any extra writing is avoided as much as possible, the result being that while the grand total of the cost of roads and bridges is known, the various items are as vague as those of a railroad company are clear.

From a practical standpoint the highways of a township should be mapped to a certain scale, say eight inches to one mile and furnished with a key showing the various bridges, culverts, hills, gravel pits, etc., and a basis formed for reference in estimating the cost of definite repairs and probable expenses in the future. The map will serve for many years and the roads will survive their users.

In New York the Highway Commissioner is elected by a different system and is responsible to the County Supervisors but the local man has his place and his selection is sanctioned by the people who used the roads under his control. He ought to be a man who has some civic patriotism outside of his job and who is not impervious to reasonable suggestion; he ought to have some knowledge of simple surveying and engineering, for to continue to use a steep grade for no reason beyond tradition shows a lack of progress. He should have some practical knowledge of the geology of his section and a good comprehension of the fitness of the local rocks for use in the road bed. It frequently happens that a gravel bank may be convenient but composed of disintegrating shale and hence unfit for a permanent foundation. In short he should be “onto his job” and be willing to accept any new information that can be conveniently and practically used in his work and lastly his pay should be in proportion to his ability and fitness for the position.

There is great need at present for more definite and complete information not only on the new stone roads, but the present dirt and gravel ones that the farmers are still using. There are the burnt clay roads in the South, the King Drag idea “from Missouri,” the snow rollers used in the extreme North, such devices and others of like value should be made more of a feature in the present Institute work, especially in sections where the prospect of State aid is very remote.

It is useless to talk of millions. It is over the head of the man to whom $10,000 is independence, but anything which will help him to get into town with a fair load of produce is much more to the point. The man who has to use the country road “in his business” is entitled to all the help possible in making the best use of them. He has to use them in November and April, and frozen ruts and mud do not “correlate” with poetry. The city man takes his outing in June with his auto and tells the magazines all about it!
ETHER AND THE GERMINATION OF SEEDS

By J. Taubenhaus, '08

The object of this experiment was to determine the effect of ether upon the germination of old and new seeds. The process of etherization was carried on in the same manner as with the bulbs, as has been described in earlier issues of The Countryman and the ether used was the same kind of sulphuric ether.

The following table gives a graphic representation of some of the results obtained in a 75°F hothouse:

<table>
<thead>
<tr>
<th>Seeds</th>
<th>Age Years</th>
<th>Etherized</th>
<th>Sown</th>
<th>Germinated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato</td>
<td>5</td>
<td>Dec. 13</td>
<td>Dec. 14</td>
<td>Dec. 28</td>
</tr>
<tr>
<td>Early Purple Turnip</td>
<td>2</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot; 26 Dec. 30</td>
</tr>
<tr>
<td>Early Purple Turnip</td>
<td>new</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot; 17 Dec. 19</td>
</tr>
<tr>
<td>Cucumber</td>
<td>3</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot; 26 Dec. 30</td>
</tr>
<tr>
<td>Cucumber</td>
<td>new</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot; 19 Dec. 22</td>
</tr>
<tr>
<td>Muskmelon</td>
<td>2</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot; 20 Dec. 23</td>
</tr>
<tr>
<td>Muskmelon</td>
<td>new</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot; 20 Dec. 22</td>
</tr>
<tr>
<td>Asparagus</td>
<td>new</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot; 30 Jan. 2</td>
</tr>
<tr>
<td>Cabbage</td>
<td>4</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot; 25 Dec. 29</td>
</tr>
<tr>
<td>Wheat</td>
<td>new</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot; 20 Dec. 22</td>
</tr>
</tbody>
</table>

No attempt was made to determine the per cent germination, as equal parts by weight only, of the treated and untreated seeds were used. As soon as germination began, it was evident that the etherized seeds started earlier as the table indicates. Moreover, it was seen that while about half of the old seeds sown germinated (tomato and cabbage) when etherized, only about one-third of the check seeds of the same kind started.

Of the later seeds, the germination was equally heavy, though in all cases those etherized germinated first, and produced the stronger seedlings. Is it not fair to suppose that plants which have a better start, which look healthier and more vigorous will, in the long run give better produce? The accompanying illustration shows the remarkable difference in the case of wheat, a difference which was equalled with practically each kind of seed.

Thus we would conclude that the sulphuric ether treatment seems to put new life into old seeds; that it seems to hasten the germination of all the seeds tested; that the seedlings from etherized seeds are stronger than those from untreated seeds; and that, since in a medium house no results were obtained, a hothouse temperature is necessary for this process.
The Cornell Countryman

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MARCH, 1908

To a Graduating Class

Three months ago we welcomed the incoming Short Course classes and attempted to express the congenial feeling and good fellowship which awaited them. Today, at this time, their twelve weeks are over. They are returning or have returned to their work, and, we hope, with larger ideals, broader, better ambitions and greater powers to live up to them. To the Short Course classes as a whole, we extend our hand with every wish for success, prosperity and accomplishment in the future; and a sense of appreciation of their work, and activity and spirit while here. We congratulate those men who reached responsible offices, made places on debate teams and all other organizations. We congratulate likewise those men who did not make the teams, but who tried for them. Their efforts were not fruitless, their energies far from wasted, and they should, harder than ever, go at the problems that confront them, in no wise discouraged but with ever a stronger determination to make good—as make good they can. And finally we congratulated all the rest—whether they became known through their activities or whether they remained obscure—for coming here to learn and develop. They too, have accomplished things already, and have gained in their life and work here, benefits that are undeniable—even though they may not realize it. And once again we wish them, one and all, success; not mere wealth, or an easy, comfortable, smooth-sailing existence. But we wish them success, activity, growth—the power to accomplish the tasks assigned them, to add their part, whatever it may be, to the good of the world; to make themselves more useful as Americans and farmers—better as men.

A Desirable "Stitch in Time."

In the face of the high general standard of scholarship which the College has justly felt to be one of its characteristics, the reception of the many delinquent scholarship, or more familiarly, "bust" notices, by its students, came most unexpectedly. It was with relief, though with somewhat a touch of chagrin, that the recipients learned that the condition of affairs had resulted from the failure of several departments to get grade marks to the Registrar in time to have them entered on the cards. We come to realize sooner or later that in college the mere marks on a "report card" lose much of their elementary school import, and that they should be but a slight factor among the motives for industry and study. But in cases like these a delay or a failure to be on time results in an extremely considerable increase of work, loss of time and confusion in the administrative offices of the Uni-
versity. We endeavor to be fair and to appreciate all the delays and unexpected exigencies which may easily cause the overthrow of even "best-laid plans," but we would suggest that the extra work and effort that might be necessary at first, would be more than outweighed by the convenience and benefit that would later lighten the more complicated duties of others, as well as save many persons unnecessary dismay and excited investigation.

When Professor Tuck's course in Extension Methods was started last fall, with a somewhat indefinite idea of introducing a few students to the work of addressing farmers' meetings and of giving them some proficiency in thinking and expressing their thoughts "on their feet," it was little expected that one of its developments would be the institution of an agricultural "Stage." And it is with interest and pleasure that we have watched the growth and development of the idea. The students with characteristic vigor, entered into it with enthusiasm and decision, and though the preliminary contest was held upon an evening of most inclement nature, twenty-three out of the twenty-six contestants were on hand. Of these, as is already known to many, six speakers were chosen by a trio of faculty judges. And at a later date these six competed for the two prizes generously donated, and for the right to speak during Farmers' Week. This activity is wholly new in this college, and so far as we know, unknown in any of the other colleges of the University. But its novelty is no hindrance to the good it can accomplish. It fosters so called "public-speaking" which in this case means more than the name implies; it opens up a new field for any number of students and its valuable training can aid certain men in their efforts toward University oratorical honors as well as prove of great value in later days. As we have already said of other activities—this is a new one, it has been successfully founded, let us now see it grow and prosper as a regular institution of the College life.

As we think of it, the idea occurs, What is the subject of the above editorial? "The Stage!"

Yes, but what stage? In what way can we refer to the contest, this new form of activity so that it is distinctive and representative. Clearly a name is wanted— one that will carry both agricultural significance and the memory or thought of some person, event, or institution. This is a question upon which every person interested should at least have opportunity to express his opinion and it seems eminently fitting that the matter be discussed either in the Agricultural Association, or through some medium wherein the faculty as well as the whole student body may gain utterance. The Countryman will be glad to receive any ideas, suggestions or sentiments along this line, and will communicate them to those who are in a position to further promote their discussion.

The Countryman regrets the necessity of acknowledging a serious error in its columns; but eager-
ly takes this opportunity to bring it forward and to correct it. In an article by Mr. Taubenhaus, on Sulphur Treatment for Powdery Mildew, published on page 132 of the January issue, the word Flax was incorrectly used in place of Phlox. The latter should therefore be understood in every case where the former appears throughout the article.

**GENERAL AGRICULTURAL NEWS**

The American Society of Agronomy was organized in Chicago on December 31, 1907. According to the constitution, the object of the society shall be the increase and dissemination of knowledge concerning soils and crops and the conditions affecting them. It is expected that the membership will be composed largely of scientific workers in agronomy. A strong feeling has been prevalent for some time that an opportunity is greatly needed for college and station men to meet and discuss methods of experimentation and instruction in agronomy. Provision has been made for including as charter members all who join the society before July 1, 1908. Arrangements were also made by which local sections may be established in any part of the country on application of three members of the society. The agricultural colleges may thus have local organizations for discussion of agronomic subjects. By resolution the society expressed its desire to assist the Society for Promotion of Agricultural Science in bringing about affiliation of all the scientific agricultural organizations. The officers for the present year are as follows: President, M. A. Carleton; First Vice-President, C. P. Bull; Second Vice-President, J. F. Duggar; Secretary, T. L. Lyon; Treasurer, E. G. Montgomery.

At a recent meeting of the Board of Trustees of the Iowa State College Mr. C. A. Scott of the United States Forest Service was elected to the Chair of Forestry to fill the vacancy caused by the resignation of Professor H. P. Baker who accepted a more lucrative position at the Pennsylvania State College. Mr. Scott is a graduate of the Kansas Agricultural College and a student of the Yale College of Forestry. Mr. Scott has been continuously in the employment of the Forest Service since graduation and during this period of seven years has gradually advanced through all stages of the work from that of Student Assistant to Forest Supervisor, which position he resigned to accept the Chair of Forestry at the Iowa State College.

The Missouri Experiment Station at Columbia has just issued a very elaborate and handsomely illustrated bulletin on the most successful methods of fattening cattle, by Dean H. J. Waters. He summarizes the experience and conclusions of about 1000 of the most experienced and successful cattle feeders of Missouri, Illinois, and Iowa, and adds also a summary of the results of a large number of tests with different kinds of feed, different ages of cattle, etc., conducted by the Experiment Station at Columbia. The bulletin considers such practical questions as the most profitable age to fatten cattle, the proper weight, the best season of the year, the best method of preparing feed, the best sort of shelter, the market demands, the best sort of roughness, etc. It is illustrated with cuts of the different types of beef cattle, including excellent illustrations of the fat steer herd exhibited by the College this season.

Now that the Jamestown Ter-Centennial Exposition has closed, all eyes
are turned toward the next great world's fair, the Alaska-Yukon-Pacific Exposition which will be held at Seattle, Washington, opening June 1, and closing October 15, 1909. This exposition will be held in a section of the country where world's fairs are new and for that and many other reasons it is expected to be a success, beneficially, educationally, artistically and financially. Work on the grounds and buildings of the exposition is well under way and the management is determined to have everything in readiness by opening day. This has been written about all expositions in late years, but the promise has never been completely fulfilled. The officials of the Alaska-Yukon-Pacific Exposition, however, have started out with a completed-on-opening-day idea above everything else, and if they do not carry out their plan it will not be because western energy has not been expended in the task. The Alaska-Yukon-Pacific Exposition promises to be different from former world's fairs in many ways, but one policy stands out so far above any of the rest that the entire press of the country is commenting favorably about it. No money will be asked from Uncle Sam to carry on the work! That policy must be conceded as original.

* * *

The Interstate Breeders' Association will hold its annual meeting at Sioux City, Iowa, March 5th to 7th. This year's meeting will be one of unusual interest, and a very instructive program has been prepared. Among other subjects that are of great interest to breeders and farmers at this time, bovine tuberculosis will be taken up. This will be presented by Dr. J. H. McNeil of Iowa Agricultural College, Ames, Iowa, Dr. G. A. Johnson of the U. S. Bureau of Animal Industry, and Professor H. R. Smith of the Nebraska Experiment Station.

* * *

Agricultural co-operation to secure farm labor is now being practiced by many farmers in Europe. In Belgium this has assumed large dimensions, and over fifty thousand farmers are members of federations whose duties include among others the supplying of farm help. In this way it is hoped that a fairly practical solution of this vexing problem may be secured, and matters placed on such a basis that the farmer can always secure good help and the laborer always obtain a position.

**CAMPUS NOTES**

Dr. Thomas Darlington, President of the New York City Board of Health, spoke before an audience that crowded the lecture room in Stimson Hall to its utmost capacity on January 18. Dr. Darlington appeared under the auspices of the colleges of Medicine and Agriculture, and spoke upon "The Relation of the Milk Supply to Public Health." Mr. Burton, Chief Inspector of the Dairies supplying milk to New York, presented lantern slides showing views of the handling of milk in the seven links of the chain from the cow to consumer—the dairy, farm milk wagon, shipping station, milk train, milk depot, store, and home—links, all of which must be watched by the Board of Health. Dr. Darlington said that the milk of only 47 of the 3,500 dairies supplying the city has been denied sale in the city, and that for only a short time. The state should test every cow within its borders for tuberculosis and reimburse the owner for all cows that it is necessary to kill. Experience shows that solely from an economic point of view it pays the farmer to produce clean milk, but more than that he is under moral obligation to do so, for the fundamental principle underlying its production is the great law "Thou shalt love thy neighbor as thyself."

* * *

Professor B. M. Duggar, of the Department of Plant Physiology has taken Professor Craig's house on East Avenue, the latter having left for a trip through the Orient early in February.
On the evening of February 5th Dean Bailey sustained a painful, but happily not a serious, injury in leaving the buildings at about eleven o'clock. He slipped on the path leading to the Veterinary building and striking his head was severely stunned. He was assisted back to the building, and later taken to his home, where he was confined for the remainder of the week. Beyond the shock and the temporary injury, however, we are glad to say that his experience had no serious effects. The Assembly announced for the next evening was at this time indefinitely postponed.

* * *

Readers of The Countryman will be sorry to learn that W. H. Griffiths, who early in the fall fractured two bones in his ankle, is still confined to his bed in the Infirmary. Recovery did not set in as soon as expected, and he has at no time had the use of his foot. We are still hoping, however, that he will be out before spring comes.

* * *

On February 4th, the Agricultural Association meeting was made extremely interesting and profitable by a talk by Mr. Myron T. Scudder on "Play as a Socializing Factor in Rural Districts." Mr. Scudder, who is School Principal in New Paltz, is an authority upon this subject, which is coming to the front with the other features of rural improvement. It is but another means whereby the country, and therefore the farm life can be made to appeal to the children on the farm, and to help keep them there.

* * *

Changes and completions are still being made in various parts of the buildings. Extensive carpentering work is being carried on in the Plant Pathology and Experimental Biology laboratories, and improved mail-chute arrangements, together with a system of private mail boxes, have been installed outside the general office.

At the meeting of the Western New York Horticultural Society held January 22-23, in Rochester, Professors Craig and Judson were in attendance, and Professor Judson gave an address on fruit packing. During the noon recess following the talk, Professor Judson and W. H. Wickson gave a demonstration in packing apples in boxes which aroused great interest.

* * *

Several members of the faculty and several students have recently become members of the local grange and others intend to join at an early date. The Winter Course students had charge of the programme of the meeting of the local grange on February 1.

* * *

The College of Agriculture has been sending out through the State a limited number of sets of apparatus for making the Babcock Test. There has been great demand for these sets by teachers in rural schools, and some teachers have had the pupils make demonstrations at grange meetings. It is quite significant that teachers in rural schools are now ready to take up definite instruction in Agriculture.

* * *

Charles A. Publow, assistant in the Cheddar cheese making course, after taking an agricultural course at the Guelph Agricultural College, graduated from Queens' University in 1906. He has had twelve years' experience in cheese making including four years as government instructor in Prince Edward and adjoining counties, and one year as inspector of exports at Montreal.

* * *

Mr. O. G. Bishop, of Pontiac, Mich., who has made considerable reputation as a market gardener, was here during the week of January 13, when he gave several talks on vegetable gardening as well as an interesting address on plant breeding before the Plant Industry Seminar.
During the last month Professor Rice spoke on various Poultry subjects at the Ontario Agricultural College, Purdue University, Pennsylvania State College and the Ohio State University.

* * *

The James W. Morrison Inter-Winter Course Debate Cup valued at twenty-five dollars, is offered, for the first time, this year. It is being competed for by the different winter course students and will remain for one year with the department whose team wins it, the names of the successful contestants being engraved upon it. The students have taken a lively interest in the contest which began with a debate between the General Agriculture and the Dairy classes, upon the topic, Resolved: That dairy farming is a more desirable occupation than general farming. This was won by the negative side. Later the team from the Poultry Course won from the Horticulturists, in defending their respective occupations. The finals were held later in the course and the winners will be announced later.

* * *

On the evening of February 10, a basketball game was held between teams from the Winter Poultry and Dairy Courses. After a most hotly contested and enthusiastic struggle the score stood 13 to 11 in favor of the Poultrymen. Great interest was shown in the game and the Armory was well filled with rooters for both teams, and the strenuous renditions of their new and varied class yells.

* * *

As we go to press we learn the result of the First Agricultural Stage on February 12th. The winner was H. Lubin, '08, and second choice was given to M. P. Jones, '08. Further notice of this event will be published in the April issue.

FORMER STUDENTS

EDITOR’S NOTE.—We want to make the "Former Student" news one of the most interesting parts of the paper. To do this we are dependent on those who have graduated or left college sending us news of their whereabouts and of what they are doing. We try to write each personally but this is a difficult task. You can save us time and expense by voluntarily sending in items of interest frequently. Won't you cooperate with us in making this the most complete part of the paper?

'73, B. Agr.—Mr. Chas. V. Lacy was the first man to receive the degree of B. Agr. from Cornell University. With thoughts of our recent pleasant reunion in our minds, an account of the life of this pioneer in agricultural education for the farmer, seems eminently appropriate. We shall leave him to tell his own story.

CHAS. V. LACY

"I was born on a farm in Monroe county, New York, in 1850. My mother was English, coming to this country with her family while yet a young girl. My father was American through many generations of ancestors. He was a farmer and always deeply interested in theories relating to farming, in improved farm machinery and improved methods of cultivating the soil.

"I began my acquaintance with farm work rather early in life. I re-
member driving two horses before a harrow for half a day when seven years old; doing the same thing day after day for weeks when eight; and driving a mowing machine at ten. My recollection is that I rather preferred this work to the study of books either at home or at school. Nevertheless, under the spur of rivalry with a play- and schoolmate and persistent parental urging I acquired a fair knowledge of the elementary English branches. I also acquired, without any urging, the absurd notion that this was sufficient education for a farmer. The opening of Cornell University with courses of study in agriculture suggested the advantages of some additional study in that direction. With such slender attainments generally, and no special preparation, I was admitted, with some conditions, to the two years' course in agriculture in September, 1869.

"From the above statements it will readily be seen that there was ample room for expansion of ideas. The great number and variety of studies presented by the different scientific and agricultural courses made my previous notions of an education look modest indeed. The attainments, abilities and ambitions of my classmates contributed to the same view. It was not long before it appeared exceedingly desirable to complete a four years' course. And to teach agriculture in some of the agricultural colleges then being organized did not seem any real abandonment of former plans. It is but fair to state that the chief encouragement to this ambition lay more in the scarcity of teachers having any training whatever in the sciences relating to the practice of agriculture rather than in fitness and preparation on my part.

"After receiving my diploma, in June 1873, the first "B. Agr." conferred by Cornell University, I returned to work on my father's farm in Caledonia, N. Y. I also taught country school in the Inverness district in the same township during the winter of 1873-4, and the following summer made a somewhat extended tour of agricultural colleges, going west as far as Kansas.

"In November, 1874, I secured a place in the Agricultural College of the University of Minnesota, where I was later appointed assistant professor and then professor, in charge of Agriculture, and where I continued until June, 1880. The warm welcome and kindly consideration extended by every person I met in Minnesota will linger long in my memory. With the members of the Minnesota State Horticultural Society my relations were very cordial and I was immediately elected secretary of the Society and was annually reelected until removal from the state. An honorary life membership bestowed upon me by it is an honor I greatly prize. Editing the proceedings of this Society while its secretary is the principal work done with my pen.

"In 1880 I entered upon new scenes and new experiences incident to the business of sheep raising and wool growing on the open range in the valley of the upper Missouri river, near Fort Benton in Northern Montana. Agriculture was almost entirely confined to grazing. Cattle and horses roamed wheresoever they would unconfined by fences and tended by herders. The business was for the most part prosperous and remunerative, but suffered a severe blow from the removal of the duty from wool in Cleveland's second administration, when many wool growers, including the writer, were seriously embarrassed or pushed to the wall. It was while living in Montana, in 1888, that I was married to Miss Ella F. Peck of Providence, R. I. From Montana I moved, in 1899, to Southern California and I again found myself mid surroundings and a mode of living strikingly different from any former experience.

"In conclusion it may be pertinent to state in reply to questions sometimes asked that I have never for a moment regretted the time and money spent in my four years' course of study in agriculture. Possibly it has not contributed very much to an indifferent success in money making."
Certainly it has never been a hindrance even in that direction. And with equal certainty it has given me a standing everywhere with people that I have met and a pleasure in that standing that I could not have had otherwise. Moreover, every task that has come to my head or hand has been more interesting because of the instruction received in the facts and principles of nature and civilized living. As a matter of fact the farmer, intelligent or otherwise, lives closer to these facts and principles than most other men. If intelligent he becomes acquainted with such facts and principles with both pleasure and profit. No courses of study are better designed to promote this acquaintance than the courses in agriculture."

'07, B. S. A.—W. J. Morse, who is in charge of the Forage Crop Experimental work carried on by the Bureau of Plant Industry, U. S. Department of Agriculture, is specializing in the breeding and improvement of the grasses on the government farm at Arlington, Va., a few miles out of Washington. While at Cornell Mr. Morse did special work with grasses and took his thesis in "Weed Seeds as Adulterants of Clover and Grass Seeds." He writes that he has found his preparation of great value in his work which he finds exceedingly interesting and enjoyable.

'94, W.—W. G. Comstock since leaving Cornell was secretary of the Chuckery Creamery Co., at Clinton, N. Y., until January 1, 1908. He sold his interest in the business in June, '07, remaining with his successor until the first of the new year. He expects to go into business with his father on his fruit farm, managing a dairy and poultry farm in connection with it.

'07, W.—U. G. Clark has successfully followed the creamery business as manager of plants for Major Root and the Sheffield Farms up to April '05, at which time he became superintendent of the Wood Brook Farms, Plainfield, N. J. This farm sells daily, 900 quarts of milk at ten cents a quart, and 200 half-pints of cream at fifty cents a quart. The Board of Health scored the dairy 97 points in 1907. Mr. Comstock hopes for a score of 100 for 1908.

'06, Sp.—George T. Reid of Tennessee, N. J., was married Dec. 28, '07, to Miss Emma T. Clayton. Mr. and Mrs. Reid are now living on the home farm.

'06, Sp.—Fernando Ortiz de Zevallos has charge of the Department of Agricultural Machinery in the Lima branch of W. R. Grace & Co., New York City.

'07, W.—Fred E. Tyler has a position on the one hundred and fifteen acre farm of E. M. Sheldon at Martinsburg, N. Y.

'07, W.—Floyd S. Platt, a former student in Horticulture, is now with W. H. Moon Co., Morrisville, Pa.

'07, Sp.—Walter C. Knapp was married December 26 to Miss Maude A. Rowley of Fabius, N. Y. Mr. Knapp is having marked success in the breeding of Holstein cattle and White Leghorn fowls.

'07, B. S. A.—John B. Shepard, who has been managing a farm near Philadelphia, has resigned his position. After a couple of months' vacation he will assume a new position—that of superintendent of the large onion farms of Johnson & Co., a large Orange County Corporation. This company has 400 acres of black muck on which onions will be grown. Mr. Shepard will have entire charge of the work and will have a large force of foreign laborers under his command. As additional preparation for his work he has been visiting the large onion farms near South Lima, and has spent a few days here at Cornell.

'06, B. S. A.—Emilio Artiz de Zevallos has bought a dairy farm of about 500 acres near Lima, Peru, and is devoting himself to the milk and cattle business, sending his milk to the capital. Mr. Zevallos is devoting his attention to the prevention of Texas fever by farming methods and we hope to hear from him sometime in the future on this subject.
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FARMING IN NEW ENGLAND.

By Dr. G. M. Twitchell,

Auburn, Me.

The western farmer finds profit in the length of his corn rows and breadth of wheat fields, while his eastern brother gathers his substance from restricted areas. With the one it is volume of output turned over to elevator, or stock yards, and with the other it is reduced output delivered to consumer. One has attracted, and still attracts, by the magnitude of operations and the suggestion of large business and possible profits; the other reaps his earnings from his own labor, or that of a single assistant, and enjoys the fruits of his toil surrounded by the blessings of society and comforts of a fixed and intelligent population. One is thousands of miles from the consumers’ market, the other finds ready sale, for what he can produce, at his own door. One has from the first availed himself of the benefits of machinery to increase operations and reduce cost, while the other has struggled on with hand labor, yielding more slowly to the encroachments which science and invention have made necessary. Extensive operations have controlled the western farmer; intensive farming has brought financial success to his eastern brother. Lack of appreciation of these extremes in conditions, while dealing with the same general problems, has made it seem strange to the western farmer that such a wealth of commodious buildings abound in New England, and to the eastern that the increased wealth per capita on the prairies is not more rapid.

Gradually these extremes of difference are yielding and one notes all over New England the evidence of a broader thought, the certainty that larger operations are contemplated, and the fact that labor is more and more being transferred from the hand to the machine and the burden placed upon the organizing power of an active brain tissue.

In a broken country, such as prevails throughout New England, diversified operations must necessarily claim attention. A granite soil in a cool climate insures certain conditions not possible on broad prairie sections, therefore one finds the farmers here carrying on several lines of work and making each contribute to the yearly surplus. Thus nearly every farmer has his orchard, dairy, flock of sheep and poultry, grows perhaps a pair of steers or a colt, and, with his general crops, finds, by the practice of wise economy, means for a comfortable living.

If the volume of operations seem small when compared with the west, the net price realized per pound or per bushel, coupled with the reduced cost of transportation, insures what no other section of this country can equal, a wealth of farm houses, substantial, attractive and commodious and an average deposit in savings’ institutions, which not only tells of individual ownership but of a growing surplus for other days. Out of seemingly hard conditions have these results obtained.
Wendell Phillips once said: "The best education in the world is that got by struggling to get a living, and what is defeat? Nothing but the first step to something better."

If this be true, the New England farmer furnishes a striking example, for success has been gained through difficulty.

In diversified crops, with a soil strong, retentive and responsive, lies the explanation of the success of New England agriculture. It is here that the maximum yield, per acre, of wheat, corn, potatoes and other crops is recorded, as it is here that prices are the highest. The lack of broad areas is overcome by the increased yield per acre and price per bushel.

The abundance of water privileges insures the growth of manufacturing industries all up and down our rivers, and there follow busy towns and cities constituting the best possible market for near-by products, so that the bulk of farmers deliver direct to consumers and reap all the profits.

The hills of New England are noted for their adaptability to fruit production, while it is here, as well as on the river levels that flint corn perfects itself, yielding from fifty to seventy bushels of shelled corn per acre.

Here also that quality of sweet corn, which marks the standard of perfection, is grown, yielding from forty-five to seventy dollars per acre for the corn cut at the factory and returning to the grower husks, cobs and stalks when in the most succulent stage for the silo. It is here that potatoes mature, as they cannot in warmer latitudes, producing from two hundred and seventy-five to three hundred and fifty bushels per acre of superior quality and putting the land in choice condition for seeding. It is here that the oats yield from forty-five to sixty bushels per acre while the two to two and one half tons of straw sell readily for seven to nine dollars per ton.

Throughout New England dairying is, perhaps, the leading branch of agricultural work, and the steady demand for and even price of dairy products, coupled with the climatic conditions tending to health and length of service, as well as cheapness of production, yield to the farmers returns which surprise those less fortunate in location.

The potato industry in the same state furnishes another illustration of profitable growth, the crop during the past decade having increased from eight to thirty or more million bushels, the price ranging from one dollar to one fifty per barrel. One county alone, in Maine, produced seventeen million bushels in 1906, and has hundreds of acres yet untouched.

The rapid development of our orchards has greatly enhanced the value of otherwise valueless land, so that sections selling fifteen years ago for three to five dollars per acre cannot be purchased today for two thousand dollars, so valuable and so certain is the crop of apples. In a hilly section of country there must of necessity be a per cent of broken, rocky soil, not suitable for cultivation, and it is here that our most profitable orchards are planted, as it is here that greatest wealth is to be drawn in future years.

Worcester and Essex counties, Massachusetts, are two of the wealthiest agricultural counties on the continent, made so by specialized market gardening, largely conducted under glass. This industry, springing up during the life of the present generation, has assumed such proportions as to claim national attention, for where conducted in accordance with recognized laws, it becomes one of the most attractive and profitable fields for the progressive operator.

The cranberry bogs of Cape Cod are noted for the quality and wealth of their product, and proofs of profit are found in the large investments in the business by commercial interests outside.

Thus every section of this rich and historic part of our domain, noted for its wealth of lakes, mountains and forests, attracts, by seemingly special adaptation, to special lines of farm work, and he who seeks intelligently to cooperate with nature finds a part-
nership resulting which insures enduring results hardly possible elsewhere.

No rosy picture has been attempted, but a simple suggestion of conditions as they exist.

As elsewhere, the greatest obstacle to progress has been the conservative native-born inhabitant wedded to old-time practices. But this conservatism has also been our greatest safeguard, preventing that impetuous movement which impulse would foster while reason waits.

One factor contributing greatly to the prosperity of New England, not always taken into account, is the summer tourist.

This steadily increasing army of health and pleasure seekers, spending two or three months in rural New England, has opened a market for fresh farm products not possible before. The summer homes dotting the hillsides, filling the groves on the shores of hundreds of lakes, and covering the bluffs all along the thousands of miles of seacoast, are increasing rapidly and constitute a permanent army of consumers of fresh farm and garden crops through the best portion of the growing season.

In the general adaptability of the soil, its retention and responsive qualities making sure a full harvest of a variety of crops and products most in demand for immediate consumption, in the certainty of a steady market and even grade of prices, in the growth of manufacturing towns and increase of summer tourists, in the stability and intelligence of the rural population, the farmers of New England face the future, certain that in it they are to carve greater results, and that by the aid which scientific research is insuring, the agriculture of this northeastern portion of our country is to be made potential in shaping the life and thought, as well as determining the prosperity of the farming population.
Great are the marvels of invention. They dominate our thoughts and dictate our modes of life. We express our domination by inverting the course of nature. We turn night into day that we may riot in artificial illumination, content thereby to forego the sunrise. Yet the novelty and the glamor will pass, we shall adapt the miracles of our own making to the days and the seasons, and in good time we shall return to the natural order.

Have you ris’n at the daybreak
When the world is cool and free
And the dawn comes up triumphant
Like the freshness of the sea?

Have you felt the nature kinship
As you walk in fields alone
When the morning light is breaking
And the world is all your own?

Have you heard the first bird calling
From the passing of the night
When the dew is on the grass-land
And the corn-tops feel the light?

Have you known the youthful laughter
Of the brook upon its bed
Ere the remnants of the darkness
From its scented pools have fled?
Have you seen the wild things feeding
In the sun-break and the shade
Living each his mode and habit
When there's none to make afraid?

Have you smelt the tonic fragrance
When the morning airs distill
And you spread your chest and breathe it
Till it sends your nerves a thrill?

So the dawn is rousing
Rousing bird and bee,
Thro' the ages calling
Calling you and me.

Yet we still are sleeping
Sleeping with our ills,
While the world is waking
Waking on the hills.

Spending hours at midnights
Making mimic day,
Longing for amusement
Burning life away.

For we yet are children
Playing with our toys,
Grasping at the fire-lights
Humored by the noise.

But I think I see the future
In the distance where it lies
Like a vision of the morning
Stretching out beneath the skies;
Nor mankind will know its mission
Nor its doubts will be withdrawn
Nor the race will be perfected
Till it rises with the dawn.
IF I could have met, beforehand, any person to whom the idea of the spirit of the College of Agriculture was an indistinct thought, who had not an appreciation of what it can mean, I wish I could have taken him to the Armory on the evening of February 15, to the Agricultural Banquet. For in all the functions and activities, the meetings and assemblies of the college, never, I think, has the spirit that exists there, been emphasized so deeply, analyzed so clearly and radiated so brilliantly as at that gathering.

Considering that there were but a few out-of-town guests and alumni present, the four hundred and nine persons who attended were representative of the size of the ever growing college. The interior of the building and especially the tables were effectively decorated, the fates had thoughtfully provided comfortably warm weather, and the banquet proper was highly satisfactory. Throughout the evening the Agricultural Glee Club supplied music and from time to time the “spirit” echoed through the Armory in the form of the new and unique Winter-Course yells.

Later in the evening, after Alma Mater and yells by the assemblage in general, Toastmaster Charles H. Tuck, '06, began at once in his opening remarks, to emphasize the feeling that holds the college together in its strength and success. He saw the whole University looking to the College of Agriculture for inspiration and spirit, to a far greater degree than many of the older men are familiar with. In impressing the necessity that the college maintain this position, he urged pride and interest in its welfare, but at the same time added as a precaution, that there must be always the air of dignity, calmness and the due regard for the University as a whole, in which we have a mission to fulfill. Expressing gracefully, the regard and appreciation of all for “Our Brother,” he introduced Dean Bailey.

“This assemblage,” the Dean said, “represents a College of Agriculture, an organization that up to a few years ago did not exist. It has grown up through the unexpressed expression of a feeling that the time has come when men may work out their own ideals—and here all these have come together to work out one—the elevating of everyone. It is a satisfaction to see so many kinds of country life represented, but it must not be forgotten that all are of one college.”

Emphasizing the essentiality of basing the learning of all knowledge on facts, he then took up the application of his words to the tuberculosis question, reading and commenting upon the resolutions passed by the Tompkins County Grange. “If any of you are going back to the farms disbelieving in the tuberculin test,” he asserted, “you are back numbers. It is a fact that bacteria cause the disease and resolutions cannot alter that and other truths. The disease is no respector of persons, and a further fact which must be accepted is that herds are infected. There is a problem to face, and if there is any man unwilling to face and fight it, I am ashamed of it! The only prevention lies with the man and his practices, and education presents the only means for driving the scourge from the state.”

Commenting upon the farm boy, he said in part, “The farm boy works—it’s the only thing worth anything and in the future socialism of life, the man who does not work will not have the right to live. You come here to work. We don’t want you, no one does, if you are not going to work. The farm develops this tendency, and helps the farm boy to work. He works to get up in the winter mornings—this is not easy—but in doing it advantage is gained over those who do not.” With his unfailing appropriateness and preparation he then closed with one of his latest poems, “Daybreak,” given on page 216.

With a brief reference to “Bill’s” popularity and his “get there” tendencies, Professor Tuck then intro-
duced W. H. Alderman, '08, who spoke representing "the long" classes. He too emphasized the growth of the college, its continual gain of dignity and importance throughout the country and world, which even in four years has been vast. "With this increasing importance we must resolve to do our best to keep the honor of the college clean."

In introducing R. C. Baynard, who spoke for the "short courses," Professor Tuck commented upon the spirit that has been shown in the Winter-Course debates, and how in such activities it is easy to pick out the men who are, and who become leaders. Mr. Baynard, in a straight, enthusiastic talk gave some of the points of view of the farm boy coming to college. He brought out the aims that they must then have, the determination to go back, even in the face of conservatism and prejudice, and prove themselves worthy of the college.

Mr. A. C. King, '99, who spoke for the Alumni was according to the Toastmaster, one of the men who has put the ideas of work and accomplishment into practice. In his address to his "fellow workers" Mr. King gave some of the impressions that had come to him in watching the college since his undergraduate days. To the students he urged continued and diverse activity, the accomplishment of things—and the acquisition of the power to think. And he urged the faculty to aid the students in gaining this power to think and cope with unexpected problems in actual work.

"Uncle John" Spencer, whom Professor Tuck called on, as the friend of young and old all over the State, "who has given us the right kind of spirit at those times when we did not know what we wanted," said that before another banquet he expected to be at home at "Bellwether," the victim of "University Oslerization." In his twelve years of work with the college he has kept as his slogan the idea that extension work lies in giving one good thing to a thousand persons rather than a thousand good things to one individual. "I shall be content, if I have added one small drop of kindness that will go to fill the great sea of Immortality."

The banquet was in no need of "spirit" and enthusiasm, but Professor Rice was introduced as the man who could always be looked to for "livening up" a meeting, and who knowing and having "college spirit" could give it to us. This, Professor Rice said, was composed of four elements. First, faith in something; second, true love; third, strength of character and courage of convictions; and fourth, the physical force, the "red blood." Every college worthy the name has these characteristics in its spirit, but Cornell in all its fibres, has the spirit of its founder, a unique spirit, that has done as much as anything in history to break down narrowing barriers. He compared college spirit to patriotism, to the right kind of hero-worship that makes us revere the names of those who stand for what we admire and respect—names of Washington, Lincoln, Roosevelt, Hughes, Bailey. These and the University we are proud of, but to feel the real pride we must each one do something for the college and Cornell. This is the democratic pride, the pride of ownership—which can come in three short months, and which can remain always.

As Professor Tuck then remarked in closing the list of toasts, seldom are heard clearer, better, more inspiring words of advice that those of Professor Rice. Throughout the evening he said, the note of service had been struck. "Some of us will go out to accomplish things, others will not; which are you? Heed in the determination to do, to take just pride and share in the college and University, which have faith in you, is the message of this banquet."
EXPERIENCES AND OPPORTUNITIES IN SOIL SURVEY WORK,

By H. L. Westover, '06.

Bureau of Soils.

SAND DUNES IN TEXAS.

ONE can hardly conceive of a person being in Soil Survey work for two years without encountering a great number of interesting experiences. While some incidents worthy of narration may occasionally befall him in the northern areas, yet the greater number are confined to the thinly populated and hence poorly developed sections of the South and West. In these places, one seldom finds a bridge, for instance, and therefore it often becomes necessary to ford the river. To the natives, this is a matter of small consequence as they know the ford, and, having what they call the "swimming mark," never attempt the passage when the river is "swimming." To a stranger, this is an entirely different proposition, and many a poor fellow, to his dismay and consternation, has found himself and his buggy being carried down the stream simply because he did not know the ford. While nothing as serious as this ever befell us, yet we have frequently gotten wet feet standing on the buggy seat, expecting every minute to have to swim for the shore.

The interesting experiences, however, are not confined entirely to fording streams, for one is almost sure to find himself facing some problem every day. Many times we start out in the morning not knowing where we are to spend the night, but are thankful to find any sort of shelter and a bite, which is not always of the most palatable, to eat. Our horses, too, are the cause of some very interesting incidents, especially when they are taken sick in a country as thinly populated as some sections of Texas.

However, the opportunities for studying the farm problems and the farm practices in different sections of the country more than counterbalance the hardships encountered, and I know of no occupation enabling a person to study these subjects as thoroughly and systematically as the Soil Survey. In fact he not only has the chance, but is compelled, to see and understand these differences, in order
to be able to intelligently describe the existing conditions.

His observations will not be restricted to dairy, or cotton, or truck farming, but, on the other hand, he has the opportunity to observe all three classes and even more. And what is still more important, he has the chance to study each of these thoroughly, and not superficially, as is the case where a person is traveling over the country. He sees all the different farming operations actually in progress from seed time to harvest, for in the summer he is almost certain to be in the north and see the practices as they are carried on in the dairy sections of New Hampshire, the fruit growing regions of New York and the grain region of the West. In the winter months he will be either in the cotton-growing states of the southeast or possibly in the trucking sections of Texas, where he sees an entirely different set of farm operations.

Perhaps I can convey a much clearer idea of the opportunities for studying the different farm practices if I give an account of the areas I have worked in for somewhat less than two years. My first assignment carried me to Merrimac County, New Hampshire, where I had an opportunity to study dairy farming. Much to my surprise, however, I found that most of the farmers were making more money from summer boarders than from agriculture. The three following assignments carried me to cotton growing sections, first to southern Alabama, then to northern Alabama and finally to South Carolina. In all of these areas the attention of the farmers is given over almost entirely to cotton growing, while the other crops are slighted. From South Carolina I went to eastern Maryland where truck farming is of primary importance. According to statistics, one-eighth of the tomatoes consumed in the United States are grown on the eastern shore of this state.

Finally I am sent to Milles County, Texas, where we find conditions quite different from the other areas. With the exception of a few comparatively small sections which are at present being developed, the whole county is made up of several large cattle ranches. One ranch that we have already visited contains 295,000 acres, and still is one of the smaller ones. The land that is being developed is almost entirely utilized in growing truck crops for the northern market, cabbage being the principle crop, although many people are beginning to grow onions. The cabbage seed is
METHOD OF CLEARING LAND IN ALABAMA.

The trees are girdled and left to blow down, while cotton is planted between them.

sown anywhere from the first of October to the first of December. The first shipments are usually made for the Christmas market and continue from that time until the crops mature in northern sections. Thus it will be seen that conditions are nearly the reverse from what they are in the north, the crops being grown during the winter months, while the greater part of the land lies idle in the summer.

This brief outline ought to give one a fair idea of the invaluable store of information secured in a short time in this work, the importance of studying the methods of cultivation best suited to each type of soil, and the crops best adapted to each individual soil type in the area under consideration, can hardly be overestimated. And in conclusion I wish to repeat what I have already tried to make clear—that I know of no occupation wherein one is thrown into such intimate contact with the farmer and his methods or wherein one has the opportunity to study each operation with as much detail, from seed time to harvest, as is offered by the U. S. Soil Survey.

ECONOMIC ENTOMOLOGY IN HAWAII

By D. L. Van Dine, '01
Entomologist, Hawaii Experiment Station

HAWAII, the mid-Pacific Territory of the United States, has eleven salaried entomologists employed in economic work. The number implies an interest to those engaged in insect warfare. The first thought might be that our islands are over-ridden with insect pests and that a small army is needed to prevent the destruction of all crops. This is a wrong impression. Hawaiian agriculture suffers from the ravages of many insects and some of them are of a persistent nature but this is a condition of affairs common to the agriculture of the United States as a whole. One might be led to think, then, that these many workers are tumbling over themselves in the hunt for "bugs" and in the mix-up accomplishing only an equivalent of the work done by the smaller staffs in mainland states.
and territories. This again would be a wrong conclusion. There is no confusion. Three separate institutions support entomological investigations in Hawaii, each along its own appointed lines, separated in character and scope of problems, differing in the phases of the subject under investigation, but united in the spirit of surpressing insect injury and winning for Hawaii the maximum return from the soil.

The Hawaiian Sugar Planters' Association employs no less than six specialists in the entomological division of their Experiment Station. The annual crop of sugar represents a sum of some thirty millions of dollars and small indeed, in comparison, are the salaries of the experts that guard the crop from loss through insect predations.

The Territory of Hawaii employs on the scientific staff of their Board of Agriculture and Forestry four entomologists in the entomological quarantine and inspection work. Quarantine is a phase of insect control that forms a weak link in the otherwise strong chain that has been welded by American entomologists to hold in check the ravages of insect pests. California and Hawaii have demonstrated that the agriculture of a country can have no better insurance than such entomological quarantine and inspection.

The Hawaii Agricultural Experiment Station has undertaken investigations relating to the insects injurious to crops other than sugar-cane, the insects affecting live-stock, bee-keeping, and has accomplished something on mosquito-control and silk-culture. The remaining worker of the eleven is in charge of these investigations. This institution will add another entomologist to its staff this coming year.

The Hawaiian Sugar Planters' Experiment Station and the Territorial Board of Agriculture and Forestry have given considerable attention to the introduction and establishment of parasitic and predaceous enemies of insect pests from abroad and by their scientific and systematic research along this line have added greatly to the literature of the subject. The Hawaii Agricultural Experiment Station has emphasized remedial, cultural and preventive measures of insect control. Entomologically, Hawaii, is pretty well provided for.

The loss from insect injury is undoubtedly higher in Hawaii than in any given area of equal extent on the mainland but Hawaii can harvest three crops in a year where only one can be gathered in a temperate climate. The greater loss is due to the fact that brood follows brood throughout the year because of the favorable conditions of temperature, moisture and food that prevail. Moreover, Hawaii's agriculture is specialized. These conditions necessitate modifications of the methods of insect warfare. Crop rotation cannot become a factor of control in a one-crop system, neither can "winter treatment" be recommended in a country where it is summer the year around. Prevention and farm sanitation become important. We have our own problems and we are solving them.

There are many lines of investigation in economic entomology that still remain untouched in Hawaii and further additions will no doubt be made to the body of workers. Hawaii, in comparison to other agricultural countries, is not necessarily in greater need of scientific work of this character but, rather, has a keener appreciation of the direct value of such investigations to the welfare of its agriculture. This is perhaps natural for, "agriculture is Hawaii's all in all." We have no mines, no manufacturing industries, nothing but the wealth of the soil. However, this agricultural wealth is practically unlimited.
FARMERS' WEEK—A CONVENTION

For many weeks preparations had been going on in the form of correspondence, and co-operative planning by the faculty and students, so that by Monday, February 20, the College of Agriculture was ready to receive its visitors at the beginning of the greatest week in its history. And the visitors came—hundreds of them—and by means of the system of registration and regularity, not one found himself lacking a place to live or board while in Ithaca. Not only was the week a red letter one in the history of the college, but a unique and important institution in the eyes of the State and its farmers, and there came from counties far and near, old students, experimenters, farmers—and their families—all who were interested in any phase of agriculture and its teaching, and who could journey to Cornell University.

The buildings were in readiness for inspection with prominent signs directing those who desired to "see for themselves" rather than take advantage of the student guides who were provided, and all day Monday, groups of visitors newly arrived could be seen about the campus. These increased steadily as the week progressed, until by Wednesday the buildings were thronged with people from morning till night.

The exercises of the week began informally, with a meeting of the Poultry Institute on Monday evening, and a good sized crowd gathered in the auditorium. Mr. J. D. Jaquins presided in the absence of Director of Institutes F. E. Dawley, and introduced Dean Bailey, who gave an address of welcome; D. J. Lambert of the Rhode Island Agricultural College, who spoke on the Poultry Business; and Mr. T. F. McGrew, of Washington, D. C., who discussed, "The History of the Breeds."

Tuesday was also given up to the Poultry Institute, the three sessions of which, were well attended by the increasing number of visitors. The morning was devoted to Scoring and Judging Demonstrations, the afternoon to Question Box discussions and a business meeting of the New York Branch of the American Poultry Association, and the evening to further considerations of Poultry Husbandry from different standpoints. The business session resulted in the election of F. E. Dawley, President; H. H. Harriman, Vice-president, and J. B. Rice, Secretary-Treasurer for the coming year. During the day two representatives from the State Library at Albany explained to those interested, the facilities for Travelling Libraries etc. These are available for any village, school or responsible body of persons, at reasonable expense, and information can at any time be obtained from the State Library.

Tuesday was marked also by the opening of the Fifth Annual Poultry Show which under the auspices of the Cornell University Poultry Association was made a greater success than ever before. It was held in the new Judging Pavilion, which was practically filled with the cages holding the birds sent in by over forty out of town exhibitors. These were arranged in two and three tiers, according to the double alley system which is used in many of the large shows and which proved extremely convenient and advantageous. Though the number of birds was not great, many were of a high standing and many of those who attended (who numbered close to one thousand) were attracted by the handsome appearance of the birds. Other particularly popular exhibits were some magnificent bronze and white turkeys, and a large number of pigeons. Exhibitions of eggs, poultry-implements and appliances, and a very complete display of books of interest to the poultryman, added to the interest of the show. As usual all the short course students and a number of regulars had entered birds from the poultry plant and entered the competitions in judging and scoring. A list of the prize winners is appended. The show which continued until Thursday...
night was on the whole a distinct and unqualified success and reflected no little credit upon the officers of the Association and the students upon whom the entire responsibility of the undertaking rested, and who carried it through with both benefit and honor to themselves.

On Wednesday, while the Poultry lectures and demonstrations were continued, the various departments of the College began their exhibitions and discussions, with the result that in a short time the buildings were full of the atmosphere of a multiringed circus with many things going on in many places at the same time. The Dairy Department provided lectures throughout the day, on cheese and butter making principles; an exhibition of farm machinery was opened in the laboratory of that department; the soils, agronomy and home economics departments attracted many visitors to their demonstration, and the Horticultural activities consisted in an apple-packing demonstration by students, and a reunion of the Craig Club of Winter Course students.

The first formal exercises were held in the evening when Dean Bailey welcomed the farmers of the State to the College and explained the nature and scope of its work. M. P. Jones, '08, one of the winners of the stage then addressed the audience as a representative of the students upon the subject of Rural Schools, and was followed by Dr. H. J. Webber, who discussed in a highly practical and comprehensive manner plans for "Plant Improvement for Farmers."

Thursday was, if anything, busier than the previous days, as new demonstrations and exhibitions were given. A test of various spraying outfits was made by the farm mechanics' department; lectures on milk production were provided in the dairy building; poultry lectures, and addresses, displays and demonstrations in practically every department of the College, filled the day without a break. A talk that attracted a large crowd was given in the afternoon by Dr. V. A. Moore, upon Bovine Tuberculosis. While he did not attempt to discuss the controversy that is now going on, nor its probable result, he presented in a very clear and understandable manner, the various phases of the disease—cause, transmission, infection, and
methods of control and elimination. Mr. H. B. Fullerton, of Long Island, also gave an enthusiastic report of the progress of that state in recent years. The evening's program consisted of a talk by Miss Alice G. McCloskey upon Rural School Education, one by J. E. Lapp upon Race-track Gambling, and a third by Mr. S. Francisco, of New York City upon Certified Milk. These were followed by a general reunion of former students and classes.

Of particular interest on Friday, was the annual meeting of the New York Experimenters' League, which during the year has made valuable and productive investigations along practical lines. The first session was held in the morning and the second during the afternoon when prizes for experimental work were awarded and officers for the coming year elected. These were Honorary President, W. H. Jordan; President, E. W. Mosher, Aurora; first vice-president, T. E. Martin, West Rush; second vice-president, J. L. Stone, Marcellus; secretary treasurer, C. H. Tuck, Ithaca. The first prize for experimentation was awarded to H. W. Webster, of Auburn, while seven other members also received prizes. For the second time $100 was subscribed and will be offered in the form of prizes for 1908.

By Friday the Poultry Institute had adjourned, but dairy activities continued together with many discussions of general interest. Vegetable gardening, plant diseases, pumps, economic entomology and other questions of farm and home importance were considered at various times throughout the day, with one or more subjects always on hand when another was completed.

The most important event of the week, however, was a grand assembly, completely filling the auditorium and crowding the corridors during the social hour that followed several inspiring and intensely interesting addresses. The function was presided over by Mr. E. R. Eastman, of Water ville, who as a "real, successful farmer," and an active, broad minded man filled his position to perfection. The evening was opened by the Glee Club, who preceded H. Lubin, '08, winner of the Agricultural Stage, who repeated his success and impressed his hearers with his forceful, glowing descriptions and contrasts.

After entertainment by the Mandolin Club, Dean Bailey presented the James Morrison Debate Cup to the class in General Agriculture, which had won the final debate from the Poultry Class. The class responded to the Dean's presentation speech through their president, who expressed the appreciation that the contestants felt for the chance they had had to work for the cup.

The Short Courses as a whole were then represented by L. M. Hurd, Dairy, who had won the Winter Course Stage and who gave an interesting and clear talk in which he expressed the feelings of the classes toward the college, its work, its faculty and students. He could see the opportunities that lay before the winter course men, and which with the help of Cornell spirit and inspiration, they are going to make the most of.

The City was then heard from in the person of Mayor Newman, who outlined the relations between the University and the town and their congeniality. He commented further upon the College of Agriculture particularly, and its work, and paid a high tribute to Dean Bailey for his help and inspiration in teaching, not only the practical things but the poetry of life. Mayor Newman was followed by Mr. L. K. Jackson of the Erie Railroad, who in a clever speech dwelt upon the relations that do and may exist between the farmers and the railroads, and upon some of the policies of the latter. He then, as he expressed it "side tracked to make room for President J. G. Schurman, of the University."

The President discussed briefly the relations between the College and the University "the hardest working community in the United States," and commented upon the versatility and effectiveness of the former. It is not working for itself nor solely for the
University, but for the State and the farmers. He was looking for the time, he said, when thousands of farmers will come to Cornell to strengthen the cooperation that the College is working for.

Dean Bailey was the final speaker of the evening and developed still further the aims and organization of the institution. The feeling of companionship and power comes, he said, from the fact that every man is a leader here and feels the responsibility which he bears. He traced the growth of agricultural societies, showing how information must be based on fact—how necessary it is that the college know facts about local conditions before it can be of the greatest aid to the farmer, teaching both principle and practice. He mentioned the local fairs as desirable factors of country life for various reasons, even though they are at present not accomplishing for agriculture what they should. The country church too, he said needs opening and spiritualizing. "This college stands for individualized men—every one of whom must be a useful part of it. Education must work outward, and in this way let the college fulfill its purpose as a social organization—this, at the present, is but the beginning. All we can do is to lay down principles—the consequences can not be seen."

On Saturday, the week was brought to a close with demonstrations in horse and cattle judging and with further informal inspections of the various departments.

One event that must not be forgotten was the organization of the New York Plant Breeders' Association which was formed largely at the instance of Dr. Webber, with some thirty or more charter members. The officers elected were H. B. Winters, president; H. N. Wells, vice-president; H. J. Webber, secretary; Samuel Fraser, treasurer. The executive committee which will arrange for experiments, etc., is composed of the above officers and T. B. Wilson, M. P. Jones and U. P. Hedrick.

Were time and space available much could be written upon this first Farmers' Week. Its good results can not even be suggested in this brief review, and only those who attended the lectures who talked to those farmers, who came and who absorbed the spirit
of coöperation, of extended knowledge and investigation, can realize what it all meant and to what an extent such an institution can increase the prosperity and success of the farming interests. Perhaps the most certain way of offering this spirit to those who have not felt it, is to extend to them an invitation and an urgent encouragement to come to the Farmers' Week of 1909.

PRIZES FOR STUDENT JUDGING AT THE POULTRY SHOW

The James G. Halpin prize of $5, won by W. O. Strong, Sp., Afton, N. Y.

The T. F. McGrew prize of $3, won by A. S. Chadwick, W. P., Newark, N. J.


The D. J. Lambert prize of 1 Barred Rock Cockerel, for the best work in scoring Barred Plymouth Rocks. Won by A. A. Miller, W. P., Buffalo, N. Y.

PRIZES FOR PREPARING FOWLS


The J. L. Gane prize of $1, won by H. L. Grubbs, W. P., Fairview, Pa.

The F. E. Benedict prize of one pound "Home Grown" Fudge, won by F. S. Jacoby, '10, Ithaca, N. Y.

The F. E. Benedict prize of one pound of "Home Grown" Fudge for Winter Course students, won by W. A. Lippincott, Jacksonville, Ill.

THE ORIGIN AND HISTORY OF THE COLLIE

By B. R. & O. A. Knapp

Cortland, N. Y.

The origin of the collie is obscure inasmuch as their breeding was carried on for hundreds of years in Scotland, before they became an acknowledged breed, separate in themselves. And here comes a noteworthy point; they were bred as a help to man as stock drivers, and became indispensable as such. One of the earliest articles on the subject came out in 1809, in Bingley's Quadrupeds, a work noted for its accuracy.

The original collies did not go by that name but were called "sheep dogs," and the herdsmen knew their worth. Each generation improved the quality and adaptability of their dogs, and usefulness seemed to be their one aim. For a long time these sheep dogs became more and more in demand, until the whole of the British Isles came to know them and appreciate their value.

It was not until the year 1860, that classes were formed for them, at the Birmingham show, and only a few were brought out at that time. In 1874 at the same show, their number had increased to 45. The show qualities and points were developed and promoted by only a few breeders, and much credit is due them. The most noted of these were C. H. Wheeler, (to whom we are indebted for most of these early points as printed in the Illustrated Kennel News) M. C. Ashwin, J. Brissell, W. A. Walker, D. Tomlinson, and J. Charles.

At this time the collies were found in many different colors including red, mottled, etc., but the majority were tri-colored, i.e., black, white, and tan. Some were found called "tortoise shell" but are now known as the blue merle. One of the first progenitors was "Old Cockie," a grand show dog, winning about 40 prizes at such shows as Birmingham, Nottingham, Carlisle, and the South Counties Shows. He was a medium sized collie, but nothing like the giants of the present day; he was born in 1867,
and was a sable and white, and it is generally conceded that all that have this color owe it to him, even to the present time.

Another noted collie was Carlyle, who came from a long line of Scotch drivers, but was born at Denbigh, North Wales. About this same time, a Mr. Thompson brought out a dog named Old Mec, and from crosses of these two the famous "Charlemane" was produced. It is truly and rightfully said of him, that no true collie is without his blood. Nearly all of our recent noted champions go in a direct line back to this dog.

Here it is well to consider the size of the original collie. Many of the females weighed only from 25 to 30 pounds, while a male that weighed 45 pounds was considered a heavy one indeed. Today it seems a sin to breed these small sizes, but it is certainly reaching a historical fact to know that the true collie was not an abnormally large dog. Breeders, in trying to improve the breed, have rather over done this, as is seen by reading the stud advertisements of certain collies which give their weight as 75 to 80 pounds.

Another feature is the extremely long heads that the judges have been favoring until very recently. In our experience, we have seen dogs brought into the show ring with a head 13 inches in length, and all the expression and beauty gone. J. A. Doyle describes the collie head as full of kindness and craft, but it can readily be seen that this is not obtainable where such length is found.

It is a very surprising fact, that so few of our farmers appreciate the worth of this noble breed, when it is to their advantage in so many ways. They can use him to his fullest capacity, not only as a great help as a stock driver, but as a watch dog, and in many other ways. One of our most noted poultry breeders comes to the front with the statement that his collie is better help in driving a flock of hens from one yard to another, or from one building to another, than two able men.

As stated above, the farmer has left it for his city cousins to make the discovery of their true worth. This can easily be proven by looking over the order books of nearly any of our principal breeders for it will be found that they ship five out of every six to cities, where with their loving, companionable, earnest dispositions, and their beauty, they have been given their just dues.

The training of the collie as a worker is an important, but not a hard task; in disposition he is a sensitive animal, full of animation, but he can be easily frightened, hence patience and firmness are necessary. The use of a whip is never advisable as a little judicial correction in other lines will accomplish more.

In discussing the history of the breed it is necessary to mention the extent to which faddists have taken it up. This is evinced by their popularity at all the leading shows. At the great Westminster Kennel Club Show which is held every February, in New York, over 140 entries are made in collies alone each year. And the exhibitors are such noted men as Samuel Untermyer, who last year paid $6,350 for Ch. "Squire of Tytton"; J. Pierpont Morgan, who a few years ago paid $5,000 for Ch. "Wishaw Clinker" and many others.

Of course these high prices are paid by men who can well afford them, and it also draws out two important points; namely that the breeder who is bending his energy towards producing the best show specimen can easily find a market if his ambition is realized, and at a price that will more than repay him. The other is that he has to battle for honors at the ring side, with men that have unlimited means to buy the best either in this or other countries.
On the evening of Wednesday, February 12, the auditorium was the scene of a new institution, an innovation in the College of Agriculture, in the form of a prize Stage in Declamation. The preparations and preliminary work for the contest have already been noted in the March Countryman, but the final result was known too late to be published at that time.

Lively interest upon the part of the student body had been aroused and a gratifyingly large attendance nearly filled the hall when Dr. Andrew D. White, who presided, rose to preface the contest with an interesting development of thoughts in regard to it. He emphasized the scarcity of true and capable orators and the extreme importance of a power to express ideas clearly and forcibly in these days of higher education. He urged that the farmer make more of this side of their life and activity, that they may not need to get lawyers to speak for them, but can develop their own views and take them, in person, before their fellows, and legislative bodies. In the course of his remarks he then gave some simple and valuable points of advice to those intending or desiring to become able to speak.

The first contestant was F. Eugene Benedict, Sp., who had as his subject, The Self-supporting Student. As a result of investigation he had found that a large number of students in the College earn part or all their expenses in various kinds of work, and that the major part of this work is in the form of manual, cheaply-paid labor. The student seeking work follows the line of least resistance and chooses the first occupation at hand, often accepting unnecessarily low remuneration. "There are too many 30 cents per hour men working for 15 cents per hour," he said, "and there is a demand for a higher class of work on the part of the student." To those who consider their work in any way he asserted that "a new man must come here with a determination to be a marked man, to do whatever he undertakes in such a manner that his name will be synonymous with hustling, faithfulness and a reputation for making good."

Following this H. Lubin, '08, who was awarded first prize, presented a vivid and appealing contrast between the American and the Russian farmer. The first half of his speech was devoted to a consideration of the advantages possessed by the American farmer in the form of coöperation, education, a just and protective gov-
ernment and most of all, liberty. He enlarged upon these benefits, dwelling upon their importance and the ways in which they enable the farmer to make use of his brains and ideas and to make his life a success.

Leaving this picture of prosperity before his hearers, Mr. Lubin then rapidly changed to a description of the condition of the Russian farmer. Under a despotic, thoughtless cruel government, he said, the Russian farmer as a peasant, is given no chance to rise, to develop the resources of the land and to make his work count. Formerly when he was an absolute slave his condition was sad enough, but with emancipation came taxes, the weakness of dissolution and the loss of the protection, however slight, of his master. The taxes were gradually increased until now, practically fifty per cent. of his meagre income is eaten up by the government. He cannot buy tools, and in many cases they are not even available. He has no transportation facilities, his market is either composed of peasants like himself, or is many miles away, and not only does the government refuse assistance, but it actually retards by its shortsightedness and domineering brutality, what little he tries to do. Mr. Lubin's descriptions, coming from one who has witnessed these scenes and lived near these conditions were thus made all the more realistic, and the audience silently echoed his denouncement of the treatment of these peasants, and the thought of gratitude for the conditions with which we are surrounded.

The next speaker was W. H. Alderman, '08, who developed the subject, "The Farmer and the College." He showed how a man to be today a good farmer must be grounded, not only in the principles of agriculture, but of business methods as well. To secure the best results toward this end, as toward others, the farmer and his college must pull together at all times. "One of the first problems to be solved," he said, "is the introduction of agriculture into the rural schools in an attempt to open the eyes of the country boy to the opportunities that lie in an agricultural education. In education and coöperation is the future of American agriculture."

At this point in the program the Glee Club rendered a brief intermission. enjoyable, preceeding M. P. Jones, '08, the next speaker, who was later awarded second prize in the contest. His subject was The Rural School, and his development of the theme gave to his hearers ideas of improvement and change that are not only good to hear and think about, but are practical and alive. These changes, he said, are coming about with the fundamental idea of adapting the children of the open country to open country conditions. "The curriculum of the country school will change, and the subjects that have no definite, tangible aim will give way to work that brings the student into sympathy with his environment, and teaches him to see the things he looks at, and to hear the sounds that come to his ear. The country school of the future will have plenty of room, with a playground and a garden of its own, and the school room will have not only its desks and blackboards but its laboratory, its workbench and its window boxes filled with growing plants. And the teacher will be one who loves not only the children, but the things of their every day life. All this will come as a result of a spirit of awakening throughout the country, the open country, bringing about a revitalization and a redirection of the factors of rural life." All through his speech—in which he touched upon the many phases of the all-important rural school,—he sounded the note of this awakening, the hope for greater, more natural things, for the pursuit of knowledge, through familiarity with the wonders of Nature that are near and around us.

E. L. D. Seymour, '09, spoke next, upon The Farm Labor Problem, which he briefly analyzed and discussed with a view to suggesting remedies. "The scarcity of farm help" he said "is the result of existing economic and social conditions which are not beyond the reach of assistance and improvement."
These conditions he considered more or less fully—pointing out unnecessary evils in many cases. His conclusion and ultimate appeal was for better conditions, a greater harmony between the work, the worker and the employer, and the improvement of the farm laborers' standard of living, through increased knowledge, and active interest in the farm and its success.

The list of speakers was completed by M. C. Burritt, '08, whose subject was Education and the Farm Boy. He first showed how civilization and agricultural progress were interdependent at the beginning, and then how agriculture gradually fell behind in its development, both socially and economically. Having pictured these conditions of the past, he said that a great change was now taking place, which was due primarily to education. He then presented the standpoint of a farm boy who had received an agricultural education and reasons why he should be thus educated. These were increased knowledge, increased profit, satisfaction of knowing the "how" and "why" of things and a broader point of view. "Education is the hope for the farmers' future" was the final and dominant thought.

The judges of the contest, Professor E. O. Fippin, of the Department of Soils; Dr. T. L. Lyon, of the Agronomy Department, and Professor E. W. Kemmerer, of the Department of Political Science, then convened for a decision, while Dr. White commented briefly and most commendingly upon the contest. "Among all the debate and declamation contests among students, which I have ever heard, he said, "rarely has there been presented so clear, interesting and mature a collection of discussions as have been heard this evening."

After a session of nearly an hour the judges announced the first prize of $15 to H. Lubin, '08 and the second prize of $10 to M. P. Jones, '08, together with the privilege of speaking during the exercises of Farmers' Week.

THE GRADUATE SCHOOL OF AGRICULTURE

The first session of the Graduate School of Agriculture was held at the Ohio State University in 1902, and its success at that time led to a second session at the University of Illinois in the following year. The enrollment of students had increased from 75 to 91, and under the direction and control of the Association of American Agricultural Colleges and Experiment Stations, its importance and success were intensified. It has been arranged to hold the third session at Cornell University and the Geneva Experiment Station during the coming summer, from July 6 to 31. The school will again have as Dean, Dr. A. C. True of the Office of Experiment Stations, and various members of Experiment Station staffs and the Department of Agriculture will be included among the faculty.

The purpose of this school is to give advanced instruction in the science of agriculture, with special reference to the methods of investigating agricultural problems and teaching agricultural subjects. Only persons who have completed a college course and taken a bachelor's degree will be admitted, except that admission may be granted to non-graduates, who are recommended by the faculties of the colleges with which they are associated, as persons properly qualified to profit by advanced instruction in agriculture.

Registration facilities will be provided by July 4, and the work of the school will begin at eight o'clock on the morning of July 6. The opening will be publicly recognized at exercises to be held Wednesday evening, July 8. It is expected that at that time addresses will be given by the Hon. James Wilson, Secretary of Agriculture, Dr. J. L. Snyder, President of the Michigan Agricultural
College and the Association, Dr. J. G. Schurman, President of Cornell University, Dr. W. H. Jordan, Director of the Geneva Experiment Station, Dr. A. C. True, Director of the Office of Experiment Stations, and Director L. H. Bailey.

The work of the School will consist of four one-hour lectures at 8, 9:30, 11, and 2, and a seminar period from 3 to 5 each day, with the exception of Saturday when afternoon work will be omitted. The seven lines of instruction to be presented, will be arranged with the following relation to the hours mentioned: Agronomy, horticulture, dairy husbandry and dairying will be given at 8 and 11 each day; biochemistry and entomology at 9:30; and poultry and veterinary medicine at 2 P. M. Saturday mornings and Wednesday and Friday evenings will be given to conferences on topics of general educational interest in agriculture. Certain of the exercises and lectures of the University Summer Session will be open to the members of the Graduate School, and on each Monday evening an address will be given upon the present status of one of the natural sciences. Certain work may be conducted at the State Experiment Station at Geneva, which can be easily reached at any time. It has been decided that save for a matriculation fee of ten dollars, no expenditures, or laboratory fees will be charged.

Among those who will either give special lectures or form part of the faculty, the following are a few:

Hon. W. M. Hays, Assistant Secretary of Agriculture; Dr. E. E. Brown, U. S. Commissioner of Education; President K. L. Butterfield of the Massachusetts Agricultural College; Dr. E. W. Allen and D. J. Crosby of the Department of Agriculture; Dean T. F. Hunt, Pennsylvania State College; Dr. N. Zuntz, Royal Agricultural College, Berlin; Professor L. B. Mendel, professor of physiological chemistry, Yale University; Dr. H. P. Armsby, director of Institute of Animal Nutrition, Pennsylvania State College; A. D. Hall, director of the Rothamstead Experimental Station, England; Professor Milton Whitney, chief U. S. Bureau of Soils; Professor T. L. Lyon, Cornell University; Professor W. J. Spillman, U. S. Bureau of Plant Industry; Dr. Samuel Fortier, U. S. Office of Experiment Stations; Professor H. J. Webber, Cornell University; Professor J. C. Whitten, University of Missouri; Professor F. A. Waugh, Massachusetts Agricultural College; Professor S. A. Beach, Iowa State College; Professor U. P. Hedrick, New York Agricultural Experiment Station; Professor B. M. Duggar, Cornell University; G. H. Powell, pomologist, U. S. Bureau of Plant Industry; Professor T. L. Haecker, University of Minnesota; Dr. H. L. Russell, University of Wisconsin; Dr. E. Davenport, Dean of the College of Agriculture, University of Illinois; Professor H. H. Wing, professor of animal husbandry, Cornell University; Professor R. A. Pearson, professor of dairy industry, Cornell University; Dr. L. L. Van Slyke, chemist, New York Agricultural Experiment Station; Professor S. H. Gage, Cornell University; Professor G. S. Hopkins, New York State Veterinary College; Professor P. A. Fish, New York State Veterinary College; Professor C. B. Davenport, Department of Experimental Evolution, Carnegie Institute; Professor J. E. Rice, Cornell University; W. R. Graham, Ontario Agricultural College; Professor James Law, New York State Veterinary College; Professor V. A. Moore, New York State Veterinary College; Dr. L. O. Howard, U. S. Bureau of Entomology; Professor S. A. Forbes, University of Illinois; Professor M. V. Slingerland, Cornell University; Dr. James G. Needham, Cornell University; Dr. E. P. Felt, state entomologist of New York.
The Cornell Countryman

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APRIL, 1908

The Countryman regrets having to announce the enforced resignation of Mr. R. H. Dayton from the Business board, on the occasion of his being summoned from the University to his home.

The scheme proposed last fall by Professor Stone, and adopted by the college authorities, in regard to the amount of practical work required before graduation, has been in operation for the greater part of a college year, and little has been heard about it save discussions before and after taking "the exam." by students involved. Whether or not every student pass this examination this year is of slight consequence, for the class of 1908 will be graduated without regard to it, while other undergraduates are given one or more summers in which to make up the necessary work. But the fact that several candidates for degrees who are specializing in certain work, have found it impossible to answer all the requirements leads us to consider possible contingencies in future years when even seniors will not be exempt.

If a student is specializing, say in landscape architecture, it seems obviously and eminently unfair that he need pass an examination upon his ability to run a threshing machine or milk and care for cows; yet if he expects a degree, in the future this will be essential. Any such special subject might be taken and it would seem no less incongruous that the student of that subject be required to know, also, all the other branches of agriculture to some extent. It may, of course, justly be said that a B. S. A. represents proficiency in agriculture as a whole, and that, as the mark of approval, the recommendation of the institution granting it, the degree should not be given to those in any way unworthy. However, such being the case, it seems rather that a separate degree should be conferred in each line along which specialization may occur, or that the degree in general be restricted or in some way modified to suit the cases of certain specializing students. We are far from disapproving of the system, and likewise appreciate what a degree should mean, the idea of a standard that it should convey. Nevertheless, with these specialists in mind, who, knowing their own subjects more or less thoroughly, can hardly be expected to be proficient in many branches that are uninteresting and useless to them, and thinking also of the general student who, knowing many phases of agriculture, seems to deserve additional recognition, we feel that these problems are worthy of consideration and that it is particularly desirable that possible emergencies and difficulties be prepared for, before they arise.
In the brief account of Farmers' Week that is given on another page, is conveyed but a hint at its success and importance, and the impression which it created upon both the visitors and those who greeted them. Even a careful consideration of the various programs, only serves to give the skeleton of its activity, and it would need much space, and a writer skilled in knowledge of all phases of agriculture, and in the analysis of thoughts and facts, to do justice to the good that was affected by the convention, the strengthening of the ties between the practical farmer and the College of Agriculture — each of whom is essential to the effectiveness and progress of the other. He would have to describe the new thoughts and determinations that arose and the rays of knowledge and understanding that came to light the dark pages of traditional and unscientific theories of farming. And he would have to express the gratitude, the pleasure and appreciation of many, in order to truthfully portray the benefits that accrued. There is justification in already looking forward to the Farmers' Weeks of the future.

Last month the necessity of a definite name for the Agricultural Stage was commented upon, and since that time another thought along the same line has entered the mind of the Countryman. During Farmers' Week, signs could everywhere be seen directing visitors, now to the “Main Building,” now to the “Agronomy Wing” and again to the “Dairy Wing.” Undoubtedly one knew where he was going when following these directions but were he later called upon to say where he had heard such-and-such a lecture, or seen a demonstration would it not have seemed more natural to him to have some name in mind, some designation that he would remember? That is one phase of the question and another is, whether the buildings are not worthy of special names, or in other words, are there not men whose memory could worthily and gratefully be cherished in such a way? On the Campus, we have Morrill Hall to bring to our minds a man to whom Cornell owes much, Morse Hall dedicated to a great scientist, Goldwin Smith in recognition of a great man of letters, Sage Chapel, and all the rest. Practically every building save those of the Colleges of Veterinary Science and Agriculture bear names that deserve to live. The Veterinary College, is beneath one roof, hence there is perhaps less reason for it to follow suit. But no such excuse exists for the College of Agriculture. Involving three distinct buildings not to mention the Judging Pavilion, and with many agriculturists whose names are already history, we have both reason and means, and the further step of action is a legitimate and logical one. Would there not be a tone, an individuality in the thought of going from a lecture in Sibley to one in Roberts Hall, or Caldwell or Nixon or Wilson Hall?

Among all the peculiar ailments and tendencies that accompany spring, not the least is the stirring of the athletic blood in the veins, the desire to get out in the sunshine and the wind, to run and leap, to row, to work, to compete, to enjoy the very life that is in the air and the earth and
the trees. This feeling has already called out the college crews who have been working for some weeks on the machines, and the baseball teams, the harbingers of spring. Here then are two more activities awaiting the muscles and grit and skill of the students of the College, who, only through the generous use of those qualities, can bring to the College honors athletic as well as intellectual. Let this be but an unnecessary urging to get into some game, some competition or sport. If it is not crew, or baseball or track, lacrosse or tennis, or any other organized game—in some way make use of the Alumni Field and the air and life of the spring-time; play for the fun of playing, for the very joy of activity, of getting tired, of gaining and enjoying power and strength and health.

The time is coming, according to Dean Bailey, when the socialistic spirit of the world will be such that “the man who does not work will not have the right to live.” This time, he says, will come, but is not this spirit, or at least its essence existing even at the present time in a figurative but undeniable sense? We see it on all sides. In athletics, if a man does not work he is soon dropped from squad to squad, and finally lost sight of altogether; in associations and organizations for literary, oratorical or scientific advancement if a man refuses to work, he assumes no responsibilities, his influence is nil and his development equally lacking; as a student, the man who does not work is either ignominiously “busted” or, even if he contrive to remain in the University, he gains nothing there, and wastes time that he cannot afford to lose, money that could be better spent and opportunities that cannot be recalled; and finally in life, while the fact may be less obvious, the man who do not work fail, as a class at least, to make good and at the end find themselves—nowhere. The world may be better, more perfect when even the right to live is denied the human parasite, but if we look closely into the pages of modern times, and watch the progress of the lives of men, can we not find proof, immutable testimony of the necessity for work? But all this is a threat, a reason based on a warning, the fear of consequence, and there is a higher, a more positive beckoning call for industry and work. For we are told to be glad of life for the chance it gives us to work, to struggle against odds, to overcome them and feel the warmth and joy of accomplishment. Here, the result may seem to be success, and concrete, measurable results; there, it may seem to be failure and discouragement; but it is no more true in Physics than in life, that work must expend itself, and accomplish something. And whether the visible fruits be great or small, gratifying or disappointing, the reward that comes with the last analysis remains as something greater than can ever be held out to the man who does not work.
CAMPUS NOTES

We, students in the New York State College of Agriculture, realizing the loss that has come to agriculture through the death of Professor Willis G. Johnson, appreciating his work as a former teacher among us and his interest in the welfare of the students of the college, resign ourselves to the will of an allwise Providence and extend our heartfelt sympathy to the family whose loss we share.

And, be it Resolved, That these resolutions be printed in the University press, and a copy be sent to the members of his bereaved family.

For the College.

E. Earle, Jr.,
S. F. Willard, Jr.,
C. J. Stein.

The Fourth Annual Carnation Show was held on March 4, 5 and 6, in the Lazy Club rooms, under the auspices of the class in Green House Management. The cut flowers, banked in with ferns and other foliage plants, were arranged on tables along three sides of the room, and presented a most attractive and artistic appearance. The number of specimens displayed was gratifyingly large, the majority being sent by growers throughout the country, to whom thanks are due for their interest, cooperation and assistance in making the show a success.

Among the exhibitors were: C. M. Ward of Long Island, who furnished his Alma Ward, winner of the gold medal at Washington, and the Mrs. C. M. Ward, which won the bronze medal; the Chicago Carnation Company, which exhibited Andrew Carne- gies; John E. Haines, Pennsylvania, represented by several types of Imperial and some of his own seedlings—one lately named after himself; the Horticultural Department of the New Hampshire College, whose exhibit spoke well for the Plant-Breeding work done there; R. F. Pearson of Tarrytown; Paul Thompson of Hartford, Connecticut; J. D. Cockcroft of Long Island, and other prominent growers.

The Monday following the show was Carnation night at the Lazy Club, and some of the varieties remained on exhibition until then. Mr. L. D. Batchelor discussed Commercial Varieties, Dr. Webber spoke on the Breeding of Carnations, and Professor Wilson described Mr. C. M. Ward’s establishment in Long Island.

* * *

In the second preliminary game of the Inter-College Basketball championship played on March 3, the Agricultural team defeated the Architects by a score of 21 to 10. The team was composed of Kelly, Grant, Rutherford, Miller, Myer and Kruse, and maintained a good lead throughout the game. Though they had had but little practice, the men played fairly well together.

On the following afternoon, however, the tables were turned and in a semi-final game with Sibley, the team lost by a score of 24 to 11. A strong rally was made in the second half, but was not sufficient to cut down the lead held by the Engineers.

* * *

A meeting was recently called of all those citizens of Ithaca interested in a horse parade. At this meeting Professor Harper was made chairman of a committee of arrangements, which decided to hold the parade on Decoration Day, at which time sixteen classes will be exhibited and prizes awarded.

Classes have been provided for old horses, heavy and light draft teams, single express and delivery horses, heavy and light farm teams, coach horses, driving horses and ponies. In most of these classes, the form, condition, grooming, shoeing, harnessing, bitting and arrangement of the horses will receive considerable attention in the judging.

This parade should prove of great benefit to the horsemen of Ithaca as it will create interest and enthusiasm in the care, keeping and breeding of the best types of horses.
Professor Wing recently purchased for the Animal Husbandry Department two mares four and five years old, sisters, by the Hackney stallion Moorland, out of a standard bred trotting mare. These mares are sixteen hands high, weigh about 1,100 pounds each and were imported from Brampton, Canada. They should prove a valuable addition to the stock of the College.

* * *

The Farm Machinery Department is continually becoming more efficient, largely because of the large supply of machinery now on hand. More of different types is being added. A new 6 H. P. hit and miss governing, horizontal gasoline engine has recently been received by the department and another is expected. Eight pumps of different styles for shallow and deep wells, spray pumps, etc., a new "Superior" grain drill with fertilizer and grass seed attachments and a Planet Jr., hand seed drill and cultivator combined, of the most modern type, are some of the new additions. The old hot air engines made by the Rider, Ericson Engine company, have been brought over from Sibley College, where they have been displaced by engines of the latest type. The old engines are essentially like the new models and illustrate the principles involved.

* * *

The old Stock Judging Pavillion is now being remodeled into a campus fire house. A hook and ladder with a reach of seventy feet and a hose cart carrying 500 feet of hose will be kept on the first floor. On the second floor rooms are being fitted up to accommodate four persons, who will sleep there. These will probably be the fireman in charge of the College boiler room, and three students.

* * *

The Countryman is glad to be able to announce the birth of a son to Mrs. and Professor W. A. Stocking on the evening of February 18.

Prince Maharajkumar Victor Niten-dra Narayan, son of the Maharajah of Cooch Behar, India, entered the College of Agriculture March 3rd, to take courses that will fit him to take charge of about 40,000 acres of his father's tobacco lands in the Far East.

Mr. I. B. Majumbar, M. S., '06, accompanied the Prince to Cornell and will act as his advisor while he is here. After about two year's stay here the Prince expects to go south and study practical tobacco growing in Virginia. The Cosmopolitan Club gave a reception in honor of the Prince and Mr. Majumbar, formerly vice-president of the club, shortly after their arrival at Cornell.

* * *

The Agricultural students are well represented on the Varsity Wrestling Team this year. R. L. Lewis, Sp., is in the 125 lb. class; M. C. Haight, Sp., and K. C. Livermore, '09 145 lb. class; W. E. Wright, captain of the team, in the 175 lb. class, and Lee Talbott, '11, represents the heavy-weight class.

**FORMER STUDENTS**

'92, A. B., '94, A. M.—On March 10, died Willis G. Johnson, and with his death New York state and agriculture itself lost a loyal supporter and an able investigator, journalist and champion. Though not a former student of the College of Agriculture, his work in the University was along agricultural lines, and in recognition of his efforts and accomplishments in behalf of agriculture, we take this opportunity to express our regret at his seemingly untimely death.

Mr. Johnson was born at New Albany, Ohio, in 1866, and after studying at the Ohio State University, took his B. S. and M. S. degrees at Cornell, specializing in economic entomology. Later he took advanced work in Leland Stanford University and served as instructor there. As instructor in the University of Illinois he conducted important investigations,
continuing his work for the Laboratory of Natural History and as state entomologist of Maryland. After organizing the State Horticultural Department of Maryland and serving as its chief until 1900, he took up journalistic work as managing editor of the American Agriculturist. He then became associate editor of the New England Farmer and the Orange Judd Farmer, as well as the Agriculturist. And but a short time ago he was appointed as one of the Board of Control of the State Experiment Station at Geneva. While living in New York City he was attacked by spinal meningitis and after some time of illness died in that place. His body was returned to Ithaca and buried in Lake View.

Mr. Johnson was the author of several reports and bulletins as well as the Poultry Book, which was published in three volumes in 1903-4-5. While living in Palo Alto, California, he was married and is survived by his wife and several relatives.

'B04, B. S. A.—Walter S. Brown has resigned his position as Professor of Horticulture at the Winona Agricultural Institute at Winona, Indiana. He intends to devote his time to the management of his farm.

'B06, B. S. A.—D. G. Dragoshinoff writes from Sofia, Bulgaria, that he is at present serving his military term which he will not finish until September, 1908. He then expects to go to Germany, there to study German agricultural methods for a time and then to undertake practical farming in Bulgaria. A general agricultural union is being formed there. Mr. Dragoshinoff is interested in this movement and looks for betterment of farming conditions from it.

'B07, B. S. A.—Lyman F. Ayers is Assistant Professor of Animal Husbandry at Hampton, Va. Besides teaching the boys in the agricultural courses he has charge of the Institute herd of about forty-five head of cattle. He is enjoying his work, and says that the greatest need of the Agricultural Course is for well written text books of High School grade. "I think The Countryman is doing a good work. You keep it newsy and readable. Many of the boys here in the school speak to me of this or that article which they read in The Countryman."

'B07, B. S. A.—Word reaches us that Horace F. Prince has purchased a ten acre fruit ranch at Grand Junction, Colorado, and expects to make this his home in the future. The varieties of apples which Mr. Prince is growing are White Winter Pearmain and Jonathan. This part of Colorado is a great fruit section and Prince hopes "to do some tall things," which we are sure he will do. He is a former Alumni editor (1907) of The Countryman.

'B03, Sp.—J. A. Clark graduated from the Ontario Agricultural College with the class of '06. He went immediately to his farm at Bay View, Prince Edward Island, and has made good. A thriving "Lazy Club" has been organized at the place. On February 7, 1908, he was taken on the staff of the Department of Agriculture, Ottawa, Canada, as assistant in the Seed Commission Office.

'B03, W.—J. J. McNamara is engaged in general farming on his farm at Stanley, Ontario county, New York.

'B95, W. A.—H. W. Thornell of Pittsford, N. Y., is now a contractor and is engaged in building a macadam State Road near his home.

'B05, W. A.—Milton B. Lisson of Almond, New York, is in partnership with his father conducting a large stock farm. Besides a herd of forty-six pure bred Guernsey cattle, they are raising Percheron horses, Berkshire swine and Shropshire sheep.


'B05, W. A.—Wm. J. Faulkner is conducting a potato farm at Hornell,
New York. He has cooperative experiments with the college here.

(The Winter Poultry Course of '06, sometimes known as the "Jimmy Jrs." are hustlers. They have a good alumni organization with a class secretary, Mrs. E. A. Wertz, New Canaan, Connecticut, who has reported to us the whereabouts and doings of the members of the class, some of which follow. We are sorry we have not space for all in this issue. We think the scheme an excellent one and suggest its adoption by other classes.)

'06, W. P.—L. Arthur Sheldon has been teaching near his home at Copenhagen during the past year.

'06, W. P.—W. H. Brigham and A. C. Burnam, the poultry pair from Bolton, Massachusetts, are running farms—the former a dairy farm, the latter successfully breeding Rhode Island Reds.

'06, W. P.—C. A. Herrick is successfully breeding White Wyandottes and has won many prizes at the county fairs of the State.

'06, W. P.—Harold St. John Morehouse married Miss Marion Abbott of Darien, Connecticut, in June, 1907. He then sold his poultry plant and stock and went to Chicago where he has entered on a commercial career.

'06, W. P.—Walter Lyons is manager of the Waubeck Poultry farm of Colonel Upham, at Waubeck, Wisconsin. He has been very successful in breeding White Leghorns.

'06, W. P.—L. D. Neish is engaged in farming at Shavertown, New York, with three specialties, dairying, poultry and fruit.

'06, W. P.—James Morrison has built quite an extensive poultry plant since leaving Cornell, including office, workshop, brooder and laying houses.

'06, W. P.—W. T. Knight has had charge of the Pencoyd Poultry Plant at Bala, Pennsylvania, during the past year. This spring he will go into business for himself at Hudson, New York.

BOOK REVIEWS

Progressive Poultry Culture. By A. A. Brigham, B. S., Ph. D. 5½ x 8 inches. 287 pages. Illustrated. Published by The Torch Press, Adair Rapids, Ia. Price (cloth) $1.50.

This book should be of particular interest and value to the student and to the beginner in poultry culture because of the logical evolution of ideas and methods which its name so well implies. The first chapter is devoted to "The Basis and Beginning of the Business," and succeeding chapters deal with the "Principles of Breeding," "Incubation," "Foods," "Diseases," etc., down to "Records and Accounts," and "Methods of Management." Each of the above and the many more topics has a whole chapter devoted to its discussion. The main purpose of each chapter seems to be to combine brevity and conciseness with a thorough discussion of details since attention to details is the foundation of the poultry business.

It should be the purpose of every book of this nature, intended as a textbook for the student, or handbook for the beginner, to give the theoretical a practical meaning and a practical value. This Dr. Brigham has accomplished to a remarkable degree, owing perhaps to the extensive practical experience and intensive investigation to which his life has been devoted.

The book seems to have been written with the purpose of laying the foundations for poultry culture in true, specific principles and in giving these principles a general meaning. And this book has succeeded in that purpose because of its subject matter which is primarily specific and the history of its publication; the book was commenced in New England, continued in Maryland, and completed in the Black Hills, of South Dakota. It is the outcome of practice, study, experience and observation not only in our country but also in Europe and Asia.

This book will form a valuable addition to the library of any progressive poultryman or prospective beginner along those lines.
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AGRICULTURAL INVESTIGATION AND THE ADAMS ACT

By E. W. Allen

Editor of the Experiment Station Record, U. S. Department of Agriculture

The passage of the Act of Congress of March 16, 1906, known as the Adams Act, has given a great impetus to agricultural investigation in this country. It has placed the United States in the lead of all other countries in fostering the highest grade of agricultural work, and has opened up an opportunity never before presented for the development of agricultural science as a basis for teaching and for practical generalization.

Probably nothing has ever set men to thinking so seriously as to what research in agriculture should be, as distinguished from the usual experiments and trials and collection of data. This has brought out considerable diversity of opinion, and quite marked differences in the conception of the qualities essential to investigation. The fact is, we have fallen into the habit of using the terms "research" and "investigation" quite carelessly, and have often applied them more broadly in reference to experiment station work than they are employed in science generally.

Everyone, practically, agrees that the Adams fund should be consecrated to a high type of investigation. The only real difference of opinion comes in the interpretation of the terms research and investigation as applied to agriculture. One man thinks a trial of the milking machine comes under that head, another the determination of the best system of farming for his locality, another the best system of rotation, another the improving of a cereal or other plant by conventional methods of selection or crossing, another soil fertility, another dry farming, another the determination of the fertilizer needs of different localities by field trials, and still others the finding of ditch linings for canals, means of producing early spring lambs, preservation of fruit juices, digestibility of local crops, and surveys of various kinds, such as botanical, plant disease, soil, range conditions, etc. Others have felt that these investigations should be aimed at more definite and more clearly defined scientific problems, which really lie at the foundation of the large and complex practical questions.

Research in agriculture must evi-
dently be governed by the same general principles as that in the pure sciences. Scientific investigation is the same in method whether it relates to agriculture or to physics. It differs only in detail and not in kind. It presumes the same analysis of broad questions into their various scientific aspects, which are to be studied by the scientific method, step by step. We cannot study a broad, complicated practical question in its entirety. We must first determine what classes of scientific phenomena the question embraces, and then single out a point which seems to be vital, and concentrate study upon it. The investigation will not solve the whole problem, but it will contribute a definite step in that direction.

One great difficulty with problems in agriculture is their complexity, and the fact that the subject has not been analyzed and classified as the older sciences have. Too often we approach a subject in agriculture from the view point of the art. Soil fertility, for example, a common subject suggested for investigation, is too broad and complicated a topic to be considered as a whole. It is not a suitable unit for investigation any more than the broad subject of health in the human being would be. Specific investigations which aim to determine definite scientific facts will help to clarify both subjects, but no single investigation can hope to settle either. It is only by differentiating such subjects very carefully that we can hope to trace the relations between cause and effect, and understand the application of scientific principles in practice. Until then we shall have only a skeleton of agricultural science permeated with empirical and unexplained information, and we shall not have a systematized basis for instruction comparable with that of the pure sciences.

It is not easy to define research or investigation as distinguished from less fundamental work, or to fix the boundaries where one begins and the other leaves off. As a matter of fact, the aim and attitude of the man in charge determine whether a piece of work shall be merely a demonstration, or have experimental features, or become a thorough-going investigation. The theme itself in no way limits the character of the work. The humblest subject may be a profitable theme for investigation in the hands of the man who has the true spirit of investigation.

It is easier, perhaps, in specific cases to determine what is not research, and to point out the respect in which it falls short. It is not the accumulation of observations or notes or data, or the making of experiments of various kinds, except as these form a part of a definite line of study. The newspaper reporter reports the news items as they occur from day to day. He supplies in part the material from which the historian does his work, but no one thinks of him as a writer of history. The historian considers the facts in their broad relations to the life of the people, weighs these in the light of other events, and writes the history of the times.

Milk sours in some cases; in others, putrefactive changes occur. To understand the reason for the phenomena we must know about the various classes of organisms which affect milk, their reciprocal relations to one another, and their behavior under different conditions of temperature, reaction of the milk, etc. Then we can understand the reason for the changes, and are prepared to bring them under control. Until we knew the theory of cheese ripening we were in no position to improve and safeguard the practice.

The usual field experiments with fertilizers gives an empirical answer as to what the plant needs—at least it shows what the soil responded to under the existing conditions. But it does not give a reason for the result, or any measure of the influences that are operative, and, as a matter of fact, contributes little if anything to a scientific understanding of either plant nutrition or soil fertility. Research does not seek to find merely what combination of fertilizers, or what
method of propagation and culture, or even what combination of crops will keep up the productivity of the land to a profitable point; the combined results of many investigations will enable these questions to be answered. But it attempts rather to find out why certain results follow certain methods of treatment, what that treatment actually brings about in the soil, and how it influences the physiological activities of the plant so that we get an abundant yield or a crop with certain qualities or characteristics. Such knowledge will enable the foundations of agriculture to be laid in science, and will supply a basis for teaching the student the reason for things instead of the bare facts.

It is essential to distinguish between the search for knowledge and the application of well established facts. The development of a method of chemical analysis on the basis of the reactions of different compounds may be regarded as a piece of research, but the application of this method in routine analysis in the laboratory is only the intelligent and skillful use of what has been learned and formulated. The development of a virus or vaccine as a preventive of disease calls for thorough-going investigation, but its employment after the method has been developed, whether by the veterinarian or the intelligent farmer, is no more research than is the every-day practice of the physician. The case seems to be similar in the breeding of plants or animals where the aim is merely to get something better. The element of investigation seems to be absent, or at most very incidental. With such knowledge of the principles as has been gained, and following methods of procedure which have been developed and tested, an attempt is made to secure or accentuate certain traits or characteristics in the plant. Here again the aim largely determines the kind of work. If the man in charge is satisfied with merely getting a better strain or variety, or determining an empirical fact without going into the reason and limitations, his work will stop at that point, and while it may have a good deal of practical value it will not teach us how better to secure such results, or the laws that lie back of the phenomena.

The immediate needs of the farmer can not be the first consideration in planning investigations, as they often are in practical trials and experiments. But investigation is none the less practical, and the knowledge gained will no less surely be of value to the farmer when it is applied in the working out of methods or the interpretation of practice. It means a little more patience in the interest of accuracy and reliability. Nowhere is a little knowledge more dangerous than in agriculture or more likely to lead to misapplication and error.

Agricultural experimentation is continually leading the thoughtful experimenter to inquire as to the reason of things as he interprets and attempts to apply his results. To him, as to the teacher, the serious gaps which now exist in our science of agriculture are continually embarrassing. The practical man is not necessarily interested in the fundamental basis of generalizations as to methods, but even he is becoming skeptical of dogmatic rules, and is taking more thought as to the reason for the practice which is recommended to him. He is beginning to understand better the nature and the importance of research in agriculture.
EXPERIMENT AND RESEARCH

By L. H. Bailey

Dean of the College of Agriculture

THE Hatch Act is the expression of a people wanting direct, quick, timely information, to aid in the daily business of farming. This is well set forth in the declaration of purposes: "That it shall be the object and duty of said experiment station to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soil and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states or territories."

Practical and directly applicable work was the result of this enactment. The work has been largely along the lines of observation, testing, compiling, disseminating. Its purpose has been to meet the pressing problems presented everywhere by the man who is meeting difficulties.

In due time, however, persons began to want knowledge independently of present difficulties; they wanted to know the real reasons why. In fact, the official horticulturist himself has felt the necessity of real understanding, for he cannot forever answer questions from the surface indications. The Adams Act is the expression of a people wanting final reasons and real facts. This is well set forth in the declaration of purposes: "To be applied only to paying the necessary expenses of conducting original researches or experiments."

As I conceive it, research is the attack of fundamental or underlying questions, founded on long and patient personal preparation, endeavoring to reach their ultimate causes and reasons, the results to constitute a real contribution to human knowledge, of wide or even universal application, and standing good in years to come as well as now. It is a contribution to the substratum of truth, on which rational practice may eventually solidly rest. As it may be non-timely, so is it unhasting. It is not observation; it is not testing; it is not demonstration; it is not playing with a thing to see what it will do; it is not recording phenomena nor reactions or other data; it is not the mere elucidation of practices; it is not description; it is not the effort to make things prove; it is not mere experimenting,—to experiment is to try. This last phrase suggests that I call attention to the fact that the Hatch Act establishes experiment stations; I have often wondered what would have been the result if it had established research stations.

Now, research is not so much a matter of the subject, as of the intention, the point of view, the method of work. That is to say, whether any piece of work is experimenting or research is determined by the man. Every subject or question has its underlying reasons how and why. This being true, there is no reason why the agriculturist should not engage in research as well as anybody else.

If every subject may develop both an experiment intention and a research intention, it will not be neces-
sary to make a list of subjects that are proper under the Adams Fund, but only to illustrate still further what I mean by these distinctions. To make tests of spraying mixtures and machines is ordinarily not research: to endeavor to study the real chemistry of spray mixtures, their physiological action on the insect or fungus, their effect on the tree or the soil, their relation to climatic changes, may be research, if the subject is approached with the determination to bring to bear patiently the best knowledge and methods and to discover laws and principles. The two kinds of work may progress at the same time under the same hand, but the likelihood, judging from experience, is that they will not. To endeavor merely to produce a new variety of plant by crossing and sowing the seeds may or may not be research, with the probability that it will not be: the effort to determine the laws of variation, the physiological processes of heredity, the numerical results of hybridization, and the like, ought to be research. Variety-testing is ordinarily not research; in fact, it is a question whether it is ordinarily even good experimenting: but the variation of varieties, their relation to soil and climate, the correlation of behavior under different conditions and in different places, ought to be research of the best kind. Similar remarks may be extended to all our customary subjects.

A man may experiment with many things, but he can undertake research with only a few things. The research man is, of necessity, a rather close specialist. He seeks permanent rather than temporary results. He is likely to be an obscure man, as the world goes, avoiding the limelight. He cannot delegate very much of his work. He stands by it and has personal knowledge of all the processes and events.

The greatest handicap to research in the American experiment station is over-organization. It is our wish to develop a large department, to have many assistants, to attack many subjects, to attend many meetings. All this is laudable, and, to avoid dispute, we will assume that it is necessary; yet even then it is possible to do something to lessen the burden of mere executive effort. There is crying need to lighten this burden, for we are spoiling our good specialists by making business men of them. I contend that it is wise, both for good teaching and for real efficiency in experiment and research that a specialist have only such executive duties as pertain to his specialty. As rapidly as possible, I would break up agronomy, horticulture, and all other customary arbitrary departments into their units, letting each man have the headship of his particular unit and of no other. In other words, I would let each man attend to his own business. Agronomy is not a unit; nor is horticulture; nor is animal husbandry; nor is rural engineering. It might seem that this small dividing of work would tend to loss of solidarity and unity in the institutions as a whole, even admitting the wisdom of allowing each man to devote himself to that subject for which he is best fitted; but if diffuse-ness and incoherence result, it is clearly the lack of a strong centralizing agency in the directorate of the institution itself. The work of several men in a department of horticulture or agronomy can be solidified by one of three methods: (1) by a dictator in charge of the entire department; (2) by mutual conference, with one of the group acting as chairman; (3) by mutual conference with the director of the college or station of which the department is a part. The first plan is inadmissible and unproductive of good results with trained men; either of the latter is advisable, a combination of the two producing the best results.

The organization that I recommend should have a powerful influence in concentrating the work of the various men. I suspect that it should produce particularly useful results in horticulture, in which the men are too general in their work and cover too much ground.

With the multiplying of demands
on the colleges and experiment stations, the time has come when we must make it possible for at least a few men of proper qualifications to devote all their energies for a life time to research, without the necessity of attending institutes, or of teaching undergraduates, or of giving advice all over the commonwealth, or of running a business organization. It is time that a few men be allowed to begin to stay at home. I distinguish four types of agricultural college or experiment station work:

Teaching of an academic character.

Teaching of an extension character.

Experimenting of a research character.

Experimenting of an extension character.

Most of us must be experiment-teachers and spreaders of propaganda; a very few may be investigators. The former has been the more needed in the past few years; they always will be of equal importance with the investigator, and they represent an equally high type of effort. My argument is that we now need to distinguish and to classify our men.

The Hatch Act came before its time if real research only were intended; or, to put it in another way, that great Act has prepared the way for genuine investigation. This investigation will not be founded on the Adams Act alone, but other funds in increasing amounts will be devoted to these ends. The funds will be forthcoming as the demands begin to press. Funds rise to meet the man. I am sure that agriculture will develop a research spirit as fundamental as that which underlies any other subject whatsoever.

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RESEARCH UNDER THE ADAMS ACT

By H. J. Webber

Professor of the Department of Experimental Plant Biology

WHAT is scientific research or investigation in agriculture? This is a question which since the passage of the Adams Act has caused much comment and discussion in agricultural circles. At first thought it would seem an easy matter to determine what work would be considered research and what would not. But the more carefully the matter is considered, the more clearly we can recognize the difficulties of determining where the limit should be drawn between scientific research and what is not scientific research. One of the first steps in clearing up any confusion of ideas regarding debatable investigations is a clear recognition of the difference between science and art, or between discovery and application or demonstration. Science in the sense in which the term is used when we speak of the science of agriculture, refers to the underlying fundamental principles of agriculture which have been discovered as a result of investigation and exact observation, and then carefully correlated and systematized. These facts, it is true, may be largely or wholly classifiable under the various primary sciences such as, chemistry, physics, botany, zoology, geology, etc., but in so far as they refer to agriculture when collected and systematized, they form what we may properly term agricultural science, just as the systematized knowledge relating to the treatment of human diseases is termed medical science. The writer would thus maintain that there is a science of agriculture in the true sense, although agriculture as practiced should be considered an art. Art, according to the Standard Dictionary, is "The skillful and systematic arrangement or adaptation of means for the attainment of some desired end. The practical application of knowledge or natural ability." The knowledge which is used and applied in the art may be science but the knowledge itself is not art and no
more is the art science in what we conceive to be the properly restricted sense.

We find too often that certain so-called scientific investigators are apparently using the fourth definition of science as given by the Standard Dictionary,—"Exceptional skill acquired by intelligent practice, as the science of the pugilist." Scientific research is the systematic and intelligent prosecution of observation and experimentation for the purpose of discovering new facts and laws. After a law or principle has been discovered and established its application and demonstration could not be considered research.

The work of our Agricultural Experiment Stations for a considerable period after their organization consisted largely in compiling the knowledge of agriculture which already existed. The hosts of discovered facts published and unpublished were in chaotic condition, scattered here and there in unavailable places. These were gradually accumulated, systematized and published in bulletins. Much of the science on which agricultural practice was based was not understood, the methods in use having been established empirically. These methods required to be tested and the underlying scientific factors discovered. A considerable portion of the work of the Experiment Stations up to the present time has been expended in demonstrating the truth or fallacy of such methods. Some of this work has been conducted as demonstrations primarily and could not be considered scientific investigations. Much of the experimentation, however, has been carefully arranged and planned to establish the scientific principles on which the practice was based and has added much to our knowledge of the science of agriculture.

The art of agriculture asks only, how? the science questions, why? These questions are almost fundamental the writer conceives, in determining whether a piece of work may or may not be considered scientific research. The farmer or artisan desires only to know how to accomplish a certain result while the scientist desires not only to know how a certain result is accomplished but why the forces brought to bear produce this result. This difference in viewpoint as the writer conceives it, may be made clearer by some examples.

Two experimenters knowing that inbreeding is used in the fixation of hybrids start experiments. One attempts to answer the question, "How can we render hybrids stable?" and makes many experiments in inbreeding and produces a number of fixed types. He has used the art of inbreeding and has demonstrated its efficiency in breeding hybrids to a state of fixity. He has, however, added nothing to the science. The other experimenter questions, "Why does inbreeding lead to fixity in hybrids?" He studies the question from all sides. He perceives that the great variation in hybrids is due to the commingling of widely divergent types. By experiment, he proves that hybridization in closely related types produces less variation than is produced in very divergent types. He postulates the hypothesis, therefore, by induction that the commingling of germ plasms with slight hereditary differences causes less variation than the commingling of germ plasms with greatly different hereditary tendencies. From this he deduces that to produce a fixed strain of a hybrid plant it should be inbred with its own pollen, which should contain the same hereditary tendencies, or with pollen from as nearly similar a hybrid in all characters as can be found, as this should transmit similar hereditary tendencies. In his experiments he would thus (1) inbreed hybrids with their own pollen; (2) inbreed hybrids with pollen from selected hybrids having similar characters, and (3) inbreed hybrids with pollen from other hybrids having widely distinct characters. When his work was finished he would not only have demonstrated how to fix hybrid races, but he would have discovered why this policy leads to fixity of type and have enunciated a scientific principle.
An experimenter may see the desirability of producing varieties of some plant resistant to a certain disease and discovering plants which show some degree of resistance, he carefully selects these, using the breeder's art, and finally produces varieties which are resistant to the disease and of very great value practically. Has he been conducting a scientific experiment? There is no question as to the value of such work; in several cases of this nature, now classical in the annals of agricultural literature, results of far-reaching importance have been secured. The methods, however, were empirical. The only fact demonstrated was that resistance to a certain disease of a certain plant constituted a character which was inherited. Had this investigation been extended and the cause of the resistance determined it would have been a scientific research of the very highest class. Such results might throw light on the general cause of disease resistance and furnish a method of producing resistance in the case of other diseases. True, the determination of the cause of resistance to plant diseases is an obscure and difficult problem toward the solution of which we as yet have nothing but vague suggestions and the experimenter is justified in taking such results as he can secure.

In the field of breeding in general, we may say that the experimenter who is breeding plants as such experiments are ordinarily conducted is not carrying on a scientific investigation. With broad knowledge of cultural conditions and crop demands, he studies the situation critically and determines that varieties of a certain type are demanded for the advancement of agriculture. His experiments may be planned and executed with consummate skill and he may achieve the end desired and produce a new corn, cotton or apple of the greatest value, yet in general we must acknowledge that he has not conducted a scientific investigation, but has simply demonstrated what wonderful improvements may be produced by the use of the breeder's art. If, in producing the improvement, instead of selecting only certain desirable variations as they accidentally occur, the experimenter had studied the causes and classification of the variations and the hereditary strength of the different types of variation, the investigation might have been made a true scientific research.

The worker in an Experiment Station even of the highest grade feels the necessity of soon getting results that can be published. This demand is a part of our national character, we want something to be doing and want proof that something is being accomplished. The station management may be broad and liberal and no actual demand may be made for quick results, yet the worker feels keenly the competition and knows that nothing succeeds like success. He realizes that the recognition by the people of his State of the value of his work is the strongest fortification in his position which he could have. The temptation to take up work of the nature that will bring this recognition, is thus well nigh insurmountable. The great temptation is to take up problems of superficial nature which will give quick and sure returns, rather than to select the slow, tedious and doubtful problems which are of more fundamental scientific nature and more difficult of solution. To meet the requirement of the Adams Act will necessitate careful, constant and wise supervision of the problems and work for many years.

Again, many of our experimenters who are expected to conduct Adams Act investigations are poorly trained and have not the critical knowledge necessary to conduct such investigations. Time will remedy this defect but much of the first work will necessarily be of doubtful quality. Again, many investigators having the necessary training and experience are handicapped for the necessary facilities to attack the problems they desire to solve. Certain it is, that even in the largest and best organized Stations with sympathetic and appreciative management the carrying out of ex-
tensive scientific experiments is difficult, and the difficulties must be many fold greater in the newer and smaller Stations, where in many places the management is none too sympathetic toward the scientific research problems. It is hard to conceive the attitude of such men when practically all of the great discoveries of agriculture have come from the conduction of pure scientific experiments. No well trained, thinking man can fail to appreciate this fact. No problems could be more scientific than those connected with soil bacteria and their relations to soil fertility and toxicity and yet, probably no investigations relating to soils promise knowledge of more practical utility. No investigations could be more scientific than those leading to the discovery and extension of Mendel’s principles of heredity, and yet we may safely say that no discovery of the last two decades is of such great importance to the practical breeder of plants and animals.

Another matter of the greatest importance in connection with the administration of the Adams Act is the question of salaries which shall be paid to highly trained men. We have not advanced sufficiently in our ideas generally to be willing to pay for extra training. We recognize the value of post graduate training and always desire to get Ph.D.’s when possible, but we expect such men to begin at the same salaries as men just out of college with no experience. Is it any wonder that so few of the young men in our Experiment Stations have the Doctor’s degree? There is now no incentive to take extra work. Students who take Doctorates now do so mainly at the sacrifice of salary and position. They are only led to take advanced work by their ambition to develop themselves so that they may attain high standards in their work. If we wish well trained men who can do advanced work we must pay for them.

WHAT IS RESEARCH? *

By Dr. Thomas F. Hunt
Dean of the Pennsylvania State College

WHEN Smithson endowed the Institution which now bears his name he declared its purpose to be "the increase and diffusion of knowledge." This wording is so simple, so clear, and so direct as to leave nothing further to be desired, yet the significance of these six words may be better understood if it is stated what the Smithsonian Institution was not intended to do. It was not to make laws nor to enforce them nor to administer justice, the three great functions of government in the days of Henry Smithson.

It was not to be an industrial enterprise, although knowledge gained might and would be expected to promote industries. As is well known one of the successors of Joseph Henry devoted much time to the construction of a flying machine. It was not to be a church, although it is hoped and believed that the increase in knowledge will influence the moral and spiritual welfare of the people. Smithson, in founding his institution, was not a patron of art. *

It will be noted that the Smithsonian Institution has two functions: (1) Increase of knowledge or research; (2) diffusion of knowledge or education. When it has discharged these functions it has discharged the purpose for which it was founded. When it discharges any other functions it exceeds the purposes of its creation. Its efforts may result in better laws, greater justice, more economical productions, higher ideals, nobler efforts and a greater sense of the beautiful; but it is no part of its duty and it cannot directly promote

*From an address delivered before the Society for the Promotion of Agricultural Science.
these ends without going beyond the purpose for which it was founded.

The Smithsonian Institution has been mentioned because it was the opening wedge of research in this country under governmental control. It should now be noted how much more direct and obvious were the six words of Smithsonian than is the phraseology of the law making power which enacted the Hatch and Adams Acts. The Hatch Act reads:

"That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and application of agricultural science" and later:

"That it shall be the object and duty of said experiment station to conduct original researches or verify experiments."

Then follows a list of subjects on which it is proper "to conduct original researches or verify experiments." The Adams Act "for the further endowment and support of agricultural experiment stations" provides that the money so appropriated is "to be applied only to paying the necessary expenses of conducting original researches or experiments." If there is in the mass of words quoted, any direction to do anything but increase certain kinds of knowledge by any form or effort calculated to increase such knowledge, it takes some one with a more acute perception than that possessed by the writer to comprehend it.

But what are experiment stations to do about the diffusion of knowledge? Section 4, of the Hatch Act says: "That bulletins and reports of progress shall be published;" and Section 5, "That for the purpose of paying the necessary expenses of conducting investigations and experiments and printing and distributing the results" certain sums of money are hereby appropriated. The Adams Act is silent upon this subject, although it states that the sums appropriated are "for the further endowment and support of agricultural experiment stations." From these quotations it is evident that the clear intent of the Hatch Act was not to supply money for the diffusion of agricultural knowledge in general but it was to be restricted to the publication of such increase of knowledge of the prescribed kind which each Experiment Station might in the course of its "researches, investigations or experiments" discover, and that if it was not so fortunate as to increased knowledge four times a year, it might report progress.

What, then, is the function of the Experiment Stations? It is to increase knowledge along the lines prescribed by the law and publish the results. Is that all that should be done to promote agriculture? By no means. But it is all that the Federal Funds are appropriated for according to the terms of the Hatch and Adams Acts. There is in every state a land grant college receiving funds from the Morrill Acts of 1862 and 1890. These institutions also in many instances receive state aid. It is without doubt the duty of these institutions to educate resident and non-resident students in agriculture, to increase agricultural knowledge among its citizens and develop in every way possible the agricultural resources of the state. Probably at all times the greater part of the activities of the agricultural college of which the experiment station is a part should be devoted to education, to the diffusion of knowledge, to the protection of the farmer against fraud, in creating higher ideals and inspiring better endeavors. Fundamental to these forms of activity is the experiment station which creates the knowledge by means of which this propaganda can be conducted.

There is an opinion current that there are two rather distinct lines of effort possible under the Hatch and Adams Acts; namely, practical experiments and original research. This doctrine has prevailed many years and has frequently been discussed. It is one that the writer has for years sought to understand but without suc-
that the sources of error surrounding many forms of investigation may be so great or the number of years required to establish the facts may be so great as to make such effort inadvisable. It is also true that many experiments have been conducted without a clear understanding of the results which it was sought to obtain. It is also true that one may seek to observe and record phenomena or he may seek the reasons for the observed phenomena. He may seek facts or he may seek principles. He should seek both. Further, it is not safe to enunciate principles without a knowledge of the observed facts. * * * * The best way to determine the correctness of new principles which some enthusiastic investigator with an ambition to make a "scoop" launches half baked upon a hungry public is to consider quietly whether it explains the known facts in the field in which this principle is supposed to operate. If it does not, it should receive further investigation, and this further investigation will be quite as important and may be quite as original as the first or "original" investigation. A farmers' institute lecturer who is fond of alliteration was wont to say: "When the chemist and cow disagree, you'd better stick to the cow." For practical purposes this is undoubtedly the safe procedure, but from a scientific point of view, if the chemist and the cow disagree it is best to suspend judgment until they do agree.

THE PEANUT AS AN AGRICULTURAL CROP

By L. C. Corbett

Bureau of Plant Industry, United States Department of Agriculture

The early history of the peanut in America is somewhat mysterious. Tradition says that it was introduced in early days in connection with the slave trade. While the plant is native to the new world, it was early introduced into Africa where it seemed to gain a foothold quickly, and during the traffic which existed in early Colonial days between this country and Africa the peanut was undoubtedly brought into Virginia and the Carolinas either as a food by the Africans or by some of the ship captains. That the peanuts early grown in the United States came from Africa led to confusion regarding the origin of this plant; but DeCan-dolle, who is our best authority on the origin of cultivated plants, unravelled the mystery and settled the question once and for all by stating
that the peanut, although extensively cultivated in Africa and India, was of South American origin. Six or seven other closely allied species of Arachis are found in South America, and it would be contrary to the laws of nature to find the common peanut an exception to the rule and a native of other territory than that of South America. The present cultivation of the peanut for commercial purposes is chiefly confined to areas in Virginia and the Carolinas, although the territory extending from the southern end of New Jersey along the Atlantic and Gulf Coasts to and along the Rio Grande River in Texas, could profitably be devoted to the cultivation of peanuts for agricultural purposes. This area is one in which the seasons free from frost are comparatively long, and much of it has a soil carrying a large percentage of sand or of alluvial matter, making it easily cultivated and well adapted to the peculiar habits of the peanut plant.

Botanically the peanut belongs to the same group of plants as do the peas and beans, but its chief peculiarity is that it bears its fruit or nuts under ground rather than above ground as do most other leguminous plants.
For a long time the peculiar habit of fruiting made the plant a puzzle as regards its botanical structure. Although it was supposed to have two types of flowers, staminate flowers borne above ground with showy petals, and perfect flowers borne close to or beneath the ground and called cleistogamous flowers, careful study has revealed that this is not the case; the plant bears one type of flower only, which is perfect, with a very long tube, and which after fertilization takes place, withers and falls away. The stem of the peanut rapidly elongates and thrusts its point into the soil, the point really being the ovary of the flower, and after it has penetrated the surface of the soil the ovary develops and the peanut is formed. With the bush type of plants it will be noted that the nuts are borne in a dense mass or cluster about the base of the stems; while with the vine or running type of peanuts the nuts are borne not only close to the root but at some distance along the branches as well.

The preparation of the soil for peanuts should begin with a preparatory crop, preferably leguminous, which has been treated as a hoe crop, that is, kept clean by cultivation. If a leguminous crop for green manure cannot be used, a clover sod or a corn stubble will suffice. The clean culture of the crop preceding the peanuts makes the cost of caring for the peanuts themselves much less than is the case upon land badly infested by weedy plants. If the soil is overgrown by weeds or is in sod, it should be plowed the fall previous to planting in the spring. If it is stubble land, fairly clean, plowing should be deferred until spring. The plowing should be moderately deep but should not bring up soil which has not previously been under the plow. If the soil is light and sandy in nature and contains a considerable percentage of organic matter, it is benefited by an application of lime at the rate of from 12 to 20 bushels to the acre, or of gypsum at the rate of 500 to 800 pounds to the acre. Peanuts are decidedly benefited by soils which are not acid. After the plowing has been completed the preparation of the seed-bed should be carried on by the use of soil-stirring implements which do not reverse the soil as does the plow. The Acme, cutaway and disk harrows could all be used to advantage for this purpose.

Fertilizers for peanuts are of a general nature but must be handled in a particular way. If barnyard manure is employed, it should be thoroughly composted and preferably applied to the crop preceding the peanut crop. If this is not the case, it should be applied in the fall and plowed under with the stubble or sod land. The use of commercial fertilizers with peanuts is very similar to its use with potatoes. For best results it is considered advantageous to apply part beneath, and part over the seed. That which is applied before the seed is planted is placed in the soil by making a furrow along the line to be occupied by the plants, scattering the fertilizer in it, furrow and incorporating it with the soil by running a cultivator over the line of the row. Next follows the planter, and in covering the seed a portion of the application of fertilizer is then distributed. The same general rules in regard to the use of nitrogen, phosphoric acid, and potash that hold with other plants are found to be true with peanuts. The nitrates have a tendency to stimulate the development of vine at the expense of the nuts, sometimes producing an undue number of "pops" or false nuts. This is particularly true of fresh stable manure applied in the spring. The phosphates have a tendency to slightly increase the fruitfulness of the plants, while potash is considered the most valuable factor in the fertilizer for peanuts. It has a tendency to increase fruitfulness and hasten maturity, both of which are desirable qualities.

Seed selection with peanuts as with all other agricultural crops is the keynote of success. The planting of indifferent seed results in an indifferent harvest, but those who carefully select
seed from the most productive plants are amply rewarded for their care and attention. The work being done by those promoting the peanut industry of the South, notably the editors of the Nut Journal, should be commended. It is not too much to say that within a few years carefully selected seed will increase the yield by 20 to 50 per cent. Good seed produces a more even stand of plants, which in itself returns a greater yield per acre; but a more uniform stand of exceedingly productive plants still further increases the yield per acre, and this is what can be expected from high-grade seed. This is what has been accomplished in the selection of seed corn. Many millions of bushels have been added to the crop of the country simply through the selection and improvement of strains of corn and what has been done with corn is possible with the peanut.

The planting of the seed is an important step in the production of the peanut crop, for upon the methods employed in planting depends to a very large extent the stand of plants obtained in the field. If the seed is planted in the pod and adverse climatic conditions follow the planting, a very poor stand of plants is apt to follow, while if the seed is hulled and only the kernels planted, a much more uniform stand will ordinarily result. With the Spanish nuts, however, this difference is not so marked as with the thicker-shelled and larger-growing varieties. For agricultural purposes I doubt if it will ever be advantageous to shell the nuts for planting, particularly as the Spanish nut will be the foundation of the peanut industry from an agricultural standpoint. But if the shells of the nuts are slightly cracked so as to admit moisture to the kernel quickly after placing the nut in the ground, almost as good results are obtained as when the nut is shelled. If some device could be designed which would crack the shell without splitting the kernel, it would be a decided advantage in most planting operations. In fact, at the present time many planters obtain their seed from the factories instead of saving it from their own plantations, because they can obtain shelled nuts which are satisfactory for planting purposes.
from the factory. This practice, however, has a tendency to discourage the selection and improvement of the crop, for the factories are not careful in selecting especially fine seed for distribution. A grower depending upon seed obtained from the factory is taking his chances and is quite as apt to get a poor as a good strain.

In planting it is customary to drill the Spanish nuts 24 to 30 inches apart dropping the nuts 8 or 10 inches apart in the row. The bunch type is usually planted in rows 28 to 32 inches apart and the nuts 10 to 12 inches apart in the row. For the running varieties the rows should be 30 to 40 inches apart and the hills 12 to 16 inches apart. The distance used for planting is somewhat dependent upon the previous condition of the soil. If it is somewhat grassy or weedy, wider distances are needed than where the ground is thoroughly clean and in a high state of cultivation.

The manner of harvesting peanuts as an agricultural crop will depend entirely upon the use to be made of the nuts. If they are grown for commercial purposes and are to be sold upon the market, it will be necessary that the vines be lifted and the nuts cared for in the fashion ordinarily practiced throughout Virginia and the Carolinas of placing the vines in narrow, tall ricks or stacks, usually built about a central pole six or seven feet in length, which has been thrust firmly in the ground and provided with some arrangement at the base to keep the vines from direct contact with the soil. If, however, the crop is to be used for forage for cattle the vines can be dug and thrown into small heaps to cure and then handled in precisely the same manner as hay. If they are to be used for fattening hogs, the most advantageous method to the farmer is to allow the hogs to gather the nuts themselves. Experiments at the Arkansas Experiment Station show that upon equal areas the pork production for peanuts is about three times as great as for corn, which is the great hog food of the west. When the vines are lifted prior to having been touched by frost and placed in the stacks above spoken of, they are allowed to remain in these stacks until the cool weather of early winter has arrived, when they are either carried to sheds where picking is done by hand, or are carried to the machine for separation.

During the last few years machinery has been adapted to the planting, harvesting, and threshing of the nuts, so that the hand labor heretofore connected with the cultivation of this crop, which was thought to be a great hindrance to its extensive use, has been largely overcome. There are now upon the market planters adapted to distributing either the whole or shelled nuts; harvesting machinery which will aid in lifting the plants from the ground; and picking devices which practically take the place of the laborious operation of separating the nuts from the vines by hand.

The peanut as a forage crop is not fully appreciated by those carrying on cattle raising or hog farming in the territory to which this crop is adapted. The value of the peanut for forage purposes is greater than that of any other agricultural crop grown in America. The percentage composition of the plant, including the top and whole nuts is greater than alfalfa. The nuts, when used as meal, produce a concentrate carrying a higher percentage of fat and protein than cottonseed or linseed meal; and the hay, when merely the tops are cut and cured, is equal in value to good clover hay. It is therefore possible in growing peanuts for market to gather a hay crop equal in value and in yield per acre to good clover hay; to secure from the nuts a meal which is superior to cottonseed or linseed meal, and when the nuts and vines are used together to produce a food which is almost a perfectly balanced food for the dairy cow. It is a crop that has been known under favorable conditions to produce from 100 to 120 bushels of nuts to the acre and from one to three tons of forage. It takes the combined products of alfalfa and of the cotton plant to equal in food value the products of the peanut alone.
OUT in the broad marsh on the west bank of Fall Creek near its junction with Cayuga Lake stands a little green building, at present entirely surrounded by water, which shelters the newest scientific work undertaken at Cornell University. It is the biological field station that has been built expressly for the investigations in limnology, now beginning. The adjoining shores of creek and cove are well known to Ithaca fishermen, but few other persons enter its wet and mosquito infested environment. After the rosy dreams of Ithaca as the port of the anthracite coal region have well nigh vanished from memory, and along with them many a scheme that was to have extended Ithaca to the Cayuga shore, the musk-rat and the bittern are still in possession of a square mile of flats, set squarely between the city and the lake. This marsh land is at times dry enough for tillage, and at other times wholly submerged. It yields of its soil-riches, twenty tons per acre of worthless sedges and cattails, of spatterdock and pickerel weed every year without fail: and in these respects it is quite typical of a hundred million other acres that are scattered about within the territory of the United States. Here it is a barrier between the city and the lake, in bad mosquito seasons a menace to public health, and at all times an economic waste, "yielding no crop but beauty."

The station was carefully located for the purpose of studying marsh problems, materials for which will be unlimited in quantity and ever acces-
The establishment was made possible by the support and cooperation of three broad-minded and public spirited men; Mr. Delavan Smith, of Indianapolis, who, out of his interest in the public welfare, is furnishing support for the investigations in limnology; Mr. Jared T. Newman (’75) who, for the sake of promoting the study of one of Ithaca’s perennial problems, donated five acres of marsh land for a site; and Dean Bailey, who gave the building. Of course Dean Bailey saw that the wet land is a part of the land; and that in both places there are abundant undeveloped agricultural resources.

The accompanying map shows the location of the Station, and the diagram shows its plan. The top floor is the laboratory set high up for better air and greater freedom from mosquitoes. A dark room, an outside aquarium and a culture room are integral parts of the laboratory. The lower floor is divided into a boat house, a shop and two toilet rooms. Back of the building are propagating ponds and spring pools fed by a flowing well 150 feet deep.

The propagating ponds of the station are now in use. Here the visitor will find “something doing,” and that something is the study of the biology of the more common herbivorous, aquatic invertebrate animals—very elementary work, but very fundamental, and work that has yet to be done somewhere. In our spring pools, other work, such as hatching experiments, and studies of life histories, is in progress. The name “Water Gardens” on our diagram indicates what it is hoped may be developed there. They do not yet exist; for what gardening is possible so long as we are without tools, without methods, and alas, even without knowledge of what is herb and what is weed in the water, and how either of them is propagated!

How bountiful nature is toward the marshes! What an astonishing quan-
tity and variety of both plant and animal life every acre produces! We have been too long content with saying, ‘What a pity that so little of it is of any value to us.’ Yet how much of the product of the wild hill slope is of any value to us? If we have found a good use for the hill slope and none for the pond, it is our own fault and not Nature’s.

It is the temporary pools, and not the fish-inhabited waters that make the marshes unwholesome; and if we knew the management of the life of these permanent waters as well even as we know that of the land, instead of draining everything and destroying a whole beautiful fauna and flora at one fell swoop, we might be making the water areas of the marshes deeper, more manageable and more permanent, and their land areas drier, and converting them into landscape gardens. It is high time, ere the swelling tide of enthusiasm for drainage has turned all our swamps into cabbage patches, that we had learned more of their present latent possibilities. For it is more than possible that we might find a better use for them. Knowledge is the thing needed. We might be able, if we had knowledge, to retain something of the aesthetic pleasure that their beauty and their interesting life now affords, and something of the pleasant recreations they make possible. And something of civic betterment might be expected to flow from using them to diversify the permanent occupations of men.

A SUGGESTION FOR THE FARM

By A. G. Ruggles, ’or
Assistant Entomologist, Minnesota Experiment Station

I AM enclosing a print of my fireplace made a few days ago. It might be used to show one of the methods of making use of the stones on the farm. I built the house last summer, and this I consider the best feature. At any rate, it is the one I enjoy most. You can readily imagine one comfortably seated before a roaring fire, munching apples and dreaming of the dear, by-gone Cornell days. The stiff unframed picture on the mantle brings it all back."

In this day of cement construction it is perhaps useless to suggest any new method of disposing of the stones on the farm. The old way of digging a hole, dumping in the stones, and covering with earth, although the best that can yet be done under some circumstances, reminds one of the story of the Irishman and the negro. Pat had just set a fence post, and was pondering on how to dispose of the pile of stones and dirt left over. The negro happening along, Pat asked his advice, "Why, suh," said he, "why don't you dig another hole?"

A young farmer just starting house-keeping for himself, and intending to build, will get more solid comfort out of a well built fireplace, than from any piece of furniture he can put into the house. In the cold winter evenings there can be nothing more satisfying than to sit before a roaring fireplace, while the winds howl plaintively outside. Here, too, many a knotty problem on the coming season’s work can be pondered over and solved. Then again, if he is in a reminiscent mood, think how stories about the good old college days will be told again.

The young man of a mechanical turn of mind, can make a fireplace such as shown in the accompanying figure in his spare moments. These stones are all laid in cement. The only necessary requirement being a good foundation. The opening should be lined with fire-proof brick, as heat will cause ordinary stones to split and break. Lay the brick the narrow side toward the fire, otherwise if the mortar between should happen to get loose, the bricks would easily fall out. The depth of the fireplace is not an
essential factor. It may be shallow or deep, but the back must slope gradually forward, toward the flue, making at its exit a long, narrow opening. This will insure a good draft, and a non-smokable fireplace.

The cut represents a fireplace in a modern nine-room (twenty-eight by thirty foot) house in a city. It is eight feet long, and two and one-half feet thick, outside measurements. The fire opening is forty-two inches long, thirty-six inches high, and twenty inches deep. It is rather shallow but burns well. In a country home where gravel and stones are plentiful there is no reason why the fireplace should not be made large enough to burn ordinary cord-wood lengths.

Such a fireplace is not only healthful on account of its ventilating properties, and comfortable, but it is aesthetic.

THE ADVANTAGES OF STANDARD BRED POULTRY

By D. J. Lambert
Kingston, R. I.

ALTHOUGH the major part of the breeds, now recognized as Standard, was the result of frequent crosses to bring about the desired type, they are all termed pure bred when they produce more than fifty per cent of males like their sire and the same percentage of females like their dam. I make this distinction as to sexes because in particolored varieties, the combination of colors is not the same on males and females. The older breeds have been improved from time to time, so that in some cases they are quite different from the originals imported from some foreign country years ago.

New breeds are admitted to the Standard of Perfection after they have certain requisites, all of which are included in Article XI of the constitution of the American Poultry Association. Every breed has a type peculiar to itself and the tendency of the times is to get as much distinction as possible between the breeds. Each
breed has one or more varieties, unlike only in color. All of the modern breeds were brought out with a distinct object in view, some to excel in one point, others in other points; with one, the largest amount of meat, with another the greatest number of eggs and with another a combination of flesh and eggs, to fill the middle ground between the first two mentioned. Thus, when we select a standard breed or variety, we can choose one which we know will be suited to our needs, and, if we have preferences as to color or its many variations and styles of markings we can choose that which suits our fancy. Any bird of a standard variety which approaches the ideal is a thing of beauty and all true fanciers may well take pride in showing their flocks to visitors.

The time was when commercial poultry keepers favored crossing the larger breeds with smaller ones to get a better layer and a quicker maturing fowl, but this was before the advent of the Plymouth Rocks, Wyandottes and Rhode Island Reds, all of which were originated to fill this particular purpose and demand. The three above mentioned breeds have rapidly gained in favor and popularity as all purpose fowls while the Leghorns, always reputed as superior layers, still maintain their place.

The practical or utility breeds are most popular because they earn money for their keepers. Only a few can afford to keep hens for fun. A survival of the fittest is continually going on in the poultry world even though man does the culling. The amount of money one can make with poultry depends more on the care than the feed and more on the feed than the breed, yet the latter must be taken into consideration if we desire to keep fowls for any particular purpose. A cross breed or mongrel will not often produce progeny like itself as each successive generation usually reverts to some one of the breeds from which they all came and you cannot know in advance what to expect from them. Keeping mongrel poultry would be going back to old time methods, refusing the improvements of this age and generation, like threshing with a flail, reaping with a sickle, traveling by stage coach and doing such old fashioned things. No progressive poultry keeper will continue to keep anything but pure breeds after giving them a fair trial and finding which are best suited to his needs or which he considers handsomest and most profitable.
THE SÃO PAULO STATE COLLEGE OF AGRICULTURE

The São Paulo State College of Agriculture of Brazil, of which Professor C. D. Smith has recently been made director, is built on the old plantation of Mr. Luiz de Queiroz, the generous Brazilian coffee planter, who donated his Piracicaba plantation with all its belongings to the State to be utilized for agricultural education. A school of Agriculture had been organized at this place about fifteen to eighteen years before and two Americans had been employed at different times to direct its affairs, but a lack of adequate funds and buildings, and perhaps a lack of public interest, were serious obstacles to its development. The public-spirited founder and his friends were not disheartened at its failure as a private institution, however, and finally resolved to turn it over to the state, where no difficulty would be found in raising the necessary funds for its support. The college is situated near Piracicaba, a flourishing town of 35,000 inhabitants, distant about six hours by rail from São Paulo, the capital of the State. It stands on the São Paulo plateau, between 1500 and 1800 feet above sea level, in a beautiful undulating country largely devoted to coffee production, whose fertility seems inexhaustible.

The new main building is equipped with a library, chemical and other laboratories, a museum of natura history, a special water supply, electric lights, and all the modern sanitary improvements. Its architectural appearance is unusually pleasing, and its surroundings singularly attractive.

All branches of agriculture are taught and special attention is given to the study of raising domestic and farm animals, an industry which São Paulo is making every effort to develop. Among other special features are manure pits for the preparation of animal fertilizers, stores for cereals, saddlery shops, carpenter shops and blacksmith shop equipped with all necessary materials for horse-shoeing, repairs of machines, implements, harness, etc., and a veterinary section.

Besides the four years' course which leads to the degree of "Agronomo" (expert in agriculture) three other courses are given, an elementary course for plowmen and stablekeepers, an intermediate course for preparation of plantation managers, and an advanced course for preparation of agricultural managers or administrators, industrial managers, professors of agriculture, and functionaries for agronomic purposes. These courses have no fixed duration as it depends upon the students ability.

The necessity for the elementary course will be understood when it is recalled that the heavy plantation hoe (enxada) was the principal implement for breaking up the soil in the days of slavery, which was abolished only twenty years ago. The enxada is still in common use, except on the more advanced plantations, and it is necessary, therefore, to teach boys how to use the plow and other perfected farm implements. The school year is divided into three periods: three months for cultivation, three months for harvesting of crops, and three months for handling of products. The vacation period, June, July and August, which is the cool season of the year, is employed in excursions to the plantations, factories and industrial plants. The faculty is composed of Brazilian and Foreign professors and it is the policy of the college not to admit into the faculty young men of little experience. The Government encourages those students showing exceptional qualifications as to application and ability by giving salaried positions or sending them to foreign universities for graduate work.

Editor's Note: On another page is given an account of the work of a Cornell alumnus, Professor C. D. Smith. To those who knew him and have learned with interest of his departure for foreign lands, it was thought that this brief sketch of the college to which he is going, would appeal. And not only this, but also it gives an idea of the growth and appreciation of agricultural education that is arising in progressive republics of South America.
In our feeling of exultation at the news of Professor Pearson's appointment to the office of Commissioner of Agriculture, was tempered for a moment, by a sensation of regret, it was not at the thought of the ultimate good that will result, but of the loss which the college will sustain with his withdrawal from the faculty. But in a moment, with the realization that we are not losing his assistance, his influence, and his ability, came the unmodified and sincere appreciation and rejoicing in the honor and reward that has been conferred upon him. For, as State Commissioner, Professor Pearson will, as before, work for progress, for agriculture, and for New York, and his deeds will bring to Cornell the fruits of their success. Therefore we do not bid farewell to the man whom we have known and respected as a teacher and a friend, but simply see him assume an office of greater possibilities and increased importance—a place for which he is eminently fitted and worthy, with a knowledge that he is still with us in spirit, in cooperation for the good of the farmer; still the same Cornellian and the alumnus of our College of Agriculture. We express our praise for Governor Hughes in his choice; we congratulate the State of New York and its farmers and its college in their acquisition; and we offer to Professor Pearson, with every expression of appreciation and esteem, our thanks for his work in the past, and our heartiest wishes for his success and welfare in his new position of honor and trust.

The board for 1908-9, as nominated and elected in April, is as follows: Editor, E. L. D. Seymour, '09; Alumni Editor, E. L. Baker, '09; Associate Editors, W. Y. Rumsey, '10, F. E. Benedict, Sp. and N. R. Peet, '10; Business Manager, S. F. Willard, Jr., '09; Assistant Managers, R. J. Shepard, '10 and T. Bradlee, '11. The position left vacant on each side of the board is to be filled from the freshman competition, which is running at the present time. This is the first time in the history of the Countryman that there has been a re-election of Editor, but the unusual condition mentioned in an earlier number, resulting in the loss of four editors by graduation, and the lack of sufficient competition for the position, may be accepted as direct causes for this policy. This is but one indication of the need of direct and active interest and support by the students, if the benefits of the Countryman are to be given to the greatest number, and its existence to be put upon a firm and permanent foundation.

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"Of the sixty-five ‘C’s’ given at the Junior Smoker, ten came to the College of Agriculture; last June four ‘farmers’ rowed at Poughkeepsie; the College named among its students the captains of the Varsity football, fencing and wrestling teams; five men of the latter team are of the same college as their captain; and we are going to be represented among the point winners in the Intercollegiates." There are not many colleges of which that could be said, and if the students of this one "stood a little straighter and taller" as Professor Pearson expressed it, when they heard the president of the Agricultural Association run through that list of University honors, no less should they have realized every thing that it meant, and how they bear a great and worthy responsibility in maintaining and augmenting that record. But they have evolved a new method through which the enthusiasm and spirit of the college can be directed toward this end, and after an athletic mass-meeting on April 14, the honor of having the first College Athletic Board of Control, may be justly claimed by Agriculture. In this Board and in the idea and system that is behind it, are great and numerous possibilities. It is the duty, then, of the students to aid the board in making its possibilities actual, beneficial realizations. It would be, we hope, redundant repetition, to enumerate the reasons why we should enter into these activities—reasons that involve duty, loyalty, and the advantages of health and development. We have the Athletic Board to bring forward these thoughts; but with an expression of hearty approval at this institution, and with the firmest wishes for its success, we simply ask that the number of teams be large, the number of men on the teams larger still, and the number of candidates, of live, energetic "Cornellian," competitors—be the largest of all—that it include every student of the college who can run, jump, row, play, and who shall bring with him added strength, reputation and honor for his college.

A month ago a short prospectus of the third session of the Graduate School of Agriculture, was presented in the Countryman. This was not so much to advertise the school, in the eyes of the public,—for by those who are interested or concerned its progress has been closely and constantly observed—but rather to explain its object and methods, and suggest the remarkable opportunities it offers. A rapid glance at the partial list of lecturers indicates in a limited way, the importance of the institution at which will be gathered perhaps the most eminent collection of agricultural scientists that has been known. With the University Summer Session in progress, the State Experiment Station conveniently located at Geneva, and the opportunities of a college such as ours, the month of July holds out to agricultural graduates, and to some extent students in general, inducements that are met with but rarely, either in the years of educational training, or even, we may say, in a lifetime.

In order that the custom of publishing a picture and write up of each candidate for a degree, may be maintained successfully and completely this year, the Countryman
requests that all such material be handed in as soon as possible. This consists of a photograph, a write up of not more than 50 words, and one dollar and a half to pay the cost of insertion and the making of the half tone. All cuts after use in the Countryman may become the property of the persons represented if desired. The success of this part of the June issue, and the convenience of its arrangement can be greatly augmented by the prompt response on the part of those concerned, and the Countryman urges that all inserts be sent to the editor by May 5th at the latest.

RAYMOND ALLEN PEARSON

By H. E. Ross, '06

RAYMOND Allen Pearson was born at Evansville, Ind., in 1873. He received his preparatory education at the Ithaca High School graduating in 1889. He entered Cornell and graduated from the Agricultural Course in 1894, specializing in Dairy Industry, and received the degree of M. S. A. in 1899.

After graduation Professor Pearson engaged in the milk business in Philadelphia, later giving it up to accept the position of Assistant Chief of the Dairy Division, United States Depart-
A recent issue of the Transvaal Agricultural Journal contains an article entitled Agricultural Education in America, which gives an extended account of the New York State College of Agriculture and its work. The article, which is by William MacDonald, Ph.D., is concluded with the following observations on the college:

"Cornell is never still. Her latest educational venture is the Travelling Summer School of Agriculture—the first of its kind in America—consisting of a train made up of a number of students under the care of the Professor of Agronomy. * * *

From this imperfect sketch it will be seen that the central thought which underlies all effort in the College of Agriculture of the University of Cornell is service to the farmers of the State. But the remarkable success of the College has been due in no mean measure to the influence of the Director, Professor L. H. Bailey, whose magnetic personality has drawn students from all parts of the world, and farmers from every state in the Union. And, had we time, it would be instructive to pass in review the life of this tireless American from the time he left the Michigan farm till the day he was elected to the Chair of Horticulture, and, later, called to re-organize the College of Agriculture."

* * *

An especially timely bulletin has just been issued from the Missouri Experiment Station by Dean H. J. Waters giving the results of some experiments to determine the value of different forage crops for hogs. Thirty-six pigs weighing about fifty pounds each, were fed in lots on different forage crops in connection with corn until they were ready for market, accurate account being kept of the cost of gains made. In cheapness of grains the feeds used ranked as follows: Corn and skim milk, cheapest; corn and clover, second; corn and red clover, third; corn and bluegrass, fourth; corn and rape, fifth; corn and ship stuff, sixth. A saving of about 75 cents a hundred in the cost gain was effected by using green clover instead of fresh bluegrass. A saving of $1.00 a hundred was effected by using alfalfa instead of bluegrass. When it is realized that alfalfa comes on early and when properly clipped stays green all summer, and until the very hard freezes of early winter, its importance as a hog pasture is apparent. Clover yields more forage per acre than bluegrass, and as shown by these experiments has a much higher feeding value. It is of the utmost importance, therefore, to provide this sort of pasture for hogs rather than to require them to run on a bluegrass pasture, or even worse than bluegrass, a timothy pasture, or even far worse than this, to confine them in a dry lot in the summer time. This bulletin recommends a succession of crops for profitable hog pasture. The bulletin is for free distribution, and may be had by addressing the Experiment Station at Columbia.

* * *

In the March number of Country Life in America, Mr. George T. Powell, of Ghent, N. Y., writes on pedigree fruit trees. Eighteen years ago, at a nurserymen's meeting, Mr. Powell made the then unheard of statement that desirable qualities in fruit trees could be secured by selecting buds from trees with a known productive record. Mr. Powell's theory was received with incredulity, but he himself proceeded to act upon it, with the result that many of his trees are now bringing him net returns of $1000 per acre. His Kings are grafted on Northern Spy, which Mr. Powell believes will ensure them against the "collar rot" so destructive to that variety. All of his Kings were budded with buds from a single tree grown in Tompkins County, which was so nearly perfect in form, resistant qualities, and the size and quality of its fruit that it attracted wide attention. All Mr. Powell's
trees have inherited the characters of this parent to a greater or less extent. Mr. Powell's article is a splendid demonstration of the fact that it is just as important to select buds from a tree of known qualities, as it is to select the parents from which to rear improved live stock.

* * *

The Second Annual New England Conference on Rural Progress was held at the office of the secretary of the State Board of Agriculture, Boston, March 6. The meeting this year, like that of last year, was a success, and the value of this conference now seems to be fully demonstrated. Delegates were sent from nearly all the important rural associations in New England. The general subject discussed was "Teaching Agriculture in the Public Schools," including elementary agriculture in the grades, secondary agriculture in the high school, separate schools of agriculture and federal aid.

* * *

The annual report of the Connecticut Experiment Station says the gypsy moth has not spread in the state during the past year. The infested area has been pretty well isolated, and within this area all larvæ, pupæ and egg masses have been destroyed as far as possible. Trees to the number of 15,000 have been banded, and 3000 caterpillars destroyed. For the work there was the annual appropriation of $10,000, and the State Board of Control could expend $10,000 if necessary.

* * *

The Bureau of Statistics of the Department of Agriculture has issued a statement showing the number and value of the farm animals in the United States, January 1, 1908. There has been, on the whole, an increase in numbers and a decrease in value since the beginning of the previous year. The average prices per head are:—Horses, $93.41; mules, $107.76; milch cows, $30.67; other cattle, $16.89; sheep, $3.88; hogs, $6.55. With the exception of sheep, every kind of animal showed a decrease in the average value per head, though the decrease in the value of horses (10 cents), milch cows (33 cents), and other cattle (31 cents), is so slight as to be inconsiderable. Sheep increased 4 cents a head.

* * *

Professor Charles L. Beach, of the University of Vermont, has been elected president of the Connecticut Agricultural College at Storrs.

* * *

A bill has been introduced into the New York Legislature, providing that the owners of lands devoted exclusively to wood, timber and forest products shall be assessed at a rate no higher than the rate on barren lands; and that on application, the forest, fish and game commissioner shall send a forester to inspect such woodlands and recommend measures to promote the growth of trees.

* * *

The 1909 meeting of the American Carnation Society will be held at Indianapolis, Ind. Marcellus A. Patten, of Tewksbury, Mass., is president, and A. F. J. Baur, of Indianapolis, vice-president for the ensuing year.

* * *

The Crop Reporting Board of the Bureau of Statistics of the Department of Agriculture finds, from the reports of correspondents and agents of the Bureau, that the average condition of winter wheat on April 1st was 91.3 per cent of normal, against 89.9 on April 1st, 1907, and 86.2 the average of the ten years of 1898-1907.

* * *

The Department of Agriculture last year examined 1,217 samples of red clover seed, and found seed of dodder in 405, yellow trefoil seed in 424, and that 135 originated in Chili. Of 399 samples of alfalfa seed secured, 191 contained seed of dodder, 135 yellow trefoil seed, 120 sweet clover seed, and
16 bur clover seed. Of 420 samples of Kentucky bluegrass seed obtained, only eight were found to be free from any trace of Canada bluegrass, and in 110 samples, Canada bluegrass seed was found in quantities exceeding five per cent, 32 of these being Canada bluegrass seed. The law authorizes the Secretary of Agriculture to make these investigations and to publish the results, together with the names of the persons by whom the seeds are offered for sale, and this publication will be made in Circular No. 26.

CAMPUS NOTES

At the meeting of the Agricultural Association on April 14, besides electing the Countryman Board for 1908-09, an amendment to the constitution providing for an Athletic Board of Control was proposed and adopted. This board is to consist of a general athletic director (student), a student and a faculty member and the captains and managers of all the Agricultural College teams and crews. H. C. Young, '10 was elected general athletic director; E. Earle, Jr., '08, student member and Professor Pearson, faculty member of the board. The duty of this board is primarily to promote athletics in the Agriculture College; it will also award shingles and in general, control the various branches of athletics in our college.

The meeting was then turned into a general mass meeting for the purpose of arousing enthusiasm in track and baseball. Coach Moakley spoke first, telling us something of the history of athletics in the Agriculture College; he showed us the remarkable advance we have made in the past and gave us some good suggestions for the future.

N. R. Peet, '10, captain of the Agricultural track team and G. H. Miller, '09, captain of the Agricultural baseball team spoke, each telling about the plans of the spring season and urging candidates to come out. Professor C. H. Tuck, '06, then spoke and besides urging the fellows to get out and "play," told us the plans for the Spring Picnic of Tompkins County schools to be held here the latter part of May.

Professor Pearson gave us an inspiring talk as usual and also urged the men to get out for something. The Glee and Mandolin Clubs furnished music from time to time and at several intervals, the candidates for cheer leader were given a chance to prove their worth. On the whole, the meeting was very successful in its purpose of starting enthusiasm in intercollegiate sports.

* * *

Saturday evening, March 14, the Poultry Association elected officers for the ensuing year as follows:—President, T. F. Boyle; Vice-President, Miss Vida French; Secretary and Treasurer, F. E. Benedict; Assistant Secretary and Treasurer, W. O. Strong. These officers with R. L. Williams constitute the board of directors. Three other members of the board will be elected or appointed next fall and winter, of whom at least one member shall be from the Short Course class.

* * *

One of the most enjoyable Assemblies of the year was held in the auditorium of the Agricultural College on Thursday evening, April ninth. The program consisted of the usual interesting talk by Dean Bailey, who, during his talk, read a selection entitled "The Devil in the Belfry," being reminded of this by seeing a number of fellows passing their whole evening doing nothing but smoking. The Glee and Mandolin Clubs rendered a number of selections which were well received.

After this part of the program the following ladies entertained in the Domestic Economy Department serving hot maple syrup, sandwiches and pickles; Mesdames Warren, Whetzel and VanAuker and Misses Rose, VanRensselaer and McCloskey. They were assisted by the Girls’ Club of the Agricultural College and a committee of men students.
The annual picnic of the students in the rural schools of Tompkins County will be held at the Agricultural College sometime during the latter part of May. Previous to this a congress of school teachers of the county will be held here to discuss the subject of agriculture in country schools and to arrange for a suitable program of sports for the picnic, such as basketball, baseball, paper chases, etc., between the different schools attending.

* * *

The captains and managers of the various college baseball teams are arranging a schedule for the inter-college series, the first games to be played about April 15th. A cup, presented by the faculty, will be awarded to the winning college.

* * *

An interesting experiment is to be made in the Poultry Department under the direction of Professor S. H. Gage, of the Embryology Department in the Medical College, and C. A. Rogers, M.S.A., and A. E. Boicourt of the Poultry Department.

The experiment is with the use of Soudan III as a coloring matter of the fat deposits in hens and hens' eggs. The object is to determine how long a time is required by the small yolk of the egg to develop to the size found in the egg, and to learn whether the growth of the yolk is uniform or more rapid during the later stages of development. The experiment will also determine whether Soudan III will color all the fat in the body and in the yolk or only that fat which is being deposited while the stain is contained in the blood; and finally, does the coloring which is given to the fat in the eggs pass into and color the fat in the body of the chick hatched from these eggs.

Hens to be used in the experiment are to be fed the regular ration as before, but in addition some will be given three doses of the reagent on three successive days, others will be given one dose each fourth day, others will be given a dose daily and the remainder will receive none. All will be killed at the end of the experiment to find the effect of the staining on the fat.

* * *

The silver cup won by the cross country team of the Agricultural College in the race last fall has been placed in a case in the hall of the main building near the west door leading into the auditorium. This cup is held by the winning college for one year.

* * *

The proceedings of the American Pomological Society for the 1907 session are now in press. The work was compiled by the secretary and assistant secretary, Professors Craig and Judson.

* * *

The Horticultural Department has recently received a number of cases in which will be displayed the smaller kinds of tools used in horticulture, such as pruning knives, garden tools, spray nozzles, etc.

* * *

A letter was recently received by the Horticultural Department from Professor John Craig, dated March 20th, Glion, Switzerland, in which he stated that he was rapidly recovering his strength after his serious illness. He wrote in glowing terms of the Swiss scenery. Professor Craig expected to leave for Italy about the middle of April.

* * *

The American Society of Agronomy will meet in Ithaca during the session of the Summer School of Agriculture.

* * *

The annual report of the secretary-treasurer of the Cornell Poultry Association shows the receipts to be $674.74 and the expenditures $674.01. The net assets of the Association are $42.51.
J. Taubenhaus, '08, has started a study of hollyhock rust and its control under the direction of Professor Whetzel of the Plant Pathology Department. The seed of one hundred and fifty varieties was furnished by leading seedsmen of the United States, Italy, Germany and France. They will be set out on about three-quarters of an acre of land.

The chief problem will be the testing of varieties for resistance to disease and the testing of colorless fungicides. Dr. H. J. Webber will work on the breeding of resistant varieties and members of the Horticultural Department will study varieties from the florists' viewpoint.

* * *

The Animal Husbandry class, accompanied by Professors Wing and Harper, visited some of the large dairy farms near Syracuse on March 26-27. Other classes in the College are planning excursions also. Messrs. Barber and Thompson are making arrangements for an inspection trip by the class in Market Milk; the class in Farm Management under Professor Warren intend making two all day excursions, one to McLean and one to farms near Auburn, and Professor Wilson's class in Practical Pomology anticipates a two day trip to the orchards and vineyards at Rochester, Brockport, Hilton and Williamson.

**FORMER STUDENTS**

'75, M. S. Agr., '73, B. S. Agr.—Clinton DeWitt Smith was one of the earliest graduates of this College and has been a prominent agriculturist and educator since the time of his graduation. He was born at Trumansburg, N. Y., in 1854, and received his preparatory education at the academy of that village. While at Cornell he was prize captain of cadets in 1873. In 1879 he was commandant of the Star Military Institute at New York. In 1880 he was admitted to the bar and practiced law in his native town for a number of years. It was in 1890 that he returned to the calling in which he had been educated and to his Alma Mater—Cornell, where he became assistant agriculturist. The year following, however, he went to the Arkansas Experiment Station. His advancement now became rapid and he became a leader in things agricultural. He was Director of the Experiment Station and Professor of Dairy Industry at the University of Minnesota from 1891 to 1893. In 1893 he was called from Minnesota to the directorship of the Michigan Experiment Station and a professorship in the College of Agriculture, where he has been Dean of the special courses since 1900. He originated the special courses and built the dairy buildings, both at the University of Minnesota and at the Michigan Agricultural College. Professor Smith has many times been honored for his excellent work. He was appointed Dean of the College of Agriculture at the University of Illinois in 1897, and elected president of the New Mexico Agricultural College in 1902. The American Academy of Science honors him as a member and the Michigan Dairy Association as a charter member. He is also a member of the Alpha Zeta Fraternity. As
the author of a number of agricultural bulletins, and a member of the editorial staff of the Country Gentleman and Cultivator, Professor Smith is also widely known. He has recently accepted an appointment as Dean of the new College of Agriculture at San Paulo, Brazil, and left early in April for his new field of work.

'06, A. B.—Chas. A. Spooner who, while not registered in Agriculture while here, took a large part of his work with Professor Comstock in Entomology, has resigned his position as Entomologist at the New Hampshire Agricultural College. Last month he spent a few days at Cornell visiting old friends. We were glad to see "Charlie" again.

'06, B. S. A.—M. W. Evans spent a day at the College, on his way from Washington, D. C., to Pullman, Washington State, where he is conducting experiments and research work for the Bureau of Agrostology of the Department of Agriculture.

'07, B. S. A.—Miss V. R. French has returned to Cornell and is now taking graduate work in the College.

'07, B. S. A.—We were in error last month, in stating that Lyman F. Ayers was Professor at Hampton Institute, Va. We have since learned that he is an Instructor of Animal Husbandry.

For the third time the Fletcher Club, General Agricultural Class of '05, met at Cornell, and the fellows who were there, Mekeel, Prole, Sisson, Snow, Hefler, Faulkner, Booth, Phillips, Fowler, Brooks and Harriman had an interesting hour talking over business of the club, old times, their efforts in farming and the results of the last season. They earnestly hope that there will be more at the next meeting to be held at the State Fair.

At the reunion of the Winter Poultry Class, '06, which was known as the "James E. Rice, Junior, Club," in honor of the arrival of the young man who gladdened the home of Professor Rice during that winter, the following toast was given by Dr. E. M. Santee, W. D. '06, at the request of chairman H. H. Harriman:— "To Jimmy Junior. May he live long and follow in the footsteps of his illustrious dad whose work for the Poultry Department has been and is a source of pride to every man who loves old Cornell." Refreshments were served, the old jolly take off's on certain members were sung, reminiscences entered into, and an exceedingly pleasant evening spent, after which the meeting adjourned for one year.

Those present were Professor and Mrs. Rice and friends, Dr. Santee, Mr. and Mrs. Somers, Miss Joslin and Messrs. Boicourt, Joslin, Boyle, Freeman, White and Harriman.

'02, W.—Colon E. Nichols, who spent three winters here in the short courses, has been managing the farms of Mr. Brisbane, one of W. R. Hearst's editors, at Farmingdale, N. J., during the past year. Recently he resigned his position to take charge of his father's fruit farm at Lewiston, N. Y.

'03, W.—D. D. Gordon is engaged in farming at Rushford, N. Y. The most of his attention is devoted to fruit raising, with which he is very successful. He is very much interested in the grange of his town and his activity is helping to make it a prosperous one.

'05, W. D.—W. L. D. Caldwell is with the Beaker Dairy Company of East Freetown, N. Y., where for nearly six years he has had charge of their creamery. A recent increase of 25 per cent in his salary is an indication of his success as manager.

'08, W. P.—W. G. Lippincott has been appointed superintendent of the Poultry Plant of the State College, Ames, Iowa.

'06, W. P.—E. O. Lansing has established at Romulus, New York, a Leghorn Plant with a capacity of 1,500 fowls. He has been unusually successful with these.
'06, W. P.—C. W. Joslin has perhaps been as successful in the same business as Mr. Lansing. He also conducts a general farm.

'07, W.—Louis W. Coffin writes us that he has strayed from the farm and is getting experience in creamery work at the milk station at Jamestown, N. Y. He expects to return to Cornell next winter for the Dairy Course.

'08, W. D.—A. G. Fletcher, who will be remembered as President of the dairy class and one of the most active of the winter course men, has, since leaving Cornell, been Superintendent on the Wilder farm at Gardner, Mass. Mr. Wilder has some 400 acres devoted to general farming, and Mr. Fletcher is getting ample opportunity to practice the principles assimilated here.

BOOK REVIEWS


As its title suggests this book is a cyclopedia of everything connected with bee-culture. The different varieties of bees, the honey, the hives, and all implements used in caring for bees are carefully described and their use fully explained. Various methods of procedure are discussed and instructions are explicitly stated so that beginners may easily understand them; yet, at the same time, are technical enough to satisfy the most experienced bee-keeper. Throughout the book are cuts and half-tone photographs which amplify and illustrate the topics under discussion. There is a supplement composed of photographs of bee-exhibits and apiaries which is very instructive and helpful.

A B C and X Y Z of Bee Culture is without doubt the best authority on such matters that has been printed. The book is full of valuable information obtained from thousands of people who have had long experience in apiculture, together with the results of the authors who have for years been practical men in this line. The book is worth several times the price to everyone interested in bees.
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FRENCH COACH.

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### THE CORNELL COUNTRYMAN

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**The New York State College of Agriculture at Cornell University**

**Address, COLLEGE OF AGRICULTURE, ITHACA, N. Y.**

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FRUIT GROWING IN WESTERN NEW YORK

By T. B. Wilson

Hall's Corners, N. Y.

The fruit-growing industry of Western New York has made wonderful development in the last quarter century. The next quarter century is destined to see a development equally marvelous. A few years ago fruit growing was a secondary operation on the farm. Nearly every farmer possessed a few trees, but scarcely enough to realize money returns. To-day fruit is a more important crop than the cereals, and many farms are devoted entirely to its production. New York, compared with other states, holds very high rank in the production of fruit. She is destined to hold a still higher rank in the future.

Western New York is admirably adapted to the production of fruit. The soil is naturally a fruit soil. It is a loam or sandy loam, with good drainage, warm and congenial. The climate, too, is all that could be desired. The Great Lakes on the north, with the finger lakes in the center, temper the climate and lessen the extremes of heat and cold. The question of marketing, which is vitally important to the grower, is almost ideal. New York has within her borders the largest consuming markets of the country,—markets which are easily accessible and which alone demand more fruit than the state can supply. This favorable location, with reference to soil, climate and markets, has made New York a distinctively fruit-growing section in the same sense as the southern states are known as the cotton-growing section and the middle-west as the "corn belt."

Since the time of the Indian orchards, the growers have realized the adaptability of this section to fruit growing. Many farms are devoted entirely to this alone, often to a particular kind of fruit. The results of years of experience have convinced the farmers that the returns in fruit growing have been much larger than the returns in general farming, and they have acted accordingly. The fruit farms which have been well cared for have brought ample returns to the owners.

In order to show the success which has been attained, permit me to mention a particular case, that of three brothers in Wayne county. A few years ago they began to grow peaches. At that time the farm was heavily mortgaged. They determined to succeed, and applied themselves diligently by hard work and study. A few crops brought them encouraging returns. The mortgage was soon paid, and the size of the farm was increased. More and larger orchards were planted until at the present time about one hundred acres are in peaches alone. The brothers have been very successful and are considered wealthy. Like success has crowned the efforts of many other fruit growers.

The principal fruit is the apple, and in its production New York stands first in rank with the other states. Peaches and grapes are grown extensively also, but are confined to
more limited area. The peach thrives near the Great Lakes, and orchards have been planted on the shores of the smaller lakes. In sections where the climate is not tempered by the influence of bodies of water, peaches are grown at a considerable risk.

The grape-growing sections of the state are also confined to the lake regions and the region of the Hudson valley. Although the grape endures the cold of winter without serious injury, growers claim that the influence of the water is necessary in order to insure proper and early maturity of the fruit before the fall frosts.

Of the other fruits, pears are grown most widely. The blight is prevalent and has done considerable damage, but growers generally have succeeded in holding it in check. Plums and cherries give good returns when the grower has a local or special market. Small fruits are becoming more popular and are grown more extensively each year. The writer believes that more attention should be paid to the small fruits. If one lives near the city where the local market is available, small fruits will be found very profitable.

A comparison of the profits in fruit growing and the other farming industries shows that fruit brings the highest income. Considering the state as a whole, the average income per farm for fruit is $915; live stock, $787; dairy, $787. In the fruit growing sections this difference is still more marked in favor of fruit. It is difficult to secure reliable net returns which would of course be of greater value than the gross income. It is a safe statement, however, to say that on the whole, net returns from fruit growing are larger than the returns in general farming, provided the same degree of intelligence, energy and capital is invested in each case.

Although Western New York is considered a distinctly fruit-growing section and although experience has shown that the income of the fruit farms exceeds the income of other kinds of farming, nevertheless there remains a considerable area devoted to the less remunerative industries. Of the 305,299 acres of improved land in Wayne county, only about 21,000 are in fruit. This is about 6.9 per cent. Equally striking are the figures from Orleans county. The total area of orchards is about 16,500 acres. The area of improved land in farms is 205,279 acres. This makes 6.9 per cent of the area of improved land in orchards. Most of the remaining area of improved land is well adapted to the growth of fruit, and yet the owner is growing on it the other farm crops which bring him less money.

An opportunity is offered for young men to start fruit growing here and an abundance of land well adapted to fruit, but which is used for other purposes, can be purchased at a reasonable price. Such land sells as low as fifty dollars an acre or even less, nor does it require a great amount of capital to start an orchard. The last census shows that the capital invested in buildings, machinery and live stock on the average fruit farm is 27.6 per cent of the total investment. This compares favorably with the amount required for general farming and stock raising, the former being 27.7 per cent and the latter 40.1 per cent of the capital invested.

But greater than this is the opportunity for improving the quality of our fruit and the methods of marketing. Such improvement is destined to bring great profits. The industry at present stands at a transition stage between the old and the new methods of production and marketing. Tillage, fertilization, pruning and spraying are recognized as important and necessary factors in orchard management. Yet the growers do not practice them to the greatest advantage. Fruit of higher color and quality is possible and should be grown.

The situation of Western New York relative to markets offers the grower the best opportunities for disposing of his fruit. Yet it is a regrettable fact that the greater part of the fruit is sold in bulk on a commercial scale and in the general market. The same
fruit if more attractively packed in the box package would bring nearly twice as much. A few growers are beginning to pack in boxes and ship to a special market. These men are receiving the highest prices for their fruit. There is no reason why New York fruit should not sell as high as western fruit.

The young man interested in fruit and intending to make its production his life work could choose no better section than Western New York. The west may produce a larger fruit, but its quality is far inferior to the eastern product. The western grower, too, is handicapped in other ways. In many sections he is compelled to irrigate, which is a costly operation. In the sale of his products it is necessary for him to ship to distant markets at a considerable risk. These disadvantages do not exist in Western New York.

OPPORTUNITIES IN WESTERN CANADA

By Richard Waugh

Winnipeg, Manitoba

WHAT attractions has Western Canada for a young man who has gone through an agricultural college? The question is a very practical one, and my reply based on the experience of hundreds of young men, ranging over a stretch of twenty-five years, is, that for the right man there can hardly be any more attractive field of farming enterprise. The suitability of the field is perhaps best evidenced by the fact that within the past few years thousands of the very best class of farmers from all over the western States have gone in a continuous stream, year after year, into the western provinces of Saskatchewan and Alberta to buy or take up as homesteads the virgin lands of these two provinces; and the flow is still going on, if anything, more freely this year than ever before, in spite of the fact that last season was the latest and most discouraging known there for many years. These American immigrants are not played out adventurers,
but men of ripe farming experience with full equipments of stock and implements, and with pretty frequently the money in their pockets, for which they have sold at fancy prices their worn out farms in Illinois and Kansas, to buy here virgin soil for one-tenth the price for which the land they left was sold. That is the kind of beginners best qualified to understand and develop the fertility of the new country in which they have already taken hold, and some of them are making their mark as leaders in twentieth century farming methods. Had they gone into the same districts ten or fifteen years earlier it would have been a weary waiting for the means of transportation; now three great transcontinental railways are branching out in all directions to collect the produce of the very first years of settlement and carry it to either the eastern or western coast, with the certainty of paying prices for all they can produce.

This is not a question of speculation or sanguine anticipation, for railroads with all their advantages are an accomplished fact and are frequently ahead of actual settlement. The men who control these vast enterprises know what they are doing, they know from positive experience that the men who are to load their freight trains, are already there, or are crowding in to aid the productivity of the country, and the loads of immigrants and their belongings of whose coming we read in every day's papers are doing their share to justify the hopes of the railroad promoters. It was a slow process when the free grant lands had to wait for the incoming of the almost penniless homesteader. Now the homesteader must hurry on ahead for the big land companies are buying all around the men who only a few years ago were beating time in their lonely shacks, cultivating as best they could the few acres whose fulfilment would entitle them to their patents, and whose forty or fifty acres of crop in their last year would be a starting point for their future prosperity.

It is at this point that we begin to see the openings for the properly developed agricultural student. It took a good few years of steady plodding before most of these homesteaders were in a position to hire even one man to help in the summer months,—the help was seldom wanted more than eight months at most. To-day the very well to do farmer, who has been taking sure foothold for a year or two, knows that it will be to his advantage to engage and keep employed, winter and summer, men on whose intelligent interest in their work he can safely count, and he also knows that such a man is cheaper at a high wage than the adventurer whose leading idea is to eat all he can, drink all he can, and do as little as he can for his money. Right here the opportunity for the properly qualified agricultural student comes in. If education is worth anything along this line it is mainly because it enables its possessor to do more work and more to the purpose, because his brain has been fitted to do his proper share in producing a man who can always be reckoned on to do the right thing, the right way, and at the right time. If his academic curriculum has resulted in merely cramming the young man with the kind of knowledge that will secure for him the necessary pass and diploma as an expert in school learning, the veneer will soon be rubbed off when he comes in contact with the realities of every day life, and then such a young man will prove a failure, no matter what line of effort he may decide to embark in. We in the West have taken a very direct way to avert such failures along agricultural lines. No young man can be admitted as a student in the Agricultural College of Manitoba who has not already worked two full years on a farm, and most of the students are the sons of practical farmers, who after years spent in mastering the "know how" on arable farms have taken at the right age the determination to find out the "know why" of their business and all that can be got along collateral lines in the wide field of endeavor, where they are to open their future lines.
Ours is not a desirable field for kid glove students; they cannot possibly do too much thinking, but our only way to find the value of that thinking is to put on the market the first fruits of their actual endeavors. If they are both “goers” and “stayers” their future under Providence is pretty well assured. If they get tired in a few hours or try to do slipshod work when no critic is looking on, they must either brace up or get out, for the man they are to work for knows too much of the realities of farm work to be easily imposed on. We have no soft jobs for soft men, the leader has earned his position by proving in a score of ways that he is the most capable, persevering, and reliable workman before he can take his place as a western farm manager. It is here that the raw fledgling from an eastern college makes his first mistake. He thinks that his college standing will count a deal in his favor among partially educated men. It certainly will do so if he takes the right way to demonstrate his superiority. “Let work bear witness” is the chief criterion of fitness anywhere, and especially in farm work. To put so much brains into what he does as to avoid the blunders of mere rule of thumb workers—skilled forecast, is the hallmark of the really educated man. He makes few blunders because he has already in imagination gone over perhaps half a dozen ways of doing a difficult thing, and picked the way most likely to lead to the desired result, and least likely to come to grief through misadventure. It is one of the special advantages of good agricultural education that its possessor is by his mental training especially fitted to forecast and therefore avert the mistakes that a less trained intellect tumbles into without knowing; and it is just here that the right kind of college bred man gets in a strong point in favor of his academic studies. The average farm worker looks on a man from college as a theorist, and secretly or openly scorns him on that account. But the properly educated brain fits the student for finding out and mas-tering in weeks what the mere clod hopper took months to master. Most of our most valuable discoveries have been made by men looked on as dreamers and theorists. “Behold this dreamer cometh” was the estimate formed by his big brothers of the qualities of the youth before whom they were one day to bow in fear, and the right kind of student is bound to come to the front in our new land where individual quality is the foremost consideration in every calling from the hired man up to the Minister of Agriculture. My experiences suggest to me that if a young man comes West with a college diploma the wisest thing he can do is to keep it out of sight, and try to make his way strictly on his merits as a hired man. We don’t expect a tenderfoot to know it all, and we are willing to deal gently with his shortcomings, but if he feels and acts as a very superior person every one wants to take a shy at him and squeeze the conceit out of him. I could tell some good stories illustrative of this tendency did my space permit. “Freshness” is good-naturedly put up with, but a man top heavy with the load of learning he has already acquired is bound to be the butt of all the rustic wits in his neighborhood. For this and other reasons, I would confidently say that a young man can never do a wiser thing before coming here than to lay himself out for two years work on a good farm before aspiring to any higher position even if his aspiring friends think he is a safe man to back with good money. “Festina lente”—hasten slowly, is my urgent advice to every young man from college who desires to make a success of western farming. The West is sometimes a rough school, but we know a good thing when we see it, and if you send us young fellows with the stuff in them to make men of, we will not fail to bring them into wholesome accord with their environment. Disciplined mind, system, stick-to-it-iveness are all in the making of the coming master of the big western farm. If you are that kind of a man, you may come along.
The Teacher's Creed

"I believe in boys and girls, the men and women of tomorrow: that whatsoever the boy soweth the man shall reap.

I believe in the curse of ignorance, in the efficiency of schools, in the dignity of teaching, and in the joy of serving others.

I believe in wisdom as revealed in human lives, as well as in the pages of a printed book; in lessons taught, not so much by precept as by example; in ability to work with the hands as well as to think with the head; in everything that makes life large and lovely.

I believe in beauty in the school-room, in the home, in daily life, and in the out of doors.

I believe in laughter, in love, in faith, in all ideals and distant hopes that lure us on.

I believe that every hour of every day we receive a just reward for all we are and all we do.

I believe in the present and its opportunities, in the future and its promises, and in the divine joy of living."
EDUCATION AS RELATED TO USEFUL ACTIVITIES

By Fred H. Rankin

Superintendent Agricultural College Extension, Urbana, Ill.

THERE are two things in this world which it is easy to give but not so easy to take; they are medicine and advice. The former is out of my line. As to the latter Carlyle says that "There is a whole lot of advising in this world but mighty little faithful performing". I hope that what I may have to say may be considered as suggestive rather than as prescribed.

The last two or three decades have witnessed more real progress in agricultural development than was attained in several preceding generations. The aim of our forefathers was to raise enough on the land to feed themselves and their animals until another harvest. Ours is to raise all that the land will produce, sell it in the markets of the world for cash and increase our capital. The object of agriculture has, therefore, become the same as that of any other business. In this way a primitive occupation has become a skilled profession, calling for high attainments. Scientific and practical knowledge, combined with a degree of financial ability. It is a profession that now challenges the best intellects and rewards the finest training and most careful study, and to this extent it is engaging the attention of our best men. If agricultural advancement has been rapid in the immediate past, it is destined to be no less so in the immediate future.

The useful man in this world is the one who does his work well. In short, it is well-directed, thinking labor that pays. The world is full of fairly good workers; excellent workers are scarce. It is not enough for a young man to say he will "try to do his best". He must actually do the work given him to do, do it thoroughly and completely. It is not a question of trying but of actually doing one's best. It is vigorous thought which pays. The mind must be trained to exactitude. You must seize and grasp with all your might the thing you are undertaking, and do it with vigor and enthusiasm if you wish your work to bear the stamp of superiority when completed. Enthusiasm is the proof that a man believes in himself. Enthusiasm attracts. It is contagious. When backed up with business knowledge it convinces. As Emerson says, "Nothing great was ever achieved without enthusiasm". Get all the information you can bearing upon the subject of the business you are going into. Of course a half knowledge of your business is better than no knowledge but it is often the other half that you want the most.

To keep up with the times in farming and live-stock husbandry, a man must not only work but he must intelligently study his business. One may learn much by practical experience but the combination of practical experience with the best of theoretical and scientific training is needed to fit the young man who makes farming his vocation. No man who expects to follow farming and get the most out of his life should fail to come in touch with the agricultural college of his state and the inspirational influence which comes therefrom. The courses offered are a happy combination of theory and practice, of study and work, designed to fit young men for the business of farming and at the same time furnish a means of culture. Not only is the theory of things taught but the things themselves are dealt with in the different departments and are studied until the student becomes thoroughly familiar with them. The courses are not only calculated to give a man a better mental training, but in the wood and forge shop and the farm-mechanics laboratory where hundreds are taught to be skillful with machinery, in the dairy and creamery work, in the horticultural laboratory or the stock-judging pavilion where students handle various
specimens of different breeds and classes of live stock, in any of those or the other departments that a young man may elect, he not only learns the theory of things but gets the practical side as well. There is a wise plan about all this work. Theories are studied and then carried out. It is not alone the purpose of the work to give information but to make the young man feel the need of knowledge and to point out some of the many sources whence it might be obtained. There is great interest from beginning to end in an agricultural college course. While young men are growing debt and skillful with their hands their thoughts are clearer and their desire and thirst for knowledge grows as the way is pointed out.

It is not the aim of the agricultural college to pound a lot of knowledge into boys which may or may not be of special use to them, but, rather, to fill them with boundless enthusiasm, to set before them high ideals, intellectual and moral, and to the right kind of young men its heart will grow more tolerant and kindly as their intellects increase, as they realize that they are building into character the best that can be received in life,—an appreciation of the beautiful. A broad and liberal education is the best heritage that a young man can have. A training in an agricultural college supplemented by participation in the agricultural club or literary society, and later on identification with the Farmers' Institute work or similar State agricultural organizations, will give a young man a training and equipment necessary to give himself opportunities of the very best advantage. It will increase and develop the gift of public speaking and the ability to preside at any public gathering with ease and dignity. These gifts must be used by some representative men in every community, and happy is that man called upon to play his part who has during his younger days prepared himself to do so with ease to himself and satisfaction to his neighbors. Just as you recall a ringing voice and pleasing smile, a genial disposition, long after the name is forgotten, so does the writer recall and cherish the memory of his connection with the college club.

Farm life invites to broadening influences. As Ruskin expresses it,—"Go to Nature in all singleness of heart; walk with her laboriously and trustingly, having no other thought than how best to interpret her meaning, rejecting nothing, selecting nothing, scorning nothing." When we stop to think, there is beauty and to spare in everything in this universe. A great many birds need not have sung. A great many flowers need not have bloomed. The sun need not have shown so brightly, but the all-wise Creator has lavishly bestowed a great many things that are charming and given a crown of beauty to all his work, and happy is the person who is trained to have an appreciative eye for these beauties. I have the deepest sympathy for the unfortunates who pass through this world with only half equipment, those persons who have no heart and no appreciation for poetry, art and the beauties of nature. No sadder sight is ever presented than is sometimes seen on the farm,—the farmer who is both body and soul bound up in all his thoughts and intents on money getting alone. To carry the avarice for developing of lands and of massing property to the extreme of miserliness dwarfs and shrivels the development of manhood even more than years can age the body. The agricultural college recognizes that this is entirely uncalled for, unnecessary, and most foreign to those sunny, broadening influences that farm life invites. It believes that every man is bigger than his business and, therefore, offers an education designed to fit the young man for the useful activities and at the same time furnish a means of culture. In short, it seeks to develop those qualities and aims which we will not find in the market quotations and yet are of the highest demand and value in every market.

It is the possession of these faculties
which promises to make the life of the American farmer boy wholesome and companionable. In the dawning days of young manhood it is well to ask yourselves this question; is it fortunate or unfortunate for the world as a whole that I was born? It costs something in this world to be born, to be fed, to be clothed, to be housed, to be educated. It costs something in this world to be nursed in sickness, to die, to be buried decently. The question is, will you and I be able to contribute to the welfare of humanity, to leave the world better off than when we came into it, or will our life be a debt to humanity. If you get an education let it be an education for service. It is not a question of whether this world owes you a living or not; rather, whether or not you owe the world a life of service.

In closing, there is a little simile that I will leave you. Way up in the topmost peak of the Swiss mountains there is a small lake which has two outlets, one to the north and one to the south. A drop of water falling from the passing cloud into this little lake finds its way northward and goes to form the river Rhine, flowing past the historic cities of Germany, down into the North Sea, along the frigid shores of Denmark, out into the Arctic Ocean and is finally imprisoned in some iceberg and practically lost to the world forever. Another drop of water falls from the same cloud and finds an outlet from the little lake southward and with innumerable companions goes to the river Rhine which flows through the fertile valleys of France, out into the blue waters of the Mediterranean Sea, past the historic shores of Italy, among the storied isles of Greece, bearing the burdens of commerce, and the while smiling in the gladsome sunshine. Now how widely different the fate of these two drops, yet from the same cloud.

Not dissimilar are the lives of two boys from the same neighborhood or school. One is careless, lazy, idle, devoid of ambition and enthusiasm, drifting from bad to worse, and making of his life a total failure. The other young man is industrious and ambitious, determined to develop his intellect he climbs higher and higher the ladder of fame until success finally crowns his effort and the world is the better for a life educated to useful activity. There are certain points in moral and intellectual development, certain ideals and ambitions most of which are acquired in our school and college life that determine the groove down which our life shall run, not only here, but yonder through an endless eternity.

JOHN WALTON SPENCER, AN APPRECIATION

By C. H. Tuck

"Uncle John" is a name that is well known to thousands of people throughout the State. No one could have watched the growth of the New York State College of Agriculture without hearing the name. Grangers, teachers and Farmers' Institute meetings throughout the State have heard personally from the man who bears that familiar name.

As the College will lose the services of "Uncle John" next year by reason of the action of the age limit rule, it seems fitting that the Cornell Countryman should give to the student world a little insight to the life and purposes of a man who has been so closely associated with the growth of the College.

"Uncle John" was born on the 12th of June, 1843, at Cherry Valley, N. Y., but soon afterward his parents moved to Westfield, Chautauqua County; by packet to Buffalo and then by water to Westfield. The district school of the neighborhood gave him his education which was supplemented by a term in the "select school."
When twenty-one he actively began farming. About eighteen years ago "Uncle John" felt the impluse to find out the "why" of farm work. He began to see the necessity of understanding the underlying principles of agriculture as they might be applied by the ordinary farmer. In this struggle for scientific information of a practical kind, "Uncle John" equipped himself not only with the information but with a point of view which made him so valuable to other farmers in the State who had to meet the problems in the same general way. It gave him the power to talk directly to his brother farmer face to face, rather than to lecture over his head.

The College of Agriculture first received "Uncle John" on its staff the day following McKinley's first election in 1896. That was the third year of the appropriation from the State of New York for extension work. During the first three years the energy of the College had not been directed toward extension endeavor. The appropriation for the maintenance of the College was $16,000 which was con-
sidered a very satisfactory amount for the work. The following year, 1897, the amount was raised to $25,000, and a broader line of work was undertak-en, conspicuous features of which were the Farmers' Reading-Courses on the correspondence plan and Nature Study in the public schools. At that time the expression "Nature Study" signifies in a great many cases, Agriculture. "Uncle John" believes that at that time the educational world would not have accepted the teaching under the name of Agriculture, but was more favorably inclined towards the use of a more scientific expression.

Many serious difficulties beset the extension workers in those early days. The methods of handling the work were severely criticised. Very fortunately Professor Bailey came to the assistance of this new work writing the first leaflet on "How the Squash gets out of the Seed." "Uncle John" believes it is one of the best as well as the first. It opened the way for further work of a similar nature along this line in accordance with the extension spirit of the time,—though many specialists were much disturbed about it.

But the work went on in a strong way. Only one year was the appropriation limited to $25,000. The next year it was raised to $35,000 where it remained for several successive years. The work with which "Uncle John" was so closely associated found immediate response in the hearts of the people. It is easy therefore to see why this work brought increased appropriation from the Legislature.

"Uncle John" attempted through correspondence to carry the farmer of that time safely through the bewildering information to a clearer conception of the practical application of science to his work. The final strength of the Reading-Course reaching thousands of practical men throughout the State is sufficient answer to his effort. But however great the problem was with the farmer, it was equally great with the teachers of the State.

To place Nature Study before the public school teachers was a task beset on every side with difficulties. The work was not required. The College felt somewhat timid about its presentation, not that it was doubtful about the value of the work, but because it feared that Nature Study might be looked upon as another fad added to an already large number. But undaunted "Uncle John" and his workers continued believing and hoping. Not long were they in waiting for an enrollment of some twenty-five thousand children, who wrote letters describing their observations on common plant and animal life about them. Some years the number of letters was upwards of thirty thousand.

During all this time the personal touch of the man who is about to leave us played an important part in the work. With diplomatic caution he faced many unexpected obstacles which threatened the endurance of the work—faced them with that sympathy which has brought him so many close friends. "The popular estimate of the value of this work is usually given to our one process of pouring information into the children's minds by means of a publication and pumping it out by their correspondence" as "Uncle John" puts it. But "Uncle John" believes that great as this has been, there is another value, that of awakening in the children's mind a desire to become inspired by the creation about them.

The development of all this extension work in recent years is well known to all the old students in the College of Agriculture.

To those who know him best let us give his own words "As the time approaches when I am to lay down this work because of having reached the age limit and return to my beloved Bell-wether, and there 'mark time' to the end, I can look back in a perspective way over the events of the past twelve years as I have never done before. I can see how the pioneer promoters thought only of the work and never of themselves or how they would be considered by the public. As for myself I am glad that I have
learned to know the heart of a child and that I have lived to see three score and five years."

When "Uncle John" does "mark time" at Bell-wether, it will be with the procession in this College, which holds him as one of her own in spirit if not always in person. The procession with which he will keep step is that of this College. There will always be a place in the front ranks for "Uncle John."

To the younger students who may not have had the pleasure of knowing "Uncle John," we need only to point out the one great power in his life, that of reaching out and drawing toward him young people. As we look back on the work of the early years we can see hundreds and thousands of young men, perhaps as youngsters in the schools, or older boys on the farm, who through some suggestion from our Uncle may have decided on a new course in life. Knowing the farm and the farm boy as he does, he has been able to stand between the plain man at the plow and the scientist at the laboratory.

The farm boys of the State join with us now in extending to him a cordial "God Speed." Long will be remembered his sympathetic message of encouragement to teachers, farmers and children. Long will live the influence that has helped so many boys toward the end emphasized in "Uncle John's" extension teaching; a successful practical farmer living a contented, useful farm life.

A SIDE LINE AT SHELTER VALLEY FARM
By James A. Stone
Marcellus, N. Y.

EVERY farmer is confronted with the question, "What can I raise on my farm or what business may I prosecute there which will bring to me the maximum return in money for the minimum expenditure of time and labor." I shall not attempt to answer this question on the wholesale for all farmers. Neither do I maintain that the methods we are pursuing are the best, even in our case, but I will affirm that from present indications they seem to be so.

Every man must for himself consider his location, his tastes, his ambitions and the means at his disposal, for bringing about his proposed schemes and must decide which are applicable to his conditions. Ofttimes a large measure of a man's success may be in his ability to discern between a good and a poor suggestion. We should all be open to suggestion but must determine whether or not its application is feasible in our own particular case.

That the reader may know something of our location and the conditions under which we labor, I might say that my father and I are located on a farm of 180 acres, in, and north of Marcellus village. A railroad, a tap of the Auburn branch of the New York Central, runs through a part of the farm, and the Auburn electric road is nearby. It may be possible by the use of green manuring and intensive tillage to crop a farm, sell its products and still maintain or gain in fertility but it would seem to us an extremely difficult task. Since we like live stock and in fact get a great deal of pleasure from breeding, rearing and handling it, and at the same time feel that it is the best way to maintain the fertility of one's farm, we are essentially stockmen. Since our tastes and ambitions are along the line of live stock (horses and cattle) our aim is by the use of farm manure and some fertilizer to raise large quantities of feed, which if fed to high class live stock will return a good percentage of profit, as well as cause an increase in the fertility of the farm.

The first reason why horses are so much in evidence on our farm is that my father is very fond of horses; en-
joys breeding, raising and fitting carriage and road horses for the market. Secondly we find it to be a crop which can be harvested during the winter months, not interfering with our summer work, and requiring less help.

It is with some timidity that I approach the subject of horse raising and training as a means of profit, for one might judge from the very little we have heard of horses at Cornell or in the Countryman that it is one of the lost arts, but I am glad to hear that horses are now to have their innings at Cornell. Since we believe that colts should be broken when in fine spirit, we firstly get them in good flesh, taking care not to fever them up in the operation. This we accomplish in this wise; in the latter part of September those colts which are to be broken are placed in an alfalfa pasture and fed freely of corn on the ear. About this time the colts should be shod with a light shoe or tip. In this way the foot is protected so that when we are ready to drive and fit the colt we have some foot to work with, which is of very great importance. It is impossible to develop action with 'stumpy' feet.

The colts are allowed to run at pasture with their allowance of corn, being taken in cold nights or stormy weather, until placed in permanent winter quarters, where they are fed plentifully on alfalfa hay, ear corn, oat meal, bran and some oil meal. We then commence bitting them, checking slightly at first but gradually drawing them into the desired position. This is not always done in the same way, being varied somewhat to suit different individuals. Some colts need more bitting than others, but when they get so that they willingly and gracefully submit to the checking, they are then broken and fitted.

The question might be asked, "what breed of horses makes the best coach and carriage horse." To make a positive or iron bound answer to this question would be to call down upon my head a storm of criticism, and justly, for beautiful specimens of the coach and carriage type can be found in every breed intended for road purposes as well as many different crosses.
between these breeds. Mr. C. J. Hamlin, of Village Farm fame, secured with marked success, an excellent type breeding a French coach stud to his trotting bred mares. Mr. F. C. Stevens, of Attica, N. Y. and E. D. Jordan, of Boston, Mass., are attempting to secure an ideal coacher from the Hackneys, while on the other side we may see some of the most prominent prize winners in years to be standard bred trotters. We must therefore conclude that the right type are not all confined to one breed.

To perfect the show horse, however, is a trade of itself and not for us as general farmers who have neither the time or necessary equipment to give them their high-schooling.

The horses which we have used mostly to fit for coach and carriage purposes have been the result of breeding French Coach studs on trotting bred and common mares. Having in mind a certain defined type, we breed and buy with this end in view. We have labored to secure horses having bredy heads, long, nicely crested necks, sloping shoulders, high withers, short, stout backs, well sprung ribs, smoothly turned hips, wide swelling stifles, high carried tail, clean, flat legs and good feet. Such a horse should have clean, straight action both with hock and knees and enough stamina and courage, that he may accomplish his tasks with grace and ease and prove withal a pleasant and cheerful road horse. Yet with all this, the more speed the better.

I find that it is impossible in my limited space to touch all points which would prove of interest, one of which is shoeing. The shoeing of horses to accomplish certain ends, produce certain results, and correct faulty action is of great interest and if accomplished is of great value to one fitting horses, with a view to developing high action.

Now comes the question of paramount interest to the practical farmer, "What is the profit in raising a colt to sale age and what profit is to be gained in fitting one for the market?"

I have no desire to publish abroad the details of our business but since the success or failure of any business bears directly upon the price secured for the finished product, I will give a few figures which may throw some light on the profits of the horse business, as compared with other farm crops. In the last nine years we have sold at different times seven or eight pairs of colts for an average of over $700 a pair. We bought one pair of mares two and three years old, respectively, and after keeping them one year, sold them, still unbroken, for $600. To allow you to make your own comparisons I can summarize and close by saying that thirty horses handled by us cost $3,583 and brought $9,175. The length of time each horse (either bred or bought) was in our possession was 11.6 months.

THE FARMER AND THE LIQUOR TRAFFIC

By H. B. Frost, '08

ABRAHAM Lincoln, on the day of his assassination, declared: "After reconstruction, the next great question will be the overthrow of the liquor-traffic." Since the war, high license has been tried in many states, and state operation in some—but still the consumption of alcohol has increased. The conviction is continually spreading and strengthening, that the beverage liquor-traffic is always and only evil, and ought to be suppressed by the state.

This would certainly mean the destruction of a vast industry. A conservative estimate—using Government figures and a moderate scale of average prices—puts the drink bill of the United States for 1907, at more than $2,200,000,000. All the corn, wheat, oats, rye and barley that we raised in 1906 would not pay that bill, and even that sum does not take account
of the enormous amount of adulteration of distilled liquors.
But all this enormous expenditure by drinkers represents waste, and worse than waste—as is generally admitted. That is, a great part of all our productive labor—the proportion has been put at one-ninth—is wasted on alcoholic drinks. The traffic means an automatic tax of perhaps ten per cent on our whole industrial income. The alcoholic liquor traffic is a parasite on legitimate industry.

The manufacture of liquors certainly requires great amounts of farm produce—yet proportionately the market thus created is surprisingly small. Taking the liquor men's own estimate for corn, barley, and rye, and adding the possible 25,000 or 30,000 bushels of wheat and oats used, we find that less than 105,000,000 bushels of grain are thus used in a year. This, for the fiscal year 1906, is about one bushel for every forty-six produced—and much of this grain is of low grade, and brings less than the average market price. The liquor traffic pays possibly $43,000,000 a year for grain, while a total of something like $6,000,000 will cover the value of all the hops produced in the country. Allowing for the use of grapes and molasses and for a few minor items, we see that $60,000,000 is probably a liberal estimate for the total annual payment by the liquor interests to the farmers of the United States.

No doubt some change of crops would result if the drink trade should be destroyed, but the farmers who now buy 'brewers' grains' would still feed their live stock, and great new markets would be opened for agricultural products. The farmer gets about one-half or more of what his wheat sells for as flour and stock feed; he gets possibly six or eight cents for every dollar's worth of beer made from his barley, and about three cents for every dollar's worth of whiskey made from his corn. In other words, the two billions now spent for liquors would buy the grain and the grapes in other forms and a simply inconceivable amount of other goods besides. It would buy annually, for each five persons of our eighty-six millions, something like $128 worth of flour, meat, clothing, furniture, and other useful articles. What this new demand would mean to legitimate industry, we can hardly imagine. There may be some hardship to a comparative few, as the growers of hops, in the change to a sober civilization, but it must prove very limited and transient in the flood of general prosperity that will follow.

The interests of the farmer in this matter are at one with those of society as a whole. As some one remarks, we could better afford to pension all the men employed in the liquor traffic, and support them in idleness, than to allow their present work to go on. Better throw away the grain and the grapes and the hops and the sugar, and let all buildings of the traffic stand empty than use them to poison the people. But there would be no such waste. We should have such prosperity, both economic and moral, as this country has never yet known—and the farmer would certainly share with the rest.

EDITOR'S NOTE: The recent formation of the Cornell Prohibition League has indicated the activity of the promoters of this reform. That it is a question of vast moral and economic import none can deny. And the relation of the prohibition arguments to the farmer and his welfare is a phase of interest to us all. As President of the League, Mr. Frost is in a good position to discuss this relationship.
The Cornell Countryman

E. L. D. Seymour, Editor

M. C. Burritt,
W. H. Alderman,
A. W. McKay,
E. L. Baker,
L. A. Toan,
E. G. McCloskey,
S. F. Willard, Jr.,
G. H. Miller.

JUNE, 1908

In the words of many college magazines, "with this issue we cease publication," but only to undergo a period of quiescence and rejuvenation in preparation for another year of activity and, we hope, of service. For the members of the Board who remain in office it shall be to devise additions and improvements for present policies, and for the new Board as a whole to plan for better, for more complete cooperation with the farmer and the college in endeavoring to reach each one as the representative of the other. But the responsibility does not rest solely upon the Board, for the Countryman belongs to the students of the College of Agriculture; it is their activity and from them as well as from those whom they have chosen to administer its affairs, must come ideas and assistance to make it essentially Cornellian and typical of the agriculture of both the college and the farm. Yet in our minds there is, or should be no fundamental difference between these two. Together they form the "noblest pursuit of man," and it is the spirit of this great vocation that the Countryman desires and aims to emanate from itself and to quicken to accomplishment in others.

The success of the Agricultural Stage in the winter, and the commendation of the work in public speaking that has come from many sources, has already been the cause of gratification to the College, and in the gift and encouragement of Mr. Mosher, we find still greater reason for appreciation. We pride ourselves upon our desires and our endeavors to promote closer relationship between the farmer and the college, and the uplifting of agriculture, but we realize none the less, the aid, the inspiration and the feeling of reward, essential to our highest development, that reach us in the words and deeds of such public-spirited, enthusiastic and progressive champions of agricultural education.

When "Uncle John" Spencer, in his speech at the Agricultural Banquet, said that he would be content if he could know that he had added one small drop of kindness that would go to fill the sea of Immortality, he was expressing the doubt and depreciating modesty that is characteristic of men who have done their work well and who have served others. We, who have known him, here, and those outside, both young and old, who have known him as a teacher of the common and beautiful truths of Nature, as a helper and a friend, can offer to him the certainty of that contentment, in the knowledge of our appreciation of his influence and encouragement. It is to these that the
drops of kindness have flowed, carrying with them knowledge, ideals and still better, assistance in making them more real. We see Uncle John retire from active duties, we see him return to his "beloved Bellwether" with something more than mere regret at our loss. It is with gratitude that we have known him, the thought of the inspiration his example has given us to do our work as faithfully and as well, and with the wishes for the reward in the happiness of his home life that his active life of service deserves.

Mr. Myron T. Scudder, of New Paltz, Ulster County, has already proven the practicability of athletics in rural schools, and the efficiency of games and out-door activities. The Countryman has for some time been interested in the progress of various communities along this line, and with no little enthusiasm and approval, heard of the active procedure of Tompkins County teachers. The Tompkins County Rural School Athletic Association is more than a step—it is a leap—in the right direction. From our collegiate point of view it is desirable because with the growth of rural schools, more graduates from them will enter Cornell, and with previous development and training can well add to her athletic laurels. Aside from this, it is physiologically, socially and educationally a good plan; yet with the weight of this commendation upon it, the system is going to mean fun, good, wholesome, unalloyed fun for the boys and girls of the County. The College is going to get into it, and Field Day on May 29th, is to welcome, we hope, the first of many an athletic carnival, here, under the auspices of the College Athletic Council, that will make more friends, more athletes, more students and more sound men and women, than rural schools have ever brought together.

As advertised in the May issue, the Countryman has taken up the publication of certain of Dean Bailey's poems, mainly those that have appeared in its pages. Appreciating the privilege that has accompanied the right to publish these works separately, and realizing their popularity among those who know the Dean, or who, having read some of his poems desire others, we have compiled this little volume. It will contain several of Dean Bailey's best productions, and being artistically printed, decorated and bound, will form a fitting background for the first collected publication of any of his poems. The price will be fifty cents, and orders by mail will be filled in the order that they are received after June 1. As the edition is limited, and applications have already appropriated a number of copies, those desiring copies are requested to communicate with the Editor at an early date.
The Countryman was surprised and grieved to hear of the sudden death on April 27, of Mr. Richard Waugh, of Winnipeg, Manitoba, who but a short time before had sent the article which appears on another page. While perhaps a new personality to many readers of the magazine, Mr. Waugh had become a firm support and champion of agricultural interests throughout Canada, and for many years performed worthy service in agricultural journalism. The pleasure the Countryman received in obtaining his message of optimism, and advice, is sorely tempered by the regret that after so short an acquaintance we can no longer receive the benefit of his active influence in the future.

Mr. Waugh was born at St. Boswell, Scotland, in 1838, and with an indefatigable energy and perseverance educated himself and earned his own living from the time he was nine years old. In 1882 he moved to Winnipeg where he soon began his journalistic activity with the Manitoba Free Press. Besides being a constant contributor to that paper, he was for twenty years Editor of the Nor'west Farmer, and spread his ideas throughout Canada and even the United States in that capacity. He was still active in his chosen work when his death occurred most unexpectedly as a result of heart disease.

* * *

One of the most significant movements recently taken up by the educational authorities of Tompkins County, and indirectly a result of the activity of the Extension Department of the College, was the organization on May 2, of the Tompkins County Rural School Athletic Association. The matter was brought up at a meeting of rural school teachers held at the College, and after enthusiastic discussion was definitely settled. The President of the new association is Principal Cole of Newfield, the Secretary is Professor C. H. Tuck, and the Board of Control includes besides the above, Mrs. H. K. Beck and E. W. Updike, Commissioners of the County, "Uncle John" Spencer, Principals Wilcox and Webster of different districts, and the Athletic Advisory Board of the College. The main object of the work is to promote play and recreation throughout the rural schools in much the same way that Mr. M. T. Scudder is doing similar work in Ulster County, and with the College as a center, its advantages and benefits may be transmitted in all directions.

One of the first results of this activity will be the Field Day to be held on the Alumni Field, on May 29, the day of the Rural School Picnic. This is to be conducted mainly by the College Board, for the enjoyment and benefit of the children who visit Ithaca on that day, and a complete list of events and competitions, with awards and plenty of excitement is being prepared. It is hoped and expected that every child will come prepared to enter one or more events and with a firm determination to finish well up among the winners.

Of course this is but a beginning, and the influence of this organization will be felt over a constantly widening area as it becomes more firmly established and more thoroughly organized. It is for all the country children in the County, this must not be forgotten, and the greater the number of active members, the more good, the more fun and the more enjoyment will result for each and every one.

CAMPUS NOTES

On April 16, Professor C. H. Tuck received a very gratifying letter from Mr. E. W. Mosher, president of the New York State Experimenters' League, in which he donates twenty-five dollars to the College as prizes for public speaking in the regular and short courses. The recipients of these prizes were determined at the time of
the Agricultural Stage, and the short course competition.

In the course of his letter Mr. Mosher says in regard to this branch of work: "That the farmer needs this training goes without saying. The time is coming when he must assert himself in public affairs, and be able to maintain his position by persuasive argument against the wily politician."

At a recent meeting of the Agricultural Association, Professor James E. Rice, of the Poultry Department was elected Faculty Athletic Advisor in place of Professor R. A. Pearson, resigned. Miss Flora Rose of the Home Economics department gave a very practical talk on buying and carving meats and illustrated the talk by giving a practical demonstration with cooked beef, mutton and fowl in the art of carving. The latter, as she says, is almost a lost art, since the almost universal adoption of the Russian method of having the cook carve the meat in the kitchen.

The Cornell Section of the American Society of Agronomy was organized at the college, May 4th and is the first section of the society to be formed. There were fifteen charter members including faculty, graduates and seniors. The officers elected were A. W. Gilbert, president; M. P. Jones, vice-president and J. O. Morgan, secretary. The main object of the society is to put advanced students in touch with Agronomy workers throughout the country. Two meetings will be held each term and a program will be presented, usually by some graduate, who has done some particularly interesting work.

The National Society will meet here on July 10th and 11th during the Graduate School of Agriculture.

On the occasion of the Inter-College Races on May 8, the Agricultural crew rowed in the second heat being beaten a scant length by the Arts crew, and finishing a little ahead of the Law eight. The make up of the crew was: Bow, W. A. Salisbury, Sp., 2, M. A. Centurion, '09; 3, G. C. Kenyon, '11; 4, L. B. Cook, '09; 5, C. M. Bromley, Sp.; 6, S. P. Hollister, '10; 7, E. H. Thomson, '09; stroke, K. C. Livermore, '09; cox, S. G. Judd, '11. After two months on the machines, the men had but four days on the water, and for that short time showed remarkably good form.

The career of the baseball team has been more or less interfered with by the bad weather. On April 21 they won from the Arts nine by a score of 7 to 2. On April 24 they played C.E. and were beaten 7 to 6, and the next week lost to M. E. by a score of 4 to 5. The team is composed of Miller, Capt.; Grant, Mgr.; Grace, McCloskey, Myer, Boehler, Peckham, Rutherford, Chase and Teall.

The Poultry Association Dance held May 9 under the matronage of Mrs. Bailey, Mrs. Rice, Mrs. Webber and Mrs. Fetter, was eminently successful. Coleman's orchestra furnished music for the fourteen regular and nine extra dances, which were enjoyed by the sixty-two couples who attended. The entertainment and refreshment committees fulfilled their duties admirably and credit is due to all the committees and to the Board of Directors, for bringing the affair to its climax of financial, social and harmonious success.

Assistant Professor M. V. Slingerland of the Department of Economic Entomology has recently been called to St. Paul, Minn., to investigate the problem of grasshoppers and crickets cutting the flax binding twine on bundles of grain in the field.

On May 11, the baseball team was again defeated, losing to the College of Law by a score of 6 to 1. Grant and Teall formed the battery and Rutherford replaced McCloskey at first.
Mr. White was born in Moravia, New York, in 1872. His parents took up a homestead in Kansas in the early days, and in 1900 he received the Bachelor's degree from Southwest Kansas College and the Master's degree the next year from Oklahoma University. He spent 1904-05 as a student assistant at Harvard and the last three years at Cornell.

Mr. Craig was reared on a general farm in Indiana and after teaching in public schools, attended DePauw and Purdue Universities and later the Virginia Polytechnic Institute from which he received his M. S. in Horticulture in 1904. After being in the employ of the Virginia Crop Pest Commission he entered Cornell in 1907 as a special, and later took up graduate work in Agronomy.

Mr. Datta was born in 1883, graduated B.Sc. from the Calcutta University in 1903, and from Sibpur Agricultural College in 1905, being the scholar of his class and the student monitor. Before deputation to Cornell by the Bengal government he was a "Swadeshi" missionary and vice-principal of a high school under the National Council of Education. He has been specializing in Plant-breeding.
Mr. Grubb was born at York, England, in June, 1883. He obtained his early education at that place until 1900. For four years he studied the fruit and nursery business in England. In 1904 he entered Cornell as a special in Agriculture, changing to the regular course in February, 1906. He has specialized in Horticulture and Landscape Architecture.

Mr. Mitra was born in Calcutta, India, in 1881 and had been a student of the Calcutta University before he was sent by the Bengal government on a deputation to study agriculture at Cornell. Having investigated cotton culture and rural economic conditions in his home country, he is now specializing along these lines.

Mr. Niven was born in Norven, N. C. and received his B.A. from the A. and M. College of that state in 1906, holding several offices while there. Taking up Horticulture at Cornell he did undergraduate work in 1906-07 and graduate work for the last year. Acacia, Cornell Masonic Club, Lazy Club.
Mr. Niven was born in Roeford, N. C. also receiving his B.A. from the A. and M. College there. After doing undergraduate work in Horticulture in 1906-07, he continued as a graduate along that line, in 1907-8. Acacia, Cornell Masonic Club, Lazy Club.

Mr. Sowder was raised on a farm in Virginia, and in Texas. He was graduated from the Sam Houston Normal, Texas, and Peabody College for Teachers, Tennessee. Received B.S., B.A. from University of Nashville, and was a graduate student at the University of Chicago. He has taught in High Schools, North Texas R. and M. College and the College of Industrial Arts, while in Texas. He is working on pecan culture, and was Chairman of Committee on Awards at the Fruit Show.

Mr. Tong was born in Canton, China in 1884, and after graduating from the Provincial School, (Chinese) received his English education at Queen’s College, Hong Kong. Entering Cornell in 1904 he has specialized in Agronomy, intending to apply his knowledge in his own country. Sigma Xi.
Mr. Wicks received his B. S. A., '04 and M. S. '06 at the Oregon Agricultural College. He served for three years as Assistant Horticulturist at his Alma Mater and resigned this position to take up graduate work at Cornell in Pomology and Entomology. He has been elected to the New Hampshire College and Station as Assistant Horticulturist in charge of pomological work.

CANDIDATES FOR THE DEGREE OF B. S. IN AGR., 1908

Mr. Alderman was born in 1885 at Albion, N. Y. After a preparatory course in Holley High School he entered the College of Agriculture. He displayed a lively interest in college activities and was elected president of the Agricultural Association in his junior year. He was a member of his Sophomore crew, manager of the college crew for two years, Agricultural Banquet Committee, Student Honor Committee, Associate Editor Cornell Countryman, Student Assistant in Soils. Hebs-sa, Cayuga Club.

Mr. Anderson was born at Hilton, N. Y., in 1882, and educated in the High School of that place and at Hamburg High School. After two years spent on his father's fruit farm, he entered Cornell in 1904. He has specialized in Horticulture and Agronomy while here, and completing his work in February 1908, returned to his home, where he is at present conducting his father's farm. Hebs-sa, Cayuga Club.
Mr. Crocheron was born in 1882 and prepared in the Boys' High School of Brooklyn and the Mt. Vernon High School. He was Chairman of the Executive Committee of the Tompkins County Children's Picnic 1906, Chairman of the Winter-Course Reception Committee 1906, Chairman of the Committee which formed and installed an Honor System 1907. Toastmaster of the Agricultural Banquet 1907, and Editor of the Cornell Countryman 1906-7. Alpha Zeta. Mr. Crocheron is to become a farmer.

Mr. Burritt was born at Hilton, N. Y., in 1883, and educated at the High School of that place and at Geneseo Wesleyan Seminary, Lima, N. Y. After two years of personally conducting his farm, in 1904 he entered Cornell, where he has specialized in Horticulture and Farm Management. In his Senior year, he was president of the Agricultural Association, Alumni editor of the Countryman, and student assistant in Farm Crops. Hebs-sa, Cayuga Club.

Mr. Davis was born in 1885 on a farm near Le Royville, Pa., and after three years at the Tonawanda High School was graduated with second honors. While at Cornell he specialized in general dairy farming, and was holder of a Roberts' scholarship, and assistant in the Testing Laboratory during the '08 Winter Course. He is now superintendent of the E. A. Powell Stock Farm at Syracuse, where he is beginning his active work which he will devote to the improvement of domestic animals and the advancement of agricultural interests in Bradford county.
Mr. Deshon was born in 1882 in Chinandega, Nicaragua, and entered Cornell as a regular student in Agriculture in 1903. Theta Lamda Phi, Theta Nu Epsilon, Class Baseball Team (2), Varsity Baseball Team (2) (3) (4), Sphinx Head, Cosmopolitan Club.

Mr. Desmond was born in Hyde Park, Mass., in 1884 and received his preparatory training at the Roxbury Latin School, before taking two years of horticultural work in the Connecticut Agricultural College. Coming to Cornell in 1906, he specialized in Landscape Architecture, which he intends to pursue as a profession.

Mr. Earle was born at Detroit, Mich., in 1885, and prepared at St. John's School, Manlius, N. Y. Having taken a general course in agriculture, he leaves for his own farm in Albemarle County, Va. Kappa Alpha, Quill and Dagger, Hebs-Sa, Agricultural Athletic Council, 'Varsity Football Team, Mummy Club, Chairman Senior Ball Committee.
Mr. Frost was born at Dairyland, Ulster Co., N. Y., in 1881, attended district school, and worked on his father's farm. After taking the Training Class course at Ellenville High School, he taught country schools four years, meanwhile preparing for college. He entered the College of Agriculture in 1904, specializing in Plant-breeding. President of the Cornell Prohibition League, 1908.

Mr. Ewing was born at Aberdeen, Miss., in 1886, and was graduated from the High School at that place. Entering the Mississippi A. and M. College, he received his B. S. degree in 1906 and entered Cornell in September, 1907.

Mr. Gilkey was born at Watertown, Massachusetts, in 1886. After passing the M. I. T. examinations he became interested in farming and decided to come to Cornell. Mr. Gilkey has studied agriculture along general lines. He takes a position on a 500-acre farm near New York City. Member of Alpha Zeta, C. U. C. A. Cabinet and Cosmopolitan Club.
Mr. Gracy was born in Jamaica, N. Y., and was graduated from the High School in that place in 1900. After completing the course in the Jamaica State Normal School in 1904, he entered Cornell, whence he expects to go to work after graduation. Delta Tau Delta, Sphinx Head.

Mr. Grant was born in 1885, at Mansfield Center, Connecticut. He graduated from the Connecticut State College in 1906 and entered Cornell the following fall. Here he specialized in Agronomy. Mr. Grant expects to take up Experiment Station work after leaving Cornell.

Mr. Hayden was born in Wyoming, N. Y., in 1883, preparing for college at the Middlebury Academy and the Wyoming High School. After a four years course in Arts, at Amherst, and a year of teaching he succumbed to a long cherished desire to become a farmer. He has since been specializing in Farm Management, and is now looking for an "original problem."
Mr. Hunn was born at East Bloomfield, N. Y., in 1884, and preparing at the Ithaca High School, entered the College of Agriculture in 1904, specializing in Entomology and Horticulture. He was on the Moakley House Fund committee. Varsity Glee Club, Advanced and Festival Choruses, was Leader of the Agricultural Glee Club, treasurer of the Agricultural Association, and a member of Hebs-sa. He left in the middle of the year to take a position as Assistant Horticulturist in the Hawaii Experiment Station.

Mr. Jacoby was born in Memphis, Tennessee, but has lived for the greater part of his life in Ithaca. He was graduated from the Ithaca High School and entered Cornell with the class of 1907 taking two years work in Arts before registering in Agriculture, where he is specializing in Horticulture and Agronomy. Alpha Zeta.

Mr. Jones was born in 1886 in Deerfield, Oneida County, New York, on the farm where he has always lived. His high school training was received in the Utica Free Academy. After another year's work in the college he will return to the farm. Alpha Zeta, Sphinx Head, Hebs-sa, Cosmopolitan Club, Business Manager Countryman (3), President Agricultural Association (4), Vice-president C. U. C. A., Agricultural Stage, '86 Memorial Stage.
Mr. Lounsbury was born on a farm near Barton, Tioga Co., N. Y. He attended the Waverly High School from which he was graduated in 1902. After working and teaching school, each for one year, he entered Cornell in the fall of 1904. While here he has taken special work in Soils and Dairying.

Mr. Lubin was born in Pinsk, Russia, and after receiving his secondary education there, and spending some time in Berlin, came to America. From a New Jersey Agricultural School, he came to Cornell for general agricultural training. Charter member Cosmopolitan Club; Cornell Chess Club, secretary, '07-'08; winner of the First Agricultural Stage, '08; Congress Stage, '08; '86 Memorial Stage, '08.

Mr. McKay graduated from the Ithaca High School in 1904, and entered Sibley College with the class of 1908. The following year he changed to Agriculture, and has since specialized for the most part in Horticulture. He completed his undergraduate work in January of the present year, and is now registered for the degree of M. S. in Agr. He will be engaged this summer in making an orchard survey of Ontario Co., N. Y.
Mr. Taubenhaus was born in Saffed, Palestine, in 1884, and attended agricultural schools in Jaffa, Palestine and in Asia Minor. Later he attended the Farm School in Pennsylvania, and took two years work in the Delaware Agricultural College before entering Cornell. He has specialized in Plant Pathology and will continue in this work for an M. S. A.

Miss Queen was educated in the schools of Washington, D. C., graduating from the High School there in 1904. She entered Cornell as a regular student in September of the same year, specializing in Nature Study and Horticulture. She is preparing to teach in one of her specialties and expects to take graduate work at Cornell and in Europe. Member of the Girls' Agricultural Club.

Mr. Toan was born in Perry, N. Y., in 1886. He prepared for college at the Perry High School entering Cornell with the class of 1908 as a medical student. After his Freshman year he entered as a Sophomore in the College of Agriculture. He intends to manage his father's general agricultural farm after graduation. Member of Countryman Board, Fruit Exhibit Committee and Agricultural Spring Day Committee. Theta Lambda Phi.
Mr. Wallace was born in Hants County, Nova Scotia, where he received his elementary education. After two years at the Truro School of Agriculture he entered Cornell as a special, but later changed to the regular course. Having finished his undergraduate work in January, 1908, he is now working for his M.S.A., in the department of Plant Pathology.

Mr. Yih was born in Foochow and came to Cornell after preparation for study abroad in St. John's College, Shanghai. His major work has been in Agronomy, while he has also specialized in Chemistry to some extent. After graduation he will return to China.

The Countryman regrets that it was unable to procure in time for publication, photographs and write-ups of the following:

M. S. A.
S. J. Craig
E. P. Humbert
J. O. Morgan
E. L. Worthen

B. S. A.
G. T. Cook
H. K. Fung

C. D. Greenman
W. E. Harries
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Does your milk come out of the can as good as when you put it in?

IF IT DOES NOT, YOU ARE LOSING MONEY

You wouldn't put a good dollar into the bank if you knew that you would get back only 50 or 60 cents.

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At the recent International Live Stock Exposition, held in Chicago November 30th to December 7th, Stallions imported by us won as follows, being the only classes in which we exhibited.

PERCHERONS.

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