The Cornell Countryman

VOLUME XIII

SUPPLEMENT TO THE CORNELL COUNTRYMAN
JUNE, 1916
## INDEX TO SUBJECTS

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ARTICLES FOR WOMEN STUDENTS

By GERTRUDE S. MARTIN and CLARIBEL NYE

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Where you saw it will help you, them and us
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Never before has such a monument been reared to achievement as these concrete expressions that a nation has found itself—found itself in the welfare not of individuals but of communities.

(See "At the Exposition," page 21)
The Man on the Land on the Other Side of the World*

By Beverly T. Galloway

Dean, New York State College of Agriculture at Cornell University

JAPAN, THE LAND OF SMALL FARMS

The very first glimpse of Japan is suggestive of that world old industry—farming. As the great ship feels her way into the Harbor of Yokohama and the weather is misty or rainy, as it is likely to be, one has glimpses of what appear to be diminutive animated hay stacks, gliding and bobbing about on the landing place. Nearer view reveals that our hay stacks are little dock laborers clothed in their picturesque grass hats and coats.

The exuberant Californian at our elbow, after two weeks of fog and water, could no longer restrain himself so he let out a very undignified yell, with an “O you alfalfa stack, you look good to me.”

JAPAN NOT A FAIRY LAND.

There is probably no country in the world so idealized as Japan. After reading the usual tourists’ literature, with which every good ship traveling to the East is well supplied, one expects to drop into a sort of fairyland, with marvelous flowers blooming on every hand, gorgeous birds and butterflies flitting about, and always shimmering in the near distance snow-capped Fuji, the sacred mountain of post card, fan, screen, and bric-a-brac fame. But we come back to earth with our first view of the landing place, for, with the exception of the animated hay stacks on the shore, and the hurrying sampans, or native boats on the water,

* This is the beginning of a series of articles on farms in foreign lands. Japan, China, Java, Ceylon, North Africa, and South European Countries will be covered. The series will be continued in the next issue.—Ed.
the setting might be that of almost any European or American port, so far as appearances would indicate.

The business of the sea has become so standardized that there is no longer much variety in docks, steam cranes and donkey engines. There are places, however, where, even with all modern machinery together with steam—the great revolutionizer and civilizer—man labor and woman labor is the cheapest energy that money can buy. But of this more anon. We are at last ashore in the land of the rising sun, and are being beseeched by rows of little jinriksha men to do them the great honor of accepting their services.

JINRIKSHA, THE PULL-MAN-CART.

Here it may not be amiss to say a few words about the jinriksha, the two-wheeled, baby- buggy-like vehicle that has made for itself such a permanent place throughout the orient as a means of getting about. There is no certainty as to the origin of the vehicle. Among other stories is one to the effect that a foreign missionary who found himself possessed of a wife quite stout, and growing stouter, invented this two-wheeled contrivance with which he could transport his spouse without jeopardy to her physical well-being, and at the same time, by virtue of the work he would have to put into the effort, keep down his own tendency to over- weight. There were no golf links in Japan in those days. The jinriksha—literally man-power-vehicle, or man mobile—is the chief means of locomotion throughout nearly all of Japan, considerable portions of China and India, the Straits Settlements, Ceylon and nearby countries. We did not see the vehicle in Java.

In countries where human labor is cheaper than that of the horse or ox, and where there is keen competition for means of making a living, the jinriksha service offers employment to many who would otherwise have to remain idle or seek work in the fields and shops, already overcrowded. The jinriksha man can equip himself with vehicle and uniform, the latter a cotton shirt and short trunks, for from ten to fifteen dollars, and with strict attention to business he may earn this much in a month in some of the larger towns.

There are, of course, all grades of jinrikshas, just as there are all grades of automobiles. The rich merchant may have his expensive, lacquered, rubber-tired machine, costing from seventy-five to one hundred and fifty dollars. Great numbers of the vehicles are, however, very cheaply but serviceably made. A good many are owned by individuals and there are organized companies or associations who own them and lease or rent them to the operators.

There are various modifications of the jinriksha used by individuals, commercial firms, and by farmers for hauling wood, coal, farm produce, lumber, or building materials. Some of them are extremely crude and to an American...
accustomed to the use of machinery, seem almost barbarous in the manner in which they require the use of human labor.

It is not uncommon to meet men and women in the country lanes of Japan, toiling through the mud hauling heavy loads of bamboo poles, farm produce, coal or wood on these cumbersome contrivances.

"The Jinriksha Is the Chief Means of Locomotion Throughout Nearly All of Japan and Nearby Countries."

The harness is simple, consisting merely of a broad band around the forehead or over the chest, by means of which the man or woman puts his weight against the load, leaving the hands free to steady and guide it. In some of the hilly towns coal and other fuel, stone and even the sprinkling carts on the streets are pulled about in this fashion by men and women laborers.

A LAND OF HILLS AND MOUNTAINS.

Before starting upon an exploration of Japanese agriculture it seemed desirable that we should get a sort of general picture of the whole situation by consulting the authorities at hand and utilizing the data which the Japanese government and other agencies place at the disposal of the public. We found that while Japan has considerable land, so much of it is nearly straight up and down that ordinary crops planted on it would be in constant danger of sliding off before the season was over. Whether it is due to the peculiar geologic formation on the comparatively thin soil combined with torrential rains and almost daily earthquake shocks, the land on most of the hillsides seems to be in a state of perpetual unrest. So of all the land in Japan, amounting to something like seventy-two million acres, or about as much as in the states of New York, Pennsylvania, and Maine combined, only about thirteen million acres is actually farmed. If we draw a line around the counties in New York State, as shown in the accompanying map, all the land actually farmed in Japan could be located in these counties. The whole of New York State contains about thirty million acres of land, and if we draw another line, a dotted one, showing the actual land farmed here, it would have to be as shown on the map outside of the first line, because New York State has about fifteen million acres in farms or two million more acres than has the whole of Japan.

I am speaking only of the Japanese Empire proper, which does not include recent acquisitions such as
Formosa and Chosen. For centuries, therefore, the Japanese farmer has been the bulwark of his nation. With a population about equal to that of Great Britain and Ireland, and cultivating two million acres of land less than is cultivated in the State of New York it will be seen that the Japanese are accomplishing a really marvelous work in the intensity of their production.

ECONOMIC RELATIONSHIPS

It is difficult in brief descriptive articles to give anything but mere glimpses of the economic relationships and balances that have combined to make Japanese agriculture what it is today. Thus we are met at once with the simple fact that the Japanese can no longer afford to keep cattle except as beasts of burden. In the course of centuries Japan has found that she can more economically and efficiently maintain the life and vigor of her people by direct rather than indirect uses of the products of the soil. We are still following the indirect and more or less wasteful methods, but even now we are hearing murmurings of the growing scarcity of meat and are noting an interest in the matter of utilizing more and more the crops we grow as food. Natives that have long since worked out this problem may very pertinently ask why waste so much energy by requiring an animal to eat the food that man might just as well eat in the first place. A hundred pounds of corn directly consumed would support a man...
twice as long as when fed to steer and the steer eaten. So that in the struggle to supply a large and growing population the Japanese husbandman has become by virtue of the necessity for economy everywhere, a crop farmer. These conditions and many others of a complex economic nature have also forced him to become an intensive farmer and a small farmer.

We find that the average size farm in Japan is about three acres. Only about three per cent. of all the farmers in Japan cultivate more than seven and a half acres. The average size farm in New York State is approximately one hundred and twenty-seven acres. There are two hundred and fifteen thousand farms in the state, and twenty-eight per cent. of them are from one hundred to one hundred and seventy-four acres in size; twenty-six per cent fifty to ninety-nine acres in size. Only a little over one and a half per cent. of New York farms are under three acres in size. A striking feature of Japanese agriculture is found in the fact that on the thirteen million acres of farm land there are about five and a half million farm homes. In the whole of the United States there are about a million more farm homes than there are in Japan. Japan, therefore, may very properly be called the land of small farms, which is in keeping with pretty much everything else in the country including houses, railroad trains, trolley cars, men, women, and children, and even the dogs. All are small, but this fact in no wise interferes with or detracts from the efficiency, economy, and happiness of the people.
At the Exposition

By B. H. Crocheron

State Leader for California. Editor of the Cornell Countryman. 1906-'07

He came in the door equipped with an umbrella and an anxious air. Even though he had aged somewhat, and had acquired a more serious and dignified air, I recognized him at once as the Cornell Countryman.

Well, it was good to see him again after the lapse of years and to renew friendship at the City of the Golden Gate. Said the Countryman, "I'm out here to see the Fair and a little of the farming of California. Can't you take a day off and show me 'round?"

Why—the good old scout—I surely could take a day off. So, I grabbed my Stetson and he grabbed his umbrella and we were off.

But I just had to straighten him out about the farming of California that he wanted me to show him in one day. So, with my best California air, I said, "Countryman, your feet are so tender that you ought to walk on your hands. You come out here and ask me to show you the farming of the state in a day—in the same tone of voice you'd ask to be shown Tompkins County or the State of Delaware."

I had sub-consciously absorbed the California "boom literature." "This California," I continued, has a hundred million acres of land—as large as all New England, New York, New Jersey and Pennsylvania taken together. Set down on the Atlantic 'twould reach from Cape Cod to Charleston, South Carolina and west across the Alleghanies. But it's far more diverse than the same area in the east. The highest and lowest spots of the United States of America are here. I know a county agent who can make snow-balls or pick oranges every day in the year in his own county. One county has nearly eighty inches of rainfall while another has never seen four inches. To travel between the two takes two days and three nights by fastest trains—you went from New York to Denver in less time." But I forgot to tell him, as all Californians do forget, what a small proportion of the state is arable.

"Maybe, you think there isn't any West any more. Say, when I first came out three years ago, I set out to cross this state on its shortest diameter in the north. It took me two weeks by the most approved means of travel. I saw a real volcano, tribes of Indians, cowboys, herds of deer, three bears and at night slept under trees fifteen feet in diameter and three hundred feet tall. For days I traveled by a stage coach that swayed on creaking leather springs and was driven by a figure from Bret Harte."

"When you've got six months to spend, come out and I'll show you California—for I average a thousand miles a week in travel within
the state—but for today you’ll have to be content with less.”

As we climbed on one of those trolley cars that ride sideways like an Irish jaunting car, I saw him look at it doubtfully till at length a smile broke out. “Oh, I see,” said he, “Built ’em this way so you can jump off easy if you hear an earthquake comin’. How’s Frisco anyway? Any signs of the shake?”

“We’ll begin your education right here,” said I. “Never speak of earthquakes in California. They are no more frequent than thunder storms in New York, and, besides, it was a fire that destroyed San Francisco—there wasn’t any earthquake to speak of, speaking suphemistically—so we don’t speak of it. Then don’t say ‘Frisco’, only hobos and Easterners do that. Don’t talk about the ‘Fair’ either or the ‘Exposition’. All west of the Rockies it is known as ‘the Expo’. By the way, you can throw your umbrella overboard. You won’t need it. Hasn’t rained here for three months and, barring accidents, ‘twon’t rain for three more.” After which we looked at the scenery and talked about palm trees and orange orchards and all the sort of stuff that Easterners want to know about the first thing.

When we got on the boat to cross San Francisco Bay, I began to tell him about things just the way the Chamber of Commerce men talk, almost as if I was in the business of selling climate—I told him how the Bay was fifty miles long and five miles wide; that it was the greatest single harbor in the world. I pointed the way out through the Golden Gate to the west where if you sailed straight through there would be nothing but salt water till you struck the coast of Japan. Then I talked of the city spread over her seven hills like ancient Rome. I told him all of it within sight had burned in 1906, and had not only risen from her ashes in a decade but had built an Exposition...
tleships always at anchor off the ‘Expo’.

We walked through the courts where fountains flash and endless beds of posies bloom in solid masses of color. We passed under arches crowned with sculpture and graven with verses from the wisdom of the ages. The Countryman strolled along, a happy light in his eyes. Finally, “What do you think of it”? I asked.

“Beats the State Fair at Syracuse,” he admitted.

“Haven’t they got any cows or anything like that?” said the Countryman.

“Sure,” I told him, “Follow me this way,” and we jumped on a little motor train that, wending its way through the crowds in a marvelous manner, takes you all around the grounds for ten cents. Meanwhile we chatted with the coin-taker on the train. He turned out to be a student from Harvard out here spending his vacation collecting dimes and western atmosphere.

We got off at the “Stockyards” where low brown buildings stretched over ten acres, their roofs almost meeting over the narrow streets, their tops gay with lines of fluttering flags of the Exposition colors.

The buildings were almost empty. “The recent outbreak of foot-and-mouth disease prohibits importation of any outside cattle,” I reminded the Countryman. But the buildings themselves are worth while visiting. As a means of showing cattle they are perhaps the best ever devised. The great emp-

ty show ring in the center is a reminder of what might have been if the dread outbreak had not occurred.

“California is just emerging from the scrub cattle stage that always holds in a new country and is learning that purebred or grade stock always pays. So, the failure of the cattle show, caused by the quarantine, has a bigger significance than the mere emptiness of some barns. It means that California has lost the good stock that would have stayed here and the education of its people that would have brought more good stock here in the future. So, the California College of Agriculture feels a sense of defeat when we look at these almost empty barns.” We strolled around looking at the sheep and the hogs, the fine horses and the great herd of Holstein cattle exhibited by a condensed milk firm probably to illustrate the sort of cows their milk ought to come from.

From there we wandered over to the New York State Building where the Countryman wanted to register his name in the big book—after which we gazed in awe about us.

“Heavens, but it looks expensive,” said the Countryman. It was. There were stiff-legged gilt chairs ranged in thin ranks along silk-covered walls. Electroliers with glittering glass prisms hung from a carved ceiling adorned with gold leaf and bright pigments. There was a half-acre of inlaid floor, magnificent in its emptiness, from the other side of which a phonograph weakly drawled forth
ragtime. "What a lot of money it must've cost" repeated the Countryman, "but where are the exhibits?"

"There aren't any—at least not here," I told him. "The building is empty but there's a restaurant on one end where you can eat if you're a New Yorker—and if you have the price. It's proudly exploited as the most expensive restaurant on the grounds. The building shouts money and emptiness. This has given some folks from other states the opportunity to remark that the building typifies its state, or at least its metropolis, better than most. But we wouldn't say that, would we, Countryman?"

"No-o-", he said slowly, "no we wouldn't say that, at least not till we get back home" and we walked into the New Jersey building to rest for a little in its comfortable rooms, conspicuous for their good taste and simplicity.

On the way toward "Agriculture" we stepped in "Education" to look at the exhibit of the U. S. Department of Agriculture where are shown the various activities of the colleges of agriculture. It was there we saw Doc. Warren's Farm management charts labelled "Cornell University" before which we swelled with pride and read in detail the figures of a farm survey. We even got down on our knees to turn over the pages of the "Day Book" and "Work Report" where they were anchored fast to the bottom of the exhibit case. We walked around that case till we excited the suspicion of an attendant.

From there we went on to the "Agriculture Palace" which covers seven acres. We walked over that seven acres as thoroughly as though we were harrowing it.

The first thing that struck the Countryman was the Massachusetts exhibit with a great sign commanding "Come East, young man, to Massachusetts" before which we both stood in admiration. "Mighty clever," said the Countryman.

Indiana, and the other corn states shone with their great exhibits of the "king of cereals." There were ten ear exhibits of prize ears beyond number. Iowa showed a great horn of plenty from which streamed a pile of yellow dent forty feet high.
About the middle of the building we struck the exhibit of the New York State Department of Agriculture which, of course interested us both. The Countryman looked it all over carefully. There was a relief map of the state showing the cheese factories by wooden blocks, a muslin sign that moved by an electric light and told of the many things in which New York excels.

**PALACE OF EDUCATION**

"Guess they spent all the money in the State building on those gilt chairs, and the like, said the Countryman, as we moved sadly away.

The Agriculture Building was empty of sight-seers except where in one corner a caterpillar tractor was in operation being guided by a young man who put it through the maxixe and fox-trot just to show how cleverly it could step among orchard trees.

"But where are the folks," said the Countryman, "the building's as empty as Ithaca in late August."

"Why," I answered, "they're all where something's doing." "Folks don't want to look at packages of seed and bundles of hay. They're in the Transportation Building watching them make Ford automobiles, a Ford in three minutes, or they're in Food Products watching them cook fried cakes in olive oil—and eating the said cakes as fast as ten perspiring negroes can cook 'em; or—come this way and I'll show you" and we walked across to Horticulture Hall, a great gray-green glass dome set in the middle of an architectural effect clearly copied from a bridal cake.

Under that horticultural dome there was a jungle of palms, ferns, flowers, fish, and birds, amongst which people wandered on gravel paths. "This thing's alive," I reminded the Countryman, "and the folks are here." We went into a side room where a canning factory was in operation and a crowd of folks watched carefully each peach which the young men put in the tin cans. Opposite was an orange packing-house in full blast with the yellow fruit gently rolling from tray to tray.

We stopped outside to see the wondrous horticultural exhibits of Holland and Japan. Holland has bulbs and plants and trees beyond number while Japan has gardens that cover seven acres filled with dwarf trees, many of which are reported to be hundreds of years old. About these gardens we walked till the Countryman complained that the pavements were harder than he'd ever struck—he'd "rather plow any day"—and confessed that he had on a pair of new shoes. So, we sat down in a Japanese tea pavilion where a tiny lady with cheeks like porcelain and hair like black satin, slipped about in a gay kimona bringing us tea and rice cakes. About us were lagoons,
bridges, stone lanterns, gnarled and twisted trees, and in the foreground a bare-legged Japanese in a wide hat waded about the lagoon catching gold fish in a net.

After our tea the Countryman said, "Now, I've gotten far enough in this job to see I've got to skip nine-tenths of it and hurry through the rest of it. No man could see it all in a month of Sundays. Tell me what are the best things to see. What's new? What can't I afford to miss?"

"Well," I said "the best thing in the show is the show. By that I mean the Exposition as a whole is the great thing. The supreme financial effort of the west, the combined art of the nation's architects, the color dream of Jules Guerin are all here with the wares of the world to make the 'Expo.' Don't spend too much time looking at the details. Get off and get the mass. Feel the thrill in the fluttering flags, the lawns and palm trees, the dreamy courts and the blue bay with its battleships and Mount Tamalpas on the horizon. Watch the hundred thousands that sift through the gates in a day. Get your head up to see the bigness of America and be proud of it.

"The thing that's different about this show—the new note in the exposition—is community welfare through social service. The last ten years has seen a moral development in America. The Buffalo fair struck no such note. It wasn't in the scale then. We've increased the register."

"Because you wanted it we've looked today at cows and corn and such. All that is incidental. The exhibits that are worth while are in the Education Building and are scattered through the exhibits of Liberal Arts and the States. They are worth while because they are new. Never before has such a monument been reared to achievement as these concrete expressions that a nation has found itself—found itself in the welfare not of individuals but of communities. See the Gary schools—see Madame Montessori herself conduct a real school—see the Rockefeller hookworm exhibit; yes, and the Salvation Army exhibit, and the Battle Creek better babies show. Spend a few minutes thinking about that great county free library map—and then if you want, go back to the dry grains packed in moth balls. But enough of work, let's roll along."

So we stepped out to a trolley train that slid along down the Avenue of Palms and down the zone to the "Yellowstone Park." There we dined at "Old Faithful Inn" while Sousa's Band played for us and colored lights were thrown on an artificial waterfall seventy-five feet high supposed to represent the great falls of the Yellowstone.

"I've never seen the Yellowstone," said the Countryman "but I guess that waterfall looks as much like the real thing as tinned beans taste like the kind mother used to bake."

As we came out the Countryman glanced at the sky. "Glad I got my umbrella," he said "looks like rain comin' up." But I told him it
was only high fog drifting in from the ocean after sunset.

We hired an electric wheel-chair which the Countryman ran over all the bumps. You've seen those electric chairs, haven't you? Well, they're sort of old ladies' automobile reduced to child's size. When you've got new shoes and have been doing the "Expo," there's nothing finer than to ride in one and watch the other folks walk.

So we rode around in a wheel chair. The lights were just beginning to come up in the buildings. Here a stained glass window showed up warmly, there a chain of columns glowed from hidden lights. Out through the Golden Gate the last glow faded from the embers of the day.

We drove through the courts where strange lights shone from pools of water, where statues came to light breathing flames and huge urns became caldrons streaming red. Fountains splashed colored drops and against the blackening sky stood forth the giant figure of an archer white in the still glare of a searchlight.

"Look!" I said, and we turned to see the Tower of Jewels lighted for the night, shining in the reflected glare of many searchlights, tinted pink and green yet changing ever like nothing in all the world so much as a glowing coal from a hickory fire.

Then the scintillators began their work. Thirty searchlights threw colored beams on the high fog-clouds above us shifting back and forth 'till the Countryman and I could only think of the night we had, together, seen the Northern lights on Cornell Heights.

The "Expo" at last was alight for the evening—yet not a light was to be seen. "Indirect lighting" I explained to the Countryman—but he answered me not a word only continuing to steer the rolling chair through courts, past palaces in silence.

It was time to go. "What do you think of it?" I again asked the Countryman.

He rose gallantly and magnificently to the occasion.

"I'll quote my fellow-citizen of New York, Theodore Roosevelt, and tell you that the 'Exposition is the most inspiring sight in America.'"
The Soils and Agricultural Development of the Hudson Valley

ARTICLE NO. 6

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This is the sixth article in a series started last year entitled “An Agricultural Survey of New York State.” For further details of the series see the Editorial Column.—Ed.

The Hudson Valley region which forms the southeastern eighth of the state, lies east of the Catskill and Adirondack escarpments and has in general a rather low elevation. It is characterized by the much folded, tilted and metamorphosed condition of the rock, the surface of which rock formations is exceedingly uneven in detail and protrudes through the soil in many places cutting the tillable land into irregular and often small areas. There is a large amount of untillable land suited only for pasture and forestry. There is, therefore, great diversity in the soil conditions and in the agricultural development of the area.

Location and extent—It is slightly wider in the southern than in the northern part. The region extends from Long Island Sound to the lower end of Lake Champlain. The Hudson river crosses the area in a direction roughly diagonal from its northwest to its southwest corner, and as the river runs nearly due south, this means the region has a slight northeast-southwest trend and conforms with the underlying and adjacent rock structures.

Parts of thirteen counties are involved with a total area of about 6200 square miles. From the foothills of the Catskills, the region extends to the east line of the state reaching up the western shoulder of the Berkshire hills.

Division and topography—The Hudson Valley region is conveniently divided into two parts due to differences in topography, rock conditions and soil conditions. The Palisade region forms the first or southern division. Its northern boundary is a diagonal line that crosses the Hudson at Newburg. It includes the eastern quarter of Orange and Dutchess counties and the region to the southward. The topography is bold and mountainous, due to the protrusion of the trap rock ridges and domes. The elevation gradually falls to the southward and the soil and agricultural conditions improve correspondingly.

The remainder of the region is embraced in the second division. The topography is rolling to quite hilly but the elevations are nearly all under one thousand feet, and the general rise of the county makes them appear less high. In general
outline the region is a broad shallow trough that rises on the east and west sides to the maximum elevations.

The Hudson river does not form a distinct bottom land but flows in a narrow low walled gorge. The tide reaches up as far as Troy. The channel is deep due to pre-glacial erosion when the country stood at a higher level.

The remainder of the region is a very irregular net work of valleys and ridges almost entirely without that regularity of form that results from normal erosion.

**Geological Structure**—The underlying geological structure has already been pointed out in a preceding article in this series. In the first or southern division the prevailing rocks are the trap that forms the Palisades and micaceous gneisses to the eastward. They form bold ridges and have contributed volumes of boulders to the soil.

In the second or northern division, the prevailing rock is sandy shale and sandstone of the Hudson river group, interspersed with calcareous deposits. The folding and pressure to which the region has been subjected has progressively metamorphosed the rocks from the west to the east into slates, quartzites and marble, which are best developed along the eastern side of the area. As a result of the sharp folding, a large part of the rock strata stand on edge or at a high angle which fact is largely responsible for the rough surface, the numerous rock exposures and the choppy character of the soil areas. The shales and sandstones are generally gray or bluish in color and low in lime, except limited areas in Washington and Rensselaer counties that give rise to the Cossayuna soils. Limestone or marble has a relatively small development and owing to its softer character is generally masked in the valleys by surface deposits.

**Glacial action**—The glacial advance in this region was over the rough upturned edges of the rocks just described. The general movement was nearly north and south—slightly southwest. The rock eminences were ground down but often not covered. The hollows were filled with detritus. The dominant soil condition is, therefore, glacial in character and very stony in nature.

During the retreat of the ice sheet the drainage water passed off through the irregularly filled valleys and left terraces of gravel, sand and loam that were later removed in large part by the cutting of the streams. In some places lakes and ponds were formed in which clay, as well as sand and gravel deltas were formed. These lakes are nearly all on the course of the Hudson river. Below Poughkeepsie there were small side pockets between the remnant of ice and the walls of the valleys. From Kingston and Rhinecliff northward to the Champlain valley there was a continuous though narrow and irregular lake which is based by a deep clay formation, over which an irregular sheet of
sand is distributed and on either side of which the inflowing streams have found gravel deltas.

The largest of these is that of the Mohawk river between Albany and Schenectady. The Saratoga sand plains were formed by the discharge from the Lake George channel. On the eastern side the Hoosic and similar west flowing streams formed extensive deltas in the lake and a succession of

Chief soil divisions: Glacial soil
—The dominant glacial soil of the northern division is the Dutchess series. This resembles the volusia series of western New York in being formed by glacial action from non-calcareous gray shales and sandstones. The soil is prevailing-ly dark gray to light brown in color. The subsoil ranges from light brown to a bluish gray color. The heavier types predominate and all are quite stony. The three leading compact. The compact nature of the subsoil makes defective drain-age. The supply of lime is de-ficient for the growth of legumes and plants indicative of an acid condition are common on neglected fields. A large part of the tree fruit production in the valley is on this type of soil. The prevailing crops are hay and grain—corn, oats, buckwheat and rye. Dairying is the most extensive industry.

The stony loam and the shale loam differ chiefly in the character of the rock of which they are large-
ly made up, the latter being a soft, thin-bedded shale that forms a heavy loam and the other is a more massive sandstone that produces a silty and sandy loam. Both types are thin and the protrusions of the underlying rock are of frequent occurrence. In the pockets between the rock exposures the soil has a good depth and is of good quality but the areas are often so small and irregular that they cannot be tilled to advantage. Because of these characters they have no distinctive agricultural developments and are largely in pasture and timber.

Where the limestone and marble have entered extensively into the formation of the soil, a chocolate color is developed and the texture is usually a loam to heavy fine sandy loam. The depth is variable and limestone ledges occasionally protrude. There are not many stones in the soil. The well developed Dover types are the best of the glacial soils in the valley but their occurrence is irregular and very limited. They occur in the minor valleys as irregular and often elongated areas. They are usually the basis of good farm conditions. Because of the close relation to other series the Dover soils have not developed any specific practices. They are excellent for fruit, including bush fruits, and for potatoes, in addition to grain and forage crops.

The most important areas are developed in the valleys in Columbia, Dutchess and Orange counties. The drainage is usually quite good. Lime is likely to be beneficial for the crops most sensitive to an acid soil.

Through the center of Washington and Rensselaer counties a calcareous sandstone gives rise to the Cossayuna stony loam, a glacial heavy sandy loam soil of a dark brown color and good crop producing capacity. It is a fairly deep formation over large but rather smooth hills in the middle parts of those counties and was formerly a very successful soil for the production of potatoes.

Clover succeeds fairly well and alfalfa has been grown on this type with the addition of lime. Forage crops and hay make a good development and dairying is the prevailing industry.

In the southern division of the valley the glacial soils of a micaceous character derived from the gneiss and trap rocks form the Gloucester series, the loam and the sandy loam being the prevailing types. The former is the more productive. These soils occur wherever there has been a deep accumulation of till and the depth varies extremely. It lies in the higher rock hollows and passes and the areas are irregular. Especially in the southern part through Westchester county, there are many large boulders in the soil that interfere with tillage. When cleared of stone and the numerous wet pockets drained, both types respond to good handling and a wide range of crops may be grown. The loam is generally the more productive of the two types.

Glacial lake and terrace soils—
The soils deposited by water fall in three main groups: The first of these represent the glacial lakes, the chief of which has been mentioned as lying along the Hudson river northward to the Adirondack foothills. The deposits are chiefly the finer sediments derived from the inflowing streams from the northeast and west country. They form grayish to light brown clay formations in the form of undulating plains with steep sided slopes along the larger streams. This division of soils has been called the Hudson series although the soils may ultimately be correlated with the Vergennes lake deposits of the northern part of the state to be discussed in a later article. The clay loam and the sandy loam are prevailing types and their natural fertility is not high. They are deficient in lime, low in organic matter and often poorly drained. The sand formation generally overlies the clay and when very deep may be drouthy. When of intermediate depth—three or four feet—and well-drained it makes a good soil. These lake plains are well developed above Troy and between Albany and Schenectady. These soils are the basis of an agricultural development that ranges from rather poor to rather good, depending much on the management of the soil. Individual farms may have a very smooth or a very rough surface, depending on the extent of erosion.

Closely associated with the lake deposits and often overlapping them are the gravelly and sandy delta terraces of the inflowing streams. Where the material is prevailingly the shale and sandstone derived from the Dutchess series, the Hoosic series is formed. Where the waste is markedly calcareous from the influence of the Dover series the Fishkill or Fox series is formed, and where it is

(Continued on page 50.)
The rapid development of Agricultural Colleges in this country has resulted in the enrollment of an increasing proportion of students who have been reared in the cities. It is quite possible for such persons to pass creditably all the courses required by the college and graduate without having had any practical experience on the farm. Inasmuch as the attitude or actions of such students, although entirely innocent in themselves, may create a prejudice in the public mind against the Agricultural College, it appears to be the duty of the college to provide a remedy.

Different Agricultural Colleges have met this problem in different ways and with more or less success, although none have gone to the extent of furnishing practice work after the manner of Schoolmaster Squeers in “Nicholas Nickleby.”

When Dean Thomas F. Hunt came to us three years ago, he favored a requirement of summer practice work. Accordingly the faculty passed a ruling making a summer practice course of six weeks duration a uniform requirement for graduation. It is required that this course be taken at the end of the Sophomore year, after the student has completed the four agricultural fundamentals: Plant propagation, soil technology, genetics, and agricultural chemistry—but before he has chosen his major subject. Six units credit are allowed but six units were at the same time added to the total number required for graduation.

Students enroll with the Record-er a month before the course begins in order that the professor may know the number to arrange for. It has been found impracticable to handle more than 12 or 15 students in a traveling course as we give it. Ten is a more desirable number. As soon as the number is known a schedule is made out covering the entire trip. Such a schedule shows the hotels, the railroad lines and the hour of arriving and departing from each town visited, together with the mileage. It also outlines the work to be done in each place. During the course students are required to put in all their time except Sundays. In the regular university courses the theoretical amount of successful effort required for one unit credit is 45 hours, while in the Summer Practice Course 48 are accounted for. Time consumed in daylight travel is utilized by taking
notes on soils and crops passed, not in card playing.

The bulk of the work as carried out in the Summer Practice Course in Citriculture consists in visiting and making a careful study of typical fruit ranches in all parts of the state. Arrangements are always made beforehand in order that the owner or superintendent may be on hand prepared to render assistance and give information. Each student is provided with a blank form which must be filled out for each ranch visited. This form covers location, soil-type, soil management, acreage, varieties, condition of trees as to disease and pests, irrigation, yields and returns, pruning, fertilization, fumigation, orchard heating, and many other points. Much time is also devoted to a study of typical packing-houses. Where time permits, a sketch to scale is made of one or two of the best arranged houses.

Citrus and semi-tropical fruit nurseries receive their share of attention as well as many other things of horticultural interest. During our 1915 trip, written reports were submitted on fifty-seven fruit ranches and many others were visited incidentally; twenty-one packing houses; six citrus and semi-tropical fruit nurseries, and sixteen miscellaneous interests. These miscellaneous items included: The fruit and other horticultural exhibits at the Panama-Pacific Exposition; a visit to the offices of the Chief Horticultural Quarantine Officer of the State; the State Horticultural Commissioner and Insectary at Sacramento; the U. S. Bureau of Plant Industry, Plant Introduction Gardens at Chico; the University Farm at Davis; the Kearney Ranch at Fresno; The Gate-City Pre-cooling Plant at San
Bernardino; a citrus by-product factory; the Citrus Experiment Station at Riverside; the San Diego Exposition; a commercial fertilizer factory; the general offices of the California Fruit Growers’ Exchange where we arranged for a series of lectures by Manager Powell and the heads of the various departments; the University of California Pathological Laboratory at Whittier; the Los Angeles aqueduct; two plants devoted to the manufacture of citrus packing-house equipment and supplies; a commercial fumigating company in operation at night; the Los Angeles City Market; Headquarters of the Los Angeles County Horticultural Commissioner; three olive oil mills and pickling works; and the offices and printing plant of a leading agricultural newspaper.

The general plan of our trips has usually been to start at Berkeley as soon as possible after all members of the class are through with examinations and other University duties. Orchard studies are begun at Fair Oaks in Sacramento County and proceed northward on the East side of the Sacramento Valley as far as Tehama, thence south through the west side of the valley to Davis. A jump is then made to Fresno, where the fig and olive orchards claim attention. The route then lies south through the San Joaquin Valley and the Tulare Citrus district. From Bakersfield we proceed to San Bernardino, Redlands, Riverside, Corona and Orange. The lemon orchards of San Diego County are next visited and the route doubles back to Los Angeles where headquarters are established for a week while the outlying districts of Whittier, Pasadena, Monrovia, Covina, San Dimas, and Pomona are reached by electric trains. We next go to San Fernando and from there to Santa Paula which in many respects is the most interesting stop of all. After the studies of the Rancho Sespe and the Limoneira have been completed the class is dismissed at Santa Paula. This year the class traveled 1729 miles exclusive of automobile transportation.

There are no fees required of the students but each man bears his own expenses. As each man spends according to his personal tastes there is considerable variation in the expense accounts. Legitimate traveling expenses vary from $120.00 to $200.00 averaging about $140.00.

Each student is required to keep two note-books, a small scratch book for field notes and a regulation note book into which the field data are copied and expanded. We have found it important to insist that all notes be copied each evening wherever possible and not allowed to accumulate and get cold. Rather extensive notes are required and the student who turns in the best set of notes is entitled to have them typewritten free, a carbon copy being bound and retained by the Division of Citriculture as a record of the trip. Many sets of notes are illustrated by photographs and sketches and this of course adds a great deal to their value.
Owing to the fact that the trip is circuitous in nature not doubling back over the same railroad lines, special reduced rate tickets are not available and it has been our custom to buy mileage books which are very convenient and affect some saving.

Our policy is always to go to a town with the idea of walking to the various ranches or of hiring an auto truck or jitneys. It often happens, however, that ranchers and public spirited citizens offer the use of automobiles. This of course is a great help, but it has been found not for the best interests of the class to accept auto transportation furnished by the local Chambers of Commerce for the reason that it often happens that the persons conducting such a trip are more interested in showing the boys the country and the most successful ranches than stopping long enough in one place to study adequately any given ranch. Although joyrides have a certain value when taken in a locality new to the observer, they are not productive of the kind of notes which should be secured.

At least once a week the class assembles in the evening for the purpose of discussing the things seen, comparing notes, and answering questions. Students have to be cautioned beforehand against discussing or criticizing the practices of one locality too much while still in the locality. Such criticisms and comparisons of one locality with another had best be left to the weekly meetings which are always private.

It is unwise to entrust a traveling course to one who has not had considerable experience in handling men. The students must be made to feel that they are representatives of the College and that farmers generally are very likely to judge the College by them and their behavior.

The original idea of these courses was to furnish practical experience. We have honestly endeavored to introduce as much practical work as possible but owing to circumstances over which we have no control we have found that it is not possible to give the boys as much practical hard work as was at first hoped. While we have succeeded in securing a certain amount of practice work we believe that much of the observation, note taking and discussion is of as great or more value than mere practice work. At one orange grove we have the men prune for several days. If we find a man setting out a young orchard we stop, pull off our coats and help him for a half day or a day. If we find a crew fumigating at night, we make arrangements for the boys to take turns pulling tents so that each man may get choked with cyanide at least once! It is valuable for students to dig out and examine the root systems of trees which appear to be sick. Sketching a modern packing-house to scale is a good problem, but so
far it has been impracticable to actually pack fruit. The packers are too jealous of the reputation of their brands to turn such a number of greenhorns loose at one time.

It has been our custom, at the end of each trip, to require from each student a written report on some item which has especially impressed him. These reports are criticised and polished until they are considered satisfactory for publication in some horticultural journal.

As this summer practice course is now required for graduation, some may wish to enquire what becomes of the man who has not, and cannot readily borrow the necessary one hundred and twenty-five dollars. Obviously he would be lead by necessity to elect the summer course which was the cheapest rather than the one in which he was most interested. To overcome this difficulty we have divided the summer practice course into two sections. Section I is the traveling section. Those who enroll in Section II are required to work for twelve weeks on some acceptable citrus or semi-tropical fruit ranch. Each student finds his own employment (although he is assisted by the College) and receives whatever wages he can secure. He is required to keep two sets of books, a journal describing his daily tasks in detail and a farm management survey with maps of the ranch. He reports periodically by mail to the Professor in charge. Thus the needy student may gain practical experience and save $125.00 at the same time. Of the two sections, No. I is preferred on account of its greater educational value and broadening influence. It is a fair question for debate whether the six units credit should be given those who choose Section II.

The plan of Section II usually works well, but one disadvantage is that some grasping employers are unwilling to transfer the men from one kind of job to another on account of a slight loss in returns. For example, when a man gets accustomed to pruning, the farmer may wish to keep him pruning all summer, whereas the student desires some work irrigating, cultivating, picking and the like. This problem will be met by gradually selecting certain practice farms where students may be sent in groups. Here they will receive a little less pay with the understanding that they be shifted from one kind of work to another according to a certain schedule.

We have also been confronted by the problem of the women students and this general requirement for graduation. After an effort to work out a plan by which the women could be accommodated on these trips, it has finally been decided that it is inexpedient and women are allowed to offer six units work in the regular University summer courses at Berkeley in lieu of this requirement.

Another question which has been repeatedly raised by the students themselves is—When is the proper time to take a summer practice

(Continued on page 58.)
Greetings to New Students in the College of Agriculture

By James E. Rice, ’90
Professor of Poultry Husbandry, New York State College of Agriculture at Cornell University

Cornell is a place where students can find themselves. Here one is expected to get his measure and obtain a proper perspective of his relationship to others. It may well be said that Cornell is a good human measuring stick. To be measured by the University standard is, of itself one of the most important essentials to a liberal education. The fact that students who enter Cornell are obliged to satisfy a high standard of educational requirement, and the fact that they have the reputation of coming to Cornell to get what they want, rather than of being sent here to secure what others think they should have, attracts students who are as a group, a high type by which to be measured.

Many a student after a few months at Cornell learns that there are many degrees of bigness. He discovers his own shortcomings and limitations and grows by striving to attain to the high ideals set by his associates. To meet the transition from preparatory school to college, he simply follows, day by day, an even course, doing as perfectly as possible the daily work and each day meeting the new problems, new responsibilities and larger tasks as they arise.

An intimate acquaintance with many college students suggests a few observations. They may be considered as first steps in the right direction in getting a college education. First consideration should be given to maintaining a perfect physical condition. This spells physical, mental and moral efficiency. Good health is the key to good nature, moral courage, happiness and clear vision. Most humans, like most properly constructed machines, work most smoothly and efficiently when running close up to top speed. This implies the living of a strenuous life. It will require, on the part of the student active participation in some regular relaxing physical exercise, preferably in the open air. The effect will be beneficial or detrimental depending to a large extent, upon the point of view of the student. If considered as helpful relaxation and counted in terms of more bright red blood corpuscles, it will be joyful living. In reality it will be play.

The second consideration, after having developed a perfect working human machine, is to secure proper mental training and the acquisition of knowledge. This education must include seeing, hearing, feeling, understanding and doing things. Part of this education may be acquired in private study in library and class room,
but nearly, if not quite as important, is the education which one may acquire by personal contact with student and faculty in college activities. Both are essential to a well balanced education. The real standard of measurement and final test of education is what the student is able to do in terms of efficiency when struggling with life’s problems. The great battle will be determined by what the student has built into his system and puts into active service rather than by what he has taken up by the mere process of absorption.

Some of the more important factors of a well rounded college education are: a knowledge of human nature; a workable cooperative spirit; a kindly, sympathetic interest in others; the faculty of seeing the other person’s point of view and some of those good old-fashioned personal qualities of push, persistency, pluck. These frequently are the factors than win the race. They may be largely developed in college. The student whose sole aim is to secure high marks to the exclusion of the other educational factors will lose much of the keenest satisfaction which should come from the pursuit of a college education. The best results are to be secured from a well balanced blending of serious application to study and a whole hearted participation in wholesome student activities.

A third factor of vital importance to the student who seeks to accomplish the greatest results during his college course is a thorough organization of time, which involves the making out of a well balanced program for each day in the year. Every minute must be made to count. The race is for four years over a new course and can be run but once. Those who are at the start waiting for the word “go” have been in training for many years in school, in shops and on farms, preparing for this event. The victory in running the college course will go to those who plan a well balanced program of sleep, recreation and study.

Somewhere in this program the student who gets the most out of his college course must plan to recognize and meet a personal obligation which he owes to himself, to the state, to the nation and to his Alma Mater. This obligation is the duty of a student to give as as to receive. Cornell students the day they enter, become a debtor to the nation, to the state, to the founder and to all who have made it possible to provide the splendid educational facilities which he enjoy. Every student owes a further debt to his parents. These debts cannot be paid in money alone. They can only be paid in the coin of loyal service and success.

This then is the student’s obligation to society, to his parents and to his Alma Mater: to throw himself with whole heart and without reserve for the next four years to the task of preparing for the greater battle which is to follow the completion of the college course. This perhaps is your greatest opportunity. Make the most of it.
History repeats itself. We who have graduated from the College of Agriculture, Department of Home Economics, well know how much you have anticipated coming to College. There have been many hours of thought spent upon planning the clothes which should be made and perhaps, as was the case with many of us, long hours have been spent in planning ways and means of paying expenses. We are glad you have decided to come. The value of college training with its instruction, social life, friendships, and opportunities to meet persons whose ideals and whose scholarship are an incentive and an inspiration, cannot be measured and cannot be realized except by the experience.

College offers unbounded opportunity for self-development. What kind of person you will be four years hence depends almost entirely upon yourself. You will get as much as you are determined to get.

The following suggestions are offered by a Freshman of long ago.

I. Keep the standard of scholarship high. A graduate of 1914, one who has already achieved unusual success gives as her advice to Freshmen this very admonition, and adds: “Every day in my work I am thankful for the knowledge and training I received by constant conscientious study. I could never have succeeded this year had I skimmed through the University.” It is better to be classed as a “grind” than to finish college knowing well that you are unprepared for your piece of work.

I. Determine in your Freshmen year to make the senior honorary society in Home Economics.

By keeping your scholarship high you will have met the first requirement. By entering into the
student life you will have met a second requirement.

Remember that equal in value with scholarship is that training which comes from working, playing, and developing work with other persons. Student activities are very important. Make it your business to take an active part in the affairs of your class; attend its meetings; express yourself on the subjects under discussion. Attend “get-wise” meetings, receptions, teas, and other functions which are arranged for the purpose of welcoming you to the University and of giving you the opportunity to meet persons with whom you will be associated.

Join Frigga Fylge, the club to which every girl in the College of Agriculture is entitled to membership.

II. Catch the spirit of the Home Economics Department—this means an interest in people; loyalty to the University, to the College, and to the Department; an enthusiastic cooperation in all that pertains to Home Economics; devotion to the traditions so jealously cherished by all the graduates.

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A Few Words to the Women

By Gertrude S. Martin

University Adviser of Women

To be asked for a “message” to the women students of the University at the opening of this new academic year—it is embarrassing, even a little appalling, to one who knows that she is not among those fortunate souls to whom are vouchsafed “messages” for the rising generation. Greetings? Yes, and those right hearty; hopes and good wishes without end; but oracles? never; that would be humorous. This is, therefore, no authoritative communication, no “message,” not even advice; it is just my “wish” for the large body of young women who enter or re-enter the doors of their Alma Mater this fall.

If I were a fairy godmother I should be limited by a tradition, too long and too respectable to be broken, to three wishes. Being just a common mortal and therefore quite naked and unashamed in the matter of traditions, I can go on wishing and wishing through all the summer day, if I so choose, and none to say me nay. To be sure, the fairy godmother, backed by all the mysterious powers of fairyland, has the advantage of me in this—that her wishes must come true; while mine—well, mine may come true; that all depends on whether my wishes for you shall prove to be also your wishes for yourselves.

What do I wish for you, then? First health, physical and mental, sanity of body and mind. This is of fundamental importance. Without it the most extraordinary talents and endowments may be perverted and are at best cheated of their potential effectiveness. With it even mediocre abilities will carry you far. And health is not a matter of “luck.” Except in the rarest
instances it is strictly within your own control. Moreover, the world knows this fact; and to be an invalid now is almost certainly to convict yourself in the eyes of intelligent persons either of unpardonable ignorance or of criminal folly. The time is past when we can live like lunatics and attribute the inevitable results to an inscrutable Providence.

Next I would wish that you might somehow acquire, if you have not brought it with you, the power of concentrated and accurate thinking. Twenty years from now by far the larger part of the information which you are so laboriously accumulating during these four years will be more or less completely forgotten, and of the rest, not a little will have been proved erroneous. The best result, almost the only permanently valuable result, that this four years' intellectual effort can yield for you is the power of sustained and accurate thought; and never in history has there been a generation of women who have so needed this power.

Next I should wish that you might come to understand through personal experience the deep meaning of that profoundest of sayings that he who loseth his life shall save it; that you might get a vision of your life as an objective thing, your one true work in the world, your contribution, your creation to make or to mar. It is the one task at which you are always laboring, no matter what your ostensible employment. You say you are making a living by teaching school, or writing books or painting pictures, or creating a home, but what you are really making is not a living but a life; and no matter how fine your teaching, how great your book, how beautiful your picture, how lovely your home, your life in its entirety, of which these are but by-products, can only be truly successful in so far as it proves serviceable to your fellowmen.

Whether your college life shall yield you these results and more besides or whether it shall prove barren depends on how you use it. “At college, if you have lived rightly,” writes Dean Briggs to college girls, “you have found enough learning to make you humble, enough friendship to make your hearts large and warm, enough culture to teach you the refinement of simplicity, enough wisdom to keep you sweet in poverty and temperate in wealth. Here you have learned to see great and small in their true relation, to look at both sides of a question, to respect the point of view of every honest man or woman, and to recognize the point of view that differs most widely from your own. Here you have found the democracy that excludes neither poor nor rich, and the quick sympathy that listens to all and helps by the very listening. Here too, it may be at the end of a long struggle, you have seen—if only in transient glimpses—that after doubt comes reverence, after anxiety peace, after faintness courage, and that out of weakness we are made strong. Suffer these glimpses to become an abiding vision, and you have the supreme joy of life.”
Greetings

The COUNTRYMAN extends a hearty greeting to both old and new students at the beginning of the college year of 1915-1916. We hope you will enter into the spirit of the college more than ever and make this a banner year all around. Of course, everyone is here primarily to learn, but that is only one of the many things which a well balanced college course includes. Take an active part in student activities and make it a point to be doing something for the University and your College. The Cornell Standard is a high one and many fall in the climb to reach it, but those who do attain it are repaid a thousand fold. It’s up to you.

Safety First

In the rapid growth and development of the College of Agriculture one vital course in the list has been grossly neglected; namely that of a course in public speaking for the instructing staff. Just as every student is required to have a certain number of credits in actual farm experience before he is granted a diploma, so it should be that every professor and instructor engaged in instructive work in the college should be required to present some sort of credentials which would show that he can deliver a public lecture properly. It is unfair to expect that a person can get up before a congregation of students and impart to them his knowledge just because he happens to know something. It is more than unfair to expect those students to listen attentively or learn anything. Yet at the present time and for some time past this has been the state of affairs in several departments. Professors and instructors no more
able to hold their own than a five-year-old have tried to deliver lectures before the students of this and other colleges and the result has been that the whole undergraduate body is pointing a finger of scorn at those unqualified professors and instructors.

The New York State College is not alone in this predicament. Students and graduates from other colleges will tell you that the same lack of public speaking ability exists among the instructing staff of their alma mater. Right here is a chance for our alma mater to step into the lead, as it has done in so many other things, and set a new precedent which will provide for some requirement in speaking ability from the instructing staff. What the students of this college want are professors with a personality and a delivery which is pleasing and from whom it is possible to understand a lecture without racking one's brain. Let's have “Safety First” here as elsewhere.

The Ag. Honor System

The College of Agriculture ranks among the foremost of the colleges of Cornell University in that it has adopted and used the honor system. Those students who had the courage to start such an institution surely deserve credit and praise for their high ambitions. Theoretically the honor system would work fine and actually it has worked with a certain degree of success. Furthermore it is unquestionably an ideal system, it encourages honor and discourages cheating. Herein we find the missing link which if found would make the honor system unquestionably perfect.

The trouble is that at the present time the honor system discourages cheating, but it does not do away with it. Last spring in many of the examinations there was so much cheating that one might easily have imagined that dishonesty was encouraged rather than discouraged.

It is high time for the honor system committee to get awake and see that further violations of the rules do not occur on such a wholesale scale as has been the case in some of the examinations of last year. If this committee find it beyond their power to enforce the rules then it is time that the Student's Association of the college adopt a modified honor system. Under such a system the students would still be on their honor, but the faculty would supervise and attend the examinations. This would eliminate cheating on a wholesale scale at least. Of course if everyone's honor was unquestionable such recourse would be uncalled for, but past experience shows that honor with some persons is often a state of mind which they may or may not be in at the time of the examination. However, it is not the intention of this article to go into the moral side of the honor system, it is merely intended to call attention to the fact that something should be done in order that it may be more of a credit to the college.
Following the announcement made in the June issue of the COUNTRYMAN this issue contains an account of agriculture at the Panama-Pacific Exposition. The travels of the COUNTRYMAN beyond this point have been taken up by Dean Galloway and will be continued by him throughout the coming collegiate year. Dr. Galloway some years ago took an extended tour through the regions which he describes in his articles and got intimately in touch with the farming conditions. This series has considerable educational value because it shows how the other half of the world "farms it."

The COUNTRYMAN is continuing the series of articles started a year ago entitled "An Agricultural Survey of New York State." When the series is completed, which will be within the next few issues, every phase of agriculture of this Empire State will have been covered in a general way. Should demand warrant, it is likely that the series will be reprinted and bound in a volume.

The plans also include several special numbers which no one can afford to miss. The December issue is to be an Annual Husbandry Number; the February, Horticulture; the March, Poultry and May, Farm Management.

In the course of the past year the COUNTRYMAN offices have been moved to the building formerly occupied by the Department of Rural Education. These new quarters give the COUNTRYMAN an abundance of room and it is the intention of the board that the rest of the student body shall share the building with the COUNTRYMAN.

All students of the College of Agriculture are urged to make use of the building whenever they desire. Furthermore the building is free at all times for committee meetings or for any club meetings. Make the COUNTRYMAN Building your building.
Campus Notes

Dr. C. E. Betten Assumes Duties as Registrar of the College

Dr. C. E. Betten, who was recently appointed registrar of the College of Agriculture in place of Professor A. R. Mann, '04, assumed his duties last June. Before coming to Cornell in his present capacity Dr. Betten was professor of biology at the Lake Forest University, Ill. There he received his bachelor's degree in 1910 and his master's degree the following year. He spent the next two years as instructor in biology at Buena Vista and from 1904 to 1905 was a fellow at Cornell and in 1906 received his doctor's degree. Dr. Betten has played an important part in administrative work wherever he has gone. Before coming to Ithaca this spring he was registrar at the Lake Forest University and was also active in committee work at that place.

Students to Get Actual Training in Rural Education

In order that they may get actual experience in teaching agriculture five members of the 1916 class will leave the University for the present term to act as assistants to teachers of agriculture in the high schools of this state. This will give them valuable experience and they will be given enough compensation to pay for their expenses. In addition they will receive three credit hours for the work. Those seniors who will leave and the schools to which they will go are as follows: H. M. Mapes to Spencerport; G. G. Row to Worcester; B. C. Whittemore to Perry; L. H. Woodward to Leroy and F. G. Behrens to Alden.

Green House Range to be Completed by October 1

Work during the summer has progressed rapidly on the construction of new greenhouses east of Roberts' Hall and the proposed greenhouse range which has been talked of for many years will soon be a reality. The completion was affected under the $30,000 appropriation made in 1912 and with the exception of one house for the department of vegetable gardening all the construction work has been done by the King Construction Co., of North Tonowanda. The additions give the department of floriculture 6,000 sq. ft. additional room, the soils department 600 sq. ft. additional room, and the departments of plant breeding, vege-
table gardening, plant pathology and botany each 2,500 sq. ft. additional room. Also an extension has been added to the head house which will provide an additional 1,200 sq. ft. for the plant pathology department.

Another Contract Let for the Ag. Heating System

A new contract has just been awarded by the college authorities for a continuation of the steam supply pipes from Roberts' Hall. Last spring the main supply pipe was laid from the plant to Robert's Hall and the new contract provides for branch pipes which will connect up all the buildings on quadrangle of which Roberts' Hall forms a part. After this has been done the fires in the old boilers will be put out and the buildings will be heated by the boilers in the new plant. The old boilers will not be removed, but will be kept in readiness in case the supply of the new boilers is inadequate.

For the coming year in the Ag. College three professors will be absent on a sabbatic leave. They are Professors Rice, Stocking and Mann.

Three Professors on Sabbatic Leave

C. E. Ladd, who has for the past year been instructor in the Farm Management Department, has left Cornell and is now director of the New York State School of Agriculture at Delhi. So far no one has been appointed as his successor.

The increase in the number of students in the Summer School and the third term this year has apparently kept pace with the increase in the number of students enrolled during the regular term. Summer School enrollment this year was 445 as compared to 388 last year while for the third term the enrollment was 108 as compared to 67 last year.

Improvements to the campus of the College of Agriculture this summer have consisted of leveling and grading off many of the uneven places and sowing the same to sod.

During the six weeks of Summer School 27051 meals were served in the Home Economics Cafeteria. At the close of Summer School the cafeteria was closed down and in the meantime has undergone repairs and changes most important of which is the transfer of the dish room to the southeast corner of the dining room and the redecorating of the interior.

C. E. Ladd
Leaves for Delhi

Miss Van Rensselaer of the Home Economics Department has been appointed president of the National Home Economics Association. Both she and Miss Rose have just completed an extensive tour through the Middle West during which they have attended many meetings of the association.
Football Games


Former Student Notes

"00, B. S.—Otto F. Hunziker is now head of the Dairy Department of Purdue University at Lafayette, Ind. After receiving his bachelor’s degree he spent another year at Cornell and in 1901 received his master’s degree. During his collegiate days, Professor Hunziker won the Osborne Prize in essay writing, he was elected to Sigma Xi and from 1901 to 1902, was assistant in Pathological and Dairy Bacteriology at Cornell. The next three years he was milk expert for the Scranton Condensed Milk Co., at Ellicottville and since 1905 has held his present position.

Today Professor Hunziker is among the leaders of the dairy industry of this country. Some of his more important research works are as follows:

Standardization of the glassware for the Babcock Test so that in place of some 35 test bottles representing different styles and capacities, three bottles are now recognized in this country as the standard Babcock glassware.

Introduction of the use of Glymol and the water bath in the reading of the cream test. This has been of great value in increasing the accuracy of the test.

The modification of the Babcock Test of evaporated milk. Prior to this modification it was impossible to secure reliable factory tests of this product.

The experimental demonstration that the original standard of solids in evaporated milk was too high and could not be complied with in many localities and at certain seasons of the year.

The invention of a quick method for factory use to determine the
per cent. of solids of evaporated milk by means of formula and tables.

A study of the cost of producing milk by Indiana dairy herds showing conclusively that the largest producing cows are the most profitable and demonstrating the importance of keeping yearly records.

Pasteurization experiments demonstrating the best method of pasteurization to be used at different seasons of the year in order to secure maximum germ killing efficiency, minimum deterioration of butter fat and keeping quality of the butter.

In addition he has made an exhaustive study of the effect of breed and the season of the year on the chemical composition of butter fat and the relative size of the fat globules and of the relation of the chemical and physical properties of butter fat to the mechanical firmness of butter.

'04, B. S.—For four years after graduation G. N. Allen managed the Reymann Estate at Wheeling, West Virginia. He then became interested in tractors and is now in the employ of the Chase Motor Truck Co., of Syracuse.

'06, B. S.—Word has been received that Lowell Gable has been awarded first prize on market milk at the Panama-Pacific Exposition. In addition his exhibit of milk won highest honors in having the lowest bacteria count. Since graduation Mr. Gable has been managing his father’s large estate near Wyebrook, Chester County, Pa. He has devoted much of his time specializing in horses and registered Guernseys. In addition he has the most modern equipment possible to place on a dairy farm.

'11, B. S.—Anna Jenkins is now located in Washington, D. C., doing mycological work in the Bureau of Plant Industry.

'11, B. S.—Elizabeth Genung has accepted a position in Simmons College as instructor in bacteriology.

'12, B. S.—Clara Browning is the Director of Household Arts in the Buffalo Technical High School. She is also in charge of the students lunch room in the building.

'12, B. S.—C. O. Dalrymple has gone to Colebrook, N. H., where he will be principal of the Colebrook Academy and teacher of agriculture.

'13, B. S.—A. B. Genung has gone to Stanford as teacher of agriculture.

'13, B. S.—C. W. Bame, who has been teaching agriculture at DeRuyter, has resigned his position there and will go to Gouverneur, where he will have a similar position.

'14, B. S.; '15, M. S.—M. V. Barnes has gone to Bethlehem, N. H., to teach agriculture.

(Continued on page 48.)
Real economy is never shortsighted. It never confuses PRICE with VALUE.

Price is what you pay for an article.

VALUE depends upon the amount and quality of service the article gives you.

You get by far the greatest actual value for your money when you buy a De Laval—BECAUSE a De Laval will give you much better and longer SERVICE than any other cream separator.

From the standpoint of its greater durability alone the De Laval is the most economical cream separator to buy, and when you also take into consideration its cleaner skimming, easier running, greater capacity and less cost for repairs, the price of the "cheapest" machine on the market is most exhorbitant compared with that of the De Laval.

And there is no reason why you should let its FIRST COST stand in the way either, because the De Laval may be purchased on such liberal terms that it will actually pay for itself out of its own savings.

A De Laval catalog to be had for the asking tells more fully why the De Laval is the most economical cream separator, or the nearest local De Laval agent will be glad to explain this and many other points of De Laval superiority. If you don't know the nearest local agent, simply write the nearest De Laval main office as below.

The De Laval Separator Co.
165 Broadway, New York          29 E. Madison St., Chicago
50,000 BRANCHES AND LOCAL AGENCIES THE WORLD OVER
THE STUDENT LOAN FUND OF THE COLLEGE OF AGRICULTURE

By H. E. Schradieck, '16.

The active organization of the Student Loan Fund Committee was undertaken by W. de S. Wilson, '13, in March, 1913. Prior to this there had been considerable agitation for a loan fund which would satisfy the particular needs of the College of Agriculture but no active steps were ever taken by the students.

A fund of $298.01 was presented to the College by the Briarcliff School in 1908 to help the needy students. This sum had been in the treasurer's hands at interest. It was the real beginning of the loan fund, but not large enough to be of any extensive service and no steps were taken to make it more serviceable until Prof. A. R. Mann suggested to the Agricultural Association the plan of enlarging this fund.

Prof. Mann saw the need of helping worthy "working students." His broad sympathy for their cause urged him to find ways and means to that end. After considerable discussion and many conferences it was decided to leave the raising of money for this purpose to the students and the management of the fund to a faculty committee. The Agricultural Association then took hold and elected a committee of twelve consisting of three members of each class, with Mr. Wilson as chairman. It was decided to raise five hundred dollars in May that year and a very active campaign was carried on which resulted in realizing $450.00. This sum does not include a subscription from Frigga Fylga which was received later and sundry small contributions which were received the following month. In November over $500.00 was turned over to the University treasurer.

The committee of twelve was found too large, consequently only five members were active in the fall of 1913. No regular campaign was carried on. The members of the committee working quietly throughout the year, realized about $200.00, which raised the total to $975.00.

In the fall of 1914 five members were again elected. It was decided that the faculty committee on scholarships and two students, the chairman and secretary of the committee should manage the loan. It was also decided to lend both principal and interest. The latter could be lent without and the former only on security. No interest was to be charged until the student ceased to be an enrolled undergraduate in the college.

The war with its financial consequences and the Belgium aid collections forced the committee to postpone the campaign for more funds. In the spring of 1915, subcommittees from the under classes were appointed, but it was found impossible to raise more than (Continued on page 48.)
NOW,---

Every new man likes to make real, lasting friendships with his fellows and he likes to get real solid things he needs in his college work when he knows the man selling is a fellow student selling on the principle of making just a little on each article, that is

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**The Student Loan Fund of the College of Agriculture**

(Continued from page 46.)

twenty dollars, leaving the fund at just about one thousand dollars.

During the year appeals for help totaling two thousand dollars came in. Loans of seven hundred dollars were made.

The present senior class is the only one in college that has actively contributed to this very worthy enterprise. Students of the other three classes should not wait until personally solicited, but are urged to give or mail their contributions to members of the committee, whose names will be posted on the bulletin board, or hand them to the secretary of the college.

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**Former Student Notes**

(Continued from page 44.)

'15, B. S.—Grace Fordyce was recently married to D. S. Fox, who is at present an instructor in the Department of Farm Management.

'15, B. S.—F. W. King has gone to Lowville as teacher of agriculture.

'15, B. S.—J. N. Hurley has gone to Malone as teacher of agriculture.

'15, B. S.—S. S. Greene has gone to Savannah as teacher of agriculture.

'15, B. S.—Norma LaBarre was married to Edwin Stevens, '12, on July 3. Stevens is a geologist at Davenport, Iowa.

(Continued on page 68.)
Mr. Student

If you are interested in getting a full dollar's worth for every dollar spent—then this is your shop.

You should know that here you can buy $15, $18, $20 and $25 Suits that are worth $15, $18, $20 and $25.

Everything college men wear at prices within your reach.

Will you come in and let us SHOW YOU?

Keegan & Clines

Just a little farther down the street—but it pays to walk
The Soils and Agricultural Development of the Hudson Valley
(Continued from page 27.)

predominately from the crystal-line rocks that make up the Gloucester series the Merrimack series is formed. All these soils were laid down during the retreat of the glacial ice when great volumes of water flowed southward through the irregularly filled valleys. They form a succession of terraces and remnants of beaches of gravel, sand, loam and sometimes finer materials. In all the series the gravel and sand deposits are inclined to be coarse and drouthy and, therefore, make poor agricultural land. The sandy loams and loams are all good soils and are the prevailing types. Silt and clay loam have small development. The prevailing colors are some shade or brown, yellow or dark gray, the former prevailing especially in the topsoil. The Fox—the calcareous soils—are naturally the best and are the least developed. So far as they are known in the state there is small choice between corresponding developments of the other two series. The Hoosic series is by far the most extensive and contains large areas of rather light gravelly loam. It is closely associated with the Dutchess series, while the micaceous and siliceous soils of the Merrimack series are associated with the Gloucester series in the southern part of the region.

Excellent farms are located in many of the valleys on these terrace soils. Due to topography and market situation, there is a wide diversity in value of the lands, and careful judgment must be exercised in selecting a farm.

All the soils respond to applications of lime. They often need organic matter and drainage is often a requisite for good work. Some peculiarities are reported. For example, beans and potatoes are said not to succeed on the Hoosic soils through the middle of the valley. The soundness of these statements needs to be verified. Dairying based on hay and forage is extensively developed, and some of the fruit and trucking land is of this series. In the main they bear the better farms of the region but it must be remembered that farms usually extend across the valleys and take in bottom and hill land as well as terrace soils.

Other types of rather poorer gravelly and sandy soils of limited extent need not be described here.

First bottom lands—The first bottoms along the streams formed by recent overflow, are generally dark grays to brown sediments of a prevailingly silty character, but ranging from fine sand to sticky clay. They may be called the On-dawa soils in distinction from the bottoms of the western part of the state called the Genesee series. They are often subject to overflow and are generally more or less wet depending on the local situation. When drained these bottoms make excellent grain-forage and trucking lands. They are found along nearly every stream, the extent

(Continued on page 52.)
We Wish to Call Your Attention to These Facts Before Asking for Your Patronage

The Student Lavndry Agency was founded in 1897 by self-supporting students and aims to help other students so situated. It has developed by virtue of satisfactory work and service.

Incorporated in 1908, its places are now filled in regular successive order by open competition. Two seniors, two juniors, and four sophomores are kept occupied yearly.

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The Soils and Agricultural Development of the Hudson Valley
(Continued from page 50.)

depending on the size of the stream and especially on the grade of its bed. The flatter streams have the broader bottoms. In some cases, as along the lower course of the Esopus and along the Hoosic river, they may be a half-mile or more in width. The danger from overflow makes them uncertain for any but summer crops. There are other alluvial soils of very limited area and these of small agricultural importance.

Truck and swamp land—Numerous depressions were left as a result of glacial action on the irregular rock surface of this region. In some, lakes were found. Some of these lakes have cut down the outlet or have filled with organic accumulations to the condition of swamp. Many small and some large areas of such swamp soils have been formed in the Hudson valley region, and when drained and developed make excellent agricultural land. They are found in all parts but the most notable areas are in central Orange county on the course of the Wallkill river. Most of these swamps have a deposit of muck or peat soil, the former prevailing. "Black dirt" it is usually called in the trucking region. Many of these areas adjacent to market facilities are being used for the productions of vegetables—onions, celery and some lettuce and cabbage. The practices are as yet not very intensive.

Rough land—In addition to the land definitely classed in soil series, there are many and often large areas of country where rock ledges predominate, or where the soil is so steep and stony that tillage is impossible, and its only value is pasture and a little timber. Such soil is termed rough stony land and rock outcrop. It ought never to have been cleared.

Distribution of soil conditions—Some idea of the relative proportion of these several series of soil may be gained from the following tabulation based on the soil survey of three counties in the region—Washington, Dutchess and Orange—which have an aggregate area of about 2200 square miles.

To the non-agricultural land should be added at least a third of the Dutchess area that is thin and stony, and the same proportion of the terrace soils that are too open sand or gravel to be of much value for anything but pasture and timber, making, on this basis of calculation, about 40 per cent. of essentially waste land so far as tillage is concerned. According to the last United States census there was 52 per cent. of improved land in farms in these same three counties, a decrease of 8 per cent. from the preceding census of 1900.

Agricultural development—If there is any one prevailing industry in the region, it is dairying in some of its forms which is practiced in all the agricultural parts. Much concentrated feed is purchased to back up the coarser hay

(Continued on page 56.)
Spraying

Insures Perfect Fruit and Vegetables

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Watson 4-Row Potato Sprayer

for wide or narrow rows. Spray as fast as you can drive. Power always strong. Automatic Agitation of liquid and cleaning of strainers. Two nozzles to each row for thoroughly saturating foliage both top and bottom.

The Empire King

leads everything of its kind. Throws fine, misty spray with strong force. No clogging. Strainers are brushed and kept clean and liquid is thoroughly agitated automatically. Corrosion is impossible.

Can be easily moved about. Adapted for spraying fruit and vegetables, also whitewash. Can be furnished on different size casks and also fitted for spraying 4 rows of potatoes.

The Leader Orchard Sprayers

are typical modern machines for large spraying operations. Combination mounted outfits, consisting of gasoline engine, spray tank, pump, platforms, spraying appliances, all complete and ready for work. Engines adapted for other power work.

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MR. FRESHMAN

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We are a supply house for Students

Where you saw it will help you, them and us
RESULTS OF A SOIL SURVEY

<table>
<thead>
<tr>
<th>Type of Land</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-agricultural</td>
<td>18.0%</td>
</tr>
<tr>
<td>Rough stony land and rock outcrop</td>
<td></td>
</tr>
<tr>
<td>Gloucester series</td>
<td>3.0%</td>
</tr>
<tr>
<td>Glacial soils</td>
<td>43.5%</td>
</tr>
<tr>
<td>Dutchess series</td>
<td></td>
</tr>
<tr>
<td>Dover and Cossayuna series</td>
<td>9.0%</td>
</tr>
<tr>
<td>Lake soils</td>
<td>8.7%</td>
</tr>
<tr>
<td>Hudson series</td>
<td></td>
</tr>
<tr>
<td>Terrace soils</td>
<td>3.6%</td>
</tr>
<tr>
<td>Merrimack series</td>
<td></td>
</tr>
<tr>
<td>Hoosic series</td>
<td>6.0%</td>
</tr>
<tr>
<td>First bottom and swamp</td>
<td>3.0%</td>
</tr>
<tr>
<td>Ondawa series</td>
<td></td>
</tr>
<tr>
<td>Muck and swamp</td>
<td>6.0%</td>
</tr>
<tr>
<td>Total</td>
<td>99.8%</td>
</tr>
</tbody>
</table>

and forage produced. Apples, peaches, pears and limited areas of small fruits are grown, particularly in the middle section adjacent to the Hudson river between Newburg and Albany. The Dutchess silt loam and the terrace intermediate soils texture chiefly of the Hoosic series are used for these crops. Climatic conditions are an important factor in success. Potatoes, formerly an important crop, especially in the northern part, are now little grown. Vegetables are grown on the reclaimed muck and swamp soils and their production centers on the large areas of such soil in the neighborhood and Goshen in central Orange county. There are undeveloped areas of such soil that await market conditions.

Poultry is receiving increased attention especially in the lower part tributary to New York and where the summer boarder industry is prominent.

Trend of agricultural practices —There is an increasing tendency towards specialized farming. A good illustration of this is the development of the growing of violets around Rhinebeck where a large part of those supplied to New York are produced. Poultry represents another developing specialty. As the pressure of conditions increase, it is likely that special types of farm industries will be developed to adapt themselves to the cut-up and diverse soil, climate and market conditions.

Land values vary extremely—from near zero to several hundred dollars per acre. The latter figures are largely determined by proximity to New York and by summer residence values.

Lines of soil improvement—As a whole the soils are not of high fertility and they need careful handling to get results. All the fundamental factors of soil improvement—drainage, lime and organic matter and good tillage need to be applied to increase productiveness. To these the soils respond generously. The small and irregular areas of most farms make the use of large machinery difficult.

(Continued on page 58.)
HOTEL IMPERIAL
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Sheep-lined Coats, NECKWEAR
is now ready for your inspection.

Sole agents for STETSON Shoes.

The Soils and Agricultural Development
of the Hudson Valley
(Continued from page 56.)
cult, and this fact will contribute
to the increase of special types of
farming. The region is worth
careful study for the person de-siring
to get near markets for he
can often secure these and get good
land and a pleasant home situation
at a reasonable cost. Patience is
usually required to secure a good
combination of all these factors.

The Summer Travelling Practice Course
(Continued from page 32.)
course—at the end of the Sopho-more
or Junior year? The original
idea in establishing these courses
was to furnish the city-bred stud-
ent a means by which he might be
able to judge for himself whether
he wished to major in Citriculture,
Agronomy, or Animal Husbandry
as the case might be. As a matter
of practice, however, it works out
with certain exceptions that the
student is bound to continue in the
division in which he selects the
practice course inasmuch as very
few divisions will accept other than
their own practice courses.

Another argument in favor of
the summer preceding the Junior
year is that the students will be
better able to understand the lec-tures
during the last two years
having the summer course as a
background. This is true, but on
the other hand the men are not
at all prepared to understand and
digest what they see on the sum-
mer course when they have had
no lectures on the subject. There

(Continued on page 60.)
Where you saw it will help you, them and us
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—Steam Vulcanizing—
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The Summer Traveling Practice Course
(Continued from page 58.)
is not time and but little opportuni-
ty on the traveling course to ex-
plain things in great detail. It is
difficult to get the growers to un-
derstand that the men have had
no instruction in the subject and
they are sure to expect too much
of them and to be surprised and
unfavorably impressed by their
questions. For these and other rea-
sions I have come to agree with the
students in their belief that it
would be better if the summer prac-
tice courses were given at the end
of the Junior year after having
taken the general course in their
major subject.

While the summer course as we
have developed it, falls short of
our desires as to actual practice
work, we believe this is more than
made up by the opportunity for
meeting and getting acquainted
with a large number of the most
successful growers in all parts of
the State. Such men are nearly al-
ways glad to meet the students and
the hard-headed, practical, busi-
ness advice given by them is of the
very greatest value.

Oftentimes the grower will seize
the opportunity to talk over some
particular trouble of his to the ex-
clusion of everything else. It re-
quires a great deal of diplomacy
on the part of the instructor in
charge sometimes to so guide the
grower and his conversation as to
bring out the essential things in
their relative importance and at the
same time keep him in a good
humor.

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The buying of the right engine for the farm is a family affair. Your wife, the boys, the girls, the help—everybody about the place will be helped so much by the engine that it pays to buy carefully. Get a good engine, a Mogul or Titan, give it all the jobs it will do and handle it properly, and it will still be shouldering the drudgery years from now.

Buy an International Harvester engine—Mogul or Titan. In time the family will come to look on it as a faithful ever-reliable friend. It will keep down your fuel and repair bills, deliver the most power with least trouble, and save you more hard work than you can realize now.

International Harvester engines are made in all approved styles, sizes from 1 to 50-horse power, operating on low as well as high-grade fuels. Some local dealer near you handles Mogul or Titan engines. If you don’t know him, drop us a line. We’ll send you full information, and make it easy for you to see the best farm engine made.

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A Message to You,
And It’s Important

After all, it’s the comfort, convenience and safety that you provide for yourself and your family, that really counts in this world.

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Tell me how many head of stock you have, and I’ll ship you enough Sal-Vet to last them 60 days. You simply pay the freight charges when it arrives and feed it according to directions. If it does not do as I claim and you make a specific report in 60 days, I’ll cancel the charge—you won’t owe me a penny. Address SIDNEY R. FEIL, THE FEIL MFG. CO., Chemists Dept.29 Cleveland, O.
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Choice Food at Reasonable Prices
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The very best of everything. Give our place a trial

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BEEF
CRACKLINGS
is due to its WHOLESOMENESS
and DIGESTIBILITY

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ASBURY PARK, N. J.

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Get the maximum amount of work out of your horses and keep them in prime condition—head up, tail over the dash. Lower the cost of producing milk. Keeps cows in good flesh and therefore strong and healthy. Raise more beef, mutton and wool. Make Dewey's Stock Feed the foundation of your ration. Puts you in line for the greatest net profits. More energy or horse power, more beef and mutton, more milk.

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Composition—Hominy Feed, Oil Meal, C S Meal, Middlings, Oat Feed ½% Salt.

Made by THE DEWEY BROS. CO.
Box 579, Blanchester, Ohio

We also make Dewey's Ready Ration

Former Student Notes
(Continued from page 48.)

'15, B. S.—Pearle Decker was married on July 21, to Erford L. Banner, '15, who is now an assistant in the Poultry Department and is working for his doctor's degree.

'15, B. S.—Eva Hollister was married during the early part of this summer to Earl Benjamin, '11, assistant professor in the poultry department.

'15, B. S.—R. B. Titis has gone to Westford, where he has accepted a position of principal of the high school and teacher of agriculture.

'15, B. S.—L. J. Steele has accepted a position as instructor in agriculture at Holey.

'15, B. S.—A. W. Wilson, former business manager of the COUNTRYMAN is now employed with the Orange Judd Publications and will devote his time to covering New York State and New Jersey.

'15, B. S.—W. S. Marsland is now managing a 300-acre fruit farm called Shore Acres Farm at Sodus.

'15, B. S.—Helen N. Esterbrook has gone to Gilbertsville as teacher of home making.

'15, B. S.—S. E. Stone is now teacher of agriculture at the Baron de Hirsh Agricultural School at Woodbine, N. J.

(Continued on page 70.)
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Former Student Notes
(Continued from page 68.)

'15, B. S.—Adeline A. Thurston has gone to the New Paltz Normal School as teacher of nature study.

'15, B. S.—Mable Flummerfelt was married to F. Elton Rogers, '14, on Aug. 11. Rogers is now head of the farm bureau work of Connecticut and is located at New Haven.

'15, B. S.—T. G. Stitts is now teacher of agriculture at New Berlin.

'15, B. S.—W. R. Roth has gone to Machias as teacher of agriculture.

'15, B. S.—R. D. Merrill has gone to Morrisville, Vt., as teacher of agriculture.

'15, B. S.—W. R. Cone has gone to Edmeston, where he has accepted a position as principal of the high school and teacher of agriculture.

'15, B. S.—Ethel L. Phelps has gone to the Minnesota College of Agriculture, where she will instruct in Home Economics. Miss Olive M. Tuttle, '15, will also go to Minnesota as instructor in Home Economics.

'15, B. S.—Gertrude L. Bloodgett has gone to the University of Texas as instructor in Home Economics.

(Continued on page 75.)

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115 N. Tioga St.

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Work has won for us a very large list of satisfied customers

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Should be used by all farmers who desire to raise their calves cheaply and successfully with little or no milk.
Send for actual feeding records of Quick Calf Raising

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The Farm Woodlot as a Farm Crop

BY G. W. HENDRY, '13

Agricultural surveys prove that many farms in New York State are financially unsuccessful, and careful analyses of the business of a great many farms have been made to determine where the leaks are. A variety of causes may be responsible for these leaks: poor cows, unequal labor distribution, or inefficient coordination of the different enterprises. Each farm has its peculiar difficulties, so that there is no general panacea. But of all of the sources of waste which, united, dissipate the profits of farming, the farm woodlot in the aggregate heads the list.

The woodlot holds this position because of its immense importance in all farming sections. More than two hundred million acres are given up to farm woodlots in the United States, or an area about twice as great as that planted to corn. A slight increase in yield over this vast acreage would mean an enormous total increment. For example, the forests of Saxony return a net yield of $5.29 per acre per year greater than the forests of the United States. If the farm woodlots of the United States yielded $5.29 more per acre net, the total increased revenue for one year would be $1,058,000,000, or a sum great enough to pay for the Panama Canal ($375,000,000), to construct the proposed inland deep waterways system ($500,000,000), and to build 18 dreadnoughts costing $10,166,666 each. These figures are given simply to illustrate the quantitative importance of the farm woodlots in this country. It may not be economically practicable to produce any such yields at this time, even if it were possible to practice forestry in this country with all of the refinements with which it is practiced in Saxony.

The central problem before the American foresters at present is to awaken the public conscience to the fact that only a sorry remnant of our forests remains, and that these are crying out for first aid treatment. It does not require a specialist to administer first aid; the farmer is amply qualified, if he is capable of using hard common
sense. Thus the farmer is the man the foresters are trying to reach. With so many other hands reaching toward him, it is not surprising that he should be inclined to stand pat. The forester, however, asks only that the farmer spend a few weeks, during the winter time when other farm work is slack, in his woodlot with an axe and a team, and start the improvement work so badly needed. A moment's reflection will suffice to convince the farmer that the basic principles of agronomy and silvics are everywhere parallel. The laws and forces of nature operate in the woodlot just as they do in the cornfield. The very first job, then, should be to weed the woodlot. Woodlot weeds in New York are ironwood, blue beech, hawthorn, and other such growths and shrubs, which never produce merchantable timber but which occupy the ground at the expense of desirable species. For the same reason as that for weeding the cornfield, the woodlot should be weeded.

It is needless to say that the farmer does not turn his stock into his young cornfield. Such a practice would be regarded as criminal folly. Yet nine farmers out of ten pasture their woodlots, and thereby not only destroy the young tree seedlings but also injure old ones by stripping bark from them and by trampling the soil away from the roots. Grazing also results in the hard packing of the forest floor, a condition no more desired in the woodlot than in the grainfield. If it becomes absolutely necessary to use the woodlot for a pasture to provide forage for the stock, then the pasturage should be regulated. Pasturing the woodlot is something like pasturing the alfalfa field. Cattle do less damage in an alfalfa field during the summer than they do in the fall. Alfalfa forms crown-buds in the fall, and if these are destroyed the succeeding crop will be seriously affected. In the woodlot the young tree seedlings correspond to the alfalfa crown-buds, and when they are destroyed there is no succeeding crop of trees. In order to get these seedlings started, the cattle must be kept out for two or three years until the seedling trees become woody, and then the cattle may be turned in again. Even under these conditions, considerable damage will inevitably result. A rule which can be safely followed everywhere and at all times is, do not use the woodlot for a pasture unless it is an absolute necessity, and then graze as lightly as possible.

This identical principle is observed in ordinary pasture management. Stock is not turned on to the pasture in the spring until the grass has made a fair start, and it is taken off in the fall soon enough to leave a suitable aftergrowth.

Most woodlots are badly in need of a thorough culling out of the overripe, unsound, crooked, and dead trees, since this class of timber decreases in value from year to year. It occupies growing space but yields no return. It has about
the same relative value to the farmer as a cow that eats a thirty-cent ration and yields a fifteen-cent product. A woodlot full of overmature trees might be likened to a field of clover which had been left uncut too long, so that the leaves had dried on the stalks and trees should be thinned so that each tree has a reasonable growing space in which to develop normally. The same principle is seen in the growing of many field crops. For example, it is a matter of the first importance in the growing of sugar beets to thin them out. In the su-

had begun to drop on the ground. The longer such a field of clover is left uncut, the smaller and poorer the yield will become. The woodlot containing overripe and dead trees is thus in every respect comparable, and the longer the harvesting of the mature trees is deferred, the smaller and poorer becomes the yield of merchantable timber.

The thinning of the woodlot should not stop with the removal of unsound specimens. Even young garlic beet sections of Colorado and Kansas, gangs of Indians from Oklahoma and New Mexico are imported annually at great expense to do this work of thinning. The growers find that it pays. German foresters systematically thin their forests and allow each tree enough room to develop. Thinning in American woodlots is even more essential, because with our greater variety of species, the crowding under natural conditions is so severe...
that very often only a few of the trees attain merchantable proportions.

The degree of thinning is a matter of judgment depending somewhat upon the purpose to which the timber is to be put. Dense stands produce better telephone poles and ties than open stands. Similarly, broadcast flax produces better fibre than drilled flax, and drilled corn produces better ensilage than hilled corn.

Farmers in the northeastern United States are familiar with the use of nurse crops. Wheat and barley are the most desirable nurses because they do not shade the seeding too completely and do not exhaust the available moisture so quickly, for example, as oats. Foresters sometimes use a nurse crop in starting a new plantation. Nature uses them also in reforestation. Throughout most of the northern States of this country, aspen groves spring up after forest fires and, if not too dense, by their shelter afford ideal conditions for the growth of pine seedlings. Farmers in the eastern United States will have no occasion to use nurse trees, but in arid regions their use is an effective means of establishing plantations.

Every farm has a perpetual demand for wood of all kinds, including fuel, posts, poles, rails, and all sorts of repair material. It is much cheaper to grow such material than it is to buy it. Of course it is not profitable to grow timber on land worth one hundred dollars an acre, but most farms have some acres on which it is profitable to grow timber. Furthermore, the woodlot provides an opportunity for profitable winter labor, and labor of a kind which does not require a large outlay of capital for equipment.

The fact that farmers are beginning to realize the great and ever-growing value of their woodlots, and are therefore beginning to improve them, and the fact that the state is going one better and aiding in reforestation by distributing trees at cost, are important and hopeful features of this phase of farm improvement.
Growing Vegetables in Greenhouses

BY H. W. SCHNECK
Instructor in Vegetable Gardening, New York State College of Agriculture at Cornell University

No branch of horticulture is more exacting than that of vegetable forcing, or growing vegetables in greenhouses. There are many things on which a man must have definite knowledge before he can be successful in growing vegetables under glass, and this knowledge can be gained only by experience. For this reason, it is advisable for men contemplating vegetable growing to get at least one season of practical experience in a good commercial greenhouse.

In growing vegetables in greenhouses all conditions are under the control of the grower. Poor management is the only excuse for failure in this branch of horticulture. There is no form of intensive agriculture which requires more skill, patience, careful attention to details, than does vegetable forcing. On the other hand, there are few lines of work which afford more pleasure to the person who likes plants, or which bring better returns for labor expended.

LOCATION FOR GREENHOUSE

The factor of proper location for the greenhouse is one of the most important to be considered. The first point to take into consideration in respect to location is water supply. Without an abundant and reliable water supply, a greenhouse man cannot succeed. The natural drainage around a greenhouse should be good, in order to avoid a soggy soil, in which plants cannot do well. The greenhouse should be built in such a location that it will secure the maximum amount of sunlight.

A greenhouse should never be built where it will be shaded by trees and buildings. If possible, it should be on a southern exposure protected from the north winds. It is well to have it near the dwelling house, as a matter of convenience in caring for the plants and in heating. In many cases a small greenhouse can be heated by the same boiler that heats the dwelling house.

SOIL

A sandy type of soil is to be preferred for greenhouse work, as such soil is easy to handle and takes fertilizers and water well. The soil should neither bake nor puddle and the surface layers should dry out quickly.

FERTILIZATION

Barnyard manure, spaded into the soil two or three times a year, is the best fertilizer. The manure should be well rotted when applied. Shaving manure should never be used, as it is detrimental to rootlets and impairs the normal growth and development of plants.

CROPS

There are two classes of vegetable crops grown in greenhouses, classed according to temperature
requirements. These two classes are “cool crops,” and “warm crops.” “Cool crops,” such as lettuce, radishes, parsley, rhubarb, and Swiss chard, do best at a night temperature of 45 to 65 degrees and a day temperature of 55 to 65 degrees. “Warm crops,” such promise in the college greenhouses is Swiss chard. The most important factor to be remembered in selecting a crop is the time required to mature it, together with the value of the crop unit of area covered.

Most greenhouse men practice as tomatoes and cucumbers, do best at a night temperature of 65 to 75 degrees and a day temperature of 55 to 65 degrees.

Up to the present time, lettuce, cucumbers, tomatoes, and radishes are the only four vegetables that have been grown to any extent in greenhouses. There is no reason why many other crops should not be grown extensively. One of these crops is cauliflower. Another crop that has given great what is known as the “warm cool” system of cropping. “Warm crops” are grown in spring and fall, and “cool crops” the balance of the season. In this way, advantage is taken of climatic conditions, “warm crops” being grown when the outdoor climate is relatively warm, and “cool crops” in mid-winter when more heat is required to keep the houses warm.

LETTUCE

Lettuce, which is more widely grown in greenhouses than any
other crop, can be grown under the widest range of conditions. It does fairly well in mid-winter during dark, gloomy weather.

morning on sunshiny days so that the foliage will dry off well before night. In this way much trouble from disease will be avoided. Let-

"The Secret of Success With Fall Tomatoes is to Get Them Started Early."

The usual practice of starting lettuce seedlings is to sow the seed in rows about two inches apart, and twelve to fifteen seeds to an inch, in a small box. Ten days to two weeks later the seedlings are transplanted to another plot, being spaced from one and one-half to two inches apart each way, depending on the length of time it is desired to keep them in the beds. They will occupy these plots for three or four weeks, when they are set in permanent beds, where they are spaced six or eight inches each way, depending on the type of the lettuce grown. In transplanting the lettuce for the last time, a cloudy day should be selected so that the plants will not wilt. The plants should be watered in the

The length of time required to mature a crop of lettuce depends on two factors, namely, the season and the type of lettuce grown. With an abundance of sunlight it requires about one-half the time to mature lettuce that it requires in the dark months of mid-winter. There are two types of lettuce grown in greenhouses, the "head type" and the "leaf type," or "bunching type." The latter is grown far more extensively than the former type and is not nearly so difficult to produce. The "leaf type" matures in about one-half the time required to mature the head type.
TOMATO

The tomato is third among the greenhouse vegetables in importance. It is grown chiefly in spring, although in late years many growers have had success with it in the fall.

The plants are started by sowing the seed in rows two inches apart and from ten to fifteen seeds to the inch, covering with finely sifted soil.

In two and a half weeks the seedlings should be transplanted to other plots, spacing them two inches apart. In three or four weeks they are again transplanted to three- or four-inch plots. It is very important to have strong, stocky tomato plants. They are secured by encouraging a slow, steady growth.

The secret of success with fall tomatoes is to get them started early, so that the plants are well established and the fruit is set before dark, gloomy weather sets in.

The seed should be sown about the 20th of June in order to get mature fruit for Thanksgiving.

As the blossoms open they must be artificially pollinated in order to set fruit. The common practice consists in shaking the vines two or three times a week. This should be done about noon, when the sun is shining brightly and when the house is perfectly dry and warm. During dark, gloomy weather it is best to pollinate each blossom by shaking the pollen from the blossom into a spoon and dipping each blossom into the pollen.

With tomatoes it is well to keep the foliage of the plants dry in order to avoid diseases. Therefore water should be supplied only to the soil around the plants.

There are two types of tomatoes grown in greenhouses, the English and the American type. The fruit of the English type is small and usually lacks quality, but the plants set fruit well in dark weather. The American type bears fruit of better quality.

CUCUMBERS

The cucumber is the second most important vegetable crop grown in the greenhouse. Cucumbers are usually grown only in the spring of the year. In starting the plant it is necessary to sow only a few seeds in a place, and not cover them very deep. The seed is sown in rows two inches apart. Just after the seedlings have broken through the soil, they should be transplanted into three-inch and later into five- or six-inch plots.

When the plants are six or seven

Cucumber Plant Ready for Bed, Showing Proper Root Development.
“It requires about nine months to produce a crop of cauliflower from seed.”

weeks old they should be placed in beds. The spacing varies from one by four feet to four by four feet, depending chiefly on the method of training that is to be followed.

The blossoms must be pollinated artificially by bees. A hive of bees should be placed in or near the greenhouse when the plants are in bloom.

There are three varieties of cucumbers: the English, the American, and the cross between these two types. The English type is not grown to any extent in this country.

CAULIFLOWER

No vegetable makes a handsomer appearance in the greenhouse than does cauliflower. Only a few men have attempted to grow it, but these few have been very successful. The secret of success with this crop lies in avoiding any check to the plant’s growth. It requires about five months to produce a crop of cauliflower from seed.

SWISS CHARD

Swiss chard is a new vegetable in the greenhouse which has given great promise of success in the college houses. It is started in the same way as parsley. The roots of plants which have grown in the open during the summer, may be dug up and placed ten or twelve inches apart in the greenhouse bed. It can be harvested throughout the winter by keeping the leaves picked off.

RADISH

The radish is the quickest growing crop that can be produced in the greenhouse. In spring or fall, a crop can be matured in four or five weeks. Before sowing radish seed it is advisable to sift out all the seed less than one-twentieth inch in diameter. It has been found that large seeds give more mature and better shaped roots, than do small seeds.

The seed should be sown about one-half inch deep in rows in the beds. In spring and fall the rows can be closer together than in mid-
winter when the plants suffer from lack of light. A good spacing for fall and spring planting is two inches between rows and two inches between plants. In mid-winter it is best to space the rows three or four inches apart.

Great care must be taken in watering when the plants are small. It is best to keep the soil dry while seeds are germinating, thus avoiding the growth of long spindling roots. As the radishes near maturity they may be watered heavily.

“The radish is the quickest growing crop that can be produced in the greenhouse.”

The Conference of High School Teachers in Agriculture

BY A. K. GETMAN

Assistant in Agricultural Education, The University of the State of New York

The annual meeting of the New York State high school teachers of Agriculture was held at the New York State College of Agriculture, July 20-23. The conference was called by the Specialist from the Education Department as a result of a unanimous vote expressing the wish of the teachers of Agriculture at the 1914 conference to hold this meeting at the College during the month of July. The teachers were officially notified concerning the date and the importance of the conference, and all but two teachers who will teach during 1915-16 were present. There were also present the Specialist and the Assistant in Agricultural Education from the State Education Department, representatives of the college staff interested in high school teaching, teachers from other States, and men preparing to teach.
At a business meeting of the 1914 conference, provision was made for the appointment of committees which would confer during the year on the courses of study in high school Agriculture and report at this meeting. Some weeks before the conference the outlines were mimeographed by the Department of Rural Education and a complete set was placed in the hands of each teacher. The reports of the committees and the discussion of the outlines furnished the basis of the program.

A brief explanation of the new plan of courses will be necessary to an understanding of the program. The courses prior to September, 1915, were individual units, occupying separate places in the schedule and receiving separate counts. The new plan provides for combining these units to form first, second, third, and fourth year Agriculture. Poultry Husbandry and Farm Mechanics constitute first year Agriculture; Soils and Fertilizers, and Farm Crops, second year Agriculture; Fruit Growing, Animal Husbandry, and Dairy-
ing, third year Agriculture; and Farm Management and Farm Machinery, fourth year Agriculture.

"The plan calls for a double period each day for Agriculture and is based on the assumption that a home project is a part of the work for each of the first three years; credit for the work of the year is to be given only after the completion of the project. Regents credit of 7½ counts is given for each year's work in Agriculture. First and second year Agriculture are prerequisite to third and fourth year Agriculture."

The conference was called to order by Specialist L. S. Hawkins, after which registration slips were filled out. The chairman of each of the committees rendered a general report calling attention to special features of the outline and to the methods employed in arriving at the final results. The exception was that Professor Fippin reported for Mr. Parker.

The results of the reports of the committees and the discussions will be found in bulletin 597 of the University of the State of New York. This bulletin is the first of a series published jointly by the Division of Agriculture and Industrial Education of the University of the State of New York and the Department of Rural Education of the New York State College of Agriculture at Cornell University.

The entire morning session on Wednesday was devoted to the address of Dr. Rufus W. Stimson, Special Agent for Agricultural Education, Massachusetts State Board of Education. Dr. Stimson, in his stereopticon lecture, spoke of some of the problems of agricultural instruction in Massachusetts. He compared the two types of high school education and symbolized them by the capital C. and V. The C. represented the college preparatory, classical and culture training, while the V. represented vocational training. The latter has much to do with culture and gives direct training for a particular calling. A small v. within a capital C. represented a general course, the plan of study of which depends on what the boy wants to do when he gets out. A small c. with a capital V. represented a type of education strictly vocational, at the heart of which is the culture work. He emphasized the need of both types of training in a state's system. Other slides presented the organization of the agricultural high school and showed numerous views of buildings, classrooms and the boy's home projects. The great point of difference between this and the New York plan is that the boy begins with his home project and proceeds into a development of the subject, while in New York the study of the subject leads to the establishment of principles which are practically applied in the home project.

The addresses of Specialist Hawkins and Professor Works were postponed until Thursday morning. Mr. Hawkins said, in part, that the teachers are responsible to the people of the state, and that the
vital part of the work is to show them real definite results. We cannot consider individuals as standards and be guided by their successes or failures, but as a body we must stand or fall together. He mentioned the policy of the Education Department to bring all matters of change before the teachers, whom the change affects. He then presented a plan of reports that would be instituted in September, 1915. The Department of Education is to furnish blank forms on which such reports are to be made, monthly. The report consists of a statement of what was studied, the method of procedure, and the reference in each lesson. These reports are to be filed with the Department of Rural Education at Ithaca, there to be classified and tabulated, and ultimately the results are to be returned to the teachers and used as a basis for further details in outlining the course of study.

Professor G. A. Works gave many

Members of the Conference Gathered on the Campus.
helpful and timely suggestions concerning home projects, extension work, and school management. He said that the home projects are only a means to an end, and that they must be more carefully planned. Each project and each projector presents peculiar problems which can only be solved by giving special study to each individual case. The community is the chief laboratory and the school laboratory is merely auxiliary, and not the reverse as many are making them. The teacher should realize that extension should be a natural development of the school work and that such work is important, but that the first duty is to the school. The thought was expressed that the teachers should be more energetic in gathering laboratory material. In many instances the chief reason for the refusal of the Board of Education or the Principal to purchase equipment is the lack of definiteness on the part of the teacher as to what he wants, how much it costs, and where it can be procured. More care should be exercised in the collection and arrangement of bulletins. Select the best publications and then arrange and index them in such a way that they are easily accessible.

The Thursday evening meeting with the Bailey Club was enjoyed by many. Several of the teachers gave their experiences in dealing with special problems.

The eight o'clock section of the class in Rural Education of the Summer School was given over to work relative to the conference. On Monday and Tuesday mornings, Mr. Hawkins addressed the class and many of the teachers. On Wednesday, Thursday, and Friday, fifteen-minute talks were given by several of the teachers. The topics chosen gave those present some idea of what has been done along various lines in the schools represented.

Three of the afternoons were devoted to a discussion of account sheets for the home project work. Suggestions and criticisms were received on proposed sheets. These will all be carefully considered, and it is planned to have the forms printed for use for the coming year's projects.

Resolutions of thanks were adopted and tendered to the Department of Rural Education for assistance in the arrangement and preparation of the outlines of courses.

The average attendance at the conference was between 75 and 80.
The Man on the Land on the Other Side of the World*

BY BEVERLY T. GALLOWAY

Dean, New York State College of Agriculture at Cornell University

II. THE CROPS OF JAPAN

VER since I can remember I have associated Japan and China with rice and rats. As a child, I recall with what mingled feelings of wonder and curiosity I studied certain pictures in our old geography showing an Oriental engaged in dropping a large-sized rat into a boiling pot which, according to the inscription, contained rice.

While rice is the great crop of Japan, one does not fully appreciate this in traveling through the country. From the impress made on one's mind, I should be led to call Japan the land of beans. Everywhere one turns there are beans. They may not all be beans in the strict botanical sense, but they are of the bean family and it is not likely that any living man has ever undertaken, or ever will undertake, to catalogue them. They seem to be neighborhood and community strains, the result possibly of long local selection and the lack of any means of a general interchange of seed. This localization of strains is common in many old countries, especially among primitive people, and some day, should be made the subject of study. The strains may have fixed characters that would make them of value in other regions.

The soy beans, of which there are many varieties, types, and strains, play a useful part in Japanese cooking. They are found everywhere, and one of the common sights in the country lanes is the Japanese husbandman returning home laden with his few crude tools and a bunch of dry bean plants from which are harvested the beans themselves. The surplus seed is used in the manufacture of soy, which every Japanese housewife finds indispensable in cooking. A kind of cheese and curd are also made of the bean, all being added to soups, rice, and fish. Certain kinds of red beans are used in combination with rice flour and sugar in making confectionery, and there are also many types of horse beans used as human food in both the green and the dried state. That the Japanese farmers long since

* This is the second of a series of articles on farming in foreign lands. The first article appeared in the October number of the Countryman.—Ed.
learned the value of the bean as a human food and as a soil improver is evidenced by the almost universal way in which it is used, and by the manner in which as a crop it is grown after and between other crops in such a way as to insure full opportunity for gathering and storing nitrogen in the soil.

The great staple crop and the basic food of the country is rice, and the genius of the husbandman is devoted to its production and use. The average consumption of rice in Japan is nearly a pound a day for every man, woman, and child in the empire. Notwithstanding the fact that this crop has been grown for ages on practically the same land, the average yield is nearly thirty-five bushels to the acre. The principal crop is grown by means of water flooding, hence is known as water rice. There is a large production, however, of upland rice, but the yield of that is not so great, seldom going over twenty bushels to the acre. Almost one-sixteenth of all the land in Japan is devoted to rice, and nearly one-half of all the land cultivated is planted to the variety of this crop requiring water. Here are to be found some of the most striking examples of the far-reaching and potential powers of water.

America cannot learn much of value from the Orient in the matter of the conservation and use of human labor, but she can learn a great deal and profit immeasurably by a study of what has been accomplished in the conservation of all the material resources, to the end of making agriculture permanent, self-supporting, and profitable. The Orientals have achieved a wonderful system of conservation by virtue of thousands of years of heartbreaking and bitter experiences. Famines and floods, pestilence and starvation, have stalked the land
for centuries, but out of it all has come what approximates a permanent agriculture, capable of meeting conditions and supplying needs which this country could not face for a single year. The question these observations suggest is whether America is to gain her position as a recognized agent in maintaining a permanent agriculture through the same bitter experiences as those of the Old World, or is it to be accomplished through the blessing of universal education, stimulating and broadening the powers of all our people. We believe it will come as a result of the last-named forces intelligently directed.

So far we have made but a feeble start in the conservation of our water resources. Practically nothing has been done in humid sections. Professor King, in his valuable book on "Farmers of Forty Centuries," very truly says that sooner or later we must develop a national policy which shall more carefully conserve our water resources, utilizing them not only for power and transportation, but primarily for the maintenance of soil fertility and greater crop production through supplemental irrigation in humid regions.

The manual labor put upon the little rice fields or paddies is something that appalls the Occidental accustomed to the use of horse power and machinery. The leveling of the ground so as to insure uniform distribution of the water, the construction of the rims or the dykes, the opening and care of canals, and the planting of the rice, involve an almost infinite amount of hand labor. Practically all of the rice seed is sown in nursery beds, and from them the rice is transplanted by hand to the larger fields or paddies. These range in

![Image: WATER LIFTING DEVICE FOR RICE FIELDS](Courtesy of David G. Fairchild)
size from those not larger than a kitchen floor to those one-fourth or one-half acre in extent. With the paddies previously prepared by dyking and flooding, and the soil the consistency of soft mortar, planting or transplanting from the nursery bed begins. Some realization of the work involved is gained when it is known that the little plants are set about a foot apart
grow and to subsist on cheaper substitutes such as barley, millet, and the various varieties of the grain sorghums.

A crop rapidly coming into favor is the sweet potato. The large amount of nutritious food that can be secured from small areas by means of the intensive cultivation of this crop makes it peculiarly valuable. In many of the towns and country villages, hot roasted
each way, and that there are over ten thousand square miles to be planted.

Of other grains Japanese farmers grow comparatively limited quantities. Barley, wheat, buckwheat, and millet are the principal crops. Barley is coming into rather extensive use on account of its cheapness. Owing to heavy taxes and the increased cost of living, Japanese farmers in some sections are forced to sell the rice they

sweet potatoes are sold by pushcart men and women, much as peanuts are sold in this country.

There is no extensive fruit and vegetable culture in Japan such as we have here. Vegetables and fruit are mainly for the wealthy, and there are not many such in Japan. Nearly every household, however, has its little vegetable patch, where giant radishes, eggplant, beans, peas, melons of many kinds, and various esculents resem-
bling our cultivated caladiums, are grown.

The fruits of Japan are a disappointment. Many kinds are grown, but as a rule they are not of high quality. Horticulturally many of these fruits are of interest, but as for their organized production there is nothing to compare with the business in America. The persimmon, of which there are many kinds, is to the Japanese what the apple is to us. It is grown nearly everywhere and eaten by nearly everybody. I was prejudiced in favor of this fruit
before going to Japan, as I had heard much of it and some of my good and enthusiastic friends had much extolled it. I think if I had to choose between the average Japanese persimmon and a good turnip, I should take the turnip every time.

The total value of all crops produced in Japan is, of course, considerably less than that for a number of the older countries. The latest figures would indicate that the money value of the products of the soil in Japan is about two billion yen, equal to approximately one billion dollars, or about one-sixth of our values according to the last census. Of the one billion dollars in Japanese products, rice furnishes fully one-half, the remainder being in barley and wheat, vegetables and fruits, beans, sweet potatoes, and potatoes, in about the order named.
Some Economic Considerations on Refrigeration

BY J. R. TURNER
Assistant Professor of Economics Cornell University

Refrigeration is an essential part of production. The gratification of desires is the aim of all production—production is the creation of the means of gratifying desires. Nowadays there are many stages in production. To say that the baker produces bread is short of truth; baking is but a stage in production. The farmer who grows the grain, the thrasher, the warehouseman, the transporter, the miller and the middleman represent different and necessary stages in producing bread. Marketing is as productive as manufacturing. The New York consumer is as dependent on the marketing as on the grower for his Western beef, California fruits or Brazilian coffee. Many cooperative agencies are necessary in order that the consumer may possess his goods in the right form and at the proper time and place. Economists have been concerned primarily with form production. Their illustrations are drawn from the division of labor, the organization of industry, business management and manufacturing efficiency. They have neglected community efficiency in marketing. Marketing is an alluring field for research and should be given vigorous study. Our marketing agencies are inadequate, chaotic, and wasteful — great social saving would be effected by an efficient system of marketing. Research into the various phases of marketing must precede system. An important phase in the marketing of food products is the disposition of the surplus.

A surplus would not exist should food products ripen week by week through the year and be regularly and proportionately distributed among the widely scattered consumers. But products mature in their season and our distribution facilities are inadequate. While apples on the city fruit stands are five cents each, others as good are rotting on the ground not fifty miles distant. In October our markets are glutted with certain fruits that are not to be had in December. The writer paid fifteen cents for a melon in Ithaca and on the next day he saw a hamper of superior melons sold in the Washington Central Market for twenty-five cents. At different places at the same time and at different times in the same place there are variations from the glut with prices ruinously low to extreme scarcity with prices ruinously high. Jobbers have different means of moving products into the field of consumption, but the most important problem is to preserve the good through time until it reaches the consumer. In periods of plen-
ty reserves must be stored for periods of scarcity.

The gain to society from a proper distribution of food products through time would be immeasurable. Commodities can render little gratification and can afford almost no profit to producers when the market is supplied at one time to the point of satiety and at another time not at all. By means of refrigeration the surplus is stored and all but a normal supply is kept off the market. As need arises this surplus flows into the market place, thus equalizing the level of supply and prices through time. The total of gratifications is greatest when desires are supplied normally through time as they arise. Not only is utility or want gratifying power increased, but also prices are equalized.

Where refrigeration is properly utilized the surplus is stored in the seasons of fat, a normal supply remains in the market places and prices hold firm. In the seasons of lean this surplus is thrown on the market as demanded and prices continue firm. The law of supply and demand when regulated by a wise use of refrigeration insures the stability of prices. In 1911 a committee appointed by the French government found that varying prices and the high cost of living had a primary cause in the want of cold storage facilities. The Massachusetts report of 1912 on cold storage made a study of the prices of food products over a period of 20 years. A conclusion of this report is that refrigeration lessens price fluctuations and that it secures a lower average price through the year. There are those who believe that cold storage raises prices. Dr. Harvey W. Wiley says that cold storage must of necessity increase the prices of foods to the consumer, because the consumer must not only pay for the foods but also pay all storage charges. Mr. Frank Tilford of the firm of Park & Tilford of New York City, and other men of prominence hold the same opinion. Warehouses, banks, cellars, granaries, and canneries would, by this reasoning, be institutions that augment prices. The opinion that the price of products is increased because we take means to preserve them seems not well founded. It is the thought of those who hold the above opinion that the costs of refrigeration are paid in the form of a higher price for goods. They ignore the law of supply and demand, disregard the wanton destruction of food occasioned by lack of refrigeration with the consequent scarcity and high value. They do not see that to extend the period of use encourages larger production and thereby reduces prices.

In 1911 the city of New York condemned in its markets 72,785 pounds of eggs; 35,755 pounds of fish and 200,000 pounds of poultry. Refrigeration facilities were inadequate. The pure food inspectors of Massachusetts in 1912 condemned but 300 pounds out of a total of 43,000,000 pounds of per-
New Publications of the College

Since the second term of College closed last June, there have been issued seven publications from the Cornell Experiment Station, and an equal number of publications from the College designed for the use of farmers and farm women of the state. These fourteen publications do not include a number of smaller circulars, such as announcements of various sorts. One of these announcements, "Courses in Forestry at Cornell," is probably the most attractive circular, typographically, that the University has issued.

Counting only the fourteen issues in the regular series of publications,—bulletins, circulars, reading course lessons, rural school leaflets,—there is a very respectable output, from both the editorial and the publisher's point of view, in an average of nearly five a month, or more than one a week, for what most of the University considers the vacation period. They aggregate 950 printed pages, or an average of about 68 pages for each.

IMPROVING THE OUTPUT

Mere quantity does not mean much, however. In the printed word it is quality that counts. If there has been any marked change in quality, it has come mainly in the improved appearance and greater attractiveness of the recent publications, which are only forerunners of further steps in the same direction. The latest issue of the Rural School Leaflet, for example, has a new and more pleasing dress. Memoir 6, Fusaria of Potatoes, intended only for plant pathologists, is marked by notably good color plates.

In addition to the fourteen publications which are actually off the press, there are seventeen others in proof or manuscript, some of them to appear soon. In fact, scarcely a day passes that boxes of publications are not received from the state printers at Albany, for distribution from the College.

This wealth of information is readily available to the students of the College and to its graduates, who may have it free of cost; indeed, it goes free to all in the Empire State who may have use for it, and is available to others. Heretofore its distribution was largely limited to New York State, but a plan is being worked out by which residents of other states may procure the Cornell farm publications on payment of a small sum to defray the cost of mailing. The agricultural publications are usually sent free to Cornell graduates, whether in or out of the state.

A VARIETY OF TOPICS

In the attached lists of publications the aim has been to give a brief synopsis of the contents of each, and, in a slight degree, some judgment as to the publication's use and value.

(Continued on page 136)
Some Opportunities for Home Economics Graduates

BY HELEN CANON
Editor, Department of Home Economics, New York State College of Agriculture at Cornell University

Dr. Langworthy, Chief of the Office of Home Economics of the U. S. Department of Agriculture, in addressing a group of students not long ago, made the statement that home economics leads one wherever she wishes to follow it. The vast number of possible lines of study included under the head of home economics is suggested by the following definition, which was formulated by a committee of the American Home Economics Association: "Home Economics, as a distinctive subject of instruction, is the study of the economic, sanitary, and esthetic aspects of food, clothing, and shelter as connected with their selection, preparation, and use by the family in the home or by other groups of people." The earlier in her college course that a student can decide on the particular line along which she wishes to follow home economics, the more wisely will she be able to choose her courses and the greater will be her gain in the end.

Teaching has been the line of least resistance too long, perhaps, for the good of the profession. Many a college graduate has discovered after teaching for two or three years that her best work cannot be done in this field. The time to study her ability and inclination is early in her college course, when, if teaching is decided on, courses in education may be elected along with courses in the subject matter of home economics, and a real interest thus developed in the science and the art of teaching.

Among the familiar positions to which a study of home economics leads, there are, besides teaching, the various phases of institution management, such as dietic work in hospitals and similar institutions; catering; housekeeping in dormitories and hotels; management of
Cafeterias, college dining-rooms, tea rooms, and clubs.

As home economics grows in breadth and intensity, many positions other than those now commonly known will be developed. Until such positions are sufficiently plentiful to create a demand for special training in the college class room, the student will probably be required to serve an apprenticeship for a year or so at a lower salary than she would be able to command if she should choose one of the more familiar positions for which training is offered. If she believes in herself and in the possibilities of her new position, she is likely to be far happier in her work, as well as a more efficient worker, than if she had tried to adjust herself to a position for which she was not suited. The newer positions, in some of which graduates are already achieving success, will become more plentiful as home economics work becomes better organized and its possibilities more widely recognized.

It has been found that extension work in home economics, as in other subjects, must be followed by the printed page, which serves to fix facts in mind and which has the advantage of being on hand for reference after the demonstrator is out of reach. Opportunities in this direction await the student who is interested in journalism.

A position that offers many of the advantages of journalistic work as far as keeping in touch with the advance of the subject is concerned, is that of librarian in a home economics library. A person of good judgment who has been fortunate enough to be able to combine library training with a study of home economics subject matter, would be a valuable addition to a home economics department.

On the more practical side there is the position of laundry manager that has already been successfully undertaken by certain trained persons. A study of such subjects as physics, chemistry, bacteriology, economics, textiles, and laundry methods, in addition to an interest in the betterment of social conditions, opens up a large and interesting field, which is generally considered commonplace.

A study of textiles may cause the alert student to ask who selects the vast amount of materials that are displayed in retail stores. While apprenticeship for such a position may be long, an inquiry into the work of professional buyers reveals many inducements to a young woman who is familiar with foreign languages, and who likes travel and the variety that such a position may bring.

These are only a few of the positions that are open to Home Economics graduates. Whether future graduates in Home Economics become luke-warm and resigned workers or ardent and contented workers, depends largely on their initiative, their interest in the subject, and the intensity of exertion that they exhibit in attempting to place themselves under conditions that will make their work of the greatest service to humanity.
November is famous the country over for that time-honored holiday of Thanksgiving. To many of us it means turkey with cranberry sauce, a football game, a trip home, and at least one day cessation of our University activities. But Thanksgiving Day is set aside for a far different purpose. As the name indicates, it is a day of general thanksgiving. It is a time when we are expected to show our gratitude for all benefits we have received. One of the greatest things that the student of this college has to be thankful for is the splendid facilities offered here for him to learn his profession. In the college world and particularly among the state agricultural colleges of this vast country Cornell stands preeminent. This means that right here at this college we have opportunities for learning such as are offered nowhere else in the United States. During the past years, improvement of the curriculum for the undergraduates benefit has taken great strides so that it is now remarkably complete.

Therefore let us not forget when the day comes, the exceptional opportunities we have here at Cornell and be thankful that we are enrolled in this great University.

The Growth of Agricultural Institutions as Shown by Statistics

At the student assembly of the College of Agriculture held October 14, Dean Galloway gave some interesting data regarding the development of agricultural education in this country. While this growth has been phenomenal in many cases, the fact remains that only a small percentage of the rural population of this country has had a college education. The Dean made the following statements:
"The latest data regarding the number of land grant colleges, professors, instructors and assistants therein show that there are now 68 of these institutions, of which 65 maintain courses of instruction in agriculture. In 23 states the agricultural colleges are connected with the state universities. In 16 states and territories separate institutions having courses in agriculture are maintained for the colored race. There are now engaged in research work, teaching and extension activities in the experiment stations and land grant colleges 7,651 specialists. There are 55,129 students enrolled in colleges of agriculture and mechanic arts. The total number of all students in these institutions is 105,803.

"In January of this year some data were collected showing the number of students, professors, instructors and assistants, and state appropriations for maintenance in seven of our large state institutions. Wisconsin had an enrollment of 1,724 students with 97 professors, instructors and assistants; $339,000 was being expended for the support of the work. Illinois had an enrollment of 1,097 students, with 88 professors, instructors and assistants, and the state was expending $222,740. Minnesota had an enrollment of 1,519 students; the number of professors, instructors and assistants was 115, and the funds expended $341,249. California listed 1,004 students, 78 professors, instructors and assistants, and was expending $350,000. Ohio listed 1,265 students, 74 professors, instructors and assistants, and was spending $378,000. Missouri enrolled 995 students, had engaged in the work 75 professors, instructors and assistants and was spending $150,000. New York State had enrolled 2,557 students, the number of professors, instructors and assistants was 142, and the expenditure for maintenance, $520,000.

"These seven institutions, therefore, had enrolled 10,161 students, requiring the service of 669 professors, instructors and assistants, and were expending $2,301,000.

"The total enrollment of students in the New York State College of Agriculture for the year 1914-1915 was 2,830. From the present outlook the number of students for the year 1915-16 will probably reach 3,000. This includes the regular four-year students, special students, graduate students, and short course students. The total enrollment to date for regular four-year students is 1,585, against 1,530 of last year. 1,481 of these students are in the regular four-year course, and 104 are special students.

"Much of the growth in the land grant colleges has been during the last eight or nine years. Since 1910 the growth has been quite rapid. This is shown by some figures indicating the growth of the work in agriculture in some of the larger states and in the Federal
government. From 1910 to 1914 increases in appropriations for the work of the federal government was 53 per cent. The increase of appropriations for agricultural work in California was 99 per cent; for Ohio 127 per cent; for Iowa 78 per cent; for Kansas 178 per cent, and for New York 181 per cent. The funds at the disposal of the national government for agricultural work increased from practically thirteen million in 1910 to twenty million in 1914.

"Notwithstanding this very encouraging evidence as to the growth the interest in agriculture, there is still much to be done. With a total enrollment of only 47,000 in agriculture in all the colleges, out of a rural population of nearly fifty million, there is seen that only a very small part of the population is as yet able to secure education along agricultural lines. There are approximately six and a half million farms in this country, and even with our present growth in agricultural educational work, it will be many years before even a comparatively small proportion of the farms can be represented in the broader questions of agricultural vocational learning."

With the rapid development of the agricultural press during the past years and the spread of information to the farmers of this country, have come the various Farm Bureau News bulletins. This new field in agricultural journalism has been taken up by county agents to the extent that we now have 19 such publications in New York State alone. These leaflets serve a real need in disseminating local knowledge in a thorough, practical way.

In the course of the past few weeks we have heard much of the difficulty of students in finding courses which they wanted. Is it not more of a question of what they don't want to take, rather than of what they can't find? It is human nature to want to take those courses which seem on the surface to be the most practical with the ultimate view that they will bring in a real monetary gain. But after we get out of college and are paddling our own canoe, what do we remember? Surely it is not the intricate theories advanced by some scientist. It is hard to say just what we are likely to remember, in fact, it is not absolutely necessary that we remember anything. It is the training in those fundamental courses that will count, for such training enables us after graduation to understand certain phenomena or reason out why certain things happen as they do. Students, then, who are looking for so-called practical courses will do well to remember the next time they arrange their schedule, that after all, it is not so much what practical knowledge they will absorb, but the training in fundamental sciences that will bring the ultimate results.
The Department of Soil Technology has recently received a shipment of ten tons of Ontario loam soil from Monroe County for the purpose of determining its fertilizer needs. This soil was carefully removed in layers of one foot each, to the depth of three feet, and each layer has been kept separate. On arrival at the College the soil was placed in three-foot cylinders, each layer being in the identical position that it occupied in the ground. A series of fertilizers were then added. At the present time plants are growing in the soil, but no results are as yet apparent.

Fifteen hundred pounds of butter and two hundred pounds of cheddar cheese are being made daily by the Commercial Dairy Department of the University. The Department is also placing on the market several kinds of soft cheeses and ice creams. The daily collections from the various receiving stations and from the college herd amount to twenty thousand pounds of milk.

Growth in the business of this Department has made necessary the purchase of a new two-ton truck to collect cream from the different receiving stations around Ithaca. The operation of this truck has reduced the cost of hauling one-quarter cent on each pound of butter. The creamery has lately installed a new ice cream mixer, a Wizzard pasteurizer and a recording thermometer.

In addition to the regular students who have their laboratory work in the creamery, the Department is employing twenty men registered in the Winter Courses in Dairy Industry. The fall registration in this Department shows an increase of fifty men over last year.

The dedication and formal opening of Schoellkopf Field and Memorial Training House took place on Saturday, October 9, preceding the Williams football game. The trustees, faculty, and five thousand students marched from Goldwin Smith Hall
to the stadium. After arrival there, George W. Bacon, '92, chairman of the Alumni Field Committee, was the first speaker, talking for the men who worked to make this giant athletic plant possible. Following him, Paul Schollkopf, '06, formally presented the keys of the field and training house to President J. G. Schurman, who delivered the address of acceptance. The singing of "America" by the entire assemblage closed the ceremonies.

This event marks the successful culmination of ceaseless efforts on the part of Cornell Alumni to provide adequate facilities for Cornell teams.

As mentioned in the previous issue, the Home Economics Cafeteria was closed down at the end of the Summer School and a number of repairs and changes were made.

Improvements in the Home Economics Building

The service counter was changed from the east side to the northeast corner. The present entrance is the old exit, and the exit now being used is through the old dish-washing room, the remaining part of which is to be made into a salesroom. The transfer of the dish-washing room to its proper place back of the service counter is an important feature. Cafeteria income funds are being used for these interior improvements.

Additions are being made to the main dining-room at both the east and west ends. Sliding doors will take the place of the present partitions, making it possible to close off the additions from the main dining-room. These may be used for private dining-rooms, faculty dinners, and the like. There will be a basement in the east end addition, which will be used for the storage of vegetables, coal, etc. Space is being reserved in the east addition for a ventilating machine.

Construction of the new tool barn north of the Ag. Barns is now well under way and in all probability this new structure will be ready for occupancy the second week in November. It is being erected on a concrete foundation, with iron walls and metal roof so that it will be fireproof.

The east section of this barn will be a tool and farm implement storeroom, while the west end will be used for an auto and machine repair shop.

According to official notice, the campus in the immediate vicinity of Roberts Hall is now torn up for the last time. A portion of the main tunnels and underground mains for the heating system, costing $35,000, was completed on May 5. An additional appropriation for an equal amount was made, and this is the work which is now in progress.

When these improvements are completed, Bailey Hall, Home Economics, Caldwell Hall, and Roberts Hall will be connected with the
main heating plant, and the soil that has so many times been turned will at last rest in peace.

M. C. Burritt, State Leader, has made tentative announcement of the program for the Third Annual Farm Bureau Conference to be held November 8-13, in of some phase of their specialty. In the afternoon the Animal Husbandry Department will do like service. The remaining sessions will be devoted to group conferences, business meetings, and the discussion of projects for 1916.

Miscellaneous Notes
The second transcontinental tour of the Prize Winners of the High School Agricultural Clubs of California passed through Ithaca early in the morning of October 27. No stop was made here, since an effort was made to see more of rural New York than last year.

The party arrived in Buffalo on the afternoon of October 26, and were met by a representation from the Chamber of Commerce and by M. C. Burritt, State Leader, who took the party into the outlying farming sections and pointed out the features of agriculture in New York State.

Crocheron, '08, State Leader of California, writes that 35 boys took the trip last year. The route covers some nine thousand miles and

GOODBYE TO THE PLOUGH HORSE

Henry Ford announces that after more than thirty years of toil, he has perfected a motor tractor that will give the high cost of living its hardest blow yet.

“A tractor has been my ideal for many years,” said Mr. Ford. “I have worked at it constantly. It is now ready and it means much.”

The inventor asserts that the new farm implement, which will cost $200 or less, will reduce at least one-third the present cost of tilling the soil; will keep young men on the farms who will produce a greater amount of food; will give work to 25,000 men, and will mean a boom in lake shipping.

Mr. Ford plans to build 1,000,000 tractors and 4,000,000 engines yearly. He says that operations on the buildings for the manufacture of the new machine will start at once and he expects to employ about 20,000 men when operations begin.—Exchange.

Room 210 of the Forestry Building.

At the opening session, three authoritative speeches on “Farm Bureau Demonstrations” will be made. C. H. Goddard, who has charge of the national work, Professor Scoville, who has charge of the New York work, and Dean Galloway, will speak. In the afternoon, C. B. Smith, Chief of the Office of Extension, will tell of “Past Years Experience in Farm Bureau Management,” and the State Leader will apply this to New York conditions.

Following sessions will be less formal. Tuesday morning professors from the Department of Farm Crops will present a demonstration
takes in practically everything in America worth seeing.

Mr. James Findley, of Salisbury Mills, offers again this year, to students in the College, prizes of twenty, ten, and five dollars. These prizes are awarded for the best discussions of some phase of drainage improvement. Any regular, special, short course, or graduate student is eligible to compete. Those who contemplate entering the competition may obtain further details from Dr. Buckman, Professor Robb, or Professor Fippin.


Professor H. W. Riley of the Department of Rural Engineering has recently added to his equipment of harvesters, mowing machines, and spray rigs, a brand new Ford touring car. Just what has become of the famous two-cylinder Maxwell which Professor Riley knew better than any man knew his automobile is not made public, but it is stated unofficially that it died a natural death and is now in peaceful repose at a nearby junk yard.

With the view to becoming more intimately acquainted with the under graduates in his classes, Professor A. W. Gilbert, at the beginning of this term, circulated cards in his classes on which were placed data on the student who filled them out, including his University activities. In the course of the term he expects to have also on this card, the photograph of the student. Another department which is doing a similar work is the Poultry Department.

Preliminary plans for the erection of a Hall of Zoology and Entomology are being considered by the State Architect. The plans, based on the sketch-figures and recommendations of the College, Hall of Zoology and Entomology are being drawn for the purpose of making an estimate of the cost. The east end of the Quadrangle of the College of Agriculture has been suggested as a location for the building, but nothing definite has been decided in this regard. It is proposed that the hall should house General Biology, General Zoology, all Vertebrate Zoology, and all Entomology, economic, systematic, and ecologic; and Parasitology, Limnology, Aquiculture, Apiculture, and Ornithology.

With a view to developing the grounds of the College of Agriculture along broad educational lines, Dean Galloway has Committee on Educational Uses of Grounds appointed a Committee composed of Professors Adams, Davis, Montgomery, White, and Curtis, to act as an Advisory Committee on the Development and Educational Uses of the College Grounds.
The committee will endeavor to make the grounds typify the work of the College and serve as an inspiration to its students. While the Department of Landscape Art will continue its work on the broader question of design for the grounds as a whole, the committee will offer constructive suggestions and criticisms, which, when approved by the Dean, will be put into effect by the landscape gardener, William A. Frederick.

Twelve new appointments have been made within the course of the past few months to the instructing staff of the College of Agriculture. These appointments are as follows:

A. A. Allen has been made assistant professor of Economic Ornithology to work mainly through the extension office. He comes to the College of Agriculture from an instructorship Zoology in the College of Arts and Sciences.

Albert R. Bechtel, instructor in Botany, comes from the Pennsylvania State College. He is a graduate of the University of Pennsylvania, 1908, and received his master's degree in 1912. In 1912 he was in the field in connection with the Pennsylvania Blight Commission, and since that time has been instructor at the Pennsylvania State College.

J. Marshall Brannon, instructor in Botany, comes from the University of Wisconsin, where he has been a graduate student during the past year. He has had an instructorship in Biology at the University of North Dakota.

Wallace L. Chandler, instructor in Entomology, comes to Cornell from the University of California, where he was a graduate student during the past year. He received his bachelor's and his master's degree from the University of California, and has been employed by the Public Health Service in special work on diseases carried by insects.

W. T. M. Forbes, instructor in Entomology, received his doctor's degree at Clark University in 1910, having specialized in Lepidoptera. He was assistant in the department during a former term.

C. H. Guise has been appointed instructor in Forestry to carry on some of the courses which have been given by Professor Frank Moody, who left the college this summer to become a member of the Forest, Fish, and Game Commission of Wisconsin. Mr. Guise has recently finished his work for the master's degree in forestry at Cornell.

Edward Riley King, assistant professor of Bee Culture in the Department of Entomology, comes from Creola, Ohio, where he has been for two years Deputy State Inspector of the Ohio State Beekeepers' Association.

J. C. McCurdy, instructor in Farm Engineering, comes from the College of Civil Engineering at Cornell.

(Continued on page 148)
Professor of Poultry Husbandry at the University of Wisconsin, Madison, was assistant in the local poultry department during the six weeks summer course of 1915.

'06, B. S. A.—R. R. Slocum has been appointed to the research division of the U. S. Department of Agriculture at Washington, D. C.

'08, B. S.—Clarence Lounsberry of the Bureau of Soils, U. S. Department of Agriculture, is now engaged in making a soil survey of Van Buren County, Iowa.

'05, B. S. A.; '07, M. S. A.—Herbert R. Cox, after receiving his bachelor's degree returned to his home in Canton, Ohio, and engaged in the fruit business extensively. In the fall of 1907 he entered the employ of the U. S. Department of Agriculture in connection with the Weed and Tillage Investigations of the Bureau of Plant Industry. He served in this capacity until June of the present year, when he became associate editor of The Country Gentleman.

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of the poultry work at the Texas College of Agriculture has been promoted from the position of foreman of the poultry plant to assistant in the extension poultry work.

'11, Sp.—James G. Cochrane, jr., is managing a dairy and general farm at South Bayfield, Mass., a village 30 miles north of Boston.

'12, B. S.—G. M. Butler was married to Annette T. Stoddart of Jamaica on July 25. Butler's present address is Branchville.

'12, B. S.—David Elder is State Director of Farm Bureaus in Rhode Island.

'12, B. S.—Laurence Howard has established a large dairy in connection with his fruit farm at Kinderhook.

'12, Sp.—I. C. Reed is operating a fruit and general farm at Oakfield.

'12, Sp.—Paul Smith is now farming in partnership with his father at Newark Valley. A large herd of high record Holsteins is kept.

'12, B. S.—Mr. and Mrs. Snodgrass (Lillian Teller, '12, A. B.) announce the birth of a daughter, Evelyn Rose, on August 31. They are located in Fredonia, Pa., where Mr. Snodgrass is instructing in the Fredonia Vocational School.

'12, B. S. A.—C. G. Wooster is managing a fruit and dairy farm at Red Hook.

'12, B. S.—Margaret Ahern informs us that she is at present in charge of the nature study work in the Jefferson Building at Gary, Ind. She and her assistant are allowed to develop their work along whatever line they choose. Her work is with children from the first to the eight grades.

'12, B. S.—Mrs. Ada Strong, nee Ada Dunn, is with her husband on a large farm near Williamsburg, Va.

'12, B. S.—Myrtle Boice is nature study teacher in the Ethical Culture School of New York City.

'13, W. P. C.—C. G. Aamedt is now in the employ of the Pittsfield Poultry Farms Company, Pittsfield, Me.

'13, B. S.—C. W. Barker together with his brother Harry Barker is operating a general farm near Spencerport, growing as their principal crops, cabbage, potatoes, hay and fruit.

'13, W. P. C.—F. H. Cockell is now superintendent of the Experimental Division of the Amherst Poultry Department.

'13, B. S.—H. N. Kustchbach is at the present time farming on an 800-acre farm at Sherburne, Chenango County. In addition to keeping about 100 pure-bred Holsteins he raises as his principal crops, hay, corn, oats and barley.

'13, B. S.—O. M. Smith is located at Holly, where he is making a specialty of fruit growing.
'14, B. S.—Dudley Alleman is making a specialty of apples on his father's farm near McDougal.

'14, B. S.—S. S. Burge has been assisting in Farm Bureau work during the past summer in Otsego, Delaware, Chenango and Oneida Counties.

'14, B. S.—T. J. Conway, after having charge of the experimental poultry work at the Texas College of Agriculture, has been placed on the instructing staff in the Poultry Department of that college.

'14, B. S.—D. W. Dunn is Farm Instructor at the New Hampton Farms, where incorrigible boys, who have committed minor crimes, are sent in order to give them a different environment. The boys are taught the elements of farming with a view of making them useful members of society.

'14, B. S.—L. L. Hull is farming on his 180-acre farm at Spencer, in partnership with his father.

'14, B. S.—H. A. Leggett, an instructor in the State Agricultural School at Marlborough, Mass., has gone to the Ohio State University as instructor in the winter poultry courses. Leggett is known in New England as an expert in poultry judging.

'14, B. S.—Roy N. Harvey has resigned his position as instructor in the biology department at the Penn Yan Academy to take up his new duties at the Texas Experiment Station.

'14, B. S.—J. Lossing Buck resigned Sept. 1, from his position as Farm Instructor at the New Hampton Farms and has accepted an appointment to the Presbyterian Board of Missions as Agricultural Missionary at the Kiang-An Mission, Central China. He believes that this is an exceptional opportunity for work along agricultural lines in China. For the first year his work consists of investigating farming conditions in that part of China, and of determining the advisability of the Board's buying land for demonstration purposes. He will sail from San Francisco, November 6th, on the Nippon Meru. He expects to be in Ithaca before leaving this country.

'15, W. P. C.—W. C. Cash is employed at the Belmont Farm, Perrysburg, O.

'15, W. P. C.—W. E. Chlund is poultryman at the Maplewood Farm, Attica.

'15, B. S.—Frances D. Edwards is assistant matron in one of the cottages of the New York State Training School for Girls, at Hudson.

'14, B. S.—Katherine Mills was married last June to Dr. Hamilton of Delhi. During the past year Miss Mills has held an extension position in Erie County, where twenty, three-day domestic science schools were organized with a total attendance of 3230 persons.

(Continued on page 154)
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Some Economic Considerations on Refrigeration
(Continued from Page 116)

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Some Economic Considerations on Refrigeration
(Continued from Page 132)

refrigeration mutton killed in New Zealand is eaten fresh in London, market places are stocked from all parts of the world, and the stability of prices through nation-wide distribution is becoming an accomplished fact. Refrigeration cars put the California truck patch in touch with the New York consumer and thus tends to equalize land rents, living conditions, and commodity prices between the East and the West. "To cold storage largely, is attributable the fact that Florida's rural population increased from 1900 to 1910 three times as fast as the average increase of rural population in the United States." Refrigeration, long shipments, nation-wide distribution, and nation-wide stability of prices must go together.

The economies of large and distant shipments secure for each community the advantages of specialization. Specialization among growers of food products is impossible so long as the output of each section is dependent on the local supply and demand. Refrigeration will tend to further augment the advantages which comes to society from a geographic or territorial division of labor.

Refrigeration is a basic problem in the field of marketing. It preserves the surplus, lengthens the period of consumption, encourages a larger volume of production, and

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E. M. MERRILL

Some Economic Considerations on Refrigeration
(Continued from Page 154)
insures a greater variety of products at more reasonable prices throughout the year. It is productive in that it avoids premature decay of perishable products, it enables shipments at will and in large lots over long distances, it brings about specialization in community production, thus further extending the territorial division of labor. Other intermediary agencies between the producer and the consumer are becoming more and more dependent on refrigeration. We hear much about middlemen, cooperation, freight rates and service, and city markets but a proper disposition of the surplus through the aid of refrigeration is the starting point in the reforms of marketing.

NEW PUBLICATIONS OF THE COLLEGE

Experiment Station Publications Recently Issued
(Continued from Page 117)

Memoir 6. Fusaria of Potatoes, by C. D. Sherbakoff. The character and development of a potato disease; highly technical and of interest only to plant pathologists.

Memoir 7. Senile Changes in Leaves of Vitis vulpina L. and Certain Other Plants, by Harris M. Benedict. A discussion of the causes and effects of age changes in leaves, very technical in character but of deep significance as bearing on the whole question of senile mutations in all living organisms.

Memoir 8. A Bacterial Disease of (Continued on page 138)
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New Publications of the College

(Continued from Page 138)

Stone Fruits, by F. M. Rolfs. The description of a disease which attacks peaches and plums, and manifests itself in various forms on foliage, fruit, twigs, and branches.


Circular 29. Poultry Parasites: Some of the External Parasites that Infest Domestic Fowls, with Suggestions for Their Control, by Glenn W. Herrick. A brief popularization, of value to poultrymen everywhere, of the very complete descriptive bulletin by the same author. The bulletin from which it was derived (359) is of value mainly to economic entomologists studying the same subject.

Circular 30.—Methods of Making Some of the Soft Cheeses, by W. W. Fisk. Tells how to make the commoner soft cheeses, and is useful for the farm dairyman or the commercial creamery; plain instructions, concise but comprehensive.

Circular 31. Fall Spraying for Peach Leaf Curl, by Donald Reddick and L. A. Toan. A timely treatise for the orchardist.

Experiment Station Publications Soon to Appear

Bulletin 361. Home Grounds, by E. G. Davis and R. W. Curtis. Promises to be a classic in landscape art literature, especially in relation to small places. The first part enunciates principles, and the second part is an exhaustive guide to plant materials, their uses and qualities. Of interest to home owners though more fitted for landscape architects. A more brief and popular treatise on the same subject, now in press, will prove an inspiration to homeowners.

Bulletin 362. Soil Survey of Oneida
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DINNER
5:30 to 7:00

FOR ALL STUDENTS

New Publications of the College
(Continued from Page 138)


Bulletin 367. Forest Conditions in Dutchess County, New York, by F. B. Moody and John Bentley, jr. A publication along the same lines as the preceding, but concerning a different locality.

Bulletin 368. Forest Legislation in America Prior to March 4, 1879, by J. P. Kinney. An exhaustive and interesting discussion of the laws relating to forestry in the early life of this country; of value to those interested in forest economics and forest taxation, as furnishing part of the historical background of present legislation.

Bulletin 369. Cost Accounts for Some New York Farms, by C. E. Ladd. Describes the system of keeping cost accounts and interprets the facts learned by them. Of practical value to

(Continued on page 144)

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New Publications of the College (Continued from page 144)
farmers as a basis for making careful records of their business.

Bulletin 370. The Metallic Flavor in Dairy Products, by E. S. Guthrie. Gives results of a study of possible causes of metallic flavor in butter and other products. Of some interest to dairymen, but mainly to investigators in the same field.

Bulletin 371. The Fruit Tree Leaf-Roller, by G. W. Herrick and R. W. Leiby. A scientific description of an insect which in some seasons works great havoc in apple orchards. To be followed by a popular publication on the same subject.


College Publications Already Issued.
Reading Course Lesson 85. The Arrangement of Household Furnishings, by Helen Binkard Young. A brief popular statement of the principles fundamental to good arrangement of furnishings in a home.

Reading Course Lesson 87. The Decorative Use of Flowers, by Annette J. Warner. Full of suggestions for those interested in arranging flowers in home, church, or public hall. The illustrations are particularly pleasing.

Reading Course Lesson 89. Beans and Similar Vegetables as Food, by Lucile Brewer and Helen Canon. A brief discussion of the nutritive value of beans and other legumes, followed by directions for cooking beans so that they are most digestible, and a number of recipes. Of value to housekeepers and students of home economics.

Reading Course Lesson 90. Alfalfa for New York, by E. Montgomery. A revision of a former publication by the same author, bringing the work

(Continued on page 146)
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New Publications of the College
(Continued from page 144)
down to date, and telling what alfalfas
to grow and how and why to grow them.

Reading Course Lesson 92. Summer
Care of the Home Vegetable Garden. Tells how to cultivate, fertilize, and ir-
rigate a garden; gives lists and illustra-
tions of the best tools to use; describes
different methods of training, pruning,
and blanching vegetables; for the coun-
try gardener and suburbanite.

September Rural School Leaflet. A
compilation of material on nature study
and elementary agriculture for the use
of school teachers.

Farm Bureau Circular No. 6. Sum-
mary Report of Farm Bureau Work in
New York State for the Calendar Year
1914, by M. C. Burritt and County Farm
Bureau Managers. Tells what the farm
bureaus in each county have done dur-
ing 1914.

College Publications Soon to Appear.
Reading Course Lesson 91. The
Daily Life of Primitive Woman, by
Blanche Evans Hazard. A series of out-
lines and references for programs, tak-
ing up various phases of primitive
woman’s life; designed especially for use
in Cornell Study Clubs throughout the
State, and as a background for present-
day domestic science.

Reading Course Lesson 93. Farm
Home Demonstration Schools. A brief
statement of the plan of organization
of these schools, and a description and
program of an ideal farm home demon-
stration school that culminated in a com-

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New Publications of the College
(Continued from page 146)

Reading Course Lesson 96. The
Surroundings of the Farm Home, by E.
G. Davis. A well-illustrated, interesting
publication telling how to lay out the
home grounds, and giving the fundamen-
tal principles underlying landscape ar-
rangement.

Reading Course Lesson 98. Cooling
Milk, by H. E. Ross and T. J. McInerney.
A discussion of the reasons why milk
should be cooled as soon as possible
after it is drawn, and telling how to do
it. For dairymen.

November Rural School Leaflet. For
children in the rural schools; a presen-
tation of nature facts as a forerunner
to an interest in agriculture.

Campus Notes
(Continued from page 147)

Cornell, where he has been in-
structor and from which he took
his degree. He will specialize in
sanitation work in rural districts.

William E. Mordoff, instructor
in Farm Mechanics in the Depart-
ment of Rural Engineering, comes
from East High School of Roches-
ter, where he has been teaching
physics. He is a graduate of Sib-
ley College.

Gilbert W. Peck, instructor in
the Department of Pomology,
comes from a fruit farm at Bir-
mington, Ohio, after having been
instructor in Pomology at Cornell
in 1913.

J. R. Schramm, assistant pro-
fessor of Botany, comes from
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Washington University at St. Louis, Missouri. He has also had training and experience in his field through work in the Missouri Botanical Gardens, and also at St. Louis.

Roy Glenn Wiggans is instructor in the Department of Farm Crops, having been graduate student assistant in the department during the past year. He received his training at the University of Missouri, and received his master's degree from Cornell.

Former Student Notes

(Continued from page 130)


'15, B. S.—G. F. Heuser and E. L. Banner will remain in the local Poultry Department this winter as assistants while pursuing work for advanced degrees.

'15, B. S.—C. R. Gleason has gone to Youngsville as teacher of agriculture.

'15, B. S.—E. A. Flansburg has gone to Castile as teacher of agriculture.

'15, B. S.—Frances J. Montrose has gone to King Ferry as teacher of home making.
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Fromer Student Notes
(Continued from page 154)

'15, B. S.—Sara T. Jackson has gone to Machias as teacher of home making.

'15, B. S.—W. D. Hill is now located on his father's farm at Cleburne, Texas.

'15, B. S.—D. M. Allman is now teacher of Horticulture at the Doylestown, Pa., High School.

'15, B. S.—Emma Robinson was married to C. E. Thomas, '12 during the summer.

---

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   Association Football—Penn. ............................. 4:00 P.M.
   Interscholastic Cross Country Run
6 Football—Michigan at Ann Arbor
   Freshman Football — Bellefonte Academy .......... 2:30 P.M.
   Association Football—Yale .................................
12 Musical Clubs Concert—Lyceum Theater .......... 8:00 P.M.
13 Football—Washington & Lee ....
   Cross Country—Pennsylvania
   Freshman Football — Cushing Academy .......... 3:30 P.M.
17 Association Football—Haverford College .......... 4:00 P.M.
20 Freshman Football—Penn ........
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27 Association Football—Columbia at

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<table>
<thead>
<tr>
<th>Breeder</th>
<th>1st yr.</th>
<th>2nd yr.</th>
<th>3rd yr.</th>
<th>Total eggs laid 3 yrs.</th>
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<tr>
<td>Lady Cornell</td>
<td>258</td>
<td>200</td>
<td>191</td>
<td>649</td>
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<tr>
<td>Madam Cornell</td>
<td>245</td>
<td>131</td>
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<tr>
<td>Cornell Supreme</td>
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<td>665</td>
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ANIMAL HUSBANDRY ISSUE

HOLSTEIN-FRIESIAN PROGRESS
By M. S. PRESCOTT

HORSE PRODUCTION IN NEW YORK STATE
By M. W. HARPER

THE WORK OF THE DEPARTMENT OF FOODS AND MARKETS
By JOHN J. DILLON
The experience of a number of growers in applying a fungicide late in the fall to peach trees for the control of Leaf Curl has been favorable to fall treatment. No cases have come to the attention of the writers in which Lime-Sulphur Solution, applied in the fall, has not been effective; one apparent exception out of many orchards visited. It would therefore appear that fall spraying in peach orchards is a safe practice for New York. Orchardists and growers are requested to at least give the method a trial in the fall of 1915.

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Your Grafonola, equipped with the individual record ejectors, an exclusive Columbia feature, is ideal in its convenience. Your records are racked individually in velvet-lined slots that automatically clean them and protect them against breaking and scratching. A numbered push-button controls each record—a push of the button brings any record forward to be taken between the thumb and fingers.

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Get a Mackinaw.

The Co-op. was one of the first stores in Ithaca to handle Mackinaws and we are still handling the same make that we had at the first. These have always given satisfaction and each year, has shown an increased sale. Our stock is not made of loud designs but rather the brown and blues which are much liked. You will get good service at the Co-op.

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THE CO-OP., Morrill Hall
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The School and Farm of the Future

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"Unmoved through all this figure shall abide
That men may think of him who saw the gleam,
The seer who toiled; whose toil is glorified
In this fulfillment of his golden dream."
Andrew Dickson White*

Here mid the fair fulfillment of his dream
    His statue broods above the busy ways;
Long since on this bare hill he saw the gleam
    Prophetic of these present golden days;

He saw these towers that catch the shafts of dawn,
    These stately halls that crown the hill grown fair,
These arching elms above the shadowy lawn,
    He heard the chimes ring through the vibrant air;

And then the higher vision came to show
    A place of freedom where the mind might be
Unfettered, and where all who would might know
    The joy of seeking truth that maketh free.

Some men who see rare visions rest content
    To see them and to let them fade away;
Not so with him; to him the vision meant
    The call to toil to make the vision stay.

Throughout the sad or joyous years he wrought,
    With love and wisdom meeting hate and strife;
Thrice blessed was his work; the thing he sought
    Is here, the fair fruition of his life.

In living presence as he walks these ways
    He faces forward still; each new day brings
New visions to make real through toilsome days,
    That mankind still may rise to higher things.

* This poem, by Dean Smith of Sibley College, was read by its author at the dedication exercises when the statue was unveiled last June.
This statue fronting west, for many a year
   Shall face the sunsets as they flush and fade;
The valley shall grow dim with mists and clear,
   Full often in the changing sun and shade;

And oft the westering moon above the tower
   Shall flood the valley with mysterious light;
And summer rains shall beat and storm-clouds lower,
   And coming winter bring the lengthening night.

Unmoved through all this figure shall abide
   That men may think of him who saw the gleam,
The seer who toiled; whose toil is glorified
   In this fulfillment of his golden dream.

ALBERT W. SMITH, '78

Holstein-Friesian Progress
BY M. S. PRESCOTT
Editor of the Black and White

The subject of Holstein-Friesian progress is such a broad one, covers such a long period of time, and includes such a record of achievement, that it is a difficult task to select just the proper phases to include in an article of the length prescribed by the Editors of the Countryman.

First, let us consider a few Holstein traditions, for the beginnings of the breed are so far distant that history cannot give us definite information. There seems to be little doubt that the breed had its origin from the cattle of the Friesians and Batavians, who settled on the banks of the River Ems, on the middle arm of the Rhine, and along the shores of the North Sea, about one hundred years before the Christian Era. It has been conjectured that the original Friesian cattle were white, and the Batavian stock black, the mixture of the two resulting in the characteristic markings of the present-day Holstein-Friesians. However that may have been, the history of the cattle of these two tribes has been identical. The lowlands in which they lived supplied an abundance of succulent food the year round; so that, from the earliest days the Dutch cattle have been large of frame, deep and broad, with enormous storage capacity for both roughage and milk.

The fame of these wonderful cattle spread until, in 1350, we find a French historian writing that at a certain siege the besieged could receive their supply of butter only from Holland, which had even then been famous for its dairy products for five hundred years. I believe
Professor Roberts is credited with the statement that “God might have made a better dairy cow than the Holstein, and he might have made more prudent dairymen than the Hollanders, but he never did.”

At any rate, the Dutch cattle made Holland the greatest dairy country in Europe, and it was not strange, therefore, that their reputation should have extended to this side of the world.

The first permanent introduction of the breed to this country was due to the perseverance of Hon. Winthrop W. Chenery, of Belmont, Mass., who, after losing his first two importations in the late fifties, made a third attempt in 1861, which was successful in establishing a foothold for the breed. The next twenty-five years showed a great influx of the Dutch cattle, several breeders annually bringing over as many as a hundred or more animals each. Many of the greatest foundation animals of the breed were brought over during this period, such as Netherland Prince, Aaggie, Clothilde, Pietertje 2d, Pauline Paul, and De Kol 2d. Altogether a total of 7752 head have been brought over, the latest importation being in 1905.

The owners of these animals, which were the best to be found in the herds of Holland, were naturally proud of their purchases, and anxious to prove their merit to the public. Accordingly it was not long before records of production were being kept. These were made by the owners, sometimes under more or less careful supervision of disinterested parties. The butter records were figured on the basis of pounds of salted butter actually made—the sort of records a certain class of Jersey breeders still swear by, and to which they “point with pride.” Enormous records were in some instances reported, so big in fact that their accuracy was severely questioned, although, in comparison with present-day records they do not seem at all impossible. Following are a few of these old-time records:

7-DAY BUTTER RECORDS

<table>
<thead>
<tr>
<th>Cow</th>
<th>7-Day Butter Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechthilde</td>
<td>39 lb. 10½ oz.</td>
</tr>
<tr>
<td>Parthenea</td>
<td>38 lb. 8½ oz.</td>
</tr>
</tbody>
</table>

PONTIAC KORNDYKE
Considered by many to be the premier sire of the breed. He now has eleven 30-lb. daughters and thirty 30-lb. granddaughters.
COLANTHA 4th's JOHANNA
The first 35-lb. cow as well as the first cow of any breed or age to produce 1200 pounds of butter in a year.

YEAR'S MILK RECORDS
Pietertje 2d .................. 30,318 lb. 8 oz.
Clothilde ..................... 26,021 lb. 2 oz.

YEAR'S BUTTER RECORD
Pauline Paul .................. 1153 lb. 15¾ oz.

These records, particularly those made in public competitions, did much to bring the breed before the public eye and to enhance its reputation. The greatest forward step since the founding of the Holstein-Friesian Association by the union of the Holstein and Dutch-Friesian Associations in 1885, was the establishment of the Advanced Registry system, whereby these records were made official, every test being performed under the careful supervision of representatives of the State Agricultural Colleges. With the inauguration of this system in 1893, the Association publicly proclaimed itself as standing back of the records, thus establishing their absolute reliability. The first year, twenty-four records were accepted, De Kol 2d winning the World's Record with a 7-day production of 26.58 lb. butter. In 1894 $1000.00 was voted by the Association to be awarded as prize money to the owners of the highest-record cows, and this proved a wonderful investment, as it helped greatly in stimu-
lating interest. From this time on progress was rapid, the total number of cows tested increasing at a phenomenal rate. During the fiscal year 1914-15, 10,743 7-day records were made—the biggest year in the history of the Association. $15,000 in prize money now goes annually to the owners of these record makers. It is interesting to note that the entire number tested last year, over half of which were

heifers with first or second calf, averaged over 18 lb. of 80% butter, and 406.9 lb. milk in 7 days, the average test being 3.56% fat—these figures likewise establishing a new general average for any one year.

The first cow to average 5 lb. butter per day was Colantha 4th's Johanna, who totalled 35.22 lb. in 7 days in February 1907. This remained unbeaten for two years, when in March, 1909, Grace Fayne 2d's Homestead just passed it with a record of 35.55 lb.

In December, 1910, Pontiac Clothilde De Kol 2d made a record of 37.21 lb. which looked good for many years at the top; but in less than four months one of her sisters, Pontiac Pet, had forced her into second place with a record of 37.68 lb., and just a year later another sister, Pontiac Lady Korn-

![VALDESSA SCOTT 2D, THE FIRST 40-LB COW](image)

dyke, became the first 38-lb. cow, with 38.03 lb. The next champion and the present title holder in the 7-day division is K. P. Pontiac Lass (44.18 lb.) who is distinguished as the only cow to produce over 44 lb. butter in 7 days. Her record was made in the spring of 1913, and has thus stood unchallenged for over two and a half years. At the present time five cows have crossed the 40-lb. mark,
one of these being a daughter of Sadie Vale Concordia, the first 30-lb. cow, and another, the only 4-yr.-old to turn the trick, being a granddaughter of the first 37-lb. cow.

Quite as phenomenal have been the advances in the year's tests which have now grown to be such an important phase of the work of the breed. In these tests the competition with the other breeds is more direct, as it is in this direction that the Jersey and Guernsey breeders are devoting their efforts. Although both other breeds have been working along this line much longer than the Holstein breed, the balance of power is all in favor of the Black and Whites. The first three places for yearly butter production, regardless of age or breed, are held by Holsteins. At this writing the record of the champion, Duchess Skylark Ormsby, is not completed, but advance estimates place her final figures at very close to 1500 lb. of 80% butter. Of the seven cows of all breeds to produce over 1000 lb. butter fat in a year, five are Holsteins, not a single Jersey being recorded in this select circle.

Of the 19 cows to produce over 1200 lb. of 80% butter in a year, 14 are Holsteins. The representatives of the Guernseys occupy fourth and fifth places, and the Jerseys, eighth, eleventh and seventeenth. Perhaps the most sensational record of all is that of the Holstein junior 2-yr.-old, Finderne Mutual Fayne (sister of Finderne Fayne) who produced 1200.64 lb. butter in 365 consecutive days. Thirty-five Holstein cows have produced over 850 lb. butter fat in a year (equivalent to 1000 lb. of butter by the standards in use by any of the other breeds), a number several times as many as all the rest combined.

For milk production, of course, the Holstein leads. Only one Guernsey has crossed the 20,000-lb. mark, that being the champion of the breed, Murne Cowan, who produced 24,0008 lb. Only four Ayrshires are in the 20,000-lb. class, while no Jersey has yet crossed the line.

As nearly as we can figure, one hundred and fifty-five Holsteins have produced over 20,000 lb. of milk in a year, up to June 19, 1915, the latest period covered by the reports of the Sup't of Advanced Registry at this writing—this number being exactly thirty-one times as many as all other breeds combined. The high mark is held by Tilly Alcartra, who in one year produced 30,451.4 lb., thus surpassing the old-time private record of Pietertje 2d, previously mentioned.

This account of Holstein achievements could be continued indefinitely without beginning to exhaust the supply of material, but I believe enough facts have already been given to prove that the Holstein reigns supreme as “Queen of the Dairy Breeds.” In brief, these are the main reasons for her popularity. That she is the most popular
is proved, not only by prices paid at public auctions, but also by the preponderance of Black and White cattle on the hillsides and in the valleys from coast to coast, and by the relative numbers of men interested in her development. About eight thousand breeders are now enrolled on the membership books of the Holstein-Friesian Association of America, which is the wealthiest and most prosperous live-stock association in the world.

On account of her great capacity for roughage she can make better use of the cheap feeds grown on the farm than any of the other breeds, and is able to get a larger proportion of her living in this economical way. Likewise she is the most prolific of the dairy breeds, and her strong, rugged calves have a far smaller percentage of "infant mortality." All in all, the Holstein is the ideal cow, not only for the business breeder, but for the dairymen who is alive to his opportunities and ready to make the most of them.

Regarding the prospects for the future of the Holstein breeding business, to me they seem very bright. The wholesale slaughter of the breeding stock of Europe will mean after the war an unprecedented demand in a new market. The cleaning up of the foot-and-mouth disease cannot fail to result in an increased home demand, for the great western field is just waiting for confidence to be restored before embarking in the most profitable breed of dairy cows. Thus, while the past year has been full of discouragements on every hand, and the cattle markets just at present are depressed, the future holds an abundant store of promise for the man who has the foresight to stock up at the bottom of the market, the nerve to surmount the obstacles at present besetting the live-stock man, the ability to breed and develop his animals along improved lines, and the knowledge to maintain them in health and contentment. The combination of the right man with the right kind of cows is bound to spell "Prosperity," and with a capital "P."
Horse Production in New York State

BY M. W. HARPER

Professor of Animal Husbandry, New York State College of Agriculture at Cornell University

New York State takes high rank among the States of the Union in the production of the lighter types of horses such as the Thoroughbred, the Standardbred, and the Hackney. It is gaining rapidly in the breeding of draft horses, particularly the Percheron and the Belgian.

This State leads the Union in the consumption of horses of both the light and the draft type. It is estimated that approximately 100,000 head of horses are used each year. Of this number about one-half are employed on farms and one-half in the cities. It is interesting to note that only 25,000 head are reared within the State. It follows, therefore, that approximately 75,000 head are introduced each year for home consumption. To this must be added many thousands more which pass through New York markets en route to other States and foreign countries, in order to arrive at the total number of horses introduced to the State and passing through the state markets. For these animals our horse merchants are paying millions of dollars annually.

According to these figures, New York farmers do not raise the horses used on their farms. This is well illustrated in some of the agricultural counties, where hundreds of horses for which the farmers pay thousands of dollars, are introduced. This is a significant observation and may be a factor in determining the profit of operating the farm. Many a farmer has gone in debt to buy a team with which to operate his farm. This aspect of horse production deserves special attention.

New York excels all other States of the Union in market quotations, the prices paid in the Buffalo and New York City markets being unequaled by those of any other State. This is significant, for, unless our State is handicapped as a horse-producing State, horse breeding should be more profitable here than elsewhere. In this connection there are some matters, more or less related, which are worthy of our attention in order to get an adequate conception of the situation.

First, we should consider the cost of raising a horse and compare with it the purchase price as well as the difficulties surrounding his introduction to the State. Second, we should consider the comparative profit between colt raising and other farm activities. It is possible that reliable information on these matters cannot be obtained, for much depends on attendant conditions and average figures would show us but little. Attention is directed to them here in order to show their relationship.
We often hear these statements: "There is no money in raising colts as the selling prices will not cover the cost of production"; "A horse can be purchased for less money than it costs to raise him"—and the like. Perhaps such statements are true for certain types of horses and under certain conditions. They are, nevertheless, exceedingly misleading, as they do not take into account all the factors involved. In the first place, the price for which we can sell a horse and the price we must pay for him usually differ widely—bearing in mind that the horses must be introduced, as we do not raise enough to meet the demand. The selling price on the farm and the purchase price on the market often bear little relation to each other. In the main, this is due to commission, freight, and insurance charges. While varying widely, such charges often amount to a considerable sum of money.

Likewise, the statement that a horse can be purchased for less money than it costs to produce him, gives us no assurance that our needs will be supplied because of the difficulties surrounding the purchasing of a horse. In the main, this is due to two factors; first, the ease with which the usefulness of a horse may be misrepresented; and second, the ills to which he is subject in transit and which may not be apparent at the time of purchase, but which will attack the horse in the course of a few days after his exposure to the disease. Thus, in the purchase of a horse, we are taking many risks.

A BLACK PERCHERON STALLION

This illustrates a very desirable type for the breeding of farm horses.

(Continued on page 224)
Hints on Hog Breeding

BY H. B. HARPENDING, Dundee, N. Y.

One of our wise men said that other things being equal, size was the measure of power. To paraphrase this a bit, in reference to breeding swine, it might be said that other things being equal, or nearly so, size is the measure of value.

The constant striving for refinement by many of our large swine breeders has resulted in a loss of size that should be given serious concern by those really interested in the improvement and promotion of pure-bred swine.

The writer has had occasion recently to pass upon several breeds of swine as judge at a few of the fairs, and the one common fault that stood out was the lack of size. No one will dispute the fact that improvement can never be made by the use of a pure-bred boar, weighing a hundred and fifty pounds at six months, or three hundred or less at a year.

Almost any farmer who is a good feeder can produce a scrub to beat this. Yet just such animals were in the pens at some or our state fairs this year as candidates for first premium. A boar which does not weigh two hundred pounds at six months or four hundred at a year should be disposed of.

The hog that brings the top price at the market every week is the hog that weighs from 160-220 lbs. according to season and age. Such pigs, brought to this weight in six months, can be produced at a profit with the price of feed and the market as they are at present.

All feeders know that the profitable feeding is the early feeding and that the pounds which are put on under five or six months of age cost only two-thirds as much as the pounds put on the next four months. But in addition to feeding, there is another factor of nearly equal importance in raising hogs. Such stock should be mated that will weigh at least six or eight hundred at maturity.

In the purchasing and selection of herds for breeding purposes, the score card has perhaps too often taken the place of the buyer’s eye, A white switch is many times given more consideration than a full ham, or the exact placing of the white markings in the face is given more attention than six inches more in length of body or a hundred pounds more of weight at the same age. A quarter of an inch off the nose is regarded of more importance than six inches more around the heart girth. The result is a herd that will fill the master’s eye, but will excite no envy of the practical feeder or the neighboring farmers.
The Work of the Department of Foods and Markets

How its Efforts Affect the Cost of Living

BY JOHN J. DILLON

Commissioner of the New York State Department of Foods and Markets

The New York State Department of Foods and Markets was originated by the State Standing Committee on Cooperation, representing the New York State Agricultural Society, the Grange, and other farm organizations, educational institutions, and individual farmers. Its purpose was to find a profitable market for the food products of the farms, and, through economy of distribution, to help reduce the high cost of city living.

Its first service was to the city consumer. An instance of this service may be cited as follows: Shortly after the beginning of the European war, prices of wheat advanced. When the millers advanced the price of flour, the bakers advanced the price of bread from five cents to six cents a loaf. The Department promptly applied to Attorney-general Woodbury to assist in an investigation of the causes of the increase in the price of bread. Deputy Attorney-general Alfred Becker was assigned to the case, with the approval of Governor Whitman. The testimony showed that a conspiracy existed among both the bakers and the wheat speculators, that the bread was being made from wheat which had been bought long before the war started, and that the extra cent a loaf was pure profit. The publicity of these revelations caused consternation among the bakers. They promptly reduced the price of the loaf to the old price, where it has since remained. This has meant a saving to the people of Greater New York of not less than $20,000 daily.

The next service was to apple growers. In August the Produce Trade Press announced that the price of apples this year would be $1.50, with $2.00 as a maximum for the choicest fruit. During the month of August, speculators went into the Hudson River Valley and bought the fruit of some of the choicest orchards at prices ranging from 90 cents a barrel to $2.00, the highest price paid. The Department advised the growers that the prices were too low, and to help the situation it organized two auction sales in the orchards of the Hudson River Valley and one at Syracuse, in Onondaga County. The Old large buyers protested against these open sales, and, while represented at the first sale, they refused to bid. During the sale a bid of $3.12-1/5 a barrel was made for the best orchard, which was owned by William Teator, of Red Hook. He wisely refused to sell for less than $3.25. Some outside buyers, however, bought other orchards at
prices ranging from $2.75 to $3.25 a barrel, but only a small part of the fruit offered was sold. Later one of the large buyers present at the sale paid Mr. Teator $3.30 a barrel, or five cents a barrel more than he would have had to pay at the sale. Mr. Teator had expressed his purpose to pack his fruit and ship to New York and have the apples sold at auction by the Department, if he did not sell in the orchard. The other orchards listed were sold in the same way.

During the second sale, in Gardiner, on September 2, some of the old dealers bought a much larger quantity of fruit at prices ranging from $2.85 to $3.25 for grade “A” fruit. These buyers were severely criticized by the apple speculators who refused to patronize the auction sales. They were called “Pikers.”

At Syracuse, on September 8, a still larger quantity of apples were sold. The orchards of Grant Hitchings and Judson K. Knapp sold for $3.40 a barrel, run of the orchard, and several other orchards were sold at approximately $3 for grade “A” and $2.25 for grade “B” fruit.

Later four sales were organized in central New York. They were largely attended by farmers and buyers, none of whom would make a bid on the apples, though they had been canvassing the orchards for weeks trying to buy at private sale. The growers promptly agreed to ship their fruit to the Department in New York, to be sold at auction to the distributors. Later some of these orchards were sold privately; the others are now shipping to the city auction.

Following the day of the first sale at Red Hook, prices of apples in New York City advanced fifty cents a barrel. The auction sales of apples established a standard

AN AUCTION SALE OF NEW YORK STATE APPLES
These were brought to New York City by the Department of Foods and Markets. “A great advantage of the auction sale is that it daily cleans out of the market soft and low grade fruits.”
of prices to growers, which competent authorities estimate advanced the price to the growers all over the State from fifty cents to one dollar a barrel. If the average advance were no more than fifty cents a barrel, the profit to the growers of the State would be not less than $2,000,000.

At best the speculators buy only the choicest fruit. A large part of this they store for fancy prices late in the winter. For the most part the speculators are also commission men. However, it is not to their interest to encourage shipments of medium-grade fruits to the market so that they can reserve their own apples. Heretofore, when the average grower has consigned apples to these commission speculators, the returns have not been great enough to encourage further shipments. The more apples that went to cider mills and that rotted on the ground, the less competition there was with apples stored for speculation, and the higher were the profits of speculators.

To meet this situation the Department opened two auctions, one at 204 Franklin Street and the other on the Desbrosses Street Pier, New York, where apples and all kinds of farm food products in containers are daily sold to the highest bidder. These sales have been eminently successful, even though the shipments are sometimes small and irregular. The sales have been attended by the best buyers for direct distribution in the city, and for choice fruit

TWO SHOW CARDS USED BY THE DEPARTMENT

These advertise the apples sold at auctions; they are colored and are hung in the stores of the buyers at auctions.
the prices have invariably topped the market.

The auction sales also have a large attendance of buyers of medium and poor grades of fruit, prices for which are up to the quotations for similar grades at pri-

vate sales. A great advantage of the auction sale is that it daily cleans out of the market soft and low-grade fruits, thereby preventing loss and waste. The buyers for chain stores and large retail distributors to hotels, restaurants, and families, buy at these auction sales when the quality is up to their requirements. Many of these buyers are selling at a profit of less than 20 per cent. This has come about through the solicitation of the Department and publicity.

The Department has prepared color cards to hang in the stores of the buyers to illustrate and advertise New York State apples. As far as this goes, it certainly helps reduce the price to consumers. The increased consumption which must follow will indirectly benefit the growers.

Plans are now being made by the Department to develop a direct trade with distributors, for eggs, potatoes, and other products. Fresh eggs which are now being received daily market readily at top quotations.

The Department has been fortunate enough to secure the services of The Fruit Auction Company to conduct auction sales. This company is backed with practically unlimited capital, and employs men of the broadest experience in the sale of produce. It advances the freight, conducts the sales, guarantees the accounts, and advances the net returns for the goods daily, so that the farmer gets his check within forty-eight hours
after the sale. The cost of all this service is 3 per cent of the gross sales. The Department charges the grower 5 per cent, the 2 per cent being to help cover the expenses to the State.

The commission dealers naturally fight this auction system with a desperate intensity. They see clearly that its success means an entire change of the old system. There can be no monopoly, no control of markets and no manipulation nor dishonesty, where the auction sales are open to all shippers and buyers, and where the transactions are open to every one and are made a State record.

Farmers, like the rest of us, are creatures of habit, for they still ship largely to commission merchants. They do it partly from habit, and partly from the fear caused by commission dealers and their local secret agents in the country. Farmers do not yet see the great possibilities in the complete plan as devised by the Department for the distribution of their products. The auction sale is but one unit in this plan. If properly and persistently developed it will restore to New York farmers the metropolitan markets, which are now largely monopolized by inferior western goods that are sold at higher prices than the products of the New York State farm. It will cause the cultivation of every fertile acre and it will treble the valuation of the farms of the State. The tax on this increment of value alone would add millions to the revenue of the State, and make the Department of Foods and Markets an asset of great value to the State.
The Man on the Land on the Other Side of the World*

BY BEVERLY T. GALLOWAY
Dean, New York State College of Agriculture at Cornell University

III. THE FARMERS OF JAPAN

Japan has been called the land of topsy-turvy, chiefly because so many things are done there just opposite to the way they are done here. The Japanese, no doubt, look upon our way of doing things as queer, for they are the opposite of their ways.

There is another way, however, in which Japan is topsy-turvy, and that is in the matter of the shifting of the different classes of society. For the past fifty years the Japanese have been trying to find themselves in the almost chaotic upheaval caused by the opening of the country to the world at large. The manner in which the Japanese people have readjusted themselves, and in the short space of half a century become a world power, is one of the wonders of the age. In this readjustment all has not been well with the farmer. He is finding himself the shuttle in the weaving of the great blanket which is eventually to be the protective covering of the empire.

The old Japan, with her nearly perfect isolation, was one where the farmer held almost full sway. It had to be so, else the people could not have lived. Cut off from all the rest of the world with an immense population to feed, it was realized that the farmer was the sole dependence for life itself. Hence, he was protected, honored, and supported in every way, and next to the soldier class was at the top of the social ladder. The merchant, on the other hand, was of small moment. He was more or less of a parish, gaining his living by hook or crook, and was regarded as altogether an undesirable

* This is the third of a series of articles on farming in foreign lands. The first article appeared in the October number of the Countryman.—Ed.
citizen. Then came the awaken-
ing, and Japan suddenly found her-
self where, if she would become a
world power, she must learn to
trade, not after the fashion of her
people, with whom the rules of the
game were much like those of
David Harum in his celebrated
method of swapping horses, but in
accordance with the principles laid
down in the golden rule. So Japan
has had no small problem in the
development of a moral sense in
her people in the matter of trade.
In doing this she has concentrated
her efforts largely on the merchant;
and, the results of these efforts are
becoming apparent, for the ethics
of trade in Japan are on a much
higher plane now than they were
even a few years ago. Critics of
the Japanese who have suffered,
perhaps, from some of their sharp
practices should bear these facts in
mind, and remember that it is not
a very far call to wooden nutmegs,
artificial coffee grains, and manu-
factured “dairy. butter.”

As Japan found the markets of
the world opening to her, she felt
less the need for depending on her
own people for food. The farmer,
therefore, has been left to a great-
er degree to shift for himself, and,
while the Government is doing
much to help him, what is being
done is not reaching very far into
his life.

We have pointed out in previous
articles that the Japanese are in-
tensive farmers, and that, meas-
ured by what they produce from
a given acreage, they are wonder-
fully efficient ones. Some Japan-
ese writer has very well said that
the Japanese farmer cannot afford
to be a poor farmer; he must be
a good one, or starve. This writer,
in speaking of statements some-
times made regarding the possi-
bility of conflict between Japan and America, remarks that it is not so plain how a Japanese, who supports a family of from five to ten on one and two-thirds acres, and is taxed about 27 per cent of what he gets should yearn for an American—Japanese battlefield on which to show his heroism. As he lives now, his everyday efforts for existence would make Port Arthur look like a crude and childish pastime.

It is true that the life of the average Japanese farmer is a very hard one compared with the standards of our own country, or even of some of the European countries. The burden of taxes is like a mill-stone around his neck. He is not alone in this, however, for all men engaged in any productive lines of work are heavily taxed. If the farmer, by any chance, should have an income of five hundred dollars or over, he would have to pay a tax of $2\frac{1}{2}$ per cent on that. If he grows a hundred bushels of rice, about one-third of it, or its equivalent, must go to support the Government. His land may be taxed as high as $5\frac{1}{2}$ per cent of its actual value. Then there is a whole budget of miscellaneous taxes which he must pay if he is to live even a modest life. Liquors, tobacco, soy sauce, patent medicines, salt, and sugar yield revenue which he must in part pay. If he can afford to take a little journey on the train he must pay a tax for that; and there are many other ways, direct and indirect, in which he is forced to go down into his pocket to keep the army, the navy, and the schools going. The schools are the special pride of the Japanese, and there is no question as to their efficiency. Illiteracy is practically disappearing from Japan, and the farmers’ children, whether they like it or not, must go to school. All these taxes are of course a part of the price which Japan must pay, and seems glad and willing to pay, for the privilege of being a world power and of securing and maintaining her place in the sun.

The farmer and his children must necessarily work like the beasts of the field. Practically all
labor is hand labor. Only occasionally is a horse or an ox to be seen, and then the animal seems to be out of place, for the crudest kinds of implements are used along with him. Most of the heavy work of the soil, the digging, trenching, terracing, and preparing for the crops, is done with the kuwa, a long-handled, heavy hoe, much like our grubbing hoe. The Japanese husbandman is very expert with this implement, and will turn over a surprisingly large amount of ground with it in a day. It is back-breaking work, however, and when the day of toil is over, the man has little inclination for anything except to rest and prepare for the morrow.

It is the very plenitude of men that in a large measure makes for all these conditions. The labor of the man is cheaper than that of the ox and all the operations of the farm must be adjusted accordingly. Economic pressure has forced the abandonment of the animal as a labor saver.

Economic pressure, probably more than religious teaching, has also made it necessary for the farmers to forego meat as an article of diet. Farmers eat practically no meat except fish. It is said that the average American eats twice as much meat in a week as the average Japanese farmer eats in a year. Many of the farmers are so poor that they can no longer eat the best rice they produce. They must sell that, and eat cheaper food in the shape of barley and beans.

The farm homes, as a rule, are clean and have a picturesque beauty that appeals to all lovers of the simple in art. They are usually grouped in villages, and are low, thatched-roofed structures
that fit and blend so well into the natural surroundings that they appear to have been always a part of them. One could hardly imagine such a thing as a group of some of our hideously painted farm structures on a Japanese landscape. Away from the railroads and the beaten lines of travel, the little homes, the little fields, and the little people seem to be a part of, and to have been always a part of, the natural surroundings. Along the railroads one sometimes sees a corrugated iron shed or a tin windmill made in Chicago or in Kalamazoo, and so out of place do these things appear that they fairly jump at one out of the otherwise perfect picture. Big tin signboards are also beginning to appear, and these are usually placed in the middle of some man's little farm. The characters on these signs are Japanese, but the pictures denote that they refer to certain American products such as 57 kinds of pickles, sewing machines, and standard oil. The earth has long since become too small to get away from these evidences of American enterprise.

The Japanese farmer is already beginning to feel the effects of the rush of the people into other forms of industrial life. The boys are leaving the farms, and this is hastened, and in a measure encouraged, by the compulsory military service. Once in this service, the boy, is much more likely, when his term is finished, to seek employment in the city factory or store than on the farm.

Is the Japanese farmer happy? Is he contented? Who can say. We Occidentals can only guess at the workings of the minds of the Orientals. We go among them and see on every side the smiling faces and the well-nourished bodies. See them up to their knees in the muck of the rice fields, always smiling! See the little village streets literally swarming with romping, laughing, roly-poly babies! And we merely shake our heads and say with Kipling:

“Oh, East is East and West is West, and never the twain shall meet, Till Earth and Sky stand presently at God's great judgment seat.”

(Courtesy of David G. Fairchild)
The Soils and Agricultural Development of the Mohawk Valley*

ARTICLE NO. 7

BY ELMER O. FIPPIN

Professor of Soil Technology, New York State College of Agriculture at Cornell University

The Mohawk Valley is a deep, broad trough situated between the Adirondacks on the north, and the Catskill Mountains on the south. It is not a simple erosion valley such as would be found in a uniform strata, but owes its character to the nature, variety and dip of the strata of rock upon which a complex succession of erosion forces have been at work for a very long period of time. The Adirondack Mountain mass must be thought of as a great dome of plutonic rock, arranged around which are the overlapping strata of the successive layers of sedimentary rock. These dip at a low angle and disappear beneath the present surface.

Pocketed between the igneous dome on one side, and the cut edge of this sedimentary rock on the other side, is the Mohawk River that flows east from the Great Lakes Valley to the Hudson Valley at Albany. It lies across the normal course of the glacial movement, but, owing to the influence of the northern mountain mass and the Catskill Highlands on the south, the flow of ice was deflected and followed an east-west course through the middle of the valley.

With the exception of the inner gorge the valley walls are not steep but retreat in long, mild slopes.

On the north side the Trenton limestone lies at the surface. It is exposed along the course of the river and has a distinct influence on the soils. Midway up the south slope, near Waterville, Sharon Springs and Schoharie, is the exposure of the Helderberg limestone which influences the soil at places where the influence of the Trenton is wanting.

The chief distinguishing feature of the soils in this region is the injection of much igneous rock into the material of limestone and shale origin. On the whole there is a large amount of very good land in this region due to the influence of the two limestone formations mentioned. Where the igneous material is deficient, the same series of soils are produced as are found further west in the lakes region; namely, the Ontario and Honeoye, with related materials. The introduction of much

* This is the seventh article in a series started last year entitled, “An Agricultural Survey of New York State.” The series will be continued in the January issue.—Ed.
igneous rock into the carcaseous residue, together with the black Utica shales of the lower valley, produces the Mohawk Series. It is recognized by the mixture of rock material, the prevailing character of the boulders in the fence rows, and the large amount of dark shale in the soil and subsoil which gives a definite color characteristic to the section.

The Ontario and Honeyo Series, both markedly calcareous, the latter especially so, are well developed on the southern slope in close association with the Helderberg formation. All three series being made up of types of a heavy loam texture, are associated with a good agricultural development. The soils are not seriously stony and, while the surface is sharply undulated to quite hilly with a few very steep, rough slopes, it can be farmed with comparative ease.

Cutting into the more calcareous soils mentioned are areas of Volusia soils formed from the unmodified Hudson River shales and sandstones, such as give rise to this series just north of Utica. They occur extensively in the territory where the counties of Montgomery, Schoharie and Albany join. The silt loam predominates and, owing to the character of the soil and its topographic position, is associated with a low agricultural development.

To the south of the Ontario-Honeoye belt, the soils of the southern plateau are dominant. Roughly, they begin at Cobleskill, in Schoharie County, and on the Mohawk-Susquehanna River divide in Otsego County. South of that general line are three series of soils: the Culvers, typical of the Catskill region; the Lackawanna, coming from a red shale; and further west, the Volusia coming from a gray and black shale and sandstone.

The first of these is a poor agricultural soil, due principally to its rough, stony character. Its climate is unfavorable to many
crops on account of the elevation.

The Lackawanna and Volusia soils are of medium to rather low agricultural value, depending on soil type and situation. Their development and needs for improvement have already been discussed in this series of articles. North of the Trenton outcrop the country passes rapidly into a wild mountain condition associated with thin, stony soils and a rough mountainous topography. To the west, north of Little Falls and Herkimer, the better soils of the Mohawk Series, following the limestone exposure, swing somewhat further north than in the middle part of the valley.

The minor valleys do not have any distinctive soil characteristics. Lake and terrace formations are rare. The soils are mostly alluvial of a gravelly and sandy nature and belong to the series that are usually associated with the upland soils. One notable first bottom area along Schoharie River, below Middleburg, is an exception. Here the material from red shales has been mingled with that from limestone till to produce a deep, dark brown silt and sandy loam of the Barbour Series. These soils are noted for their productiveness and strength and, as they are high enough not to be seriously troubled by overflow, they command a high price.

As in other parts of the State, the lines of soil improvement follow the soil series. The Honeoye, in particular, is well supplied with lime. The other series may be arranged in a descending order of lime supply and a corresponding need of that material. In the Volusia, Culver and Lackawanna soils, lime is the greatest need while drainage is a close second. On the other upland soils, drainage takes precedence over lime in importance and may be considered to be the most important factor in soil improvement, although better tillage practices, and a better
system of crop rotation are also important.

Land values are relatively low in this region, especially for good soils. The region is in the process of an important crop shift. It has been the area in which the bulk of the hops were produced, but the decrease in price of this crop, coupled with an increase in the difficulties of production due to disease, has greatly lessened the acreage devoted to hop growing and has resulted in a corresponding depreciation in price of land. So far, only a relatively small proportion of farmers have reorganized their business in an effective way and, for the present, most of them are farming with a few, staple, low-priced crops. Near the Mohawk River, where hops were not an important crop, and where transportation is relatively better, dairying is the leading industry. Further back, advantage is gradually being taken of the possibility of producing, on certain soil types, alfalfa, and other good hay and forage crops, as the basis of a dairy industry. Many farms are in excellent condition with splendid buildings.

This region as a whole is one of wide range in soil productivity, in business conditions and in agricultural development. The selection of a farm site should be made with those factors clearly in mind.

The School and Farm of the Future

Dean Galloway speaking at the Convocation of the University of the State of New York at Albany on, "The School and Farm of the Future," outlined his conception of the future and its place in the life of the nation. He spoke in part as follows:

"Wherever is found a permanent and successful agriculture, measured merely by the maintenance of soil fertility and high average crop yields, there is found a peasantized and labor-depressed people, whose days are full of toil and whose minds have never been given much opportunity for growth.

"Even in this country more than a million farmers live and support their families on a labor income of less than a hundred dollars a year, and very little of this income actually comes to the farmer as money. So, despite all that has been said regarding the delights, the independence, the freedom, and the self-sufficiency of the farm, people are turning from it.

"While there has been a steady decrease in the percentage of our population engaged in agriculture, the per capita production of our staple crops has been increasing. This is primarily due to the utilization of machinery, making it practicable to more and more utilize horse power and other power instead of man power."
INTENSIVE FARMING NOT THE SOLUTION

“Despite the fact that in practically all other countries the intensity of the farming has increased with the density of population, this need not follow here. It would be unfortunate if it did follow, because an intensive agriculture has been practicable only where there is an oversupply of human labor. The bountiful crops from small areas have been made possible only by the toil and sweat of the man who, while he is able to produce these results, must do so at the expense of the mental, and I might almost say moral, side of his being. This is agricultural peasantry in its worst form, while much may be said on the subject of making two blades of grass grow where only one grew before, we do not want to accomplish this object by sacrificing the very things that make life worth living.

THE FARM OF THE FUTURE

“The farm of the future will so utilize modern labor-saving devices and efficiency methods that human labor will be reduced to a minimum, and the farmer and his children will have time, opportunity, and means of living a satisfactory, wholesome life. It will probably mean a farm of average size.

“We may look forward to a permanent husbandry, freed from the blight of peasantry, standing squarely for its place in the affairs of the nation, but recognizing its relations and responsibilities to other industries, and recognizing further that the fullest and best development of one can be attained only through the fullest and best development of all.

EDUCATIONAL FORCES FOR FARM DEVELOPMENT

“The demand is for education that will teach the meaning of things and their relation to the present, rather than the teaching of words and their relation to the past. I am not so much concerned with making more farmers, as I am with making better ones.

“The school must concern itself more and more with the needs of the people, and be more of a community center with the teacher as a community builder.

“The mere introduction of ‘agriculture’ into the school will not accomplish the ends desired; and it must be fully realized that the school is not for the preparation of life, but is life itself.

NEED FOR COOPERATION

“If it is vital that the people of the open country learn to work together in matters affecting their economic and social welfare, it is even more vital that those who are directing the forces in the field of education and redirection of rural affairs, should also strive to bring about unity of purpose.

“Probably one of the greatest and most potential forces for bringing about and welding together the agencies that are to advance agriculture is to be found in the recent federal law known as the Smith-Lever extension act. This
The men and women on the farms stand for what is fundamentally best and most needed in our American life. Upon the development of country life rests ultimately our ability, by methods of farming requiring the highest intelligence, to continue to feed and clothe the hungry nations; to supply the city with fresh blood, clean bodies, and clear brains that can endure the terrific strain of modern life; we need the development of men in the open country, who will be in the future, as in the past, the stay and strength of the nation in time of war, and its guiding and controlling spirit in time of peace.”

The New Home Economics Project at Cornell

BY SUSAN USHER

The Department of Home Economics has recently started a project to show how discrimination in the purchase of foodstuffs, and their judicious utilization with a view toward eliminating waste, affects the high cost of living. At the present time a family of five living in the Lodge adjacent to the building is being used as a nucleus for the experiment, and plans have been made which will include the cooperation of several other families, so that a representative study may be made. Since conditions vary not only between town and country, but also between different localities of the same town, a thorough and wide investigation is necessary.

Intelligent buying demands that one know something of food production, transportation, storage, distribution, adulteration, chemical composition and physiological effect; together with a sound, discriminating common-sense to cope with the present practice of confusing the value of a product with its ornamentality. There is too great a tendency today toward advertisement and fancy packages; too much attention is paid to the effect on the eye and not enough to taste and food value. Merchants invariably say that people
"eat with their eyes." This is an expensive habit.

Most people have no time or equipment to become expert buyers. For this reason we shall have to organize and cooperate, so that we can put some of this work into the hands of experts. But until that time comes, it may be worth while to study the mass of material and pick out such as may be of practical assistance to the housekeeper.

It may be that a uniform system of grading produce would aid the inexperienced buyer. Expert discrimination could determine these grades, and the housekeeper would get the advantage of it. But discrimination should extend beyond the impersonal question of grade to personal consideration of adaptability to the buyer's needs.

Let us stop for a minute and consider tea. It is a well-known fact that few housewives are discriminating buyers of tea, but it would not be difficult for them to learn the grades used for iced tea, for serving with lemon or with cream. Certain black teas will stand a five-minute brewing; others will be spoiled if brewed more than three minutes because of the excess tannin they contain. These illustrations could be greatly multiplied. However, it is sufficient to say that we must strive against the confusion caused by pictures and ribbon; and that we must work to be better judges of quality and the value of foods for various needs and purposes.

The utilization of foods in the household and the elimination of waste is important. Our population is increasing more rapidly than our food supply, particularly the supply of meats. Now is the time for the housekeeper to consider these problems; that is, the problems of the use of waste meat materials in the home. It is such an idea which has prompted the Home Economics Department to start the project to determine "Household Waste in the Utilization of Fresh Meats."

One source of waste may be the leaving of the trimmings in the market; another may be the throwing away of fats that could be used for frying, baking and soapmaking. Such wastes apply particularly to city and village homes; the country person probably has more means at hand for using all the bone and fat of the meat, and doubtless has worked at the uses and combinations of different fats in making breads, cakes, cookies, and pastry.

Miss Susannah Usher, B. S., who is conducting the Home Economics Project at Cornell, is a graduate of the Mass. Institute of Technology. Her official title at Cornell is that of Research Worker. She was the first person to apply for the Normal Course in Domestic Science at Pratt Institute and since then she has studied food supplies in Columbia University, the shipping and grading of fruit and vegetables in Florida and Cuba, and has taught Home Economics for seven years at the University of Illinois. Her work has been varied and extremely interesting.
The Cornell Countryman rejects all advertisements which are in any way objectionable or likely to prove fraudulent; and so far as it can do so, assures its readers that only reliable advertisers are represented in its pages.

The Dairy Industry in New York

The statistical records of the United States Department of Agriculture show a perceptible falling off in the number of dairy cows in the State of New York since 1910. Notwithstanding this fact, there is no evidence of a decrease of interest in dairying, particularly so far as pure-bred cattle are concerned. The records of the various breeders’ associations show a marked increase both in the number of animals recorded, and in the number of persons engaged in breeding improved cattle.

The number of cattle making requirements for advanced registration has practically doubled in the last two years. The dairy industry is also increasing perceptibly in those parts of the state which are outside the limits of the so-called “dairy districts.” Growing herds of high-producing pure-bred cows are now to be found with increasing frequency in such counties as Genesee, Livingston, Monroe and in the fruit-growing districts of Orleans as well as in the Hudson River Valley, and in the counties of Rensselaer, Washington and Saratoga, hitherto not distinctly dairy localities.

An important recent development that is likely to materially affect the dairy industry in milk-producing sections, is the adoption by one of the large milk concerns of a graduated scale for the payment of milk depending upon its fat content. While the premium for the higher-testing milk is not strictly proportional to the percentage of fat, the adoption of any sort of a graduated scale marks an important step in the right direction.
Welcome to the Winter Course Students

The Countryman extends to the Winter Course students of the College of Agriculture a hearty welcome and wishes them the best of success for the time they are with us. Just as Professor Everett said in the “Get-together,” the student body of this institution is a big family and we hope you will make yourself “at home” immediately.

The Growth of Winter Course Registration

The total registration in the Winter Courses and the number of subjects taught have been steadily increasing since their organization. Beginning in 1893 with 48 students, the registration increased until, in 1912, it reached its maximum of 597. Since then there has been a slight yearly decrease, with an average for the last four years slightly over 560. The number of courses has increased from one, General Agriculture, to seven. Dairy Industry was added the second year and Poultry Husbandry ten years later in 1904. Home Economics and Horticulture were first given the following year; but in 1913 Horticulture was divided into three groups, namely, Fruit Growing, Flower Growing, and Vegetable Gardening.

The increase in registration has been greatest since 1904 when Poultry Husbandry was added. The addition since then of four more courses has, no doubt, been the stimulus for further growth. Previous to and including 1905, the registration in the Winter Courses was greater than that of the regular and special students. Since then, however, the increase in the number of regular students has been so marked that there are now more than twice as many candidates for degrees as there are students registered in the Winter Courses.

Death of Miss McCloskey

Miss Alice Gertrude McCloskey, '08, Assistant Professor of Rural Education died at her home in Ithaca October 19, after a long illness. In the death of Miss McCloskey, the College of Agriculture loses one of its most earnest and sincere workers. She was perhaps better known to the school children of the State through her writings in the Rural School leaflet than to undergraduates of this College.

The November issue of the Cornell Rural School Leaflet says this of her life and work:

“She had great love for the boys and girls of the country and had no deeper interest than the desire to contribute to the enrichment of their lives. Miss McCloskey’s educational message is well summarized in her belief that one must be something before he can do anything. She gave unsparingly of her time and energy for the betterment of school life in the open country. Her effort has left a permanent impress on rural education in this State. Through her written and spoken word, many a teacher has been inspired with a zeal for the profession and has gone to work with new confidence.”
Getting the Most Out of a College Course

One of the biggest problems which confronts the average undergraduate of the College of Agriculture, as well as the University as a whole, is how to get the most out of a college course. With some persons this problem is worked out by close application to study and no participation in outside activities. With others the solution lies in a fairly close application to studies with a good admixture of an active participation in student activities; or in other words, a well rounded life of work and play. Every one is here primarily to learn a profession or to fit himself for some particular line of work—that remains undisputed, but the methods by which undergraduates accomplish this varies greatly.

The recent athletic rally which featured the November Assembly of the College of Agriculture clearly brought forth the opportunities to participate in student activities in our College. One fact stands out prominently. It is that the 53 students who participated in athletics during the past year had an average of 1.6 per cent higher than the rest of the student body. Does this not show that to get the most out of one's course it is necessary to take an active part in a student activity? It shows furthermore that such participation is actually conductive to success.

The Passing of Joe Wing

So writes the editor of the California Journal of Agriculture. To which the editor of the Countryman adds nothing, but joins in the tribute.

"Joe Wing has passed! Seeing always the fineness of life he preached optimism by living it; knowing always the blackness of despair, he faced about to see the earth steeped in country sunshine.

"As lamps are lit and embers of the sunshine fade, as tinkling bells of sheep and cattle hush to sleep—then in myriad homes will he be missed. Cowboy of the plains, miner of the mountains, farmer of the fields, writer of many books, speaker to a thousand hearts—Joe Wing!"

The Countryman

We wish to call our readers' attention to the statement at the top of our editorial columns which reads, "The Cornell Countryman rejects all advertisements which are in any way objectionable, or likely to prove fraudulent; and so far as it can do so, assures its readers that only reliable advertisers are represented in its pages." In the advertisements of the Countryman you will find the highest class of products obtainable, backed by responsible organizations, and covered by the above statement. When writing to Countryman advertisers, mention having seen their advertisement in our columns; this will help you, them, and us.
During the month, the Ag. Soccer Team has tied Chemistry and Veterinary, and won from Mechanical Engineering.

Ag. Soccer

The team is tied for first place in the Intercollege Soccer League. Members of the team are Wilson '16, goal; Young '16, right full-back; Faulkner '18, left half-back; Hassen '19, left full-back; Purdy '18, center half-back; Weinstein '18, right half-back; Spencer '18, center; Ford '19, left inside; Spencer '19, right inside; Mardfin '17, right outside; Cordon '19, left outside.

The Thanksgiving recess has been reduced to one day by vote of the Trustees of the University, on recommendation of the Faculty. One day has been added to the Christmas recess so that the total number of holidays will remain unchanged.

The history of this recess has been most vacillatory, changing from one to two days and back again to one, eight times during the fifty years the University has been established. From 1891 to 1893, the recess was extended to four days, only to revert to one again in 1894.

Lieutenant H. T. Bull, who has been commandant of the cadet corps at Cornell for the past three years, has been transferred to Troop “E” of the Fifth U. S. Cavalry, stationed at Fort Leavenworth, Kan. During Lieutenant Bull’s regime, the cadet corps has undergone a steady improvement, so that Cornell now stands among the foremost in military institutions in the country. Lieutenant Bull has been succeeded by Lieutenant C. F. Thomson, who was graduated from West Point in 1904. The new commandant was prominent in college athletics and has served in the Philippines and recently along the Mexican frontier.
THE RECENTLY CONSTRUCTED GREENHOUSE RANGE.

To the left may be seen the houses occupied by the Department of Vegetable Gardening while in the immediate foreground are the houses used by the Floriculture Department. Soils, Botany, Plant Pathology, and Plant Breeding share the new houses stretching back toward the Poultry Building.

The 1915 football squad will go down in history as a genuine "Big Red team," equally as good as and in many respects mightier than, any football eleven which has ever represented Cornell. Our Championship Football Team with not a single defeat and with seven decisive victories to their credit, the Cornell football squad gives every indication of having a "clean slate" this year. All praise is due to the football squad and to the untiring efforts of Dr. Sharpe, Dan Reed, and Ray Van Orman. The victories won so far are as follows:

- Cornell 13 Gettysburg 0
- Cornell 34 Oberlin 7
- Cornell 46 Williams 6
- Cornell 41 Bucknell 0
- Cornell 10 Harvard 0
- Cornell 45 Virginia Poly. Inst. 0
- Cornell 34 Michigan 7
- Cornell 40 Washington & Lee 21

Among the drawing cards which always attract a number of spectators to the College was the Ninth Annual Fruit Show held November 4 to 11 in the Exhibit laboratory of the Pomology Department. Practically every variety of apples grown commercially was on exhibition, as well as a collection of pears and citrus fruits. The Geneva Experiment Station furnished a display of Vinifera grapes, which are being propagated successfully at that place. Nearly every prominent fruit-growing State in the Union was represented by an exhibit. This wide range of climatic conditions under which fruit is grown brought out differences in single varieties which were striking. All the work of the show was done by students registered in advance courses in Pomology.

"DOMECON" NOTES

The Women's Honorary Society of the College of Agriculture announces that hereafter their organization will be called "Sedowa."

The regular monthly meeting of Firgga Fylge, was held in the Home Economics Building Tuesday evening, November 9. After a short business session, Mrs. Comstock read a story written by Mrs. Catterall, the wife of a former Cornell professor, who is now studying law in Boston.

There are, according to latest statistics, 735 girls registered as regular students at Cornell, making this University the fourth largest for women in the East. Vassar, Smith, and Welleslay lead.

MISCELLANEOUS NOTES

The Department of Agricultural Extension reports an encouraging increase of fifty per cent. over last year in applications for Farm Demonstration Schools in the State.

The experiment to determine the fertilizer needs of Ontario loam has been supplemented by the introduction of samples from Oneida County. Five or six years of research will precede the final report of the experiment.

E. C. Gillette, Secretary of the New York State Fruit Growers' Exchange, announces that the annual Rochester Stage will be held as usual this year. Prizes of thirty-five and fifteen dollars for the best and the second best speech on some phase of fruit growing will be awarded. D. S. Hatch, '15, won first last year.

A CORNER OF THE NINTH ANNUAL FRUIT SHOW

This exhibit is conducted by students of the Department of Pomology in Roberts' Hall.
On October 23 a judging team, made up of students from the Department of Animal Husbandry, traveled to the Field Day Exercises of Strathglass Farm, Port Chester, N. Y., to compete for prizes offered by Mr. Hugh B. Chisholm for the best student judging of Aryshires and Clydesdales. Competing against four teams from New England and one from Pennsylvania, the Cornell team was awarded third place. Highest individual honors were won by C. L. Dunham, jr., '16. The other members of the team were D. U. Dunham, '16, and L. W. Hovey, '16.

The 1916 class in Forestry numbers fifteen, of which but four are in attendance at college. The remainder are out in the woods, getting the practical experience which their department requires for graduation.

According to a census taken by the C. U. C. A., there are this term enrolled in the University students from forty-six states, one territory, and fifteen foreign countries. The war has decreased the foreign enrollment. With this exception there has been a uniform increase in all departments. Among the States, New York leads, with a total more than double that of all other States combined. Pennsylvania is second and New Jersey third.

In October the advanced classes in Farm Management visited the farms of the following alumni: Barker Brothers, at Spencerport; H. V. Taylor and his father, Spencerport; C. A. Rogers, Bergen; Frank Monroe & Sons, Elbridge; Earl Crocker, Senate; and F. M. Harroun, Spencerport.

C. R. Crosby, Extension Professor of Entomology, will work in cooperation with the Monroe County Farm Bureau on the control of the pear psylla.

The Senior Honorary Societies of the College of Agriculture now enroll the following members:

HELIOS: W. W. Eisele, A. R. Eldred, G. S. Ennis, K. H. Fernow, R. M. Halstead, A. P. Hoffman, T. C. Logan, E. E. Ludwig, C. W. Moore, R. C. Parker, N. C. Rogers, wide variation, been made. Among the most notable varieties were: William Turner, a massive, white, incurved flower; Mrs. Prin, a fine, incurved pink; and Mrs. Stevens, a beautiful reflex type of a bronze pink. The Floricultural Department announces that its annual show of potted and cut flowers will be held as usual during Farmers’ Week.

The 1918 Class in Agriculture has elected the following officers for the present year: President, William Dean; vice-president, Miss Marcia Grimes; secretary-treasurer, George Miller.

Dr. H. O. Buckman, Assistant Professor of Soil Technology, is on leave for this term, taking advanced work at Harvard on Geological phases of soils.

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<th>Apples at the Fruit Show</th>
<th>Winter Banana</th>
<th>Northwestern Greening</th>
<th>Stayman Winesap</th>
<th>Opalescent</th>
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'05, B. S. A.—G. Wendell Bush is now State Leader of county agent work in Ohio for the Federal Department of Agriculture. His address is 1995 North Fourth Street, Columbus, Ohio.

'06, B. S. A.—Morgan W. Evans was married to Miss Zoe Dyer, daughter of Mr. and Mrs. M. F. Dyer, of New London, Ohio, September 1. The couple are living at 930 Middle Ave., Elyria, Ohio, where Mr. Evans is in charge of a forty-acre experimental farm. The work is being done in cooperation with the U. S. Department of Agriculture and the Ohio Experiment Station.

'06, B. S. A.—Ernest Kelly is in charge of the Market Milk Investigations, U. S. Department of Agriculture.

'07, B. S.—Howard C. Price has announced his marriage to Miss Stella Earle of Worcester, Mass.

'08, Sp.—O. F. Ross, who has been manager of the Franklin County Farm Bureau for the past two years, has been transferred to a similar office with the Oneida County Farm Bureau. His office is in the Utica Chamber of Commerce.

'09, B. S. A.—G. H. Miller is Assistant Agriculturist in the office of Farm Management at Washington, D. C.

'09, B. S. A.—C. M. Bennett is specialist in charge of the Cost Accounting Investigations at Washington, D. C.

'09, B. S. A.—Alice C. Evans is employed in the Dairy Division, U. S. Department of Agriculture.

'09, W. D. C.—Robert L. French is superintendent of the creameries operated by G. Smith & Sons, Seelyville, Pa.

'10, Sp.—Milligan Kilpatrick went from Cornell to Pennsylvania State College as an instructor in Poultry Husbandry. He is now engaged in extension work in Ohio.

'10, B. S.—P. H. Elwood, formerly of Amherst, Mass., will have charge of the recently established Landscape Gardening course at Cornell. After graduation, Professor Elwood was instructor for two years at the Massachusetts College of Agriculture.

'10, Sp.—I. H. Warner is president of the Monroe County Farm Bureau.
'10, B. S. A.—Vincent J. Frost died June 2, 1915. He was born at Henrietta, in Monroe County, where he lived until 1900, when his parents moved to Lakemount in Yates County. After graduating from Palmer Institute in 1904, he went back to the school and took a two-years post graduate course, entering Cornell in 1906. While in college Frost was a member of the first Student Honor Committee. In the Eastman Stage competition he won first prize, his subject being, “The Farmers and the Railroads.” Following the completion of his course he was employed by the American Steel and Wire Co., and later went to Germany to study the language. On his return in 1912 he reentered the employ of the same company and took charge of their research work. During the financial depression of 1914, he was sent on extension work through the states of the Atlantic Seaboard and while engaged in this work contracted the sickness which proved fatal. He returned to his parents’ home in Lakemount where he died. He is survived by his wife, an infant son born Jan. 2, 1915, his parents and one sister.

'10, Sp.—T. E. Schreiner, who has been manager of the Briarcliff Farm, Atlanta, is now superintendent of the Poultry Plant at the Arizona College of Agriculture, Tucson, Ariz.

'11, B. S. A.—W. C. Funk is Assistant Agriculturist in the Office of Farm Management, U. S. Department of Agriculture at Washington, D. C.

'11, M. S. A.—E. H. Thompson, Assistant Chief of the Office of Farm Management, has supervision of the Farm Economics section. In the past year he has been elected to Sigma Xi.

'12, Sp.—H. G. Strait is Assistant in the Office of Farm Management at Washington, D. C.

'12, B. S. A.—A. M. Goodman is engaged in extension work for the Dairy Division of the Federal Department of Agriculture.

'12, B. S. A.—S. N. Stimson has resigned as County Agent of Caledonia County, Vt., and has taken up his duties as County Agent in Rhode Island.
'12, B. S.—E. W. Peterson is vice-president and general manager of the Moon Nursery Coop-

'12, B. S.—Paul Hemus is manager of the Northfield High School, Northfield, Mass. The school is a girls’ preparatory institution, owning a large acreage of land and some high-grade stock.

'12, B. S.—F. H. Lacy is Farm Bureau Manager of Dutchess County, with headquarters at Poughkeepsie.

'13, B. S.—Benson Paul is now employed by the New York State Conservation Commission as State Forester. His address is Conservation Commission, Albany, N. Y.

'13, B. S.—C. H. Elliott will assist in the 1915-16 Winter Poultry Course at Cornell.

'13, B. S.—C. M. Austin, who since his graduation has been teaching agriculture in the public schools of Annandale, Minn., has resigned to accept the position of Farm Bureau Manager of Franklin County, with headquarters at Malone.

'13, B. S.—R. H. Hewitt is farming at Gouverneur, making a specialty of pure-bred Holsteins.

'13, B. S.—H. W. Allyn writes us an interesting letter from Marianna, Victoria County, Texas, in which he states that in spite of many floods and overflows he is making good on his four-thousand-acre ranch.

'13, B. S.—George B. Hiscock, elder son of Judge Frank H. Hiscock, '75, was married on October 14 to Miss Genevieve Saxer, daughter of Mr. and Mrs. L. A. Saxer, of Syracuse. Luther H. Hiscock, brother of the groom, acted as best man. The couple will make their home at Appledore Farms, Skaneateles.

'13, B. S.—E. G. Meissner, Extension Professor of Farm Management, has been doing special survey work on the cost of milk production in Broome County. He is working in cooperation with Farm Bureau Manager Minns.

'13, Sp.—E. R. Zimmer, an Assistant in the Department of Animal Husbandry at Cornell, aided Manager Robertson, of the Jefferson County Farm Bureau, during a part of last summer.

'13, B. S.—Blanche A. Corwin is teaching agriculture and nature study in the State Normal School at Shippensburg, Pa. Miss Corwin writes that her department is progressing splendidly since she has succeeded in convincing the people that a woman can teach agriculture.

'14, M. S. A.—Henry W. Schneck has been appointed instructor in the Department of Vegetable Gardening of the New York State College of Agriculture. Mr. Schneck received his bachelor’s degree at Wisconsin in 1913, and for his
master's degree at Cornell he prepared a thesis entitled, "The Relation of Health and Vigor of Plants to Disease."

'14, B. S.—F. H. Branch is doing special work for the U. S. Department of Agriculture in relation to farm management problems of the New England States.

'14, B. S.—L. M. Thompson is in the Bureau of Farm Management at Washington, making investigations on the cost of producing apples in the United States.

'14, B. S.—John C. Vanatta is in business with his father at Brookstown, Ind., operating a farm of eighteen hundred acres.

'14, Sp.—Arnold Davis is managing a farm at Livonia.

'14, W. P. C.—Roy T. Argood writes that he is poultryman at the Mooseheart Farm, Mooseheart, Ill.

'14, M. S. A.—R. H. Wilkins, who was formerly in the employ of the Independent Agricultural School, Hathorne, Mass., is at present engaged in research work in poultry husbandry at the University of Kentucky, Lexington, Ky.

'14, B. S.—Henry B. Steer, who specialized in Forestry, has just received an appointment for forest work in the Indian Office, U. S. Department of the Interior. He will work on the Eastern Cherokee Lands in western North Carolina, where forested areas exist in connection with Indian Reservations. The Indian Service has a regular corps of foresters and resident forest officers on most of the reservations where timber is growing.

'14, B. S.—J. R. Teal, who is manager of the Cayuga County Farm Bureau, has recovered from a five-weeks' attack of typhoid fever and is now back at his work.

'14, B. S.—Burleigh N. Phelps, who since his graduation has been teaching agriculture at the Greene High School, died on October 6, 1915, from an attack of spinal meningitis.

'14, B. S.—H. F. Keyes has been transferred from Farm Efficiency work at the Connecticut State College of Agriculture in Connecticut, to Oregon, where he has charge of the Farm Demonstration work. It is rumored that "Hank" will join the ranks of the "Benedicts" when he returns home at Thanksgiving time.

'15, B. S.—Sara T. Jackson is teaching home making and science in the high school at Machias, Cattaraugus County.

'15, B. S.—Cecil R. Gross is studying for his master's degree at the University of Illinois. He is a graduate assistant in Bacteriology in the College of Arts and Sciences.

'15, B. S.—After having worked on a government farm survey in New England during the past summer, Leland A. Wood became County Agent of Caledonia County on October 1. His headquarters are at St. Johnsbury.
'15, B. S.—Miss Mary L. Thatcher is Librarian in the Poultry Department at Cornell.

'15, B. S.—Marshall L. Johnson's address is 1725 Wilson Ave., Chicago. He is with Jens Jensen, landscape architect.

'15, B. S.—Robert W. White may be addressed at the Kenwood Manor Hotel, 1134 East Fifty-Seventh Street, Chicago, or in care of the Linde Air Products Company, his employers.

'15, B. S.—H. C. Kellaran's address is P. O. Box 487, Rochester. "Dutch" is with Chase Bros. Nursery Company, learning the nursery business.

'15, B. S.—P. K. Whelpton has left his government position in Connecticut to fill the position of teacher of agriculture in the Greene High School, a vacancy caused by the death of B. N. Phelps, '14.

'15, B. S.—Wilfred Senbert is working on the farm of Henry Ford.

'15, B. S.—E. J. Gallogly has returned to his father's 150-acre farm three miles north of Albany. As the farm is largely devoted to dairying, he plans to increase the herd and specialize in the breeding of Holsteins.

'15, B. S.—R. Rischer is in charge of extension floricultural work at the home of George Hawley in Albany.

'15, B. S.—Delmar Turner is acting as assistant in Poultry Husbandry at the Texas College of Agriculture.

'15, B. S.—Raymond Sierk, who coached the inter-college crews for 1914-15, has recently been married to Miss Carolyn A. Broadbrooks. We are informed that "Sunny" holds a good position on a farm near Groton Lake.

'15, B. S.—Theodore W. Cann is superintendent of the Hurricana Farm at Amsterdam, having left college last May to accept the position. The farm, which comprises 700 acres, is located in the Mohawk Valley. A specialty is made of thoroughbred horses, and at present the farm has 28 brood mares, 12 two-year-olds in training, and 20 foals.

'15, B. S.—Lutha Banta is teaching at Alfred University, Alfred.

'15, W. P. C.—D. B. Greenberg is teaching in the New York State School of Agriculture at Farmingdale, L. I.

'15, B. S.—Helen L. Comstock is living at Chestertown, Md., where she is County Agent for Home Demonstration in Kent County.

'15, W. D. C.—W. F. Hanavan is with the Richardson Beebe Company, of East Aurora.

'15, W. D. C.—E. V. Smith, President of the 1915 class, is in the certified milk business at Ann Arbor, Mich.

(Continued on page 224)
DE LAVAL
SEPARATORS
Save in
7 Ways

QUANTITY of cream that no other separator will recover completely, particularly under the harder conditions of every day use.

QUALITY of cream as evidenced by De Laval butter always scoring highest in every important contest.

LABOR in every way over any gravity system, and also over any other separator, by turning easier, being simpler, easier to clean and requiring no adjustment.

TIME by hours over any gravity system, and as well over any other separator by reason of greater capacity and the same reasons that save labor.

COST since while a De Laval Cream Separator may cost a little more than a poor one to begin with, it will last from ten to twenty years, while other separators wear out and require to be replaced in from one to five years.

PROFIT in more and better cream, with less labor and effort, every time milk is put through the machine, twice a day, or 730 times a year for every year the separator lasts.

SATISFACTION which is no small consideration, and can only come from knowing you have the best separator, and being sure you are at all times accomplishing the best possible results.

Easy to prove these savings

These are all facts every De Laval local agent is glad of the opportunity to prove to any prospective buyer. If you don't know the nearest De Laval agency simply write the nearest main office, as below.

THE DE LAVAL SEPARATOR CO.
165 B'way, New York 29 E. Madison St., Chicago
50,000 BRANCHES AND LOCAL AGENCIES THE WORLD OVER

In writing to advertisers please mention The Cornell Countryman
ORCHARD TEA GARDEN
204 East State Street
UP-STAIRS
ITHACA, N. Y.
Open from 11 a. m. to 10:30 p. m.
Sunday, 5 to 8 p. m.
Regular Lunch
Every Day, 35c.

For Christmas
Your Photograph
The simple gift that lends the touch of friendship without the embarrassment of an obligation.

Kadoks for Sale,
Rent or Exchange
Supplies
Developing and Printing
Both Phones

Make the Clinton House Your Home
Until You Get Settled, and Then Make It Your Place for Relaxation, for Good Food and Good Service After You Get Located on "The Hill."
"We treat you right not once but always."
A la Carte Service 6 A. M. to Midnight
When the boarding house fare gets monotonous, try our Sunday table d'hote dinner served from 12 to 8 at 75 cents. Week days from 6 to 8 at 75 cents.
If you have to come down town at noon, come in and try our fifty-cent luncheon.

The Clinton House

Horse Production in New York State
(Continued from page 191)
which often increase the cost price by a good margin.

Such observations are significant as they operate against importing horses from other States and favor the production of horses within the State. If we are borrowing money, giving our farms as security, to buy horses with which to work the farms, and if we have been deceived as to the comparative usefulness between a so-called "western" and a native horse, it certainly is high time we were giving the matter of producing horses more serious attention than has been our custom hitherto.

In this, however, we must take into account our second consideration, namely, the comparative profit between colt raising and other farm activities. This matter is even more deeply involved, and attention is directed to it to suggest that, even though we can produce a horse for less than it costs to purchase him, still it may be more profitable to carry on other operations, such as fruit farming or raising dairy cows for market, and purchase the horse stock needed to operate the business. The likelihood of profit from horse production in New York State is a question too deeply involved to discuss in detail in so short an article.

Former Student Notes
(Continued from page 222)
'15, W. D. C.—Charles Mertz, jr., is conducting a market milk business at Stanhope.
The MOST UNIQUE CAMPUS PICTURE
SOLD ONLY BY
THE UNIVERSITY PHOTO SHOP
G. F. Morgan 314 College Ave.
SPECIALTIES:
Amateur Finishing, Picture Framing, Lantern Slides

For cows, beef cattle, sheep, etc., the feed value is greater than C. S. Meal and it usually sells at a higher price; but owing to the unusual shortage in the C. S. Meal, it now costs $4.00 to $8.00 per ton less—the cheapest high protein concentrate. Equally good results with ensilage or all dry feeds. Write today for the proof.

The Dewey Bros. Co.
Box 579 Blanchester, Ohio

Cornell CALENDAR
Ask to see the Colored Albertype Calendar
For sale at all the leading Stationery and Art Stores

Don't BUY Poultry Feed— INVEST In It
That is, buy the feed that will bring you actual returns—the feed that makes poultry-raising profitable.

H-O SCRAPING
FEED
contains hulled oats; keeps the chicks active, healthy and strong all the year 'round. Cheaper because not mixed with gravel, grit or sweepings.

J. J. CAMPBELL
GEN. SALES AGENT HARTFORD, CONN.

The H-O
Company Mills
BUFFALO, N. Y.
PRAGER’S
Dancing Academy
(Opposite Tompkins County Bank)

Member of American Society of Professors of Dancing, New York City.

All the Latest Standardized Dances taught correctly. Private Lessons at any time when not engaged with classes. Pupils can begin at any time. Winter Term begins Saturday, January 8.

Right and On Time

DO YOU KNOW WHAT THAT MEANS?

Try Stover Printing Co. the next time you want a job of printing done and find out. Others have tried us and been satisfied.

Former Student Notes
(Continued from Page 224)

'15, M. S. A.—V. R. Jones, who has been assistant in the Dairy Industry Department of the College, is now Assistant Professor of Dairy Husbandry at the South Dakota College of Agriculture, Brook- ing, S. D.

'15, B. S.—A. Chuckrow is employed by the New York Globe to assist in that journal’s campaign for pure food.

'15, B. S.—George A. Abell, whose address is 159 Botolph Street, Boston, Mass., is studying music at the New England Conservatory.

'15, W. C.—Clinton G. Abbott is located on the Orchard Hill Farm, of 250 acres. His principal enterprise is fruit growing.

'15, B. S.—E. R. Wagner, who has been assisting the Farm Bureau Manager of Niagara County for the past two months, has returned to his farm in the same county.

'15, B. S.—C. P. Clark is assisting in Farm Management Survey work for the U. S. Department of Agriculture.

'15, B. S.—D. W. Kelsey, of Franklinsville, has returned to take work in rural education as a preparation for teaching in the high schools of the State.

'15, B. S.—R. A. Pollard, who has been acting as Farm Bureau
.. SHORT COURSE MEN ..

Before you decide on a Sheep-lined Coat, a Mackinaw or Overcoat, be sure and get my prices.
In my store you will find everything a man can wear from top to bottom, and this is

ITHACA'S ONLY CASH STORE

Don’t miss my Shoe Department. Better Shoes For Less Price is my Argument.

GEORGE F. DOLL

The House of Quality

418-420 Eddy Street

Ithaca, N. Y.

---

TREES at WHOLESALE

W. & T. Smith Company, Geneva, N. Y.

Write for Catalogue and Prices

Our trees are not lowest in price, but we guarantee Quality and Purity of varieties, and such nursery stock is the cheapest

In writing to advertisers please mention The Cornell Countryman
AN EDITORIAL BY THE BUSINESS MANAGER

In order to get the reader in closer touch with our advertisers the Countryman has started a new plan. We have secured, as you no doubt have noticed, several national advertisers to take space in our magazine and we are now anxious that they will be well satisfied with their investment. So that this may work out to the fullest extent we are going to publish from time to time short editorials and comments on advertising, also some of the facts that the Countryman has compiled for the benefit of its advertisers. It is hoped that the Countryman will be able to bring its readers and advertisers closer together. Any comments as to how this plan can be improved will be gratefully received.

* * *

How long was it after the first “horseless carriages” were developed, before the automobile business became the largest single factor in general advertising? Now the motor-driven vehicle has almost usurped the horse in the cities, and has greatly specialized the horse’s work in the country. The agricultural papers are carrying a large share of the automobile advertising, because the farmer needs the auto. Among the most important uses of the machines is in connection with rural betterment work. For example, 65 members of the staff of the New York state College of Agriculture including members of the farm bureau organization, own autos, and 12 more are prospective owners. At least a dozen cars are represented as follows:

<table>
<thead>
<tr>
<th>Cars</th>
<th>Owners</th>
<th>Prospective Buyers</th>
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<tbody>
<tr>
<td>Ford</td>
<td>41</td>
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<tr>
<td>Overland</td>
<td>7</td>
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<td>Reo</td>
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<td>Metz</td>
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<td>Dodge</td>
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<td>Cadillac</td>
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<td>Hudson</td>
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<tr>
<td>Hupmobile</td>
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<tr>
<td>Studebaker</td>
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<tr>
<td>Maxwell</td>
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<tr>
<td>Oldsmobile</td>
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<tr>
<td>Chase (truck)</td>
<td>1</td>
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<tr>
<td>Indian (motorcycle)</td>
<td>1</td>
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</tr>
</tbody>
</table>

No wonder the agricultural journal is a good medium for automobile advertisers especially after two years of bumper crops and good prices!

* * *

An American had a friend sojourning abroad. In order to save postage on certain magazines, this New Yorker, in sending them across the water, tore out the advertising matter. The friend wrote back: “For Heaven’s sake; if you’ve got to tear out anything, sacrifice the reading matter! The ads are the more interesting part.”

* * *

A good thing to the credit of advertising is that many of the new and useful designs of type owe their origin to the needs of the advertiser for artistic type display. Some of these designs, in fact, have been named from the product which they were used to advertise.
The New York State Grange Purchasing Agency

having had many requests from members to put upon the market an absolutely pure dairy ration, has made arrangements to do so; and the feed will be known as the

"Cornell Dairy Feed"

The tag on each bag will contain the formula from which this feed is made, the amount of each ingredient and the analysis. Competent and Skilful Feeders have already used this Feed in making Advanced Registry Records. They have proved that it is a most excellent feed and a splendid milk producer. We believe that we have something that will strongly appeal to the dairy interests of the state.

By Using the "Cornell Dairy Feed"

you will know exactly what you are buying and the exact amount of each ingredient you are feeding.

Address all inquiries to the

New York State Grange Purchasing Agency

OLEAN NEW YORK

In writing to advertisers please mention The Cornell Countryman
HERKIMER COUNTY
THE
Home of the Holstein
WE OFFER
One of the Finest Lots
OF
Pure Bred Holstein-Friesians
EVER OFFERED TO THE
Dairymen of New York State
COWS, BULLS, HEIFERS, CALVES
TWO WORLD RECORDS THIS YEAR
WRITE OR VISIT US

Herkimer County Holstein-Friesian Breeders Association
124 N. Main Street
HERKIMER, N. Y.
Phone 134-W

In writing to advertisers please mention The Cornell Countryman
EMPIRE CALF MEAL
Saves the Milk and Saves the Calf.

Empire Calf Meal is the result of careful study and experiment, in feeding calves, by experts.

We Guarantee it
Safe, Sufficient, Satisfying.
Second to none as a milk substitute.
It is reasonable in price.
Ask your dealer about it.
Write us if he cannot supply you.

Do not be satisfied until you have tried Empire. We will make you satisfied with Empire Calf Meal or refund your money.

EMPIRE GRAIN & ELEVATOR COMPANY
Binghamton, New York

Co-operating with the Agricultural Colleges

When two men are working close together and are striving to bring about similar results, it is logical to assume that they will sooner or later become acquainted with each other.

That is what happened between Agricultural Colleges and Wyandotte Dairyman's Cleaner and Cleanser.

One of the prime objects of the Dairy Department of Agricultural Colleges is to promote the cause of better products. This is the sole purpose of Wyandotte Dairyman’s Cleaner and Cleanser. Not long after Wyandotte Dairyman’s Cleaner and Cleanser was discovered Dairy Authorities found that the assistance rendered by Wyandotte Dairyman’s Cleaner and Cleanser in the work of producing clean, pure dairy products was invaluable, hence the common ground for mutual cooperation.

Today there is scarcely a single exception to the rule that Dairy Colleges in this country and Canada and other dairy nations use Wyandotte Dairyman’s Cleaner and Cleanser in their own Dairy Department. They practice what they teach.

For the convenience of those engaged in the dairy business, Wyandotte Dairyman’s Cleaner and Cleanser is carried in stock and can be promptly obtained from any of the leading dairy supply houses.

The J. B. Ford Co.
SOLE MANUFACTURERS
Wyandotte, Michigan

This Cleaner has been awarded the highest prize wherever exhibited.

Where you saw it will help you, them and us
OUR DELIVERY DEPARTMENT

An adequate and efficient delivery force assure our customers of PROMPT and CAREFUL SERVICE at convenient times in any part of the city.

THE PEARSON SANITARY DAIRY, 412 North Geneva Street
For More Milk and Butter
Better Condition of Stock

SCHUMACHER
FEED

Should Be the Base of Your Ration

Most of Present World’s Champion Cows

Made their astounding and remarkable records with rations based on SCHUMACHER FEED. Some of the most famous cows and their records are,

Finderne Pride Johanna Rue, (Holstein) World’s Champion butter producing cow, produced in one year 1470.5 lbs. butter—28403.7 lbs. milk.

Finderne Holingen Fayne (Holstein) record surpassed only by Finderne Pride Johanna Rue, produced in one year at the age of only 4 years, 1395.6 lbs. butter—24612.8 lbs milk.

Sophie 19th of Hood Farm, World’s Champion Jersey cow, produced in one year 1175 lbs., 702.5 butter—17557 lbs. milk.

Auchenbrian Brown Kate IV. World’s Champion Ayrshire cow, produced in one year 1080 lbs. butter—23022 lbs. milk.

Jean Duluth Beauty, World’s Champion Red Polled cow, record not yet completed, has already produced in nine months 863 lbs. butter.

SCHUMACHER FEED helped these cows make such extraordinary yields of milk and butter, it will help your cows give steadily their largest yields of milk and butter.

SCHUMACHER FEED is rich in the condition—sustaining elements—decidedly palatable—easily and thoroughly digested—kiln dried—made from various products of corn, oats, barley and wheat, finely ground, scientifically blended.

No other feed just like SCHUMACHER FEED, if your dealer does not handle it, write us.

The Quaker Oats Company
CHICAGO
Machinery and Supplies

for Dairies, Creameries and Milk Dealers

Write for catalog and prices

Prompt and Courteous Service

New York State Distributors for the Cherry Line

D. H. Gowing & Co. Incorporated

SYRACUSE, N. Y.

Dairy, Creamery, Cheese Factory

Apparatus and Supplies

Burrell (B-L-K) Milkers

Simplex Cream Separators

D. H. BURRELL & CO.

LITTLE FALLS, N. Y.

Former Student Notes

Manager of Oneida County, has returned to the college as an instructor in the Department of Farm Management.

'15, B. S.—H. K. Rulison is in the Department of Dairy Husbandry of the University of Illinois at Urbana.

'15, B. S.—Stanley Coville is with the U. S. Forest Service at Las Cruces, N. M.

BOOK REVIEWS

(By L. H. Bailey. Charles Scribner's Sons, New York. 171 pages. $1.00 net.)

In this volume Professor Bailey presents his personal views of man's relation to the soil, both physical and spiritual. That is, he treats of the practical questions involved, such as the conservation of resources and the like, but in such a way as to arouse the sense of the basic character of nature with respect to intellectual and spiritual, as well as physical, life. From an introductory statement that the earth is holy, the reader is led out on a pleasant and stimulating "journey of recognition, not of protest"; the author employing his poetic gifts of vision and expression to make the reader not only understand, but feel, the truth.

Beekeepers

(By Everett Franklin Phillips, Bureau of Entomology, United States Department of Agriculture. Published as a part of the Rural Science Series, L. H. Bailey, Editor, by Macmillan, New York. Price, $2.00 net).

(Continued on page 244)
A test of Sucrene Calf Meal is now being made by the Cornell Experiment Station.

**Sucrene Calf Meal** makes calf raising profitable. This is shown by the enormous demand for it among dairymen and farmers.

At a feed cost of from $3 to $4 the Sucrene fed calf develops sufficiently to command from $15 to $20 on the market.

**The Secret of Extraordinary Success With Sucrene Calf Meal**

- **Blood Meal** is one of the important ingredients exclusively used in Sucrene Calf Meal. It is rich in digestible protein, and a bowel corrective of exceptionally high quality—prevents scour.
- **Bone Meal** is another. This supplies material to build up the young animal's frame.
- **Soluble Starch and Malt Flour** supply the necessary sugar in its most digestible form.
- Other ingredients are Linseed Meal, Desiccated Skim Milk, etc.—all accurately proportioned to make a scientifically balanced ration to form muscle, bone, lean meat, cartilage, rich blood, etc.

**Note this remarkable guaranteed analysis of Sucrene Calf Meal:** 20 per cent protein, 55 per cent carbohydrates, 5 per cent fat and only 3 per cent fibre.

Sucrene Calf Meal is easy to prepare and feed; makes calf raising profitable, easy, and free from the ordinary risks. A 100 lb. sack costs only $3 and gives you over 100 gallons of rich milk equal.

Fill out and mail us the coupon, with check or postal order for $3.

**American Milling Co.**

Sucrene Station 10  Peoria, Illinois

Ask your dealer about Sucrene Calf Meal, Sucrene Dairy Feed, Sucrene Hog Meal, Sucrene Alfalfa Horse Feed, Sucrene Stock Feed, Sucrene Poultry Feeds. They cut the feed cost, and animals thrive better.

**Free Book on How to Raise Calves Profitably**

Containing valuable facts on how to avoid the troubles which often afflict calves. Also, authoritative information on general care and special feeding. It is indispensable to you. The coupon or a postal card will bring it to you free.

**Where you saw it will help you, them and us**
A FEW FACTS RELATING TO

Chenango County Dairy Cattle

I. Several hundred are now listed for sale by our members, including the following:

Grade Holsteins—Fresh Cows—Nearby Springers—and several carloads of Yearlings and Two-Year-Olds.

Pure Bred Holsteins—Service Bulls and Bull Calves—well bred Heifers and Cows.

II. Chenango has more dairy cows to the square mile than any other county in New York State.

III. Chenango and Madison, the adjoining county on the north, have more Grade and Pure Bred Holsteins than any other like area in the United States.

IV. This is one of the pioneer Holstein sections in this Country.

V. This is the place to buy high quality stock at reasonable prices. Write us your wants, or call..

Chenango County Farm Bureau
NORWICH, N. Y.
KING OF THE WALKERS
NO. 136512

KING OF THE WALKERS
and his full brother
King of the Black and Whites

are the only bulls whose seven nearest dams average 31.04 lbs. butter in
7 days, and four of the seven have produced 30-lb. daughters, that have
also produced 30-lb. daughters. Six of his seven nearest dams have thirty-
day records which average over 126 lbs. butter each.

As this bull is bred to daughters of the great transmitting sire, King
Veeman De Kol and to daughters and granddaughters of De Kol Queen La
Polka 2nd, butter in 7 days, 35.38 lbs., milk, 845 lbs.,

NEWTON FARMS or SHERBURNES STOCK FARM

is the place to buy your next herd sire.

R. P. KUTSCHBACH, & SON
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Book Reviews
(Continued from page 234)

The needs of the beekeeper with a few colonies are considered in this book, as well as those of the specialist who devotes his entire time to honey production. The treatment of the subject is based wholly upon fundamental principles. The author presents the essential manipulations in their logical order and shows the desirability of eliminating all that is non-essential. Since tools alone do not make a good beekeeper, the consideration of apparatus is subordinated, though all of the equipment is briefly described and illustrated. On the whole, this is a work that should be both of interest and of practical value to the man who keeps bees.

The Principles of Floriculture
(By Edward A. White, Professor of Floriculture in the New York State College of Agriculture at Cornell University. Published by McMillan, New York, as an edition of the Rural Text Book Series, edited by L. H. Bailey. $1.45 net).

In this book Professor White furnishes the student of Floriculture an attractive and interesting text, without in the least neglecting the substantial, scientific side of his subject. Floriculture is considered in all its parts. By a brief botanical explanation of plant life the student is led into consideration of the practical factors by which the floriculturist controls to his profit the environment of the plant. Site and structure of the greenhouse, selection of soil, control of insect pests and plant diseases, planting, transplanting, harvesting and marketing are thoroughly considered.
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The following records are productions of our flock:

<table>
<thead>
<tr>
<th>Breed</th>
<th>Eggs laid 1st yr.</th>
<th>Eggs laid 2nd yr.</th>
<th>Eggs laid 3rd yr.</th>
<th>Total eggs laid 3 yrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lady Cornell</td>
<td>258</td>
<td>200</td>
<td>191</td>
<td>649</td>
</tr>
<tr>
<td>Madam Cornell</td>
<td>245</td>
<td>131</td>
<td>163</td>
<td>539</td>
</tr>
<tr>
<td>Cornell Prolific</td>
<td>243</td>
<td>162</td>
<td>146</td>
<td>551</td>
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<tr>
<td>Cornell Laywell</td>
<td>205</td>
<td>165</td>
<td>159</td>
<td>529</td>
</tr>
<tr>
<td>Cornell Supreme</td>
<td>242</td>
<td>198</td>
<td>225</td>
<td>665</td>
</tr>
<tr>
<td>Cornell Surprise</td>
<td>180</td>
<td>186</td>
<td>196</td>
<td>562</td>
</tr>
<tr>
<td>Cornell Persistent</td>
<td>192</td>
<td>197</td>
<td>178</td>
<td>567</td>
</tr>
</tbody>
</table>

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THE CO-OP., Morrill Hall

Where you saw it will help you, them and us
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"We minded that the sharpest ear
The buried brooklet could not hear,
The music of whose liquid lip
Had been to us companionship,
And, in our lonely life, had grown
To have an almost human tone."

(From Snow-Bound by J. G. Whittier)
The Hydraulic Ram

BY B. B. ROBB, ’11
Assistant Professor of Rural Engineering, New York State College of Agriculture at Cornell University

The hydraulic ram is an automatic device by which the fall of a comparatively large volume of water furnishes power to raise a part to a height greater than that of the source, by taking advantage of momentum and the inelastic properties of water. The original inventor was a man named Whitehurst, of Derby, a mechanic, who built his first ram about 1772. He had observed what is so familiar to most of us, that if water flowing through a long pipe with considerable velocity is suddenly stopped, a heavy rise of pressure is produced within the pipe, occasionally causing it to burst. Like Watt with his observations of the steaming kettle, it occurred to Whitehurst that advantage might be taken of this phenomenon.

If a small branch pipe is taken off the main near its lower end, a small quantity of water will be forced up this branch, to a height far greater than that from which the water originally fell. It is said that even though the Whitehurst ram was exceedingly crude and operated by hand, it was nevertheless actually used until about 1800, when Joseph Michael de Montgolfier, of France, devised a plan by which the Whitehurst ram was made automatic in its operation. This greatly added to its practical utility. The hydraulic ram of to-day, with only a few minor alterations for increasing its efficiency, is practically as Montgolfier left it. It is claimed that some of the rams of the original pattern as modified by Mr. Easton, who acquired from Montgolfier the British manufacturing rights, are still operating.

If simplicity were the only factor involved the hydraulic ram would be universally used, as it is mechanically the simplest self-contained pumping unit known. But unfortunately its use is restricted by certain physical conditions. In order to make use of this simple little machine, one must have an abundant supply of water in the form of a flowing stream with considerable fall. In other words, the major portion of the supply is used to force the minor portion to the point of utilization. There should be between the levels of the supply and the location of the ram a fall of three feet or more, although with a sensitive ram installed under favorable conditions this fall may be as little as two feet, and rams have been operated with a head of only eighteen inches.

The actual height to which water may...
be lifted will depend on the supply head and on the design of the ram, some raising water only ten times as high as the supply head, while others will deliver to twenty-five or thirty times as high as the supply.

The amount of water raised depends on three factors—the distance the supply water falls, the height to which the delivered water is raised, and the quantity of water wasted. Within the range of practical operation the amount of water delivered will vary from as little as one-fifteenth of the quantity supplied to as much as one-quarter or one-third of that amount.

The principle of operation of the hydraulic ram is comparable to that of driving a nail into a piece of wood with a hammer. It would be impossible to push the nail into a piece of hard wood by means of pressing against its head with a hammer, but if the nail has been started and is then hit successive blows with the hammer it will be gradually driven into the wood. Hence the principle of the ram is that the water, by successive blows (made by its rushing down the drive pipe), drives a portion of itself into the air dome and up the delivery pipe.

The essentials of the hydraulic ram (Fig. 1) are, a supply pipe, a discharge pipe, and a reservoir, or air chamber; the lower end of the supply pipe is enlarged to form the impact chamber. Besides these parts there are two valves,
quiring during this stage considerable velocity. Soon this velocity through the ram becomes so great that the impetus valve is carried shut (C, Fig. 2). Now water is incompressible; no steel bar could be more rigid than that mass of water coming down the drive pipe. It has no place to go to, and its inertia, with terrific driving force, is expended against the closed impetus valve and against the valve leading into the air dome. As a result, since water is a fluid and free to move in any direction, it rushes rapidly into the air dome (D, Fig. 2) and is gradually brought to a standstill by the reaction of the confined air. This reaction is so determined that the inrushing water is not only stopped but is rebounded like a billiard ball from the cushion, sending the water backward along the drive pipe. This is indicated in the sketch (D, Fig. 2) by the arrow pointing in the reverse direction. This recoil of the water leaves a part of the space in the impetus chamber unoccupied; or, in other words, a partial vacuum is formed, under the influence of which the impetus valve drops open. The water recovers from the rebuff given it by the air and again starts flowing out at the open impetus valve. Since the valve in the air dome has been forced shut, the air pressure relieves itself by discharging water up the delivery pipe. Theoretically this is all that should be necessary for the ram to operate, but unfortunately the air in the air dome is gradually absorbed by the water and in a little while the cushion would be lost. In order to avoid this there is tapped in the base of the ram, as shown in the sketches, a little hole called the snifting valve. If we watch the action of the tiny stream spurting from the snifting valve we find that it is vibrant as well as intermittent, showing that the actions attending recoil are complex.

When the rebound comes and the partial vacuum forms, air slips into the impetus chamber (D, Fig. 2) through the snifting valve and is carried into the dome by the succeeding drive. Thus we have the ram cycle, and one of these little machines, if given a steady supply of water, will operate continuously, day in and day out, for years with but little cost or attention.

When installing a ram it is very important to protect it and the drive and delivery pipes from freezing (Fig. 7). Usually a small pit or well is built, in which the ram is located. A sufficient drain should also be provided to remove the waste water, as flooding reduces the efficiency of the ram. A ram will work under water, however, provided there is a net fall in the supply.

By the law of conservation of energy,
the quantity of water entering the ram multiplied by the distance of fall should equal the quantity of water delivered by the ram times the distance raised. If we let $f$ equal the fall in the drive pipe, $h$ equal the delivery head, $Q$ equal the quantity of water supplied by the reservoir, and $q$ equal the quantity of water delivered, this fundamental expression would be:

$$Qf = qh$$

Unfortunately, however, friction losses in the pipe and imperfections in the ram prevent this formula from holding true. In computing the capacity of an actual ram we must correct the ideal equation by introducing a correction factor, which is really the mechanical efficiency of the ram. Putting the corrected expression into words, we would say that the water supplied times the distance of fall times the mechanical efficiency of the ram equals the water delivered times the distance raised; or, if $k$ equals the correction factor then

$$Qfk = qh$$

or

$$q = \frac{Qfk}{h}$$

In practice $k$ equals from 60 to 66 per cent.

The inertia of the moving column of water in the drive pipe is very great. If the drive pipe is very long, it is possible for this inertia to be too great for the valves and the working situation of the ram. There is a fairly definite relation between the length of drive pipe and the head on the ram. The following formula for determining the proper length of drive pipe is deduced from one more complex given by the Rife Hydraulic Engine Company:

$$L = \frac{h^2}{f} \left( n - 0.002 \right)$$

in which $n = 0.12$ when $h/f$ is 10 or less, and $n = 0.08$ when $h/f$ is between 10 and 20; when $h/f$ is more than 20 this formula does not hold. So far as we know this formula is purely empirical.

Should it be found that the length of drive pipe is less than the distance from the supply necessary to secure proper fall, a standpipe is placed in the supply line (Fig. 1). The purpose of this standpipe is to maintain the head but shorten the driving column to the proper length; therefore it must be an open-top pipe, rising slightly above the level of the supply.

The operation of a ram is regulated by varying the length of the impetus valve stroke. Shortening the stroke in-
creases the number of impulses per minute. The performance of a typical ram operating under fixed heads but with varying lengths of stroke is represented in a set of three curves, shown in figure 4.

For abscissa we have length of impetus valve stroke. The ordinates are gallons of water per hour on the one hand, and delivery ratio on the other. The first curve is called the water delivered curve. It is the amount of water that the ram actually delivers for the various lengths of stroke. On a very short stroke the ram delivers no water, merely maintaining the pressure; there-
fore this curve does not pass through zero. The second curve, showing the amount of water used, represents the quantity of water which flows into the ram—part to be wasted, part to be delivered. The third curve is obtained by dividing the water delivered by the water supplied for each length of stroke. This curve is interesting in that it shows at what stroke we get the most water delivered in proportion to the water supplied to the ram. It will be noticed that this curve rises very rapidly to a maximum and then gradually falls away. Now, if we either shorten or lengthen the stroke from this point of greatest efficiency, we get less water in proportion to the amount supplied; if we lengthen the stroke we use more water and deliver more, but if we shorten it the reverse is true.

These curves tell us also that if our supply of water is small it is best to set the ram for the largest delivery ratio. If, however, the quantity of supply water is unlimited, we can afford to lengthen the stroke and get more water delivered at a greater expense in waste.

Should it happen that our water supply is so limited that we cannot set the ram for the high point on the ratio curve, it would be much better to get a smaller machine.

The hydraulic ram is generally used to pump directly into a tank (Fig. 5) from a stream or a spring, in which case the head pumped against is nearly constant. It is possible, however, to pump directly into a pressure tank; if this is done, care must be taken not to draw the pressure down too low, as great range of pressure is likely to stop the ram. No particular damage will be done, but one must go down to the ram and start it again.

It sometimes happens that one has a spring emptying into a stream. It is desired to have the spring water pumped to the house, but the supply of spring water is so limited that there is not enough to waste through the ram in order to do the pumping. By making use of the double-acting ram (Fig. 6), the energy of the creek water may be
used to force the spring water to the point of utilization.

The double-acting ram works on exactly the same principle as the single-acting ram just described. There is determined by relative heads of respective supplies, size and shape of impact chamber, and length of impetus valve strokes. In order that the impact chamber may fill promptly, an auxiliary tank

one additional feature, however. Water from the clean supply enters the impact chamber and passes toward the open impetus valve, while the dirty water from the drive pipe is already flowing out at this valve. When impact occurs, the clean water, being nearer the air dome check and prevented from returning the way from which it came by the supply check, is forced into the air dome. The extent of mixing of the two waters is deter-
or standpipe is placed in the clean water at a considerable distance away with the supply head low. This arrangement greatly reduces the extent of mixing. The only requirements for successful operation of the double-acting ram are that both sources of supply be higher than the ram. If the clean water has greater head than the dirty water, the loss of clean water through the impetus valve will be considerable.
"This is no vacation!"

Such were the words of a song which was very popular in a certain section of the Adirondacks during the past summer. These words were feelingly uttered on many occasions by a group of some twenty seniors and graduates in the Cornell forest school during the third, or summer, term. Yet the fact that they had the time and the inclination for singing indicates in some degree that life was not wholly a burden. On the other hand, it must be admitted that a good many who went to the camp had to readjust their views, and came to realize that their roseate anticipations of camp life were not in the least like the actualities of work and study which they found. The men arrived in camp on a July morning, in the midst of a cold, and clammy, and foggy, foggy dew, which was a good deal more than a Scotch mist. However, their tents were soon habitable and the weather was unable to dampen their spirits as much as it had dampened their clothes and bedding.

The camp was in no sense a summer resort. The men had reached it by going to Tupper Lake and from there to St. Regis Falls. From St. Regis Falls it was four miles through the woods to the head of Lake Ozonia, and then the length of Lake Ozonia to the holdings of Mr. F. A. Cutting, who had agreed to permit the forest students to use his woods as a field of study. After that, another three miles through a real forest of mixed hemlock and hardwoods, with some spruce in the flats, brought the students past sawmills and lumber camps to the place that had been selected for their headquarters.

The camp, stretched out along the logging road—which was facetiously termed “Broadway”—was near a small stream in which trout were supposed to lurk. Certainly the stream was cold enough. If the students failed to demonstrate whether the trout were there or not, it was because they respected the wishes of Mr. Cutting and refrained from casting a line into the stream. The stream itself was not deep enough for swimming, so one of the first tasks to which the fellows set themselves was
the construction of a dam that would give the required depth. After it was finished the daily morning plunge became a fixed part of the program of camp life, and in this plunge professors and students shared alike. Usually there was an evening plunge also, and sometimes one at midday if the work permitted a return to camp. For some the morning ablution proved a little onerous, particularly toward the end, when, in September, frost on the ground and ice on the board that led to the pool, combined with the chill of the air and the water, made the exercise somewhat rigorous.

All the members of the forestry staff were in attendance at the camp at one time or another during the summer, as were also Dean Galloway, Professor E. S. Savage, and Professor Bristow Adams, of Cornell, and Professor Lovejoy, of the Forest School of the University of Wisconsin, who gave a very valuable series of talks and demonstrations. Professors Recknagel and Bentley were in attendance during all of the third term, and Professor Spring came up as soon as his duties in the summer school at Cornell permitted him to get away.

The work consisted of silvicultural studies, of forest mensuration, and of administration studies. Four of the men made a special trip over Labor Day to the former Cornell plantings at Axton, and inspected the plantings of pine, which the cutting of the hardwood trees had made necessary in order to renew the original pine character of the forest, practically all of the larger pine trees on that tract having been taken out in earlier lumbering operations.

There were daily visits, under instructors, to the various cuttings, to the log slides and skidways, to lumber mills, and to different types of forest. There were lectures in the combined dining, study, and lecture hall, a frame building immediately adjoining the cook house—these two being the only permanent structures.

In the words of the song, the refrain of which has been quoted, "Exams came off on schedule time"; and they were, if one might judge from the comments of the men who took them, pretty stiff "exams." At the end of the term there were the regular final examinations, and

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**SUNDAY MORNING CEREMONIALS**

Some of the men acquired considerable tonsorial skill in the period immediately preceding these the camp was peculiarly quiet and studious.

There were no visitors, no distracting elements, and no temptations to go to the movies because there were no movies to go to.

There were, however, certain recreation features. The students fraternized on good terms with the lumberjacks, and earned the liking and respect of that
THE FORESTRY CAMP IN THE ADIRONDACKS

Brown tents, each occupied by two or more students, stretched along a logging road called “Broadway” — in the background the combined mess hall and study room somewhat critical and sensitive class of workers, who usually look upon the forest student with an amused tolerance bordering on contempt. The students played baseball with the lumberjacks in the one small clearing for miles around large enough for a baseball field — even though the game was complicated by stumps — and were beaten. It must not be supposed from this, however, that the students could not play a reasonably good game of ball. There was a large proportion of athletes among them, and as a whole they were remarkably clean-built and well set up. For example, some of the men were ‘varsity athletes, as Bird, number 2 on the crew, Irish, intercollegiate miler, Tinkham, of the cross country team, Fielding and Zimm, of the swimming team, and various others of only slightly less prowess.

At the end of the summer camp there was a great bonfire, with the lumberjacks and sawmill men for miles around listening to the stunts of the college men and furnishing stunts of their own in the way of songs and speeches. This was the climax of the

STUDENTS MEASURING LOGS ON A SKIDWAY

The advantage of working where lumbering operations were being actually carried on gave unexcelled opportunities for the study of timber utilization
extra-curricular activities at the camp itself. The next morning the camp was cleared up, the study-hall windows were boarded and nailed tight, duffle-bags were packed, and tents were struck. Most of the men, however, went on to Dickinson, the home of the camp cook, who had endeared himself to all by his viands and his patience. At Dickinson they gave an entertainment which, according to local report, is likely to live long in the traditions of that town.

It is quite beyond the possibilities of space to give here all of the many sidelights that had to do with this, the first full third-term period of the Cornell forest school in the woods, but they live in the minds of those who participated and in the songs and stories that were developed. Most of all, the camp showed up the qualities of all the men there, students and faculty alike. If it so happened that there were streaks and mottled spots in a man's make-up and disposition, the camp showed them. If he had strength, initiative, adaptability, and other qualities that the classroom failed to bring out, the close contact in the woods brought them to the fore, and it was the unanimous opinion of all there that uniformly the good points were preeminent.

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A Question Concerning Lime

BY P. R. YOUNG, '16

One day last summer, as I was on my way home from the railroad station with a load of pulverized limestone, a farmer of my acquaintance drew up and accosted me with the question, "Do you think that stuff is really good for anything?" I told him I thought it was very good for a great many things in the farming line, to which he replied: "Well, I don't! I wouldn't give a cent for all there is of it." Then came the story of how he had bought a few tons the year before, put it on some of his seeding, and now could see a distinctly poorer stand and crop where he had put it. With the final word, "Let me tell you, I've had enough of that stuff," he drove on, leaving me rather at a loss to account for such a result. For I knew that all the land in that region was suffering for lime.

Could it be that his land had actually failed to respond to the application of lime? or was it possible that he was only talking for effect? Neither hypothesis seemed reasonable. Again, it might be possible that he was buying poor, useless stuff with very little available value. Even this seemed impossible in view of the rigid laws regarding statement and guarantees of analysis, backed up by a system of state inspection. The results from impartial analysis of all lime, fertilizers, and other soil dressings are gathered and are published in a bulletin. This would seem a pretty effective means of keeping the products up to their stated analyses. Later in the summer, however, I had a little experience which seems to shed a new light on the subject, and perhaps explains the disgust of my farmer friend.

By demonstrating its worth, and by considerable argument, I managed to get three or four of the conservative farmers of my neighborhood to purchase with me a carload of ground limestone. They had all heard more or less about the necessity of lime for their land, and were all still more or less doubtful as to whether it would pay. Nevertheless, they agreed to take a few tons each from my carload, leaving such details as the selection of any particular brand entirely to me.

Correspondence, and a comparison of analyses and fineness, led me to decide on a certain well-known brand of limestone, with a guaranteed analysis of 94 per cent of carbonates and ground fine enough so that 80 per cent of it
would pass through a 100-mesh screen. To this particular firm whose product I had chosen I sent my order, enclosing the cash. The car came in good shape, about the middle of August, and the various investors took their apportioned amounts. The whole affair was considered settled.

About the first of September Mr. E. M. Baker, agronomist at the New York State Experiment Station at Geneva, and a friend of ours, came over in his car to spend a few days with us. He noticed the limestone stored in our barn, and, as he has charge of all analyses of lime at the station, he said that if we cared to have him do so he would take a sample of this lot back with him and analyze it. We told him to go ahead.

In the course of two weeks it happened that I visited him at Geneva. He then informed me that, to his surprise, our lime had analyzed only 63 per cent of carbonates, instead of the guaranteed 94 per cent. He was quite as surprised as I was, the company in question having always lived up to its professions, and he advised that I take the matter up with them directly. By this time I did not have much good feeling to spare toward that particular company, and I wrote them a letter. In a few days along came a stranger who introduced himself as a representative of the company and requested facts at first hand. He got them! After mature deliberation, he came to the hopeful conclusion that there was a big mistake somewhere, preferably in Mr. Barker's analysis.

In order to decide for a certainty, he took a good, fair, composite sample from my bags and carried some back to the works and some to Professor Fippin at the College of Agriculture, who forwarded it to the Department of Agricultural Chemistry. We agreed that all future action would be based on a comparison of the two analyses. The representative of the company was very fair-minded on the subject; he intimated that we would get our money back if there had been a mistake, but he was convinced there had been no mistake, at least on the company's part.

In the course of a week, I received an apologetic letter from the sales manager of the firm, stating that Mr. Barker's analysis was right and that the product delivered to us contained but 63 per cent of carbonates. The letter also bore a rather hazy explanation of the difficulty, stating that, through carelessness of some workmen, some low-grade commercial limestone—building stone, perhaps—had been run through the pulverizer and sent to us. In order to prevent any further mistakes, the letter continued, all cars of limestone would hereafter be individually analyzed after loading and before shipping. The company offered recompense, either by replacing the lime with a carload of real lime, or by returning the money. With no noticeable hesitation, we took the money.

It was just by chance that we discovered the situation. Had not my friend happened to make that analysis, we should have gone hopefully along and limed our land with 63 per cent lime. There could have been no appreciable results; and like the man on the wagon, we should have said, "It's no good."

How many cases like this are never discovered in the bags, but have gone on all the way to application and a lack of results, I do not know, but it might be worth looking into. This episode indicates that it may be advisable to get an individual analysis whenever possible.
Bees as a Side Line on the Farm

BY E. R. ROOT, Medina, Ohio

There is perhaps no one side line on the farm that will yield larger returns under careful management than beekeeping. Inasmuch as bees require care, they are well adapted to the farmer who thinks he has no time to take up any new venture. Beekeeping affords no royal road to wealth, but in an average year bees will yield a good income, and also a considerable amount of pleasure for the other members of the family. In addition the bees serve a useful purpose on the farm in pollinating processes, as will be pointed out later.

Bees, poultry, and gardening go well together. Aside from the direct pecuniary gains from intelligent handling of the three lines, it gives the boys and girls on the farm something to do. They should be taught business methods. They should be charged with the cost of the bees and the poultry, and should be credited with the earnings.

The question may be asked whether the bees will work for nothing and board themselves. Not quite. They require intelligent care and attention at certain seasons of the year. A few days in the spring should put them in proper condition for increase and for the harvest to follow in June and July in the northern States. A little care in the honey season to give the bees sufficient room will enable them, if the season is at all favorable, to produce a fair crop of honey.

What is a fair crop? Much will depend on the form in which the honey is produced. If it is extracted, from fifty to seventy-five per cent more liquid honey can be produced than there would be of comb honey. But, on the other hand, comb honey brings practically twice as much money. The production of extracted honey requires less attention, and perhaps is better suited for general farm work, than the production of comb honey, which occasionally requires swarming. It is recommended, therefore, that the average farmer procure hives of ten-frame Langstrotth size, and with enough upper stories, or supers, to take care of the crop that may be produced during the year. If this extra room is provided in time, there will probably be very little swarming, in case the keeper carefully follows a good textbook giving directions, not only on how to manage the bees, but also on how to prevent them from swarming and at the same time take care of the few swarms that do come out.

If the beekeeper wants extracted...
honey, from fifty to seventy-five pounds of extracted honey will be a fair crop. If he wants comb honey, the amount might be perhaps half as much. Extracted honey will bring, in round numbers, anywhere from 10 to 15 cents a pound at retail, while comb honey will bring from 20 to 25 cents a pound. It is therefore possible for any one to produce honey to the value of from $3 to $10 in a season, from a single colony of bees. Such yields are not uncommon when there are not more than from half a dozen to a dozen colonies on a farm, and where the bees have free access to all the nectar that is within a range of a mile and a half. If, however, there are from two to three hundred colonies in this area, the yield may not be more than from ten to fifteen pounds per colony. Such a case is called "overstocking," and it is rare that more than from ten to fifteen colonies are found to a radius of a mile and a half. It follows, therefore, that the average farmer can keep a few bees and make larger relative returns if these are intelligently handled, than can be obtained by the professional beekeeper who numbers his colonies by the thousand, and who will have as many as one hundred colonies to a radius of a mile and a half.

If the bees did nothing more than furnish fine honey we should consider them a good investment on the farm. But they do more than this. They enable the farmer to grow more and better fruit, if he has fruit on the place; more and better clover; more and better buckwheat. Nearly every farm has an orchard and some small fruit. Without bees in the locality, the crop of cherries, peaches, apples, plums, and pears might be very small. While there are certain classes of insects that help to pollinate fruit trees, the bees are out in the spring in such force that they outnumber all other insects combined, and therefore do practically all the work of pollination. In the case of certain varieties of fruit that are sterile to their own pollen, there would be almost no yield of fruit were it not for the presence of bees. If a farmer has any doubt of this point, let him cover the limbs of certain of his apple, peach, and cherry trees with mosquito netting before they come into bloom, keep them
covered until after they bloom, and mark the limbs. The result will be that almost no fruit will set on those limbs that were covered.

So important and valuable are the services of bees that the largest and most extensive fruit growers of the country are putting bees on their places. The famous Repp Brothers, of New Jersey, grow apples by the carload. About a year ago they made the statement that they would about as soon think of going without spraying and pruning their trees as of going without bees. Bees they must have, especially since the variety of apples they grow is Winesap, which is sterile to its own pollen.

Very near us is an apple orchard of 50 acres. Until recently this orchard had never yielded a large crop of apples, the reason for which the owner did not know. He finally leased the orchard to a practical apple grower, who, as soon as he took possession, began spraying and pruning the trees, and then asked to have bees put on the place. Fifty colonies were placed there, one colony to every acre of fruit trees. The crop previously had not averaged much more than 500 bushels of poor, gnarly fruit; but after the bees were introduced, a crop of 16,000 bushels was harvested. These men would not think of growing apples without bees, any more than they would try to run a farm without men and machinery to operate it.

Two years ago the cranberry growers of Cape Cod, on increasing their acreage of cranberries, discovered that they were not getting the yields of cranberries they had expected from the increased acreage. The introduction of bees increased their crop nearly tenfold.

It follows, then, that the average farmer, even though he obtained no honey during the season, would be amply repaid in more and better fruit and better seed on his farm. And when I say seed, I mean the clovers of various kinds and the buckwheat. The grasses and the grains do not need the agency of bees; but the finest and the best of fruit, especially the modern varieties, all the clovers, and buckwheat, do require the agency of bees in order to get a full yield.

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The Value of Potash for Potatoes

BY JAMES B. MORRAN, Kensington, Md.

Every crop of potatoes grown removes a large quantity of potash from the soil. Potatoes are grown principally to be sold off the farm, so that little of the potash is restored to the land by being fed to livestock as is the case with many forage and cereal crops.

It has been maintained by some experiment station scientists that it is not profitable to farm without potash. While satisfactory yields can be obtained on many clay and loam soils without this fertilizer, other lands that have been extensively cropped absolutely require the application of potash in some form if they are to yield a profit on labor and capital. The fact is that soil conditions vary in different parts of the country, which makes it impossible to lay down any set rule. But the problem of supplying our garden, truck, and farm lands with sufficient potash under existing conditions is becoming one of no small importance.

As regards the production of potatoes, a few figures will indicate the situation. The Rothamsted Experiment Station has shown that land which yields 300 bushels of potatoes to the acre loses 108 pounds of potash per acre in the form of potassium oxide (K₂O). Every ton of potatoes, therefore, contains about 13 ½ pounds of potash.

The average yield of potatoes in the
United States in 1912 was 113.4 bushels per acre. On this basis the potash removed that year by the potato crop averaged 41 pounds per acre. Potatoes were grown on 3,711,000 acres of farm land, the crop of 420,647,000 bushels removing 152,151,000 pounds of potash from the soil in 1912. The sweet potatoes grown the same year amounted to 55,479,000 bushels, which removed about 20,300,000 pounds of potash. The total potato crop, therefore, resulted in a loss of soil potash for the year of 172,451,000 pounds.

Potatoes rank high in the consumption of potash. This is shown by the following comparison with the weights of potash removed by a few other crops:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Potash Removed in Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potatoes, producing 300 bushels per acre</td>
<td>108</td>
</tr>
<tr>
<td>Hay from well-manured land, at 2 1/4 tons per acre</td>
<td>101</td>
</tr>
<tr>
<td>Clover hay, yielding 2 tons per acre</td>
<td>68</td>
</tr>
<tr>
<td>Ordinary meadow hay, 1 1/2 tons per acre</td>
<td>54</td>
</tr>
<tr>
<td>Oats (straw), yielding 32 hundredweight per acre</td>
<td>36</td>
</tr>
<tr>
<td>Wheat (straw), yielding 36 hundredweight per acre</td>
<td>32</td>
</tr>
<tr>
<td>Oats (grain), yielding 60 bushels per acre</td>
<td>12</td>
</tr>
<tr>
<td>Wheat (grain), yielding 40 bushels per acre</td>
<td>12</td>
</tr>
</tbody>
</table>

**Home Sources of Potash**

Potatoes and other crops may be grown, however, without the application of imported potash salts. For the past ten years I have grown potatoes on the same land by the use of home supplies of potash. Every farm has many organic sources of potash which can easily be utilized. Moreover, by proper cultivation to make available the potash in our subsoils, there need be little or no diminution in yield of potatoes for some time to come.

All organic matter contains some potash. When these substances decay, the contained potash is liberated. Professor Hopkins, of the Illinois Experiment Station, has pointed out that, besides yielding up nitrogen, the decay of clover and other leguminous roots also increases the solubility of potash minerals in soils. By plowing under organic substances, more or less potash is supplied to the land.

In this regard farm wastes differ in potash content. Professor Russell, of the Rothamsted Experiment Station, says that the leaves of mangels from a 40-ton crop of roots contain 150 pounds of potash, "equivalent to eleven hundredweight of kainit. It is evident that the leaves represent a useful source of potash, and should not be wasted; they should be spread evenly on the soil and plowed in; decomposition rapidly begins and the potash is set free." Beet leaves also contain relatively large quantities of potash, and could readily be used as a fertilizer for potatoes.

Mineral substances are the natural supplies of potash in soils. The potash in the upper strata, however, has been largely used up by long cultivation. Deep plowing of soils will therefore be found a great aid to farmers in bringing nearer to the surface untouched potash minerals. These can be made available for crops by soil microorganisms and decaying organic matter.

Many waste organic substances are to be found on every garden and farm which may thus become available sources of potash. Among these may be mentioned dried weeds, trimmings from hedges and shade trees, orchard prunings, corn cobs, threshing wastes, and numerous other organic products. These waste materials should be burned and converted into ashes, the amount of potash in the residue varying with the material burned. Analyses of the ashes of various garden and farm wastes give
results in potash content approximately as follows:

<table>
<thead>
<tr>
<th>Material</th>
<th>Per cent of potash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corncobs</td>
<td>10 to 40</td>
</tr>
<tr>
<td>Trash from hedgerows</td>
<td>9 to 13</td>
</tr>
<tr>
<td>Hedge, tree, and orchard trimmings</td>
<td>8 to 10</td>
</tr>
<tr>
<td>Threshing wastes</td>
<td>8 to 10</td>
</tr>
<tr>
<td>Weeds and other organic wastes</td>
<td>5 to 7</td>
</tr>
</tbody>
</table>

These figures showing the percentage of potash in ordinary waste farm materials compare well with the best potash fertilizers. German sulphate and muriate of potash contain from 48 to 50 per cent of potash, while kainit contains only 12 per cent. Corncob ashes contain a high percentage of potash. In the Corn Belt States many grain elevators burn corncobs for fuel; this would prove a profitable source of potash for American manufacturers of fertilizers. Where soils are in need of humus, it is better to turn the leaves and threshing wastes directly into the soil instead of burning them.

I have found corncob ashes of great fertilizing value. During the summer months corncobs are used as fuel in my home, and the ashes are carefully preserved or applied immediately to crops that require plenty of potash. In fact, all ashes from organic substances burned on the place are gathered and used on the garden.

Organic ashes possess one drawback, which is very soluble in water. For this reason all organic ashes must be protected from rain or dew, or they may lose a large part of their fertilizing value in a single day. If the material is burned on the land on which the potash is required, no harm is done thereby because the soluble potash leaches into the soil. Otherwise the ashes should be gathered as soon as they are cool enough to be handled. Ashes of organic origin containing potassium carbonate may be mixed with superphosphate and kept until the time for their use if they are retained in a dry place. Being readily available as a potash fertilizer, organic ashes are especially valuable for potatoes.

The various farm manures are sources of potash. Where crops are consumed on the farm, a large proportion of the potash content of the crop is recovered in the manure and so is returned to the soil. About 90 per cent of the potash in farm feeding stuffs may be restored to the land in this manner.
Experiments at the Pennsylvania Experiment Station have shown that the potash excreted by cows includes 10 per cent in the milk, 15 per cent in the solid manure, and 75 per cent in the liquid manure. Hence every farmer should take special pains to preserve the urine from livestock and the leachings from manure piles. This can easily be done by using cement manure pits, by using enough litter to absorb the urine, and by protecting the manure heap from rain and from loss by leaching. A good cement manure pit would more than pay for itself in a single season, in the value of the potash saved for the land. Carefully preserved farm manures would easily supply the potash requirements of potatoes or any other farm crop needing abundant potash.

Although most potash fertilizers are easily soluble, they do not readily wash out from the soil. As previously pointed out, they soon become fixed by some of the microorganisms or by organic substances in soils. Wherever gardening or farming is properly practiced by the use of sufficient organic ashes and manures, the quantity of potash in the soil may be increased because more is supplied than is removed by the crops. A gradual accumulation of potash may take place in soils, even where potatoes are grown extensively, by rotation of crops and by burning all organic waste substances.

New York farmers should be particularly interested in this problem. The Yearbook of the Department of Agriculture for 1913 gives New York's acreage in potatoes as 360,000. This was a larger acreage than that of any other State in the Union. But several States, as Maine, Michigan, Minnesota, and Wisconsin, had a larger potato yield in bushels than did New York. This difference in yield with a smaller acreage might have been due to unfavorable climatic conditions in New York in 1913, or it might have been the result of a deficiency of potash in the soil. If the latter is the cause of a diminished yield in the potato crop, the farmers of New York have it within their power to improve this condition by supplying the soil with imported potash salts and by utilizing the home supplies of this very important element.

Ten years of experience in growing potatoes has convinced me that the potash problem can be more than half met by deep plowing of soils, turning under organic materials, a more systematic use of farm manures, and the use of ashes from burnt farm waste substances. For the production of potatoes, American farmers are thrown on their own resources more than formerly for supplying potash fertilizers. They can do this successfully for years to come by conserving the natural supplies of potash that are easily within their reach.

In view of the great quantity of potatoes raised in the United States—the crop having a farm value in 1913 of $227,903,000—the use of potash as a fertilizer seems indispensable. Light loams especially, as well as muck, peat, and gravelly and sandy soils, contain so little potash that the substance must be supplied in some available form in order to raise potatoes profitably on soils of this nature. When well supplied with potash, these soils are capable of producing good yields.

The potash problem has been agitating our government for many years. Every possible source of new supply has been carefully investigated with a view to the economical production of potash as a fertilizer. The utilization of kelp and other forms of seaweeds has been practiced to some extent in California and on other parts of the Pacific coast. But for the past twenty years our main source of supply has been the enormous underground deposits at Stassfurt, Germany. In 1895 less than 150,000 tons of imported potash salts were used by our farmers; by 1905 the amount had increased to more than 500,000 tons a year; while just before the outbreak of the European war our yearly consumption of potash for fertilizers had grown to more than 1,500,000 tons. At present the German supply of potash salts is cut off altogether, so that imports have fallen off greatly.
The Man on the Land on the Other Side of the World*

BY BEVERLY T. GALLOWAY
Dean, New York State College of Agriculture at Cornell University

IV. CHINESE AGRICULTURE

Silently and like some mammoth of the deep, the great ship swung into the channel of that mightiest of rivers, the Yangtze-Kiang, and slowly wended her way through a multitude of craft of every description. If it had not been for the sampans, big and little, and the junks of many shapes and forms, we could well have imagined ourselves entering the Mississippi River below New Orleans. The same muddy water, the same flat and uninteresting shore line, and even the same kind of flat, squat warehouses along the shore, brought back remembrances of our own muddy stream. For nearly four thousand miles this river runs back into the heart of China, draining some of the richest and most thickly populated sections of the globe. It is a river of mystery, and merely to lie in one of the modern traveling hotels and watch the people coming and going is to start one's thoughts into many different channels.

We were entering a part of China that has been pretty thoroughly Europeanized. It makes no difference in these oriental countries how many Americans are about—if they are white, they are all Europeans. Shanghai is to a considerable extent a white man’s town, and the surrounding region is a white man’s region. Of the real China we saw but little; so that this one story of the man on the land in a country which probably raised crops when our ancestors were living on roots, can be nothing more than a mere glance at what is probably the greatest of all agricultural countries.

The first glimpse was a surprise, for it revealed junk after junk loaded with the cleanest and neatest bales of cotton that it had ever been our good fortune to see. The cotton was a surprise and the neatness of the bales was almost a shock. For it must be frankly admitted that the United States of America, the greatest cotton-producing nation in the world, puts up a cotton bale that for untidiness and slovenliness is the laughingstock in every market from Liverpool to Tokio. Our bale is about as disreputable inside as it is outside, for very little attention is given to uniformity of grade. The only reason why we have been able to hold the cotton market of the world is because we are blessed with natural advantages in the way of soil, climate, and labor, which gives us the monopoly. The world sim-

(Courtesy of Frank W. Myers)

CHINESE AGRICULTURE

Typical river-land country, showing intensive crop production, mostly vegetables

*This is the fourth of a series of articles on farming in foreign lands. The first article appeared in the October number of the Countryman.—Ed.
ply has to take our cotton,—it cannot get cotton anywhere else, so ours must be taken as we choose to supply it. This is the old story of lack of competition breeding carelessness and general shiftlessness in the production and marketing of one of the most important crops in the world.

The cotton loaded on our ship was consigned to mills at Hamburg, Germany, and as each bale was swung up from the junk it was received by three men who inspected it carefully before it was permitted to go into the hold. Each bale, after inspection, was given identification marks indicating the grade of cotton and the locality from which it came. The growing of cotton is a comparatively new industry in China, but there are no reasons why it should not be made an important one. The people use immense quantities of cheap cotton goods for clothing. Japan has its eye on this market and is hoping to produce the raw material near home and not have to depend on the United States for it.

It must be borne in mind that the average Chinese farmer and laboring man does not even have some of the common comforts of the negro tenant farmer of southern United States. The little houses, as a rule, are made of mud bricks or of reeds plastered with mud. There are no chimneys, and in order to keep warm in winter the natives must pad themselves with clothes. Cotton is the poor man's friend in this respect. The rich can wear silks and furs. I was told by a gentleman who had just returned from a lengthy trip into the interior that one of the small cotton mills he had visited was just about to close, for it could no longer stand the loss of raw cotton carried away every day by the mill hands, who secreted it about their persons and either sold it or used it to make padded clothes for winter wear.

The Chinese farmer, like the Japanese, deals with small areas. China, with the exception of parts of Manchuria, is a land of little farms. Multiple cropping is practiced to an extent to be found nowhere else in the world. In some provinces wheat and cotton are grown together, the cotton being sown about the time when the wheat is beginning to head. The hand-sowing of this cotton in the wheat, and the laborious method of covering the seed by handfuls of soil, involves great patience and a disregard of cost so far as labor is concerned, which Occidentals cannot meet. It is no uncommon thing for a Chinese farmer to grow, by this system

( Courtesy of Frank W. Myers)
of double cropping, more than four times as much wheat and twice as much cotton from a single acre as we get from two acres. We should have to use two acres, anyway, for there is no place in this country, so far as the writer is aware, where wheat and cotton can be grown on the same land at the same time.

China has not awakened to the need of statistics, so that there are no authentic figures as to the kind and quantity of crops produced. Rice is, of course, the great staple food crop, and it is grown in nearly all parts of the country. It is probably safe to say that China produces from two to three times as much food per acre in the form of rice as we do of wheat. The rice grown on irrigated land is the more prolific, but dry-land rice is grown in many sections. Estimates as to the yield of these two kinds of rice go all the way from two and a half to three billion bushels for the entire country. This is about three times the quantity of wheat produced in this country.

China produces enormous quantities of beans. No one knows the immensity of these crops. Great quantities are con-
sumed at home, but in recent years there has been a large export, especially of soybeans.

Little attention is given in China to stock raising. The farmers use more horse power and cattle power than do the Japanese farmers, this being especially true in certain of the provinces where the ground is frequently broken and tilled with two-horse and three-horse plows. Plows are of the crude sort seen in the Orient, usually having only one handle and with an immense iron, or in some cases a wooden, moldboard.

In the vicinity of some of the coast towns hog raising is practiced to a considerable extent. At one point we noticed a peculiar way of bringing the hogs to market. Coarse wicker baskets had been made, in which the live hog was placed with his feet sticking through the holes in the basket. These baskets each contained a hog weighing from 150 to 200 pounds, and were piled like cordwood on a two-wheeled cart and brought into the market in this manner.

China still remains, and must continue to remain for many years, a vast and hidden storehouse of knowledge and materials that will be extremely helpful to America and the American farmer. Despite the many explorations that have been made of this country, we have as yet merely skimmed the surface. For the past seven or eight years the Department of Agriculture at Washington, through its Office of Seed and Plant Introduction, has been making explorations of this most interesting country. Mr. Frank W. Myers, of the Bureau of Plant Industry, has made three or four trips into China and has just returned from a trip extending through nearly two years. Mr. Myers has been successful in discovering many new and rare plants which give promise of much value for our own agricultural and horticultural industries. Among his most recent introductions is a very promising large-fruited variety of hawthorn. This tree is said to be remarkably drought-resisting, and the fruit is used for the making of preserves. A new wild pear has also been secured, which may prove of great value to the northwestern sections of our country, where hardiness and resistance to cold are very much to be desired. Some valuable varieties of new grapes have also been sent in by Mr. Myers. One of his interesting discoveries is a new variety of walnut, which may prove useful for our southwestern States. Many useful and promising grains have also been procured by Mr.
Myers, and these are now being introduced in various parts of our own country.

China offers one of the great fields for the study of the effects of conservation of natural resources. By sheer force of circumstances China has been forced to the necessity of conserving many things which in our new country we allow to go to waste. She has perhaps gone further than any other country in conserving and utilizing water, which in China can be said to be practically the servant of the farmer.

Professor King, in his most interesting book *Farmers of Forty Centuries*, speaks of these matters and says:

*If the United States is to endure; if we shall project our history even through four or five thousand years as the Mongolian nations have done, and if that history shall be written in continuous peace, free from periods of widespread famine or pestilence, this nation must orient itself; it must square its practices with a conservation of resources which can make endurance possible. Intensifying cultural methods but intensifies the digestion, assimilation and exhaustion of the surface soil, from which life springs. Multiple cropping, closer stands on the ground and stronger growth, all mean the transpiration of much more water per acre through the crops, and this can only be rendered possible through a redistribution of the runoff and the adoption of irrigation practices in humid climates where water exists in abundance. Sooner or later we must adopt a national policy which shall more completely conserve our water resources, utilizing them not only for power and transportation, but primarily for the maintenance of soil fertility and greater crop production through supplemental irrigation, and all these great national interests should be considered collectively, broadly, and with a view to the fullest and best possible coordination. China, Korea, and Japan long ago struck the keynote of permanent agriculture but the time has now come when they can and will make great improvements, and it remains for us and other nations to profit by their experience, to adopt and adapt what is good in their practice and help in a world movement for the introduction of new and improved methods.*

**Bean Growing in Wyoming County**

BY H. H. CLARK '17

Being a resident of Wyoming County, I am very much interested in the possibilities and problems of bean growing in that locality. I am somewhat concerned for the permanence of this industry, in view of those epidemics of bean diseases which of late years have appeared and threatened to exterminate it.

Beans fit in well with our scheme of farming in Wyoming County, and the limestone soil seems well adapted to their growth. Early spring sowing makes it possible to get the crop off the land by September 10, which, when followed by two harrowings, leaves the land in excellent condition for winter wheat. In order to accomplish this, however, it is necessary to hoe out all the weeds when the beans are young.

Profits are comparatively large. On our farm beans have been the best paying crop in the last few years. Allowing 20 bushels to the acre, an average yield, there remains, after deducting cost of seed, labor, and fertilizer, a profit of from $30 to $40 an acre. Last year the increased export to warring nations forced the price up to $4 a bushel. During the past three years, however, the crop has been threatened by diseases and insects. Last spring, for example, one of our neighbors planted fourteen acres of marrow beans. The beans came up and grew well, but snails began to work and the root rot started. When harvest came there remained only two acres to harvest.

Anthracnose, a fungous disease, has also done damage. It attacks the pod as well as the plant, leaving its characteristic, blackish brown spots on both. These spots carry infection to the bean (Continued on page 318)
Hardy Alfalfa
BY E. G. MONTGOMERY
Professor of Farm Crops, New York State College of Agriculture at Cornell University

The great value of alfalfa as a forage crop is now generally recognized. As a result farmers everywhere are making an effort to cultivate the crop. In the past alfalfa culture has been limited in its northern extent by winter killing. The common alfalfa has heretofore generally been successful as far north as North Dakota in the west or the southern part of New York State, but in other parts of the State it is still uncertain from various causes. One of these causes has been winter killing. For this reason the hardy alfalfa, which has attracted attention only during recent years, will probably find considerable use in New York State.

The best-known hardy alfalfa is the Grimm variety. This was discovered growing on a farm in central Minnesota, where it had been in continuous culture for more than 40 years. The seed was originally brought from central Germany and was probably similar to the old Sand Lucerne long cultivated in northern Europe.

The Grimm alfalfa has some yellowish and whitish flowers, the
same as Sand Lucerne. It is believed that these variegated flowers are due to the plant's being a natural hybrid of common alfalfa and the small hardy yellow alfalfa. Grimm alfalfa has been thoroughly tested in the Northwest and strains found in the Black Hills district, and a strain which found to have been growing for about 40 years in Ontario.

At present the Farm Crops Department is testing about ten varieties of these hardy alfalfas

ROOTS OF COMMON ALFALFA ON THE LEFT, GRIMM ALFALFA ON THE RIGHT

The hardy alfalfas have a higher per cent of branching roots than the common variety. The branching root is now believed to be correlated with winter resistance.

found much more winter-resistant than common alfalfa, and will probably extend the culture of alfalfa from 300 to 400 miles northward. Other strains of hardy alfalfa have also been discovered recently, as the Baltic from South Dakota, certain among 50 farmers in the State. Three years ago samples of the Ontario, Grimm and Baltic were put out in a few places and have already shown their ability to withstand winter killing much better than the common alfalfa.
PINEAPPLE PRODUCTION IN HAWAII

(From New York Times, November 22.)

The pineapple production of the Hawaiian Islands for 1915 will approximate 2,500,000 cases of canned product, so experts report. Years ago the pineapple canneries threw away the cores, parings, and trimmings as refuse. Nowadays the one-time refuse is converted into a mash from which pineapple juice is extracted, the cores are cut into cubes and used in the manufacture of glacé fruit, and no part of the pineapple is lost.

NEW YORK STATE CROP REPORT

According to the annual crop report of the State Department of Agriculture, the grain crop for this year is the largest for many years. The price, however, is slightly lower than last year, but it still affords a good margin of profit to the producer. Potatoes, apples, beans, and onions show a very material decrease in quantity from 1914, but prices in consequence are much higher and final estimates for the year will probably show a profit to the farmers of the State equal to or greater than that of 1914.

SERIOUS DISEASE OF PINES

According to the United States Department of Agriculture, the alarming character of the white pine blister rust and the economic loss which it threatens in the northeastern and the western United States are sharply emphasized by four recent serious outbreaks on pine trees and currant bushes in Massachusetts and New York. This disease was introduced on imported white pine nursery stock and first appeared at Geneva in 1906.

In 1909 extensive importations of diseased white pine nursery stock were located and destroyed in New York and other eastern States, and warnings were issued broadcast against further importation of white pine from Europe. In spite of these warnings, importation continued, even from the particular nursery in Germany that was definitely known to be the main source of disease, until finally, in 1912, all such importation was stopped by federal action.

The white pine blister rust affects the eastern white pine, the western white pine, the sugar pine, and indeed all of the so-called five-leaf pines, producing cankers on the stems and branches, killing young trees, and maiming and disfiguring old ones. It also produces a leaf disease of currant and gooseberry bushes. The fungus causing the disease must live for a part of its life on pine trees and a part of its life on currants and gooseberries. The disease cannot spread from one pine tree to another, but must pass first to currant bushes and then back to pine.

Investigations made by the Department of Agriculture at Washington indicate that the average cost of raising a heifer on a dairy farm in the northern and eastern sections of the United States is $61 at the end of her second year. This includes an allowance of $7.81 for labor.
HIGHER EDUCATION AND HORTICULTURE

(From Country Life in America, December.)

The University of Oregon has assumed the pleasant task of distributing roses as well as disseminating knowledge and culture. Probably the finest and largest collection of Frau Karl Druschkis in the State grows upon the university campus. Last winter when the bushes were pruned it seemed unnecessary waste to destroy so much beauty and fragrance by throwing away the clippings. Accordingly, the University, through its extension department, sent a notice to every high school in the State that these rose slips, up to the number of ten, might be had for the asking. Every school took advantage of the offer and requested the maximum supply. The senior classes carefully set them out on their respective campuses—1500 plants in the aggregate, in 150 towns of a big commonwealth. Some of the young shrubs even this summer bore one or two roses, delicate and quickly deciduous, but promising of another year’s heavy fruitfulness of graduating bouquets.

In farm work the machine that lasts the longest, in years, is generally the least profitable. This is because it is the number of acres covered per year, rather than years of life, which determines the profitableness of an implement.

Forest culture is as much of an art as is corn culture. A good woodlot, like a good cornfield, is the result of applying intelligent methods to produce a full, valuable crop. A cornfield with fall spots, empty hills, feeble stalks, and half-filled ears is neither a credit to the farm nor a paying investment to the farmer. No more is a woodlot half stocked with inferior trees. The time to apply forestry is when the timber is cut.

HOW TO ARRANGE HOUSE FURNISHINGS

System, order, classification, and common sense should be taken by the housewife as the basis of the arrangement of all furnishings in the home, from the furniture in the living-room to the contents of the jelly closet, according to a publication entitled The Arrangement of Household Furnishings, issued by the College of Agriculture. The arrangement of objects in a room, it is stated, should follow, repeat, or fit the structural outlines of the space used. For example, a piano, a table, or a sofa should not be placed diagonally across the corner of a room, but parallel with the length or the breadth of the room. This arrangement not only assures an orderly and restful repetition of the structure lines of the room, but prevents a waste of space and a place for dust to accumulate. A long, narrow room may be made to appear better-proportioned by placing furniture, especially rather large pieces, across the ends of the room.

Objects should be massed or grouped, not scattered over a space. For example, the publication states that vines, ribbons, and flowers are sometimes strewn over a dinner table when the table would be much more attractive if the decorations were massed or grouped so as to be surrounded and set off by the plain cloth. Plain space around an object draws attention to it and enhances its good qualities.

A survey made by the Department of Agriculture at Washington has shown the average annual value of the food, fuel, oil, and house rent of the farm family to be $598.08, of which $421.17 was furnished by the farm.

It is estimated that the average corn binder is in use about four days of each year, lasts about eleven years, and costs its owner 84 cents for every acre it covers.
The week of January 2 sees the beginning of the fourteenth demonstration school that the Department of Home Economics has conducted this season for homemakers. Except for five three-day schools held in St. Lawrence County early in October, each school has lasted from Monday through Friday, and has consisted of five afternoon sessions divided between the discussion of fundamental principles of dietetics and cookery, and the preparation of dishes to illustrate these principles. The schools have been held in communities that have applied in due form to the department and have pledged the required number of members.

Extension work is a regular part of the departmental program, and since the fall of 1914 the demonstration school of foods and cookery has claimed the entire time of one member of the staff. Before that time, schools were conducted by resident staff members who could spare a few days from college classes, by paid outside lecturers, and occasionally by some of the more mature students.

During the winter season, homemakers' schools are frequently held in connection with farm demonstration schools; before December 1, and after April 1, they are held independently. Last year thirty-three schools for the study of foods, thus far the only course completely organized, were held in twenty-five counties, and for the months of January and February there were two workers in the field. This year the schools will be carried entirely by the department worker, with possibly a little time from one other member of the staff. The schools promise a larger average attendance than last year, and the increasing proportion of younger women among the members is encouraging.

In lesson 93 in the reading course for the farm home, entitled Farm Home Demonstration Schools, the schools of foods and cookery are described in detail, with photographs of extension classes and of the school equipment. The lesson tells also of the singing school sometimes held in connection with the demonstration school, and gives an account of the demonstration school held last summer in the little village of Jacksonville, near the College, as a part of the field work of the summer school class in rural home economics extension. Here the large number of workers made it possible to conduct classes in sewing and cooking for the women, games and cooking for the children, and singing for the whole village. The week culminated in an old-fashioned singing school in costume and a jolly community picnic.

Such an explicit description of the homemakers' schools is needed, for membership has frequently suffered from amusing, if lamentable, misconceptions of what the College proposed to offer. Even the most carefully worded programs and newspaper items have failed to give an exact impression. One such instance may be cited here. Last winter a small and dubious group of women gathered for a school in the church parlors of a little village. "We just can't afford to make cakes with
twelve eggs!” they were heard to say to one another as they came up the street. As the first lesson developed, and they were shown how to boil onions delicately, to scallop them with a delicious white sauce, and to use the onion water, which they had previously thrown down the drain, to flavor a cream-of-onion soup, astonishment gave way to amusement, and amusement was succeeded by approval. The demonstration served as the text for a running dissertation on the preparation of other homely winter vegetables, and on the food value of and the many good uses for the water in which they are cooked. At the close each member had an opportunity to taste the dishes that had been demonstrated. Even the oldest housekeeper present was willing to admit that “the women from the College” could give her points in economy, and could explain matters that no amount of practical experience had yet made clear to her. By the end of the week the attendance had trebled. “If we had only understood what this school would be like, we might have had twice as many members,” they all declared; and indeed, in the experience of the extension instructors, this has been the most frequent comment.

Women’s magazines, women’s pages, state and federal bulletins, and a host of special and general cookbooks, offer to the housekeeper of to-day a bewildering profusion of tested recipes. The College has no intention of “carrying coals to Newcastle” by sending out an old-fashioned “cooking school” that can only demonstrate the technique of preparing particular dishes. The purpose of the extension schools in foods and cookery is to explain, to illustrate, to coordinate, to suggest, and to inspire to further study, as well as to demonstrate. The College tries to show the housemaker just why differences in age, in bodily vigor, and in occupation make imperative certain differences in food, and to lead her to consider her family, with respect to its food needs, as a group of individuals rather than as an indivisible unit whose food standards may be set by the requirements of the heartiest member or by the preferences of a single individual. Any one who has studied the winter diet of the average family will readily concede that instruction along this line is much needed. The College tries to introduce to the housemaker the “true inwardness” of the various groups of food, so that she may with assurance select from each group the kinds most accurately fitted to her need; it tries to prove the fundamental value of such cheap, abundant, and often neglected foods as milk, cheese, whole cereals, fruits, and the winter vegetables, and to give a glimpse of the many easy and attractive ways in which they may be served; it tries to show that all successful recipes—as, for example, those dealing with the cooking of meats, of vegetables, of flour mixtures—are based on a few fundamental principles, and that a group of these principles and a knowledge of a few simple proportions sets the housekeeper free from slavish dependence on recipes and gives wings to invention; it preaches the gospel of simplicity, and shows why a groaning table, crowded with viands whose meaning and flavor overlap one another, gives less real satisfaction to the appetite than a small number of dishes, combined according to certain well-defined laws of contrast, if each dish is abundant and each is perfect in its appeal to the eye and to the palate.

The College tries also to call attention to the need for intelligent homemaking in the larger, or community, sense. Housekeeping is a narrower term than homemaking. Yet even housekeeping cannot be successful in these days unless it ventures beyond its own front gate. The woman of to-day needs to study the moral atmosphere of the village street, the sanitary condition of the schoolhouse, and the local production and distribution of foods. For generations she has been trained to standards of cleanliness and to attention to detail. The moral responsibility, at least, for clean schools, clean streets,
New Year's Greetings

To all of our readers and to the faculty and student body of the College of Agriculture the Countryman extends its best wishes for the year 1916. May the year be full of success, and may it see continued the progress in agriculture which has been so characteristic of the past decade.

Rural Credits

For the last three years there has been considerable discussion in this country relative to rural credits. Two years ago a special commission was authorized by Congress to visit foreign countries in order to study rural credits methods and report results to Congress. This commission made a very full and fair study, with the result that a bill was formulated and presented to Congress but failed of passage. Since the report of this commission and of a number of other organizations, the matter has been discussed to a very considerable extent in Congress, in the press, and in the state legislatures.

Generally speaking, the advocates of rural credits may be divided into two groups. First, there is a group that believes the farmer should be regarded more or less as a special class for whom special legislation in credits should be enacted. This group would give special privileges to farmers, some even going so far as to advocate lending money deposited in the postal savings banks to farmers at lower rates of interest than the banks are able to do. The second and more conservative group has held that the Government should at least commit itself
to the support of rural credits, to the extent of taking over certain amounts of the bonds of the land mortgage banks which might be established under federal law. President Wilson, in his latest annual message to the country, refers to the rural credits matter as follows:

I earnestly recommend in principle to your consideration, that we should put into early operation some provision for rural credits which will add to the extensive borrowing facilities already afforded the farmer by the reserve bank act adequate instrumentalities by which long credits may be obtained on land mortgages; and that we should study more carefully than they have hitherto been studied the right adaptation of our economic arrangements to changing conditions.

In this brief statement, the President has struck the keynote of what will probably be the action of the Congress in legislating for rural credits the coming winter. It is believed by those who have given the matter study that the federal reserve act, with some modifications, will make adequate provision for rural credits. The chief object to be attained is to provide, through some modification of the federal reserve act, for long-time credits based on land mortgages.

It should be definitely understood that the rural credits problem is a complicated one. Even specific legislation on the part of the Federal Government or of the States will not provide a satisfactory and complete solution.

Secretary Houston, of the Department of Agriculture, who is one of the most able and eminent economists in the administration, says:

It is a question whether by federal action, existing banking arrangements may not be so modified as to bring them into closer contact with rural communities and with individual farmers, giving farm collateral more readily and fully the advantages of the rediscount feature of the federal reserve act. It also seems clear that legislation on the part of the States permitting and encouraging the creation of personal-credit unions and removing any obstacles that may exist to the easier and more orderly handling of farm finance should be enacted. Reinforcing such agencies, there would be at work all the great forces of the Department of Agriculture, of the land grant colleges, and of the state agricultural departments. Their activities all contribute to make agriculture more profitable, to improve distribution, to eliminate waste, and to inject business methods into farming. In proportion as they accomplish these tasks they tend to solve fundamentally the whole problem of rural credits.

In this last statement of the secretary, we have the real crux of the situation; namely, that a good farmer, respected in his community for his success as a farmer, his business acumen, and his fairness to all men, finds little difficulty in getting credit either for long or for short periods.

No amount of legislation—federal, state, or otherwise—will prove of help to the farmer if he continues to be shiftless.
One of the big events of the year for the College of Agriculture is approaching. It is the time when the student body and the faculty play the part of hosts to some five thousand visitors. Farmers' Week affords an opportunity, not only for those who cannot attend any of the courses at the College, but also for those who want to spend a few days in "brushing up" on some of the scientific ideas advanced by the Cornell authorities. The doors of the College are thrown open to every one. Parallel with the other improvements that are taking place around the College, which of necessity must take place in an institution of this kind, Farmers' Week promises to be every bit the success it has been during the past years. Special features are to be added, and better facilities will be afforded the guests because of the recent additions to the college buildings. And right here the Countryman wants to add that while Farmers' Week is intended primarily for persons interested in agriculture in the State, it should not be ignored by the undergraduates of the College, for there is much to be learned from the program that it is impossible to get in other ways. The Countryman is planning to give a full account of the happenings of Farmers' Week, including a résumé of some of the more important lectures.

In these times, when a discussion of the honor system dominates the conversations of the student body, the Countryman wishes to add its views on the situation.

In the October issue of the Countryman, attention was called to the fact that, while the honor system discourages cheating in examinations, it does not do away with the practice altogether, and that, because it does not abolish cheating, it should be so modified that cheating may be abolished. It was also brought out that there was much cheating in the examinations last term, and at this time we may add that this term is no different from the last in this respect.

It is a good indication that the student body is being aroused and the faculty interested over this matter, because it shows a needed awakening. The appointment by Student President Eldred of a committee to look into the matter ought to bring good results; for such a committee can look at the matter from a point of view different from that of the Honor Committee.

As the Countryman sees it, there are three big problems which, if solved, would help ameliorate conditions and bring about an efficient honor system.

The first and most important is a proper attitude of the student body. We believe that there are undergraduates in the College who do not consider it a violation of honor to cheat in an examination. There are others who perhaps have no honor in such cases. Every one ought to consider it a penal offence to break the rules of the honor system.
The second problem is to get more publicity. The freshmen should be made to understand the honor system and what it stands for at a mass meeting where attendance would be compulsory. There should be a campaign every year to publish and make known to everybody the rules of the honor system, so that every student could realize their full value. Another phase of publicity would be to make known, by publishing on a prominent bulletin board, the proceedings of the Student Honor Committee, bringing out in particular the names of the persons who have violated the rules and the action taken in such cases. This, we think, is absolutely essential in order to show how the honor system works out.

The third problem, which is equally as important as the other two, is the cooperation of the faculty. Several cases are now on record in which faculty members have actually remained in the room with the students in order to detect cheating. There are other cases in which students are required to take alternate seats, and in one course alternate sets of questions are provided. This, of course, is not putting the students on their honor, and in a sense it encourages cheating; for the students, seeing that they are not being trusted, do not think it is necessary for them to be trusted.

Nearly every one agrees that the honor system, as now used, is far more effective than the proctor system. Many of the exams under the proctor system, in vogue in other colleges of the University, are actually a farce. This cannot be said of any exams now being taken under the honor system.

Whether the honor system is to be continued is up to the student body of the College. The members of the faculty have their opinion in the matter, but they are largely influenced by the sentiment and attitude of the student body. The Countryman hopes that the honor system is here to stay, and will not be discontinued merely because some technical problems stand in the way, or because there are some cases that it cannot cure. Legal remedies against murder and burglary do not prevent these crimes. Neither the honor system nor any other system can wholly prevent cheating; but it can be an effective deterrent, and when dishonest students are found the system should be supported to the extent that such students may be given a permanent opportunity to carry their activities elsewhere.

Verse

The Countryman would like to publish good, original, short verse on farm or country life subjects. There must be some poets among us! But note the conditions; it must be good, it must be original, it must be short.
Campus Notes

The third Assembly of the College of Agriculture, held in Bailey Hall on the evening of November 17, was made the occasion of a college athletic rally. The Intercollege Association presented the College of Agriculture with two large shields for intercollegiate championship for the years 1913-14 and 1914-15. Shields for college championships in track, soccer, and cross-country, and a trophy cup offered by the Association for three years of consecutive championship in cross-country, were also presented. Individual awards of medals or shingles to sixty men in the College for membership on last year's teams were made by Professor James E. Rice, '92.

Two New Residential Halls under Construction

The work on Cornell's group of residential halls is progressing rapidly. One building has been occupied by sixty men since the beginning of this term, and another was completed by December 1, while two more are under construction. When completed the group will occupy the land between Stewart and West Avenues, south of University Avenue.

It has been divulged by the trustees that the funds for the construction of these buildings were given by Mr. George F. Baker, President of the First National Bank of New York City. Mr. Baker has never been connected with the University in any manner, but became interested in the project through George C. Boldt, '05, who as chairman of the committee has worked hard to make these buildings a reality.

Ex-senator Burton Speaks at Student Convocation

At the student convocation held on December 1, Theodore E. Burton, ex-senator from Ohio, spoke on "1915 and After." He pointed out to the undergraduate body the destruction which world civilization is undergoing in the throes of the present war, and indicated their responsibilities in that general reconstruction which must follow the cessation of hostilities.

The Rural Problems Class

The Rural Problems Association meets in Barnes Hall each Sunday at noon for the purpose of discussing problems concerning the welfare of the rural community. The members of this class believe that the best task to which an agricultural education can be put is to help others, and that after graduation the agricultural college graduate will wish to enter into the life of his community and make it better. The class seeks to train itself to recognize such problems as affect the social and economic life about them. To fully realize that these problems are so interrelated that none may be separately recognized, studied, or bettered is
an important feature. Briefly, the course seeks to give a broad outlook on American country life.

In order that this fundamental correlation of all parts of the country life problem may be made plainer, the discussion has been directed along a definite outline—an outline that makes no differentiation between problems of personal, material advancement, and those of the relationship of man to man. These are considered inseparable, and are so treated.

These Sunday meetings are entirely open to the public, all persons interested in the problems of rural life being urged to attend, particularly students in the College of Agriculture. The program consists of sixteen meetings, nine of which have already been held. D. S. Hatch, '15, the winner on last year's Eastman and Rochester Stages, led the first discussion, on October 24; his subject was "Interesting Young People in Rural Life." On the following Sunday, C. W. Thompson, of the Rural Organization Service, came up from Washington and helped the class to develop, as a groundwork for future study, a definition of a rural community and an idea of its relation to world civilization. At later sessions, Professor E. O. Fippin led the class into a consideration of the physical resources of a community, and Edward van Alstyne, State Director of Farmers' Institutes, called to their attention those higher resources within the people themselves.

The committee in charge of this year's meetings is as follows: R. C. Parker, '16, chairman; B. W. Kinne, '16; P. R. Chappell, '17; C. A. Thompson, '17; O. J. Link, '18; Miss R. H. Smith, '16; Miss G. B. Hayden, '16; Miss H. S. Clark, '17; Miss A. MacDonald, '17; Dr. A. W. Gilbert, '05; and B. W. Shaper, '14.

The fourth Assembly of the College of Agriculture, held in Bailey Hall on the evening of November 9, was featured by the presentation of "The Burglar" by the Cornell Women's Dramatic Club. This was preceded by songs by the boys' and girls' glee clubs and a stunt on the piano by A. E. Davis, '16.

The cast of "The Burglar" comprised the following young women: Julia Smith, '16, Katherine Lyon, '16, Mary Larkin, '17, Margaret Lucing, '18, and Henrietta Ely, '18. "The Burglar" was played by Mike, a large cat.

The "Crew Song" and "Evening Song" by the men's glee club concluded the entertainment in Bailey Hall. Every one then went to the home economics cafeteria, where refreshments were served.

Professor L. A. Clinton, of the Federal Department of Agriculture, who has just returned from a trip to the West, spent a few days in Ithaca in the first week in December while en route to Washington. The following is an account of his meeting with Professor Roberts in California, as given to the Countryman by Professor Clinton:

"I found Professor Roberts with his daughter, Mrs. Mary Roberts Coolidge, of Berkley, California, where a number of association meetings were being held. All the associations, however, adjourned their meetings to hear Professor Roberts present his paper on 'The Promotion of Agricultural Science.' Professor Roberts was introduced as 'The Dean of American Agriculture,' by H. J. Waters, President of Kansas State College of Agriculture. Enough Cornell students were present to give him the Cornell yell, and an ovation was extended to him such as is seldom extended to any man. Professor Roberts, although eighty-three years of age, is as keen and vigorous as most men are at fifty. He takes keen delight in relating anecdotes of Cornell, and he entertains Cornell people for hours with his reminiscences. He has recently prepared his autobiography, which will shortly be published. Although it is said that Professor Roberts considers his regular home with his son, Roger R. Roberts, of Fresno, California, he spends much time with his other son, Perry, at San Francisco."
The sixteenth annual banquet of the College of Agriculture was held in the Armory on December 18 with over five hundred attending. The principal speaker was C. W. Thompson, Chief of the Rural Problems Division, Department of Agriculture, Washington, D. C. Dean B. T. Galloway spoke on "After College, What?" Professor C. H. Tuck, '06, spoke on "The Cornellian." Professor H. W. Van Loon, '05, gave a recitation, and C. W. Whitney, '13, sang. The members of the Banquet Committee were: M. G. Cheney, chairman; Miss E. V. Botsford, '16, C. W. Gilbert, '16, Miss Helen Irish, '16, T. C. Logan, '16, G. M. Montgomery, '16, Stuart Wilson, '16, Miss M. S. Albertson, '17, Miss Alice Bristow, '17, A. B. Fords, '17, J. E. Houck, '17, H. O. Johnson, '17, J. W. Campbell, '18, R. G. Knapp, '18, M. P. Newton, '19.

Recently compiled statistics show that the newly established Information Growing Office of the College has already become of great value as a news dispensing agency. The circulation of news items containing helpful information to the rural newspapers and the agricultural press during the past month exceeded that of any previous month by about two million items. The total number of items published, as shown by clippings returned to the office, was 8,771,686. The previous high-water mark was reached last April, when 6,845,932 items were published as a result of information sent out by the central office.


During the past month, Royal Gilkey, '11, of the Department of Extension Teaching, accompanied by A. M. Hollister, farm bureau manager of Saratoga County, has been organizing Cornell study clubs in that county. Five clubs have been established, with an average membership of twenty-five in each place. The clubs are local organizations of farmers and their families, and their aim is to promote the study of Cornell reading-course lessons.

At the initial meetings Professor Gilkey used the Cornell reading-course lessons as a basis for a discussion of subjects of local interest. In the dairy sections visited, balanced rations were figured out which would supplement the feeds in the barns with those economically purchased according to the data given out for the month of December by the Department of Animal Husbandry. Another subject discussed was the principles of soil management, on which a series of five lessons is available.

Requests for similar work have been received from other parts of the State. Professor Gilkey's next trip will probably be to Montgomery County, in response to a request from Allan S. Merchant, farm bureau manager of that county.

Floriculture students from both the regular and winter courses went to Buffalo on December 10 as guests of the Buffalo Florists' Association. The party, in charge of Professor E. A. White, spent two days inspecting large retail and wholesale establishments in and around Buffalo. They also visited the South Park Conservatory.
During a recent trip to Washington, Dean Galloway arranged for a number of speakers of national prominence to talk before the students of the College, particularly for the benefit of the seniors. These men will discuss, each in his chosen field, the opportunities in agriculture. The dates of the lectures have not yet been announced, but they will probably be started soon after the Christmas vacation.

The speakers and their subjects are as follows:


Dr. A. C. True, Chief of the States Relation Service, United States Department of Agriculture—Opportunities in Agricultural Colleges and Experiment Stations.

Honorable Carl Vrooman, Assistant Secretary of Agriculture—Opportunities in General Farming.

L. C. Corbett, of the Bureau of Plant Industry—Opportunities in Intensive Agriculture.

Charles J. Brand, Chief of the Office of Markets, United States Department of Agriculture—Opportunities in the Fields of Marketing and Distribution.

The opportunities for service open to graduates of agricultural colleges are likely to be greater than in many of the older-established professions. While such professions may pay more, the chances to help one's fellow men, always open to the leader in rural life, will go a long way toward compensating for differences in pay. Leaders in any field of agricultural endeavor may be sure of places and reasonable recompense. The speakers will tell where the places may be found and what opportunities they hold for the well-prepared man.

W. W. Warsaw, extension instructor in soils, is the father of an eleven-pound girl.

**MISCELLANEOUS NOTES**

A demonstration school under the auspices of the New York State College of Agriculture, in cooperation with the Farm Bureau of Tompkins County, was held at Jacksonville from November 29 to December 3, inclusive. Among those from the College who gave courses at this school were: W. W. Warsaw, of the Department of Soil Technology; Professor J. L. Stone, ’89, of the Department of Farm Practice; and Professor H. W. Riley, of the Department of Rural Engineering.

On the afternoon of December 17, A. K. Getman, ’11, deputy in charge of secondary agricultural education of New York State, addressed the farm management seminar on the subject of secondary education.

Professor G. F. Warren, of the Department of Farm Management, spoke informally before a meeting of the Pomology Club on November 27, on the subject of the cost of producing apples.

L. W. Kephart, '13, who has been assisting in weed investigations for the Department of Agriculture at Washington, is spending a vacation at his home in Ithaca.

The Agriculture basketball team opened its season on December 7 in the armory, with a 22-to-14 victory over Architecture. This year's team is a well-balanced one and should make a strong bid for the championship. The players are: J. Houck, '17, W. Palmer, ’18, guards; H. J. Karr, '18, center; J. Wilson, '18, H. B. Ortner, '18, forwards.

The extension division of the Department of Vegetable Gardening is assisting the bean growers of Genesee County in working out a better method of culture. Plans for demonstrations in this locality are being formulated. The department is also working with the farmers of Steuben County in a common desire to find a cash crop which equais the potato in labor requirements, storage properties, and general adaptability.
Any regular, graduate, short-course, or special student in the College of Agriculture is eligible to present a discussion of some phase of soil drainage in competition for the three Findlay Drainage Prizes of $20, $10, and $5, respectively. The presentation will be at an evening session in Farmers' Week, February 7-12. Duplicate copies of papers must be ready by January 10. Further information may be obtained from Professor Fippin, of the Department of Soil Technology.

Professors M. C. Burritt, H. E. Babcock, and G. P. Scoville attended the annual conference of farm management demonstrators and state leaders of farm bureau work at the Planters’ Hotel, St. Louis, November 15 to 19. All three took part in the program.

E. C. Volz has arrived to take up his duties as instructor in floriculture. Mr. Volz graduated from the College of Agriculture, University of Michigan, in 1914. Last year he instructed in floriculture and truck crops at Iowa State College.

Professors H. H. Wing and M. W. Harper, of the Department of Animal Husbandry, went to Rochester on December 13 and 14 to address the annual convention of the New York State Dairymen’s and Breeders’ Associations. Edward van Alstyne, director of farmers’ institutes, and L. L. van Slyke, of the New York Experiment Station at Geneva, were also among the speakers.

The college team finished second in intercollege soccer. Arts won the championship.

The Department of Military Training has announced an optional company for short-course men, in which thirty men have already registered. It is planned to give the members of the company as complete a course in the elements of military training as the time will allow. Practice in rifle shooting will be especially emphasized.

Professor John C. Burg, of Northwestern University, who has compiled figures on the geographical distribution of the student body at a number of universities and colleges, states that sixty-two per cent of the undergraduates registered in Cornell University are from New York State. This University leads all others in number of students from insular and non-contiguous territories.

The Department of Poultry Husbandry has recently received from George Urban, jr., of Buffalo, a gift of thirteen representative individuals of the following breeds: Mille Fleur, Jungle Fowl, Phoenix, or Long-tailed Japanese, White La Bresse, and CouCou Naked Neck. These, together with thirty varieties which have been recently added to the equipment of the department, may be seen in the new breed exhibition building.

From the forty competitors who tried for the Rochester stage, the following have been selected to speak in the final competition at Rochester on the evening of Thursday, January 6: Leslie Brown, ’16, E. R. Fornhoffer, ’16, B. W. Kinne, ’16, S. H. Palmer, ’17, and Miss A. Bristol, ’17.

The following lectures remain to be delivered to the students of the short course: January 11, Professor B. B. Robb, Home Sanitation; January 18, Honorable C. S. Wilson, The Work of the State Department of Agriculture; January 25, Dean B. T. Galloway (topic not yet announced); February 1, Professor C. H. Tuck, Extension Work of the College.

Life in Inland Waters, a textbook by Professor J. G. Needham, ’98, of the Department of Entomology, is now being printed by the Comstock Publishing Company. The book will be used as a text in limnology, and is the first edition of this kind that is not a translation.
'74, B. Agr.—William R. Lazenby, who is professor of forestry at Ohio State University, read a historical sketch of the Ohio Academy of Science at its quarter-centennial meeting on November 27.

'77, B. S.—Lelia B. Palmer has retired from her position as teacher of biology in the Utica High School and is living at her home in Cassville.

'86, B. S.—H. C. Chatfield-Taylor has been elected president of the Society of Midland Authors, of which organization James Whitcomb Riley is honorary president and Brand Whitlock, William Allen White, George Ade, and Hamlin Garland are vice-presidents. The membership is composed of authors living in the States between the Allegheny and the Rocky Mountains.

'04, W. C.—Alexis York is farming near Poolville. He is specializing in dairying, and reports several breeding experiments under way.

'06, Sp.—George T. Reid has been appointed county farm demonstrator of Burlington County, New Jersey. His address is Mount Holly.

'08, W. C.—Elbert Slorah is farming in partnership with his father near Holland Patent. At a recent election he was made a member of the Board of Supervisors of Oneida County.

'08, B. S. A.—Edwin Earle, jr., has changed his address to Box 558, Salisbury, North Carolina. With R. W. Sinclair (who graduated from the University of Michigan in 1907) he has formed the Farm Power Company, a corporation organized under the laws of North Carolina for the sale of farm machinery, with headquarters at Salisbury.

'10, B. S. A.—P. H. Elwood, after graduation, spent three years in doing various kinds of landscape work in New York City, and two years as extension instructor in civic improvement in Massachusetts. Mr. Elwood is now assistant professor of landscape architecture at Ohio State University, instead of at Cornell as was stated in the December issue of the Countryman.

'11, B. S. A.—Ray E. Dewell is acting as county agent in Orleans County, Vermont. His headquarters are at Newport.

'11, B. S. A.—George B. Birkhahn is instructor in farm management at the Baron de Hirsch Agricultural School, Woodbine, New Jersey. S. E. Stone, B. S., '15, is instructor in animal husbandry and dairying at the same school.

'12, B. S. A.—Jay D. B. Lattins is engaged in the Cornell Medical College in New York City. While he is no longer on the farm, he still retains the management of his orchards in Erie and Orleans Counties.

'12, Ph. D.—T. T. Odaria is working with the Forage Agriculture Experiment Station in Japan, having been transferred from his previous position at the Nara-Ken Agriculture Station at Nara, Japan.
'12, B. S. A.—E. T. Lewis, who was formerly teacher of agriculture in the De Ruyter High School, has accepted the position of county agent for Lancaster County, New Hampshire.

'12, B. S. A.—A. F. Barss is research assistant in horticulture at the State Experiment Station, Corvallis, Oregon. Since leaving Cornell in February, 1912, he has spent a year on a farm and a year and a half in postgraduate study at Oregon State Agricultural College. During a part of the latter period he was a student assistant in horticulture, and obtained his master's degree in that subject.

'12, B. S. A.—Dee Baker taught school gardening at Willow Grove, Pennsylvania, during the past summer, and is now teaching in the public schools of Willow Grove and taking graduate work at the University of Pennsylvania.

'12, B. S. A.—C. E. Ladd, who is director of the State School of Agriculture at Delhi, is the father of a ten-pound baby girl.

'12-'13, Sp.—Robert Aldrich York, who has formerly been engaged in agricultural, industrial, and social survey work, is now director of the Neighborhood House at Kennebunk, Maine.

'12, B. S. A.—William E. Garnett taught agriculture for two years after graduation, and then had a year of graduate study at the George Peabody College for Teachers. Immediately upon receiving his master's degree, he took part in the organization and field work of an economic and sociological survey, conducted by the University of Virginia in cooperation with the Federal Department of Agriculture. He is at present engaged in teaching biology and general agriculture in the Memphis High School, Memphis, Virginia.

'12, B. S. A.—Stanley H. White received his master's degree in landscape architecture at Harvard in 1914, and is now in a landscape architect's office in Boston. His address is 58 Pinekney Street, Boston, Massachusetts.

'12, B. S. A.—Claude G. Cornne is engaged in farming near Avoca. Besides his regular farming operations, he is conducting experiments in the breeding of farm crops.

'12, B. S. A.—John W. Law is with the Federal Department of Agriculture, engaged in work for the Bureau of Markets.

'13, B. S. A.—Earl Brown is assistant to L. H. Goddard, Chief of Farm Management Demonstrators, Washington, D. C.

'13, B. S.—Caroline Higgins is assistant director of the "Foodshop" for the Women's Educational and Industrial Union, Boston, Massachusetts.

'13, B. S.—Mortimer D. Leonard is taking up extension work in the Department of Entomology at Cornell.

'13, B. S. A.—George W. Kuchler, jr., is at Lagrangeville, where he is managing the Locust Lodge Farm.

'13, B. S.—Irene W. Quirin is teaching at St. Mary's College, Dallas, Texas.

'13, B. S.—H. E. Greiner is teacher of agriculture in the Red Creek High School. He has been devoting his time to perfecting demonstration schools for general agriculture and specific problems in that field.

'13, B. S.; '14, M. S.—Oliver F. W. Cromwell is farming at Newburg.

'13, B. S.—F. C. Shaw is farming on Thompson's Island, Boston Harbor, Massachusetts.

'13, B. S.—Pearl I. Boynton has changed her address to Studio Club, 35 East Sixty-second Street, New York, where she is assistant house superintendent.
'13, B. S.—Edmund H. Stevens was married to Miss Norma V. La Barre, B. S., '15, on July 3. The wedding took place at the bride's home in Ithaca. Stevens' permanent address is Bureau of Soils, Washington, D. C. He is now engaged in a soil survey at Davenport, Iowa.

'13, B. S.—Irene J. Brooks is now fourth assistant bacteriologist with the Board of Health of Philadelphia.

'13, B. S.—W. H. Hamilton is going to Summerville, New Jersey, to teach agriculture.

'13, B. S.—R. C. Reeve was for one year after graduation instructor in the Territorial Normal School, Honolulu, Hawaii. On returning to this country he did survey and drainage work in western New York for a time. He is now manager of the Stonehouse Farm, an estate of 600 acres near Jay.

'13, B. S.—R. H. Denman is instructor in farm management and field crops in the State School of Agriculture at Randolph, Vermont.

'13, B. S.—Miss Dorothea E. Killands has sailed for South Africa, where she will engage in foreign mission work. She may be addressed at Quanda Mission, via Durban, Natal, South Africa.

'13, B. S.—Charles Dimond is running a truck farm on Long Island.

'14, B. S.—M. C. Wilson is farm management demonstrator in Vermont and New Hampshire.

'14, B. S.—Lewis H. Martin, who makes his home at Napoleonville, Louisiana, is working with the Federal Department of Agriculture as parish agent in Assumption Parish. In Louisiana the parish is equivalent to the county in New York.

'14, B. S.—G. J. Philip is instructor in pomology at Oregon State Agricultural College. His address is 2735 Jackson Street, Corvallis, Oregon.

'14, B. S.—Raymond R. Jansen is farming in partnership with his father. His address is R. F. D. 1, Fonda, New York.

'14, B. S.—Leon E. Cook is teaching agriculture and is principal of the Worcester High School.

'14, B. S.—Herbert A. Thompson, a former member of the Countryman Board, has been employed since graduation by the Jerome B. Rice Seed Company, at Cambridge.

'14, B. S.—Elmer Snyder is with the United States Department of Agriculture as a scientific assistant in the Division of Pomology. His address is 1316 Q Street N. W., Washington, D. C.

'14, B. S.—M. E. Krueger is taking graduate work in forestry at the University of California.

'14, B. S.—Edwin G. Bishop is at present engaged by the Floesch Construction Company in the Little River Drainage District, Whitewater, Montana.

'14, B. S.—In 1914 Nicholas Kopeloff was awarded the Edison Pulverized Limestone Research Fellowship at Rutgers College, New Brunswick, New Jersey. During the summer session of 1915 he was assistant instructor in soil physics. He is now president of the Rutgers Graduate Club.

'14, B. S.—William H. Upson has been for the past year foreman of the Leeland Orchards at Leesburg, Virginia. This farm consists of 150 acres of orchard and 150 acres of general farm crops, such as wheat, corn, alfalfa, and hay. The orchard includes 5000 apple trees and 10,000 peach trees.

'14, B. S.—Ferd J. Burgdorff, whose address is 73 Hollywood Avenue, East Orange, New Jersey, is instructor in horticulture at Columbia University.
"14, B. S.—Lawrence J. Motyca is teaching biology and general agriculture at the State Normal School at Millersville, Pennsylvania. During the school year of 1914-15 he taught in Mississippi, where he managed a plantation through the summer months.

"14, B. S.—William Karl von Fabrice spent his first year after graduation as head of the Department of German in De Veaux College, Niagara Falls. This year he is principal of the Ridgefield High School, Ridgefield, Connecticut.

"14, B. S.—A. Everitt is working for a New York concern in connection with its export and import trade.

"14, B. S.—G. S. Rose is in the employ of the Empire Separator Company.

"14, B. S.—S. C. Leete is with the Castle's Ice Cream Company of Newark, New Jersey. This concern is one of the largest retailers of dairy products for New York City.

"14, B. S.—H. A. D. Leggett writes to correct a recent statement concerning him in this department. He is not going to Ohio State College, but to the University of Vermont, at Burlington, where he will be head of the newly organized Department of Poultry Husbandry.

"14, B. S.—Lucia Burbank is the dietician at the Norton Infirmary, Louisville, Kentucky.

"14, B. S.—Ira D. Yoder is associated with his two brothers in the operation of an extensive system of growing vegetables under glass. The firm, which is known as the Anna Dean Perennial Gardens, is located at Barberton, Ohio.

"14, B. S.—H. E. Denmark is in Ridgefield as manager of the Pierrepont Farm.

"14, B. S.—Earl S. Shaw is superintending a large estate at Albany. His address is 590 Morris Street.

"15, B. S.—Hilma Bergholtz, who was women's editor of the Countryman in her senior year, is teaching at the Northfield Seminary, Northfield, Massachusetts.

"15, B. S.—Elwood Chase is instructing at the New York City Farm Colony at West New Brighton.

"15, B. S.—Francis Edwards is instructing at the New York State School for Girls at Hudson.

"15, B. S.—W. H. Boehler is in Cleveland, Ohio, engaged in landscape work.

BOOK REVIEW

ESSAYS FOR COLLEGE ENGLISH

The title of this book is poorly chosen in that it fails to arouse in the agricultural mind that degree of interest to which its intrinsic agricultural application entitles it. It is more than an English text; it is a well-arranged collection of the most significant utterances on the problems of American country life. Rural leaders such as Bailey, Plunkett, Roosevelt, and Carver are represented in a series of excellent essays attacking the subject directly, while such standard essayists as Arnold, Huxley, Ruskin, and Emerson furnish further essays, no less applicable to the problem in that they treat it in a more detached manner; developing the relation of scientific knowledge to man's mastery over nature, and the relation of a comprehension of the fundamentals of life to his happiness and usefulness among his fellows.
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Bean Growing in Wyoming County

(Continued from page 397)

on the inside of the pod, making the crop of no value other than for feeding sheep. At present there seems to be no known way of combating this disease other than to avoid it by the use of absolutely healthy seed. The blight, a bacterial disease, affects the bean crop in about the same manner as anthracnose, and is of the same economic importance. But perhaps the most serious disease attacking beans in our country is the root rot. Soil bacteria produce a rot on the bean root just below the ground, with the result that the plant is either dwarfed or completely killed. During the past summer I have seen many bean fields either partially or completely destroyed by this disease.

I have already mentioned snails. The bean-eating snails live in the ground during the day, and at night feed on the leaves of the plants. In a remarkably short time they clean up a vigorous growth of foliage, leaving only the stubs. Attempts to fight this pest with sprays of lime-sulphur and arsenate of lead have been largely successful.

We in Wyoming County have found in beans a new crop that can be profitably grown, but it is useless for us to try to grow beans if these diseases are allowed to continue. We are doing all we can to get at the source of the difficulty and eradicate it. Local farmers and produce men have donated $750, and the State has supplied a like sum to fight disease and insects. The Wyoming County Farm Bureau has cooperated with the College to establish with this fund a research laboratory at Perry. Mr. Burkholder, of the Department of Plant Pathology at Cornell, is in charge of the work and is studying the diseases and trying to find a way of successfully combating them. Mr. Burkholder's work, which was begun last spring, is still under way, and is likely to continue for at least another year. Just now he is advising longer rotations and greater care in the selection of seed as partial preventive measures.
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Demonstration Schools for Homemakers
(Continued from page 304)

and clean food lies at her door. She must learn what it is reasonable and right to expect in the different departments of community housekeeping, and must not rest until she has secured it. Women are the recognized purchasing agents for the family. Who can doubt that a clear-cut demand for safe milk, wrapped bread, clean shops, sanitary markets, unadulterated commercial brands, and full weights and measures, will be promptly met by some enterprising dealer if backed by the united purchasing power of the community. Yet women are strangely slow to grasp the meaning of this great instrument for reform that lies so ready to their hands, and even slower to use it, fearing lest in their inexperience they do more harm than good. In this one field the College can render a large service to the State. In other lines, too, the training of the extension worker, and her broader experience, make possible helpful suggestions to local leaders grappling with problems that appear to rise out of conditions peculiar to the neighborhood yet are characteristic of like communities throughout the State.

With such various and such fundamental topics to consider together, the hours of the extension school draw all too quickly to a close. Many questions have been settled, but others have been brought to the front, and students and instructor alike look forward to another meeting. It is hard to meet an eager chorus of "Next year?" with "Let us hope for it, but the State is large, other women are waiting, and one worker can hold only thirty odd schools in a season. Your turn may be a long time in coming." A very few second-year schools have been held, and in point of numbers and of results they have been better than their predecessors.

Eager requests come to us, too, for extension schools in sewing, in the study of textiles, in the choosing of household

(Continued on page 328)
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<table>
<thead>
<tr>
<th>Weight</th>
<th>Price</th>
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<tr>
<td>40 pounds</td>
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<td>100 pounds</td>
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<tr>
<td>600 pounds</td>
<td>21.12</td>
</tr>
</tbody>
</table>

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The following records are productions of our flock:

<table>
<thead>
<tr>
<th>Eggs laid</th>
<th>Eggs laid</th>
<th>Eggs laid</th>
<th>Total eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st yr.</td>
<td>2nd yr.</td>
<td>3rd yr.</td>
<td>laid 3 yrs.</td>
</tr>
<tr>
<td>Lady Cornell</td>
<td>258</td>
<td>200</td>
<td>191</td>
</tr>
<tr>
<td>Madam Cornell</td>
<td>245</td>
<td>131</td>
<td>163</td>
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<tr>
<td>Cornell Prolific</td>
<td>243</td>
<td>162</td>
<td>146</td>
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<tr>
<td>Cornell Laywell</td>
<td>205</td>
<td>165</td>
<td>159</td>
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<td>Cornell Supreme</td>
<td>242</td>
<td>198</td>
<td>225</td>
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<td>Cornell Surprise</td>
<td>180</td>
<td>186</td>
<td>196</td>
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<tr>
<td>Cornell Persistent</td>
<td>192</td>
<td>197</td>
<td>178</td>
</tr>
</tbody>
</table>

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AN IMPORTANT HORTICULTURAL INDUSTRY OF NEW YORK
A typical vineyard in the Niagara district
The Packing of Apples in New York State

BY H. B. KNAPP

Assistant Professor of Pomology, New York State College of Agriculture at Cornell University

Any changes that have been made in the methods of packing apples in New York State during the seasons of 1914-15 and 1915-16 have come about primarily through the operation of our compulsory packing law.

The need for such a measure has been discussed, and for the most part conceded, for many years. Only within recent years, however, has the marketing situation become so unsatisfactory as to make the passage of such a law of prime importance. With the increasing output of box apples from the North and from the West, and of barrel apples from the Piedmont section of the South, serious inroads on the domestic market have been made. Canadian fruit packed under the Fruit Marks Act and handled largely through central or community packing houses has grasped with disconcerting firmness the European apple trade. Under such conditions New York growers have realized that their hope for the future depends on their supplying an article in all respects the equal of that supplied by their competitors. This calls for a far greater degree of standardization of pack than New York fruit had formerly received, and as a result the New York Apple Grading and Branding Law was passed by the Legislature in its session of 1914, taking effect on July 1, 1914.

During the following season the measure was subjected to a severe test under conditions not altogether favorable. An unusual amount of late scab infection made the work of running the fruit more than ordinarily difficult and expensive. As was to be expected, some dissatisfaction was expressed with the provisions of the law and with the manner of its enforcement. This criticism was most severe in the general farming regions, where the orchard is only a minor part of the farm business. Many farmers in these sections did not or could not find the time to spray more than once or twice, and then not always at the proper stage of development. More important matters often claimed their attention at a time when the orchard was in need of care. This enforced neglect resulted in a grade of fruit inferior to that produced in the well-kept orchards of the highly specialized fruit sections. Under previous methods of marketing this fruit could be sold on the reputation of better fruit, because there were no standard grades nor standard methods of marking the barrels except within very wide limits. It was not plain to such growers that their problem was one of farm management, possibly involving a readjustment of their business, and that, while the law might hasten this change, it was bound to come eventually. There appears to be no good reason, however, why the
entire apple industry in the State should in the meantime be permitted to fall further into disrepute.

There was no question also that the grades under the law were in a few cases not sufficiently different and distinct. This fact, coupled with opposition from the sections mentioned, brought about certain alterations in the instrument. Among other changes, the measure was made a part of the Agricultural Law of the State, an act very essential to its proper enforcement. The amended law has been in operation during the present packing season. This year also a large amount of late infection of scab has complicated the situation, and it now appears that particular attention must be given to this problem, especially to the rapidity of development of scab on fruit in storage at different temperatures, before the question can be handled satisfactorily.

In general, results have been encouraging during both seasons. In 1914 the law tended to keep a large quantity of apples out of barrels, compelling their sale in bulk, with the result that the tone of the market was steadier and stronger than was deemed possible in face of the heavy crop. The Department of Pomology at Cornell received many letters of approval from growers and dealers. Apparently about eighty per cent of the growers are in favor of the measure, and practically all produce men in the market centers endorse it heartily. In one instance—that of the firm of E. P. Loomis & Co., of New York City—the Department received the following letter under date of November 15, 1915:

Yours of November 12th received. I thoroughly believe in the New York Apple Grading and Branding Law. Its effects were beneficial last year and were even more beneficial this year. I will give you one example:

At a time when the apple market in New York this fall was $2.25 to $2.50, we were able to quote out, to firms in Minnesota, offers on New York Standard “A” Grade Baldwins, min. size 2 1/2 inches, at $2.75 i. o. b. shipping points New York. We received answering telegrams saying: “Do you guarantee pack and grade of apples according to the New York State Law?” and we wired “Yes.” As a result of our being able to offer a certain definite grade and pack, we have been able to sell 70 carloads of apples and they were accepted and paid for without complaint. This was never possible under the old rule where every farmer packed his apples in a different way.

The State Commissioner of Agriculture recently sent a corps of men to the docks, terminals, warehouses, and stores in New York City to cover the market and note violations. Their reports show that eighty-five per cent of New York fruit in the city at that time was packed in accordance with the law.

Many obstacles are encountered in the enforcement of such a measure. The State Department of Agriculture, with which its enforcement rests, is hampered by lack of funds. It finds much ignorance on the part of the growers concerning the provisions of the law, even after two years of publicity work. One of the serious disadvantages of a state measure is that the State has no jurisdiction after the fruit leaves its boundaries. This makes it possible for unscrupulous growers and dealers to remove, change, or substitute marks on the barrels in other States, to the evident injury of the reputation of our fruit and of the respect in which the law is held. A federal statute is needed, covering the same general grounds.

The conviction is strong that the law has survived the experimental stage, and that, although changes will still need to be made, it has justified its enactment. If the experience of other similar sections may be taken as a guide, we may now look forward to the gradual establishment of community packing houses in which large quantities of fruit may be brought together under one label and in which the grower is not responsible for the packing of his own fruit.
Orchids, The Royal Family of Plants

BY DAVID LUMSDEN
Assistant Professor of Floriculture, New York State College of Agriculture at Cornell University

The last half-century has seen many changes and developments in the horticultural world, but in none of its branches has more rapid progress been made than in the cultivation and hybridization of the orchid. The interest taken in orchids was never greater than at the present time, and each year additional greenhouse structures are being erected in various parts of the country for the sole purpose of cultivating these interesting, fascinating, and beautiful flowers.

Orchids hold one of the most important places in gardens, and such genera as Cattleya, Laelia, Cypripedium, Dendrobium, Odontoglossum, Oncidium, and Phalaenopsis are so popular that they are cultivated on a very extensive scale. These genera are grown not only by orchid enthusiasts in private collections, but also by amateurs and commercial growers. Commercial florists are importing and growing these plants by the tens of thousands, expressly for the trade in cut flowers. The reasons for this popularity and for their more extensive culture are attributable mainly to the exquisite beauty of the flowers of many of the species, their choiceness, and their adaptability to all artistic floral arrangements in the making up of bouquets for weddings and other occasions, for corsage bouquets, and for dinnerable and all other decorations where the choicest and most beautiful in flowers is desired. The value of orchids as cut flowers is greatly enhanced by their excellent keeping qualities; in many instances cut flowers of some of the species have remained in a state of perfection for more than three weeks, while those left on the plants have kept for a corresponding number of months.

The present lower cost of the plants in comparison to the prices paid in former years has also been an important factor in increasing their popularity. Practically all the orchids cultivated under glass with the exception of hybrid forms, are imported from tropical or semi-tropical countries. The hybrids are the progeny resulting from the artificial crossing of genera species and varieties under cultivation in the greenhouses.

Imported orchids

With present-day improved facilities of steamship transportation, species of orchids that were hard to import a few years ago are now received from their native habitats in large quantities with the reasonable assurance of their arriving in good condition. The probability of successful growth following transportation was more or less a matter of conjecture in earlier years. During the period that may be spoken of as the experimental stage in orchid importation, the collecting of plants was left almost solely in the hands of a few prominent nurserymen and horticulturists, who sent out travelers to the four corners of the world in search of new and choice plants. Prominent among these pioneer horticulturists, the name of Veitch has become immortalized. It is due to the patience, perseverance, and enthusiasm of the members of the firm of James Veitch & Sons, and its corps of able collectors, that we are indebted for the introduction of many choice and rare orchidaceous plants, as well as other plants that have become great in economic importance.

Geographical distribution

Orchidaceous plants are widely distributed over most of the entire world, except in the coldest sections. The most important genera, broadly speaking, are confined between the thirtieth parallel of north latitude and the thirty-fifth parallel of south latitude, this broad zone including about three-sevenths of the land area of the globe. The genus Cattleya is found in the Colombia-Guiana region of South America, and both Laelia and
Cattleya are found in southern Brazil and in the western section of Mexico and Guatemala. The exotic Cypripediums and Phalaenopsis are largely confined to the Indo-Malayan region. The Odontoglossums are found in the Andean region of South America, in Mexico, and in Central America. Other genera are largely confined to the above-mentioned regions. Many genera and species of orchids are found also in North America, prominent among them being the lady's slipper, or Cypripedium, in its several varieties.

The orchids of the temperate region are chiefly terrestrial. They have fibrous roots, and often large, fleshy tubers, and derive their nutriment from the soil in which they grow. Those of warmer countries are epiphytal in nature. They are often incorrectly spoken of as parasitic, but they derive little or no nourishment directly from the host plant. An epiphyte merely uses the branch as a support or resting place, taking its food from the surrounding atmosphere, while a parasite obtains its nourishment from the host plant.

Morphology of orchid flowers

From a botanical standpoint the orchid furnishes varied and excellent material for study, as in structural formation the flowers differ entirely from those of other endogenous plants. It is in the floral structure that we find the features prominently characterizing the orchid. The eminent botanist Dr. Lindley, in the English Cyclopaedia on Orchidaceous Plants, writes thus of their morphology:

"There is no order of plants the structure of whose flowers is so anomalous as regards the relation borne by the parts of reproduction, or so singular in respect to the form of the floral envelope. Unlike other endogenous plants, the calyx and corolla are not similar to each other in form, texture and color (as in the lily, crocus, narcissus, squill, amaryllis, etc.); neither have they any similitude to the changes of outline that are met with in such irregular flowers as are produced in other families of the vegetable kingdom. On the contrary, by an excessive development and singular conformation of one of the petals called the labellum or lip, by irregularities
either of form, size, or direction of the other sepals and petals, by the peculiar adhesion of those parts to each other, and by the occasional suppression of a portion of them, flowers are produced, so unusual and so grotesque in form that it is no longer with the vegetable kingdom that they can be compared but we are forced to seek resemblances in the animal world.

Mimicry in orchids

Many well-known instances of mimicry occur among the orchids, in particular those that are natives of Great Britain and the Tropics. Prominent among these are the bee orchis (Ophrys apifera), the fly orchis (Ophrys muscifera), the frog orchis (Habenaria viridis), the bird's-nest orchis (Neottia nidus avis), the butterfly orchid (Oncidium papilio), the dove orchid (Peristeria elata), the swan orchid (Cynoches pentadactylon), the moth orchid (Phalaenopsis schilleriana), and many others.

Fertilization

Not a whit less interesting than the mimicry just mentioned are the contrivances by which orchids are fertilized. Darwin says, "They are almost as perfect as any of the most beautiful adaptations in the animal kingdom."

Most orchid flowers are incapable of self-fertilization, owing to the position in which the reproductive organs are placed in the flower as well as to the nature and texture of the pollen (pollinia). In orchidaceous plants the pollen grains, in waxy masses, are united by excessively elastic thin threads; therefore we infer that they have for their main object the fertilization of each flower, not by its own pollen but by the pollen of another flower. This is accomplished through the agency of bees, moths, and other insects that are native in the sections of the world where the orchids abound.

The engrossing pursuit of raising or-
chids from seeds had its genesis only a comparatively few years ago. The art was first introduced by the late J. Dominy, in the nurseries of James Veitch & Sons at Exeter, England. The suggestion was made to Mr. Dominy by Dr. Harris, a surgeon of Exeter, that it might be possible to artificially cross orchids and raise them from seed. Dr. Harris, being a botanist as well as a surgeon, explained to Mr. Dominy the reproductive organs of the flowers. Dominy lost no time in following Dr. Harris's suggestion, and commenced his experiments in 1852. It was in October of 1856 that the first hybrid, Calanthe Dominii, flowered. Mr. Dominy successfully carried on this work of hybridizing among the various tribes of orchidaceous plants for about twenty years. During that period he raised several meritorious hybrids, including the bigeneric orchid, Laelio-Cattle Dominiana, a cross between two genera, Cattleya and Laelia. This hybrid flowered in 1878. Mr. Seden, who succeeded Mr. Dominy, raised and introduced many orchids of sterling merit. Other nurserymen, orchid enthusiasts, and gardeners in private establishments, both in America and in Europe, took up the work, and many beautiful and interesting orchids have been produced, including bigeneric and multigeneric hybrids.

As has been stated, one of the reasons for the more extensive cultivation of orchids is the length of time the flowers of most of the species continue in perfection after they open. It is now conceded that with few exceptions the duration of bloom is due to the flowers' never becoming fertilized unless by some external agency. The number of self-fertilizing orchids is infinitesimal when compared with the whole number of species contained in the family Orchidaceae. Darwin mentions ten species, and other botanists of later date have added a few more to this number.

In commenting on the self-fertilization of orchids, Darwin states: "Considering how precious the pollen of orchids evidently is and what care has been bestowed on its organization and on the accessory parts; considering that the anther always stands close behind or above the stigma, self-fertilization would have been an incomparably safer process than the transport of the pollen from flower to flower. It is an astonishing fact that self-fertilization should not have been an habitual occurrence. It apparently demonstrates to us that there must be something injurious in the process. Nature thus tells us in the most emphatic manner that she abhors perpetual self-fertilization."

A striking example of this extraordinary manner of fertilization and how it is accomplished is afforded in the genus Coryanthes. The scape bears from two to three large, curiously shaped flowers, which hang downward. The generic name, taken from Korys, a helmet, and anthos, a flower, alludes to the helmet-like appendage to the lip of the flower. The sepals, after opening, soon collapse and assume the attitude of bats' wings at rest. The lip is fleshy and solid, and the sepals and petals are delicate in texture. The lower part is converted into a large bucket, above which two horn-like appendages secrete so much nectar that into it. The total quantity of fluid secreted in the bucket is about one ounce. When the bucket is nearly full the fluid overflows by the spout. This spout is closely over-arched at the end of the column which bears the stigma and drops may be seen continually falling the pollen masses, in such a manner that an insect forcing its way out of the bucket through this passage would first rub its back against the stigma, or female part, and afterward against the viscid disks of the pollinia, or male parts, and thus remove them. This remarkable method of fertilization has been observed in plants growing in their native country (Tropical America). The bees, attracted either by the perfume of the flower—which is very powerful and agreeable—or by the nectar, approach the flower in large numbers and dispute with one another for a position on the edge of the bucket. Partly for the contest, and possibly be-
cause of the liquid's being somewhat of an intoxicant to bee life, the bees fall into the bucket and receive a drenching sufficient to prevent their immediate escape. Crawling around inside, they soon discover the opening of the spout and emerge therefrom. It is here that the pollen is removed by its adhering to the bee's back. As soon as the insect comes out he returns almost immediately to his feast. He is generally precipitated a second time into the bucket, passing through the same opening, and during that time the pollen masses adhering to the thorax or other parts of the bee's body are deposited on the stigmatic surface of the same or some other flower. It is stated by observers that sometimes there are so many of these bees assembled that there is a continual procession of them through the passage. Both Dr. Cruger and Dr. Darwin were much interested in this genus, and Darwin, in commenting on the Coryanthes in the Botanical Review, states that he thought "there could not be the least doubt that the fertilization of the flower absolutely depended on insects crawling out through this passage. If the bucket had been dry, the bees could have easily escaped by flying away." He argued therefore that the fluid is secreted by the horn-like appendages in such extraordinary quantity for the purpose of wetting the wings of the bees, and thus compelling them to crawl out through the passage.

One of the most interesting circumstances connected with artificial hybridization is the means it has afforded of tracing the life history of many of our orchids. It has also afforded the student in heredity excellent material for carrying on his work. It is very true that in the case of orchids several years must elapse from the sowing of the seed to the flowering of the plant. In some cases and with some genera the period of time has been about two years, while in other cases it has been twenty years. These long periods of time, however, are exceptions, and in general from three to six years would be considered an average..
Injury to plants used for hybridization purposes has prejudiced some persons against the general practice of hybridization. There can be no denying the fact that the strain of fructification does considerable injury to the parent plants, and oftentimes it takes several years for these plants to recuperate. But owing to the vast depletion of some of the forests in which the orchid was once found abundantly, as well as to the cutting down of great numbers of trees by the ardent orchid collector, many thousands of small seedlings of orchids perish annually. This felling of trees by the orchid collector often becomes necessary in order that he may obtain the plant for which he is seeking. In many cases the plants are situated high on the branches, and a luxuriant growth of vines attached to the trees forms a harbor in the tropical wilds for venomous insects and reptiles. This makes climbing the trees to obtain the plant extremely difficult and dangerous. Owing to the increasing popularity of the orchid and the demand for the cut flowers, it has become necessary for the florist to practice hybridization in the greenhouse on a far larger scale than formerly in order that the race of these royal plants may not be exterminated.

The Purple Raspberry

BY R. D. ANTHONY
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The purple-cane, or purple-cap, raspberry was first called *Rubus neglectus* about 1869 by Peck, at that time New York State Botanist. As botanists became more familiar with these raspberries, the wide range in type which they showed and the fact that they were found only in limited numbers, and then in the presence of both the red raspberry and the blackcap, led many to surmise a hybrid origin. The possibility of hybridizing the blackcap and the red raspberry was soon proved and the similarity of such hybrids to *Rubus neglectus* strengthened these doubts as to the correctness of Peck’s species. The production of hybrids seems not to have been done on a sufficient scale to give indisputable evidence as to the origin of the purple raspberries until a series of crosses had fruited at the State Experiment Station at Geneva, New York. This included over fifty pure seedlings of Columbian, a purple raspberry, and over eight hundred hybrids of the blackcap and the red raspberry. A study of these seedlings leaves no doubt of the hybrid origin of the purple raspberries. The popularity of the purple raspberries has been increasing rapidly during the last ten years and in some regions they have largely supplanted the blackcaps. This has been due to their heavy production and their nearly complete immunity from anthracnose, which has been destroying the blackcaps. When we consider that but two varieties, Columbian and Shaffer, are responsible for this development, and that these are but chance seedlings, we realize what an opportunity there is here for the fruit breeder.

The study of purple raspberries which was started at Geneva in 1910 has now progressed far enough to enable us to draw a few conclusions, and promises to give us new varieties much superior to any now under cultivation.

The pure seedlings of Columbian fail to show the breaking up which we would expect in the F/2 generation (the second from the original crossing). Out of half a hundred, none could be described as a pure red raspberry, though several approached closely to the red raspberry both in color and in cane characters;
nor did any show a tendency to propagate by suckers as does the red raspberry, though some failed to tip readily. In cane color and glaucousness there was more of the expected splitting up, some seedlings having the deep purple-red canes of the Columbian while others had green canes, and some having a bloom such as is found on the base of Columbian canes while others were non-glaucous as in the supposed red grandparent.

In the crossed seedlings, June, a station seedling red raspberry, has been used as the male, and two different blackcaps, Cumberland and Smith No. 1, have been used as females. Practically every crossed seedling shows clear evidence of its hybrid origin. The Smith No. 1 seedlings were all purple, though the color showed varying degrees of intensity; but among the 289 Cumberland seedlings there were nine yellows that were intermediates in their bush type, and one that might readily have been classed as a blackcap bush. None of the seedlings of either cross gave any indication of propagating by suckers.

An unusually large proportion of these crossed seedlings were very promising. The bushes were more vigorous than either parent and bore a heavy crop of large, firm fruit, somewhat later than the parents. Some were rather unattractive because of their dark color and dull look caused by a thick pubescence, but many were a rich, glossy purple.

For those wishing to breed purple raspberries, the best mode of procedure would seem to be to cross the most desirable reds and blacks rather than to attempt intercrossing among the purples or to grow pure seedlings of any purple sorts. For such persons the chances of reward are excellent, and as results can be obtained in from three to four years—a comparatively short time for the fruit breeder—this offers an attractive field.
The marketing of farm products is an extremely complicated problem. Manufacturing involves the observance of certain fundamental rules and principles which may be formulated and shaped into a code of action. The production of crops from the soil is an art supported by science, and this art lends itself more or less to certain given principles and rules that may be catalogued and applied. Marketing, on the other hand, is empirical. There is no science, and as yet little system, to it. Hence the field for its development is open.

In this paper we are concerned only with the marketing of farm products, which is even more complicated than the marketing of manufactured materials. To obtain a proper conception of what might be the Government's relation to this problem in the future, we must look back and view what has been the Government's attitude on similar matters in the past.

Our people are worshippers of the fetish of independence—the right of every man to go his own way, mind his own business, conduct his own affairs, and let the body politic take care of itself as best it may. About the last thing that comes into the mind of the average citizen is the thought that what is good for the hive is good for the bee. The usual concept is to take care of the bee first; the hive can take care of itself. The reflection of this spirit is seen everywhere: in our scheme of education with its hundreds and thousands of little independent units, at once the most wasteful, illogical, and inefficient, perhaps, in the world; in our whole system of land settlement and land allotment, whereby the dweller has been compelled to isolate himself and make his way without opportunity or hope of community life; in the organization and development of legislative bodies, the members of which are expected first of all to look after the interest of the particular ward, county, district, or State they may represent, and as a secondary consideration to look after the welfare of the country as a whole. This condition of affairs is not limited to the United States alone. It is more or less prevalent in the whole of the Western Hemisphere, and is in part due to the fact that heretofore there has been plenty of room for expansion and expression. We are now beginning to crowd one another. We can no longer move about as freely as formerly, and we are feeling the need of combined effort and collective effort in solving the new problems that are rapidly arising.

To further complicate matters, we find the farmer, the man who produces so much of the material to be sold, not long removed from a period when the farm was self-contained. In a good many sections the farmer can still manage to live fairly well on what he produces at home and on what he can sell and barter near by. It is beginning to dawn on him, however, that with all the rapid economic changes he is more and more being brought into competition with the world, and that as an individual he is unable to cope with the situation. In his bewilderment he appeals to the State, with the result that there is much scurrying and scuttling here and there, and innumerable bills for relief are introduced, which seldom accomplish anything except, perhaps, to secure a few votes for the introducer. This procedure may continue indefinitely until

THE RELATION OF THE GOVERNMENT

out of it there is gradually developed some plan or policy that will be far-reaching and permanent in its effects. This is economic evolution in a democracy—a tremendously wasteful and costly proceeding, but in the end occasionally successful.

It took nearly half a century, at a cost that no one can tell, to evolve a system of currency which from its very simplicity one is amazed to find was so long in coming. It seems fairly reasonable, therefore, to surmise that in the marketing of farm products and the Government's relation thereto, we must look forward to a considerable period of shifting and changing and more or less uncertainty while education is doing its work, until, through one means or another, the people are brought to think and to act in terms of community effort. For the marketing problem now and in the future is a community problem, which means that any country founded on the tenets of a democracy must first heed the great call for educational effort, in order to bring all the people to a realization and understanding of the need, the important need, of working together.

We would, therefore, put down as a first step of Government in the marketing problem, the development of a definite policy in educational work looking toward what may be called social preparedness. This is a legitimate problem for the state, which all of us who have the highest ideals of a democracy at heart can thoroughly approve. To educate for social preparedness, to develop from within the desire and the spirit to work together rather than have to be forced to work together, is certainly worthy of our best effort. We now have the opportunity of studying something of the workings of these two methods in the deplorable conflict that is shaking civilization everywhere. What the end will be we do not know. I think many of us, however, are ready to admit that some of our theories as to the powers and influence of a representative democracy will have to be revised.

That the people are awake to the needs of the matter is evidenced by the demands for help and light. Good beginnings have already been made, and it is gratifying that our own Department of Agriculture is taking the lead in this work. Through its Office of Markets and Rural Organization and its States Relations Service, lines of work are being developed that will lead to far-reaching results in establishing safe and sane principles.

This work offers a great field for our agricultural colleges. It must be developed, however, through a new form of teaching and a new kind of teacher—a form of teaching that is concerned less with academic theories and more with the real everyday affairs of life, and a new kind of teacher who knows life and its problems rather than books and the problems they present; a form of teaching and a kind of teacher that will bring about "a wise and just evolution of our social and industrial problems, the union of clashing elements in our population, the adjustment of differences, the wiping out of bitterness, the establishment all through our social and industrial life of a justice so patent that none but the unjust can doubt it." These things cannot be accomplished by government fiat, but the Government can lend its aid by liberally supporting all properly organized educational agencies engaged in the work.

As we come to view this type of effort at close range, it becomes more and more evident that it must be based on a systematic study of the real facts of working together, rather than the theories of collective effort. For a time at least we shall need to be concerned more with the facts as to what has been done, than with the theories of what might be done. There is a vast fund of fact that could be made immediately usable if it were properly brought together, sifted, assimilated, and put into teachable form. All the issues are now very much confused by the action and operation of many types of so-called cooperative or collective agencies whose
primary object is pecuniary gain for the few rather than the establishment of fair and just relationships and mutual helpfulness for all. It will require a decade of active educational work to bring about a proper understanding of some of these matters and to bring our people to the state of mind necessary to enable us to proceed with broader and better constructive plans. Nothing will accomplish so much as the mere bringing of the people together to discuss the questions at issue under agencies that will guide and not attempt to direct.

Already the Government of the United States is laying the foundation for future work of this nature through the organization of a broad scheme of extension work, localized in counties but guided by a comprehensive scheme of cooperation through the colleges of agriculture in the respective States. I refer to the cooperative work of the Federal Government with the state colleges in the conduct of the county agents' activities.

Briefly, then, one of the first functions of Government in relation to the marketing problem is to develop, through properly organized educational work, a state of mind, a real knowledge of the broader questions and issues, and a true understanding and appreciation of the social, moral, ethical, and business questions involved. The state, and the state only, can do this, but up to this time the state has done but little, and it must be admitted that as yet we are all groping as to the method that should be employed in developing social consciousness.

A second and vital function of Government in relation to the marketing problem has to do with the securing of uniform legislation affecting legitimate organized effort in the field of marketing farm produce. We can sweep aside at once all those proposed forms of legislation that aim to do the things for the producer that he ought to do for himself. There should be no place anywhere in all these matters for development of anything like class legisla-

tion. The farmer does not need, and should not be regarded as needing, special privileges from the Government. There may be times when this appears to be the case, and our dangers lie in the direction of misconceived action in the belief that the difficulties can be met and overcome by government fiat rather than by the observance of economic laws. We do most sorely need, however, uniform constructive legislation that will establish and maintain the principles of justice between the producer and the consumer.

Here again we are confronted, in this country at least, with another fetish that has blocked progress for fifty years, and this is the fetish that holds that in vital matters affecting all the people all the time, we must recognize certain arbitrary and more or less meaningless boundary lines and provide for the people within these lines as if they were beings apart from all the other people. This policy, based on conditions which as a nation we have long since outgrown, has had more to do with holding back progress in some of the larger questions concerning the welfare of our people than almost any other one thing. View the situation with reference to protecting the life and health of all the people. Surely this is not a local question to be met by setting up certain health laws in one place and very different ones in another place. Pure food is pure food wherever found. Food cannot be pure and wholesome in Maryland and Virginia and the opposite in the District of Columbia. The distressing blight of child labor, which certainly concerns the Nation as a whole, we cannot check nor mitigate until there is some assurance of legislative uniformity throughout the entire land. If there cannot be uniformity of legislation which will guarantee to the producers of the necessities of life a fair share of the profit therefrom, or at least a living wage, then democracy is a failure and some other form of government must be devised. It would seem, there-

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Influence of Low Temperature on Fruit Growing in New York State
BY W. H. CHANDLER
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The climate of several sections of New York State is unusually favorable for the growing of nearly all temperate zone fruits, not only because the influence of the lakes makes the extremely low winter temperatures which kill the wood or the buds very uncommon, but also because the long, steady winters, with very few days that are warm enough to start growth, tend to keep the tissue dormant until danger from severe spring freezes is past. Further, this long period of cold weather brings the tree through its necessary period of dormancy with a large store of plant food to start it into a vigorous growth in the spring. If there were many warm, sunny days in winter, such as there would be at some distance farther south, much of this stored plant food would be exhausted. For this and other reasons, fruit trees make a more vigorous growth, and perhaps live longer, in New York than farther south.

In another way, the climate of New York is fortunate for growing certain kinds of fruit. In the case of peaches, the section in which this fruit can be grown with safety is along the Great Lakes, where the climate is mitigated by the large bodies of water. Since these areas are very limited, there is much less likelihood that too many peach trees will be planted and the market over-supplied than in such sections as those farther south, in Georgia for example, where very large areas are available and there is generally great over-planting. For this reason, peach growing along the Great Lakes has been a much more stable and uniformly prosperous industry than in most other sections where peaches are grown.

It is the purpose of this paper, however, to discuss the losses that fruit growers suffer due to low temperatures in New York State. Perhaps it may be well to make clear, so far as we are able, how plant tissue is killed by low temperature. It is not possible to say with certainty what happens, but we know that the injury is associated with ice formation in the tissue. It is sometimes possible to lower the temperature below that at which a tissue normally kills without having ice form—that is, to supercool the tissue. After such supercooling, if the tissue can be warmed above the freezing point without ice formation, no injury results; but if ice forms, serious killing may result at the same temperature. As a rule, the ice forms in the spaces between the plant cells, the water being drawn out of the cells. It is rather common for writers to make the statement that if the thawing is slow enough so that the water is taken back into the cells gradually, as it thaws, injury is not likely to result. This, however, is not true. In the case of most tissues the amount of injury is not influenced by the rate of thawing. In fact, the death of the tissue may be proved before thawing occurs. Yet in the case of ripe apples and ripe pears, generally, unless the temperature goes too low, the amount of injury may be reduced by permitting the fruit to thaw very slowly without being handled while it is frozen. It does not reduce the injury to thaw the fruit in cold water, since this is not a method of slow thawing but is in reality a method of very rapid thawing.

In the case of dormant tissue that requires a winter temperature to kill it, the rate at which the temperature falls has a marked influence on the amount of killing at a given low temperature. It is possible to kill almost any tissue
in a tree at a temperature that is reached in many winters, by lowering the temperature much more rapidly than it would fall under normal conditions. This fact seems to have some practical importance. In most years, if the winter temperature reaches −15°F., the fruit buds of peach trees will all be killed; yet in some years a crop may be obtained after the temperature has been at −20°F., or lower. So far as I have been able to learn, in all cases in which the buds have withstood such low temperatures there has been a long period of cold weather preceding the time when the temperature fell low enough to kill, and thus the rate of temperature fall was rather slow.

With regard to the wood of the trees, the most important factor in determining the amount of injury is maturity. In the early summer, when the trees are growing rapidly, almost any of the tissues will be killed by a temperature but a few degrees below freezing. Later in the summer a lower temperature is required to kill the tissue. This increased hardiness continues even after the leaves have fallen, and therefore the tissue is generally more tender in late November or early December than it would be in January. If the tree grows very late, the tissue will be more tender, throughout the early part of the winter at least, than if it had ceased growing rather early. In the case of a young tree that has grown late, the more tender tissue is that at the end of the twigs, and so on such trees there may be killing back from the ends. This is very common with peaches and apricots. When the trees have become old enough to bear, or nearly so, generally the last tissue to become hardy seems to be that near the base of the tree; hence it is not uncommon to see areas killed just above the surface of the soil or at the union of a vigorous branch with the trunk of the tree. These injuries are often spoken of as crown rot and crotch injury, respectively. Of course dead areas at such points may result from other causes than winter injury. This form of injury is often found on the Tompkins King variety of apples, and it has been observed recently that even the Northern Spy is not free from it in colder parts of the State. McIn-
tosh, Fameuse, and Oldenburg are some of the varieties in which this form of injury is less common. Crown rot due to this cause is very common also with young peach trees, even in sections where the climate is reasonably favorable.

In New York, because of the short growing season, this lack of maturity is the most important cause of winter injury to the wood. There may be no relation between the minimum temperature observed in winter and the amount of winter injury that will result. The most serious winter injury may result from winters when the temperature has never been more than a few degrees below zero Fahrenheit. Therefore, in any New York fruit-growing section where winter injury has been observed to a considerable extent, it is exceedingly important that the trees should be handled in such a manner as to make certain that the wood will go into the winter in a mature condition. This does not necessarily mean that the trees should be kept in a weak condition. In a poor soil that is unretentive of moisture, trees having a weak early summer growth may be less mature when winter comes than they would have been if they had made a vigorous early growth. In the past summer I had occasion to examine an orchard that was not cultivated during the summer of 1914, in which there had nevertheless been very severe winter injury during the following winter. The explanation for this seems to be that because of very weak early growth in the summer of 1914, the trees were started into a slight growth by the rainy weather of August; while if they had made a vigorous early growth they would have had a large leaf surface to evaporate the excess water, and furthermore they would not have been through any period of partial dormancy but would instead have been just entering

PEACH TREE SHOWING RESULTS OF WINTER INJURY

Note that the buds opened very late on the young twigs at the top of the tree while on the older twigs toward the base of the tree they have started normally. These older twigs perhaps matured their wood earlier in the fall of 1914.
the dormant period—a time when it is very difficult to force new growth. It therefore very improbable that they would have made any late growth had they made a vigorous early growth. The better cultivated orchards did not show this injury.

So far as cultivation is concerned, then, it seems that the best way to make certain that the trees will go into the winter in a mature condition is to begin cultivation very early in the spring, so that vigorous growth will begin early, and then cease cultivation and sow a cover crop earlier than is the common practice, say sometime in July. The early growth insures a large leaf sur-

face which will evaporate large quantities of water, and the early sowing of the cover crop reduces the water supply. Thus the tree is encouraged to cease length growth and acquire maturity. If cultivation is begun later, the tree is likely to start a vigorous growth later and to continue it later.

To some extent the same is true in regard to the use of a fertilizer containing nitrogen. If manure is plowed under late in the season, the increased growth due to its application may begin and end too late in the season. In the case of young peach trees, I am of the opinion that wherever winter injury is observed it would be wise to get increased vigor by the use of nitrate of soda rather than of manure, since one can be sure that the increased vigor from the nitrate of soda will result early in the season and that the nitrate of soda will be gone from the soil before the end of the season. The nitrogen in manure is not so readily available early in the season, and therefore the increased vigor might begin so late that the wood might not become mature. Very heavy pruning of young peach trees seems unwise, since this treatment forces them to grow too late in the season. In the case of peach trees that are bearing, however, this does not seem to be true.

Killing of the Fruit Buds

In the case of apples, pears, sour cherries, and most varieties of plums, the killing of the fruit buds is of so little importance that it may be ignored here. In the case of peaches, apricots, Japanese plums, and sweet cherries, however, it is not uncommon to have the flower parts of buds killed during the winter. The killing temperature for peach fruit buds when they are fully dormant varies from $-10^\circ$ to $-25^\circ$ F., depending on the weather that has preceded the freeze. Fortunately, most of the peach trees in New York are planted in sections where such low temperatures are very uncommon. Generally the flower parts of the fruit bud are the first to be killed.
Killing of Flowers and Young Fruit

In most fruit sections it is probably true that a fruit crop is more frequently lost from the killing of the flowers or the young fruit than from the killing of the buds in winter. It is impossible to fix on a temperature at which the flowers will be killed. In the case of peaches, this killing temperature may vary from 22° to 27° F. The longer the bloom has been open, the more easily it will be killed, and the young fruits are more easily killed than are the flowers. Apple flowers generally may be killed at a higher temperature than peach flowers. The reason why peaches are more frequently killed is because they open earlier in the season, when there is still more liability of a freeze. Apricots are seldom grown in this section, but not because the trees are less hardy than peach trees nor because the fruit buds are more easily killed. The fruit buds of apricots are in fact slightly more hardy than the fruit buds of peaches, but their habit of blooming very early, before danger of late frosts is past, makes the crops uncertain. Loss of crops from late freezing is much less common in New York than in sections farther west, such as the fruit sections of the Mississippi Valley, or in sections farther south.

In case of some very valuable fruits, such as the orange, it has been found profitable to heat the orchard during cold nights in order to prevent loss of fruit and, in the case of oranges, also to prevent injury to the trees. The same method has been used in some sections with apples, peaches, and other deciduous fruits. I do not believe, however, that we are as yet in a position to say that it has been used with profit. To equip for heating would require an initial investment of about two thousand dollars on forty acres. When interest on this investment, and depreciation on heaters and other equipment, are added to the annual labor expenses, the annual cost of being prepared to save the fruit crop will amount to about ten dollars per acre. So far as experience indicates, it is highly improbable that in any good fruit section of this State one crop in ten years would be saved by heating. I am therefore of the opinion that orchard heating would not be profitable in New York State.

PEAR TREE SHOWING WINTER INJURY

Kieffer Pear tree in the Morrell orchard. Taken June 12th, showing retarded growth resulting from winter injury to the spurs. Much injury was found in this orchard following the winter of 1914-15. If the orchard had been cultivated very early in the season of 1914, it is probable that it would have been in a condition of greater maturity at the beginning of winter and that this winter injury would have been avoided.
How I Handle My Apple Orchard

BY F. W. CORNWALL, Pultneyville

AN EFFICIENT COMBINATION

This team of mules has covered twenty-two acres of orchard in a ten-hour day

Forty years ago the orchard here discussed was set out on the home farm by my father. He selected a 5½-acre lot about half a mile back from the lake shore; the soil was a light sandy and gravelly loam, the general slope was toward the north, and the drainage was good. Baldwin and Rhode Island Greening trees were planted 40 feet apart, in rows running north and south. For twenty-five years after planting, this orchard was neglected. Crops of corn, oats, wheat, and hay in rotation were raised between the trees. Little trimming and no spraying was done.

About twelve years ago we started in earnest to reclaim the orchard. The trees had grown so high that ladders twenty-four feet long were necessary for picking the fruit. The trees had to be gradually worked down, and we are now picking all the fruit from ladders eighteen feet long. The trimming is done every year, during December and on through the winter, beginning just as soon as the apples are harvested and the corn is husked. This practice has been followed for several years with no detriment to the trees and with a great saving of time in the spring. The trees are well opened up in the center, to allow the sunlight to get in. They are kept thin and the tops are kept down. The brush is gathered and burned, leaving the land clear for a very early plowing in the spring.

In the spring the cover crop is turned under just as soon as it is possible to get on the land, care being taken not to plow deeply enough to cut off the small roots. This is followed immediately by harrowing. Then orchard cultivators are sent over the land after every rain or about once a week up to the middle of June or the first of July. The team of mules shown in the photograph has covered twenty-two acres in a day of ten hours.
Not earlier than the middle of June nor much later than the first of July, the cover crop is sown. We like best a mixture of 7 pounds of mammoth clover and 15 pounds of winter vetch to the acre. When it is impossible to obtain the vetch, the mammoth clover is used alone at the rate of 11 pounds to the acre. Inasmuch as we have found vetch seed expensive and difficult to procure, we are now raising our own.

For fertilizer, bone meal and potash, 4 to 1, or acid phosphate and potash, 4 to 1, have been used at the rate of from 20 to 30 pounds to a tree, depending on its size. At the present writing, potash is out of the question. Stable manure has been applied once in three years. Formerly the fertilizer was applied early in the spring around the trees, and plowed under. Now it is sown broadcast and harrowed in over the entire orchard a few days before the cover crop is sown. Applied at this time it cannot be called a direct fertilizer for the tree, but is put on for the immediate purpose of raising a cover. Thus it indirectly benefits the tree. I believe this to be the more effective of the two methods.

But there came a time when we were unable to get a catch of clover. We resorted to buckwheat and rye, which made a thick cover, but there was a question as to how beneficial it was to the orchard. We then decided to try lime. Five years ago we put on about 700 pounds to the acre, and since that time we have succeeded in getting a good stand of clover and vetch. The lime is sown early in the spring, following the plowing.

Of all the important operations in fruit growing—and each one seems important—none is more so than sane and thorough spraying. We usually spray three times only, unless there is a special reason for a fourth application. But if sufficient care is taken this fourth is not usually needed. Our three sprayings are as follows: First, the dormant spray; this is applied just as the tips of the buds begin to show green and the aphids begin to hatch; lime-sulphur is used at dormant strength, 1 to 8, with \( \frac{3}{4} \) pint of black-leaf 40 to 100 gallons of the solution; we spray both sides of the tree with the wind, using a power sprayer and a rather coarse driving spray for contact; a strong wind is very desirable. Second, just as the blossom clusters separate and before they begin to open; lime sulphur at summer strength, 1 to 40, with 2 pounds of arsenate of lead to 50 gallons of the solution, is applied. Third, just after the petals fall; lime sulphur, 1 to 40, with 2½ pounds of arsenate of lead to 100 gallons of the solution, is applied.

In cold, wet seasons we have in some cases sprayed a fourth time, about two weeks after the third spraying.

Thinning comes after the July drop, and the fruit is thinned from 4 to 3 inches. This has a very important effect on the bearing of the orchard.

PICKING APPLES

"An apple in the hand is worth five on the ground"
The picking is done by the day and not by the bushel. The men use three-peck splint baskets instead of bags, and we try to have them take great care not to drop the fruit, for an apple in the hand is worth four or five on the ground. Drops and windfalls, which bring only from ten to thirty cents a bushel, go to the evaporator and are grown at a loss. The good apples are taken in the baskets to the packing house, where they are graded and bailed. Most of them are packed and put in storage the day they are picked.

In the last four years—and in this orchard there is a crop every year—4248 barrels of apples have been picked, 80 per cent of which were No. 1 grade. The lowest price for the No. 1 apples has been $3.25, and the highest $7, a barrel. The price for No. 2 fruit has been from $1.75 to $5. Gross sales for the four years amount to $17,416. Total expenses, including cost of production (which we figure at $1.73 per barrel), storage, transportation, and commissions, amount to $11,257. The net profit for the four years comes to approximately $280 per acre.

But there are other orchards on the farm where the returns are not so good. We are using the same methods on them but have not succeeded in growing a crop every year.

THE ROCHESTER STAGE

B. W. Kinne
E. R. Forthoffer
(Miner)

Leslie Brown
Miss Anna Bristol
(Second)

S. H. Palmer

These five students competed at the annual meeting of the New York State Fruit Growers' Association for the sixty-five dollar prize offered by the association. All the speakers are now taking work in pomology, or have taken courses in the department. This is the fifth competition of the kind which has been held.

The speeches, all of which pertained to fruit growing, were entirely original. The work of these students exemplifies the nature of the work carried on at the College, the idea being not only to impart information to students, but also to enable them to present such information in an effective manner. Of the sixty-five dollar prize the winner received $35 and the second contestant $15. Leslie Brown and B. W. Kinne tied for third place, each receiving $7.50. S. H. Palmer did not compete.
The purpose of my talk to-night is to tell you something about student labor. I want to explain what student labor is, to correct any mistaken ideas that you may have regarding student labor, and to try to bring about a clearer understanding of the relationship that should exist between the student and the farmer or the fruit grower.

First, I must state that there are many students from many colleges seeking summer employment. What I have to say to-night refers not to these students as a whole, but only to the students going out from the New York State College of Agriculture.

The College of Agriculture at Cornell has had a phenomenal growth. In each of the past few years there has been an increase in registration of approximately two hundred students, until at the present time there are more than sixteen hundred students enrolled. Many of these students are from cities and know little or nothing of farming. The College therefore requires, and rightly, that each student shall have a certain amount of practical experience, the idea being to turn out men with a broad scientific training but with a foundation of good, practical experience. Now the College may place requirements on the student for graduation, but it must show the student the means of obtaining these requirements. Scholastic learning is required, and the College has a corps of professors and instructors, it has laboratories and lecture rooms, and all the equipment that is necessary to give the student a technical education. It is manifestly impossible, however, on the university farm to give sixteen hundred students, or even one-tenth that number, the practical experience they should have. For this reason the College must look to the farmers of the State to take these students on their farms and give them the practical experience that they need in order to become successful farmers.

The general impression has been that student labor is unsatisfactory. Without a doubt you have all heard that old, old story of the man who went into the orchard to trim, and, getting out on a dead limb of an apple tree, sawed it off between himself and the trunk of the tree. It would not be surprising if the present-day version of the story had this hired man a Cornell student.

Last summer a student went into Seneca County to work on a farm. The farmer had a field of barley in which there were a number of patches of yellow mustard, and, thinking it would be a good idea to prevent this from seeding, he told the student to go back into the field and take out the mustard. About two hours later the farmer thought he would see how the work was progressing, and, much to his surprise and astonishment, he found the student had been weeding the barley from the mustard. Anthony said, at the funeral of Caesar, "The evil that men do lives after them, the good is oft interred with their bones." The evil reputation for student labor which that student established must remain for the next ten years, while any good service he may have rendered was no doubt never mentioned.

The College now feels that it can say with certainty that student labor is satisfactory. Professor King, who is the first vice-president of this organization, has been in charge of farm practice and student labor, and obtained employment for a large number of students last summer. He kept in close contact with the farmers hiring student labor, and at the end of the summer they reported on their opinion of the plan. Of one hundred and fifty students, one hundred and thirty-five, or ninety per cent, had given satisfaction, and the farmers who hired these students expressed the willingness to hire them again next summer. Only one man in ten, therefore, had

(Continued on page 412)
How Types of Farming in New York State are Determined*

BY K. C. LIVERMORE

Professor of Farm Management, New York State College of Agriculture at Cornell University

Beans

Nearly three generations of farmers have grown beans on a commercial scale in New York State. The extremely high prices paid for beans during the Civil War resulted in a great increase in the acreage grown, and probably resulted also in thorough trial of the crop in different sections. The old-time expression "too poor to grow white beans," referring to soils, seems to suggest that beans may be grown almost anywhere. This may be true, but the experience of preceding generation's of farmers, as summarized if this condition results from practices based on experience, rather than from custom or chance, it must be explainable.

The first observation that helps to explain, is that the normal rain fall for these counties for the months from April to August inclusive is from 14 to 16 inches in nearly every case. This is shown in Table 1. In Wyoming County the rainfall is from 14 to 18 inches, and in Schuyler County, the last on the list, it is from 16 to 18 inches. A glance at a chart of the normal rain fall for these months shows this bean section

Table 1

COUNTIES WITH THE HIGHEST PROPORTION OF THE CROP AREA IN DRY BEANS, 1909

<table>
<thead>
<tr>
<th>Counties</th>
<th>Percent of crop area in beans, 1909</th>
<th>Normal rainfall where grown, April to August, inclusive (inches)</th>
<th>Normal length in days of growing season where grown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orleans</td>
<td>13.6</td>
<td>14-16</td>
<td>155-165</td>
</tr>
<tr>
<td>Livingston</td>
<td>9.7</td>
<td>14-16</td>
<td>150-165</td>
</tr>
<tr>
<td>Genesee</td>
<td>9.4</td>
<td>14-16</td>
<td>145-155</td>
</tr>
<tr>
<td>Monroe</td>
<td>6.5</td>
<td>14-16</td>
<td>160-175</td>
</tr>
<tr>
<td>Wyoming</td>
<td>6.5</td>
<td>14-18</td>
<td>135-145</td>
</tr>
<tr>
<td>Yates</td>
<td>5.4</td>
<td>14-16</td>
<td>160-165</td>
</tr>
<tr>
<td>Ontario</td>
<td>4.2</td>
<td>14-16</td>
<td>160-170</td>
</tr>
<tr>
<td>Niagara</td>
<td>2.4</td>
<td>12-16</td>
<td>155-165</td>
</tr>
<tr>
<td>Wayne</td>
<td>2.3</td>
<td>14-16</td>
<td>165-175</td>
</tr>
<tr>
<td>Seneca</td>
<td>1.9</td>
<td>14-16</td>
<td>155-165</td>
</tr>
<tr>
<td>Schuyler</td>
<td>1.5</td>
<td>16-18</td>
<td>155-160</td>
</tr>
</tbody>
</table>

in present practices, indicate that in general bean growing adds to the farmer's profits in only one part of the State. Practically all of New York's beans—94 per cent of the acreage in 1909, to be exact—are grown in eleven counties grouped compactly in the northern half of western New York, as shown in Chart 1. No other county had as much as 1 per cent of its crop area in beans. Keeping just within the 16-inch rain fall line except in the two counties just mentioned. Evidently more than 16 inches of rain in the growing season is detrimental to beans. This checks with the opinions of growers. A comparatively dry season is preferred because anthracnose (the most injurious disease of beans) and blight are much less active in such a season, because snails are less

*This is a continuation of the fifth article in a series dealing with the Agriculture of New York.
numerable, and because it is much easier to dry the crop preparatory to storing or threshing it. The harvesting cost may be doubled by a wet season, and there is likely to be considerable loss by discoloration or rotting.

Erie and Jefferson Counties are the only ones, aside from those listed in the table, that grow more than enough beans for the use of their own farmers. In both these counties the crop is grown where the rainfall is under 16 inches in the growing season.

 Importance. Like other leguminous plants, beans are partial to soils well supplied with lime. As described in preceding articles in this series, the soils of these bean-growing counties, in general, are well supplied with lime and are also deep. This applies to the soils on which beans are grown in Erie and Jefferson Counties. There is much limestone soil in Jefferson, St. Lawrence, and Clinton Counties, but most of it is too stony for cultivation or is too shallow or wet for any crops except hay, oats, and

**CHART 1. DISTRIBUTION OF DRY BEANS IN 1909**

Counties with one per cent or more of their crop area in beans, as indicated. Ninety-four per cent of the bean acreage of the State is included.

Rainfall, however, cannot be the only determining factor, because there are several other sections in the State that have the same light summer rainfall but that grow very few beans. Parts of Oswego, St. Lawrence, and Clinton Counties, in the northern part of the State, and a part of Broome County in the southern part, have a favorable rainfall but grow very few beans.

Soil is perhaps the factor of second importance. This probably explains in part why the favorable rainfall in sections of these counties does not induce bean growing.

It will be noticed that every county in this bean section of the State is also included in the wheat section. (See vol. 12, p. 727). Beans are important only where considerable wheat is grown. This fact suggests that the economy of growing wheat after beans without plowing,
as is common practice in the bean section, together with the somewhat better yields of wheat obtained after beans as compared with the yields after oats, is an important factor in determining where beans shall be grown. This may or may not allow one to figure greater profits on the beans. But it does add to the profits of the business as a whole, other things being equal, and this is what the farmer is looking for. Because of this economy farmers who do not grow wheat cannot compete in bean growing with farmers who do grow wheat, unless they can get considerably better yields. The fact that practically no wheat is grown in Oswego, Jefferson, St. Lawrence, and Clinton Counties explains further why beans are not important in these counties although their rainfall is favorable.

Length of growing season also limits the bean-growing area. Although beans mature in a shorter period than does corn, they really require just as long a season, if not a longer one. An even stand can be secured only by delaying planting until the soil is thoroughly warm and mellow. Late planting is necessary also because the plants succumb to very light frosts. Then the season must be long enough to mature the crop and still leave time for wheat planting. Most of the beans are grown where the season is one hundred and sixty days long. The favorable rainfall for bean production in certain parts of Broome County is offset by too short a growing season. The season averages only one hundred and thirty days, which is too short for beans and which also indicates winters too severe for wheat. Furthermore, the soils of that county lack sufficient lime for profitable bean production.

Competition with other crops also helps in determining where beans shall be produced. Orleans County had in 1909 almost one-seventh of its crop area in beans, but the adjacent county, Niagara, with climatic and soil conditions apparently as favorable for the crop, had only 2.3 per cent of its crop area in beans. This county is probably better adapted to peaches, pears, quinces, and plums than any other county in the State. These fruits, especially the peaches and the pears, require labor at about the same periods as do beans. Consequently the less profitable has to give way to the more profitable. The fruits apparently pay better than beans in Niagara County.

Competition with other crops nearly eliminates beans in Erie County also. More than half of this county has a bean climate, and the farmers grow wheat but comparatively few acres of beans. One reason is that much of the soil in that part of the county is a clay or a clay loam, too heavy for very profitable production of beans or of any other cultivated crop. Because of this, competition between the cultivated crops on the soils that are suitable is all the keener. The proximity of this section to the Buffalo markets gives it an advantage in the production of truck crops, small fruits, and potatoes, which is decidedly greater than in the production of beans. Beans are storable, and the transportation costs in relation to the value of this crop are so low that nearness to markets is not a very great advantage in growing them. Hence most of the land in Erie County where beans might be grown profitably is devoted to these other crops, which pay better.

Outside the bean-growing section, the reason frequently given for not growing the crop is lack of bean threshers and of picking establishments. This is not a reason, but instead is evidence that the real reason is climate, soil, or competition with other crops. Beans were threshed with the flail and entirely hand-picked long before the later conveniences were common. The bean-threshing and bean-picking outfits were introduced where beans were grown.

Year after year beans are tried by some one outside the bean section. The results of these experiments in general check with those of the preceding generations. Something else pays the farmer better for his time. Farmers in this
State find that bean growing is desirable in their systems of farming only where a certain combination of factors exists. The factors are: light summer rainfall, 16 inches or less from April to August inclusive; a soil well supplied with limestone and not so heavy as to make cultivation difficult; wheat raising in the system of farming; a fairly long growing season, generally one hundred and fifty days or more; and absence of more profitable crops requiring labor at the same time or requiring the land.

BEANS GROWN IN LIVINGSTON COUNTY
Comparatively dry seasons make bean harvesting easy

Hay
The humid and comparatively cool climate of New York is especially favorable for hay production. Northeastern United States is the hay market of the country because of the great city horse population and also because of great numbers of dairy cattle. Hay is so bulky, and the shipping costs are so high in proportion to its value, that New York has a decided advantage over more distant States in marketing hay. These conditions make hay the most important crop of the State. Ninety-one out of every one hundred New York farms reported in the last census produced hay. Every county in the State grows hay. This crop is more widely distributed over the State than any other.

In spite of this fact, however, the importance of hay in the systems of farming varies markedly in different sections. Over most of the State, from 40 to 60 per cent of the crop area is devoted to hay. But in New York, Richmond, and the Long Island counties the proportion of crop area in hay is from practically nothing to only 25 per cent. Through the northern half of western New York, from 25 to 40 per cent only of the crop area is in hay. On the other hand, Cattaraugus and Allegany Counties devote from 60 to 65 per cent of their crop area to hay; Dutchess, Putnam, and Westchester Counties, from 60 to 70 per cent; the central part of northern New York, from 60 to 80 per cent; and the section comprised of Broome, Chenango, Otsego, Delaware, and Sullivan Counties, and parts of adjacent counties, from 60 to 80 per cent.

In seeking an explanation of this, the first thought is that hay is given more importance where it yields best and less importance where the yields are generally low. A study of the census reports since 1880, however, reveals the fact that, while there are definite areas of high and low yields of hay (which, as a note of interest, are closely correlated with rainfall), they bear no consistent relation to the areas of much or of little hay. Some of the areas of low yields overlap the areas of high yields, and one area of high yields has the smallest pro-
portion of hay. Hence other factors must be the cause.

From a study of Chart II, and a consideration of the topography of the State with its influence on length of growing season and on land values, it appears plainly that the better agricultural sections grow the smallest proportion of hay and the poorer sections grow the largest proportion of hay. This probably means that at the higher elevations, where the growing seasons are short—one hundred and forty days or less—where fields are smaller, more irregular in shape, and rougher, and where hauls to market are long, hay is the most profitable crop, almost regardless of yield. Generally the only other crops that are practicable in these parts of the State are fodder corn, buckwheat, oats, and sometimes rye. Hay is not only a more profitable crop than these under such conditions, but it is also a much safer crop. Very little expense and practically no labor is invested until harvest time, and then the labor is somewhat proportional to the yield. Hay is a safe crop in other respects also. It is not perishable, as are potatoes or cabbage, and furthermore it may be marketed or fed on the farm as conditions warrant. It is comparatively difficult to lose money on a hay crop. With conditions unfavorable for very profitable farming, the natural tendency is to devote a large proportion of the crop land to the surest crop.

One other condition helps to explain the proportionately large hay acreage in these sections. Much of the cleared land is suitable only for pasture purposes, because of rough topography. Many farms have one-half or more of their area in pasture. In order to utilize this pasture, it is necessary to keep more cows than can be wintered on feed from the tillable land. Since all the feed cannot be grown, of course the most profitable will be grown; and since some feed must be bought of course that which can be shipped in and handled with the least cost will be bought. So the farmers in those sections generally raise all the hay

![Chart II](chart.png)
needed, or as much as they can, and buy all or most of the grain feeds. Whatever grain is grown is usually grown for rotation and reseeding purposes, primarily. Most of the crop land is in hay, and the meadows are cut as long as the yields pay.

Very different conditions prevail in the two sections where relatively little hay is grown. Heavy rainfall makes

In the northern part of western New York, hay has to compete with a great variety of crops all adapted to the section because of the long growing seasons, favorable topography, and generally fertile soils. Most farms in this section, besides growing hay, oats, wheat, and sometimes corn, can grow profitably one or more of such crops as apples, other fruits, potatoes, beans, cabbage, canning factory crops, and, near cities, truck crops. Generally these crops pay as well as or better than hay. Therefore, the tendency is to grow as much of these crops, together with the grain crops and hay, as will make a practicable distribution of labor. Instead of having one-half or more of the crop land in hay, only from one-fourth to two-fifths is in hay.

Very few farms, however, go to the extreme of having no hay, as is common near New York City. Not having city stable manure in great quantities, farm manures and a sod to plow under are the most economical means of maintaining the supply of humus. Land values are not so high as to prevent growing hay at a profit. So it’s usual to grow at least enough hay for the stock kept, and to furnish a sod to plow under on each field every three to five years.

MARKETING HAY

Hay is most important in New York systems of farming where conditions are not favorable for such crops as fruits, beans, cabbage, potatoes and tobacco, and where conditions make dairying necessary

high yields common in New York, Richmond, Kings, Queens, and Nassau Counties. But in spite of this fact, the area of hay in these counties, and also in Suffolk County, is small in proportion to the area of other crops. The location of this section in relation to markets, combined with a long growing season—from one hundred and seventy to more than two hundred days—usually ample rainfall, and a great deal of light soil, makes truck crops very profitable. The high-priced land makes profitable hay production almost impossible. On the light soils of this section hay does not do well. Great quantities of manure are available from city stables; because of this, the hay crop is not so important for maintaining humus as in other parts of the State. All these conditions cause the relative unimportance of hay in this section.
Since a large proportion of every one's income is spent on food and in the general upkeep of the home, it is not strange that a course in homemaking should be given a place with other trades in a prevocational school. To make work successful it must be standardized, and this may be given as an important part of the homemaking course.

There are many things which housekeepers cannot learn from books but must gain from their experience. It is to the schools that we must look to give the opportunity for this experience with guidance and supervision.

In the course of homemaking there is an opportunity for individual work and development, as each girl spends three hours a day at this work and the classes are limited to from sixteen to twenty persons.

The equipment for such a class is a four-room apartment, either connected with the school or in the near neighborhood, so that little time is lost between classes. This apartment is model in its appointments, but it is appropriate to the means of the children who are studying in it. In the selection of utensils, as in all other fittings, economy is the chief consideration—not low price alone, but low price and durability.

Let us look at a class at work. It numbers sixteen and is divided into five groups—three groups of four and two groups of two each. Visitors have been invited to come in for a simple luncheon and the girls' problem is to have the apartment appear at its best, and to offer hospitality. The first group of four girls goes directly to the kitchen, where they immediately begin the work of polishing the stoves and the brass, sweeping and dusting, airing the ice box and attending to many other things which they find to do. In the dining room we find the next two groups. During the day, except at meal times, this room is used as the sitting room, so that the dining room table is covered with a large table scarf, with books and magazines arranged on it. Two of the girls go to this table to prepare the luncheon menu, figuring the cost and making a market list which they present to the kitchen group for marketing. The other girls in this room, having done the dusting, are now ready to polish the silver. In the same way other groups are at work at several tasks in the bedroom and the bathroom.

When the visitors arrive they are met by two girls who act as hostesses. The same girls entertain at the table when luncheon is served. In this way the girls not only are taught how to do the housekeeping and the marketing, but also have an opportunity to entertain, which arouses pride in their work, which in turn induces better work.

On the following day the groups exchange places, so that each girl becomes accustomed to the different tasks that housekeeping offers. Near the end of the term, girls are selected to take charge of the entire work of the department. The girls are trained in shouldering responsibility by holding this
position of superintendent, and it gives them confidence in their own ability.

There is a great field for work of this sort. It is needed alike in city and in country. And it is to the graduates of the home economics departments of the various colleges that we look for leaders.

Following are the names of the conference speakers and the subjects upon which they talked:


THE VOCATIONAL CONFERENCE

The second Vocational Conference, under the auspices of the Women’s Student Government Association, was held on January 18 and 19. The purpose of the conference was to bring the undergraduate women in contact with those actively engaged in the business world and learn from these active workers the vocations which will be open to them upon graduation. Previous to the meeting a vote was taken to determine the relative popularity of the various vocations to be considered and the program was arranged with regard to the desires of the students.

Especially interesting among these speeches were those of Miss Gilson, who is engaged in factory work in Cleveland, Ohio; of Miss Kennard of New York University; and of Miss Dingham, representing the national Y. W. C. A. Mrs. Falconer, who spoke on Corrective Work, and Miss Landman, whose subject was Institutional Agriculture, were also able to speak interestingly out of actual experiences together as superintendent and head farmer at Sleighton Farms, a corrective school for girls near Philadelphia.

The following list shows the relative popularity of all subjects proposed, as shown by popular vote among home economics students:

1. Educational Work
2. Dietetics
3. Social Settlement
4. Institutional Management
5. Public Health Work
6. Newspaper or Magazine Work
7. Secretarial
8. Physical Training
9. Corrective
10. Agricultural
11. Y. W. C. A.
12. Landscape Architecture
13. Architecture
14. Law

It being impossible to treat with all these desired subjects within the range of a two-day conference, it was deemed expedient to bring in outside speakers at various times throughout the year as well as during the time of the conference. Miss Edson of Rochester has already addressed the students on “Opportunities in Physical Education” and during the second term Franklin Matthew of New York will talk on “Opportunities in Journalism.”

Each speaker gave information along her particular line in accordance to the following outline:

1. Opportunities in the field
2. Training Necessary
3. Renumeration

The conference is largely the outgrowth of a Vocational Bureau for Women, founded last November. Professor Ernest Merritt is chairman of this bureau.
Elections

As a result of the sophomore editorial competition which closed prior to Christmas, we are glad to announce the election to the board of Russell R. Lord of Cockeysville, Maryland, and Eugene B. Sullivan of New York City.

Because Horticulture continues to hold its high place in the study of agriculture, we have this year followed the custom of devoting an issue to this field. New York State leads the Union in floriculture, in the production of vegetables and in the production of fruits adapted to its climate. New York may well be proud of her fertile soils and favorable climates, but she has great problems of transportation and marketing, which still remain to be solved. Hardly ever before were the opportunities so great for well-trained horticulturists, not only in the production of the highest quality of marketable goods, but in the working out of these market problems.

The COUNTRYMAN takes keen delight in welcoming visitors to the Ninth Annual Farmers Week, Feb. 7-12. This is an annual event which has increased its scope of attractiveness and helpfulness so that at the present time it is the State’s largest convention of men and women interested in country life. To the alumni of the College, Farmers Week is of more than practical value. It is the one week of the year that brings them in personal contact with the members of the faculty with whom they were as students associated; it is the week of class reunions, which bring with them the so many and pleasant reminiscences.
To the farmer, a week in the New York State College of Agriculture at this particular time should be the most profitable of the whole year. Special effort is made to present, in the most condensed and practical form, information on better farming. Some 350 lectures have been arranged, which will cover the educational, religious, and social sides of country life. New York State farmers, the College swings wide-open its doors and turns over its staff and student body for your service.

Ten Days
Before Examinations

It is a custom among the faculty of the College of Agriculture to give no examinations during the ten days preceding the finals. There is to our knowledge no definite rule to this effect; it is just a tradition handed down from year to year. Consequently the student body has come to expect the faculty to give no examinations whatever during the ten days preceding the opening of “block week.”

This year there seems to be little or no regard for this custom. Many instances have already come to our attention where examinations were given within the ten-day limit. This has caused considerable resentment in the student body, for most undergraduates during the last two weeks of the term are busy with term reports, assigned reading, making up back work, and with preparation for the finals. Is it playing fair with the students to ignore the ten-day limit? Why break a commendable custom of the College?

The Farm Bureau Publications

The COUNTRYMAN is very glad to welcome to its reading table the publications of the various Farm Bureaus with which it is exchanging. They are worth reading. Plainly printed on plain paper and evidently gotten out by busy men, they come to us devoid of those ornaments and superficialities which encumber so many of our agricultural papers. Brief, crisp, almost brusque in content, they bring word of the growth of a great work out in the open country; a work the beginning of which we, as agricultural students, have been privileged to witness and which, as graduates, we may hope to aid.

Particularly we would commend such effort as that manifested in the special Christmas issue of the Nassau County Farm Bureau News. In margining their cover with holly leaves and quoting upon it from William Henry Channing’s My Symphony, the editors have in no sense departed from the practical standards of their organization. Rather, they have struck that which we interpret to be the keynote of all real rural progress—the evolution of a better, happier, and more cultured countryman.
It is extremely unfortunate that Farmers Week and Junior Week conflict this year. Undergraduates of this College are interested in both of these affairs and naturally want to participate in both. Cornell is known the country over for its Junior Week and the College of Agriculture for its Farmers Week, but the importance of both of these events is sadly diminished by the conflict.

The College depends on student committees' aid in the convenience and comfort of the 5000 farmers expected here at that time, but it is evident that many students will hesitate before accepting such work on the various Farmers Week committees, because of their obligations as Junior Week hosts. It is promised that this conflict will not come next year, and probably never again. The date of Farmers Week is set to follow the meeting of the State Grange, which ordinarily convenes during the first full week of February.

The results of the senior questionnaire recently issued by the College indicate that there is dissatisfaction with present faculty advisory system in the College. It is going to be a hard problem to solve. The COUNTRYMAN expects to do its part by an inquiry as to the practices of some of the important agricultural colleges of this country, the results of which will be published in a future number.

While military preparedness, industrial preparedness and kindred terms are on every tongue, it would be well for us to realize that the whole solution of success in any phase of endeavor is preparedness. Anything less than a thorough preparation will yield indifferent success or failure. College courses offer great opportunities for the development of necessary skill and knowledge for the successful pursuit of many callings. In many branches of agricultural work, however, more practical knowledge of the subjects is needed than can be given by a single institution to several thousand students. For the profession of actual farming, training in the real thing, "next to the soil" is indispensable. As with swimming, farming cannot be taught to the novice from books. This form of practical preparedness is therefore of extreme importance to the prospective husbandman from the town or city home.
At the Founder's Day lecture, President Schurman announced a gift of $10,000 from Willard D. Straight, '01, to be used by the Department of Military Science and Tactics. The President stated that this is the first gift of its kind received by an American college.

The Department has decided to use the gift to establish an annual summer camp of two weeks duration. Complete field equipment, including two motor truck transports, will be purchased. It is estimated that at least six hundred cadets will attend and that they will be able to accomplish as much in two weeks as recruits do in five weeks at Plattsburg.

Speaking at the reception tendered him by the cadet officers, General Leonard Wood, U. S. A., the Founder's Day orator, said that he would like to see some of this money spent to bring the Cornell Cadet Corps to Plattsburg as a regiment.

On November 6 the Cornell Breed Department of Poultry Husbandry started its 1915 breed test, the object being to give the poultrymen of the State an opportunity to have their birds officially tested on a common basis. Various persons, companies, and associations have entered flocks of ten individuals, representative of their particular strain or breed. These have been trap-nested in order that their eggs may be graded in size, shape, and texture. Other factors to be considered in the competition are the apparent vitality and percentage of mortality of the flock, the cost of producing eggs and their money value, the average fertility of the hens, and the percentage of chicks that hatch from their eggs. Complete records will be kept and these will be made public in periods of seven days. While in these weekly reports the names of the owners of the fowls will be withheld, the complete records of all fowls that qualify as high producers will be published, together with the names of their owners, at the completion of the test.

To take the place of the Announcer, publication of which was discontinued in 1914, the College contemplates the publication of a four-page monthly to be known as the Cornell Letter. The page size will be 9 x 12 inches, carrying three columns of newspaper width. The edition will be limited, the object being to make those who receive it disseminating centers of information for their communities. It will be sent to all former students who desire it.

While at first the Letter will be issued only monthly, there is a possibility that later it may be issued more frequently. Each month it will contain a summary of helpful hints for work on the farm during the succeeding month. It will give a résumé of recent work at the College, and will announce new courses, special lectures, and new publications. The Letter will be prepared by the Information Service in cooperation with the Department of Extension Teaching. Professor Bristow Adams will have direct
General Wood was to act as his assistant. The first issue, it is announced, will be published before Farmers' Week.

Founder's Day was celebrated on January 11 this year, when Major-General Leonard Wood, U. S. A., made the annual address in Bailey Hall, speaking on "Military Training in Schools and Colleges." He said in part: "I know of no country—certainly none among the great nations—where military education is more needed in school and college than in these United States." He then proceeded to make clear the great need for trained men to command the volunteers raised in time of need. The schools and colleges of the country furnish the best and largest source of supply for this type of officer. Standardization of military training in universities and lower schools is most necessary, however, if this training is to result in the establishment of an adequate policy of preparedness.

General Wood's conception of the principal purpose of the military instruction given in school or college is that it should bring home to every boy and girl, every man and woman, an appreciation of the real facts of our military history. When this is accomplished we shall have action based on information concerning the past, less Fourth of July eloquence, and more sound, thoughtful study of the situation.

Dean Beverly T. Galloway spoke at a luncheon given by the Syracuse Alumni of the College of Agriculture on January 13. The title of his talk was "The Work of the College of Agriculture: Its Relation to Cornell University, the State, and the Nation." Dean Galloway told of the work the College is trying to do in all those things that will uphold the ideals and traditions of the University, and of the advantage of the College of Agriculture in being a part of Cornell. Conversely, he treated of the advantages to the University as a whole in having as a part of it a college whose ideals are high and whose motto is "Service." In regard to the College and the State, he spoke particularly of the efforts that are being made to reach all the people in the open country and to understand and aid in the solution of their problems. In reference to the College and the Nation, he spoke of the work that is being done by the College in making its influence felt as part of a great national movement for universal education. It is possible to achieve tangible results in this direction largely through cooperation with the Federal Department of Agriculture and with other similar institutions elsewhere.

The members of Frigga Fylge, under the direction of Miss Sara Huff, are preparing a short play which will be presented as a part of the regular evening entertainment given in Farmers' Week by the different departments in the College.

Construction of the new armory on the campus is progressing rapidly and its completion by September of 1916 is now practically assured. The exterior is receiving some finishing touches, while most of the working force are concentrating their efforts on the roofing and the interior features.

The building is being erected by the Government from a $350,000 appropriation made in 1914. It occupies nearly three acres, and contains a drill hall 376 feet long and 225 feet wide covering a floor space of nearly two acres. It has been estimated that the drill hall will seat 16,000 persons. In addition to the drill hall there are to be officers' quarters, non-commissioned officers' quarters, a rifle range, a trophy room,
George N. Allen entered the College of Agriculture in September, 1901, and with a total capital of $10 proceeded to earn his way through college. To earn his expenses he did various odd jobs around the College, such as milking cows and raising hot-house lambs for Professor Wing. During the summer months also he worked for Professor Wing, testing cows on various farms throughout the State. At the end of his third year at Cornell he decided to leave college, and accepted a position as dairy manager of Woodcrest Farm, at Rifton, Ulster County. After spending a few years in this capacity he went to Wheeling, West Virginia, as manager of the Reymann estate of 10,000 acres. On this farm he produced the first certified milk ever produced in West Virginia. In addition to the production of certified milk he made a specialty of purebred Ayrshire cattle and White Leghorn fowls. He held this position for nearly four years, at the conclusion of which he entered the employ of the Chase Motor Truck Company, of Syracuse. He is now manager of the tractor department of this company. He has been working for this company for the past ten years, but has been actively engaged with them for only the past five years. In these five years he has spent much of his time in perfecting a farm tractor, and the latest model of the Chase tractor as exhibited at the Fruit Growers' exhibit in Rochester last month is the result of Mr. Allen's efforts along this line. Mr. Allen is now in the southern Mississippi Valley, where he has been detailed by the company to study the Mississippi delta region from the standpoint of the manufacture of tractors, giving due consideration to the financial situation there. This is the second visit he has made to this region within the past year. Because of his broad education in the field of agriculture, Mr. Allen is often consulted in matters concerning the large farms near Syracuse owned by Colonel Chase. Mr. Allen himself owns a farm of 221 acres in Washington County, on which he raises apples and potatoes as a cash crop in connection with general farming.

Harry Haywood, director of the Delaware Experiment Station, recently called on Professor Wing. Mr. Haywood was on his way to Chicago, where he was to represent the State of Delaware in the Third Annual Conference on Marketing and Rural Credits.

J. Bennett Nolan, of Read-
ing, Pa., announces the birth of a son, James.

'05, B. S. A.; '07, M. S. A.—L. G. Dodge is with the Farm Management Department at Washington, D. C., in charge of field investigations in the Northeastern States.

'08, B. S.—H. K. Fung is teaching in the Government University at Peking.

'09, B. S.—S. F. Willard, jr., was married last September to Miss Helen D. Buck, of Wethersfield, Connecticut. Their home is at 3147 Prospect Avenue, Cleveland, Ohio.

'09, W. P.—John H. Marshall, whose address is Box 504, Hagerstown, Maryland, is running a truck farm of thirty acres near that city.

'09, W. P.—J. P. Landry was married last October to Miss Violet Mary Robbins. The wedding took place at Truro, Nova Scotia.

'10, B. S. A.—George G. Becker is head of the Department of Entomology in the University of Arkansas. Mr. Becker is also state entomologist for Arkansas. His address is Fayetteville.

'10, B. S.—Grace Bennett, who is conducting a cafeteria on the grounds of the Department of Agriculture at Washington, D. C., has met with such marked success that the scope of her work has recently been increased. She now occupies two buildings, the second having been remodeled to suit the needs and meet every requirement of a model cafeteria. Four hundred persons are served daily. Besides this work Miss Bennett edits the household page of the New York Tribune Farmer.

'10, '11, Sp.—C. E. Smith writes: "Enclosed find two dollars as advanced payment for my subscription. I enjoy the Countryman because it keeps me in touch with the College." Mr. Smith is managing a general farming ranch of five hundred acres on Carleton Island, in the St. Lawrence River.

'11, B. S. A.—Harold N. Humphrey has been employed since leaving Cornell by the Office of Farm Management, United States Department of Agriculture. As a result of investigations that he has recently made, a bulletin entitled The Cost of Fencing Farms in the North Central States has been compiled. Mr. Humphrey's address is 754 Quebec St. N. W., Washington, D. C.

'11, B. S.—Wallan G. Stephenson is agricultural chemist for the Cuban-American Sugar Company. His address is Pijnan, Cuba, care of the Cuban-American Sugar Company.

'11, M. S. A.—Edward H. Thomson was married last November to Miss Ethel Cutts, daughter of Mr. and Mrs. E. B. Cutts, of Milford, New Hampshire. G. H. Miller, '09, was best man. Other Cornell men present were S. M. Thomson, '13, brother of the bridegroom, and L. G. Dodge, '05. Mr. and Mrs. Thomson will reside at 1417 Belmont Street, Washington, D. C.

'11, W. C.—Timothy E. Donovan has been herdsman on the Broad Brook Farm in Westchester County since the spring of 1912. There are at present 132 head of cattle and 2000 laying hens on this farm. Fruit growing is carried on rather extensively, the peach and the apple orchards together consisting of 5000 trees. Mr. Donovan writes that he is to leave this place and take charge of a farm near Syracuse, where purebred Holstein cattle and thoroughbred Belgian horses are raised. He also writes that G. D. Brill, '88, B. S., is superintendent of the farm that he is leaving.

'12, B. S. A.—J. Coryell, whose address is 66 Hungerford Street, Burlington, Vermont, taught agriculture in a Massachusetts high school after leaving Cornell. Following this work he was county agent for Windsor County, Vermont, but has now accepted a position as assistant state leader in county agent work for the State of Vermont.

'12, B. S.—Raymond S. Washburn was (Continued on page 428)
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Relation of the Government
(Continued from Page 372)

fore, that Government may very properly direct its energies toward the question of uniform legislation under which and through which the producers of farm crops may organize their industries along lines that are safe morally, ethically, socially, and economically.

Government may establish principles of action, may go so far as to demand that these principles should apply uniformly, and may very properly take the stand that it will see to it that the principles are lived up to by all parties concerned. How otherwise are our people to receive social and economic justice?

I believe it has been the general rule that whenever the producers of an agricultural commodity have attempted to concentrate for the purpose of securing additional control of their product, the business has eventually passed into the hands of nonproducers, owing largely to the absence of proper protective laws or of any laws whatever. These nonproducers have then proceeded to organize the business and to conduct it, not so much with the object of rendering justice to producer and consumer as for the purpose of insuring the largest profits to the organizers permitted by the laws of the land and by their own conscience.

We have only to recall what has taken place in this country in the past thirty-five or forty years to realize what these changes mean. In the handling of cotton, of grain, of meats, and of milk, all vital to our welfare, we have seen uncontrolled concentration developed to the point where the concentrators so well control the situation that those who provide the raw products can no longer afford to take the risks; hence they give up the business. The raising of cattle in the Middle West is no longer a business with the farmers; it is a gamble. The milk situation is very little better.

It must not be understood that we are advocating specific legislation and gov-

(Continued on page 400)
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Extra beam and bottom, readily attached, increases a regular two bottom plow to three bottoms or a regular three bottom plow to four. Size of the plow can be increased or decreased to meet conditions.

Famous John Deere Bottoms with Quick Detachable Shares that are taken off and put on in one-fifth time ordinarily required.

John Deere, Moline, Ill.
John Deere Dealers Everywhere

Relation of the Government
(Continued from page 398)

government action to correct all these matters. The greater number of the problems can be met, as we have already pointed out, by the extension of knowledge and the further encouragement of all those things that the Government may do in the direction of stabilizing agriculture. Proper crop rotations, systems of farm management, prevention of losses to crops and animals through diseases and insect attacks, adaptation of crops to soil and climate, introduction of new crop industries, the breeding and improvement of plants and animals, will all tend toward stabilization.

Government may very properly play another important rôle in the marketing problem, and that is in lending its aid in the matter of determining and fixing standards. Many of our existing difficulties would be overcome if trading in agricultural products could be done on a basis of fixed grades and standards, such as would be recognized as fair and just to all parties involved. Government, and Government only, can determine the principles and factors on which these grades and standards should be fixed. To make such grades and standards effective and acceptable without question will require much painstaking scientific and technical work. Here is an important function of Government, and one that should be fostered and encouraged in every way.

Government may also very properly function in developing the principles that should govern in the storing and warehousing of farm products. Undoubtedly our food supply would be greatly stabilized, and the violent fluctuations in prices, detrimental to both producer and consumer, could in a measure be overcome, by a proper system of regulated storage. Here again we must guard against the fallacy that relief will come through mere legislative action without regard to the fundamental economic, biologic, chemical, physical, and other laws involved. For example, a mere fiat that eggs should not stay in storage longer than thirty days or ninety days will not solve the problem of the

(Continued on page 402)
All the Wild Game You Want

FOR many years we in America have spent much time bemoaning the disappearance of our feathered game. But the fact that we have little game to shoot and little to eat is due solely to our own lack of initiative. We should have an abundance of game in the fields and on the market. We may obtain such an abundance by creating a supply equal to the demand. This can be done by increasing nature’s output through game farming. And moreover, the demand of the sportsman may be much greater than at present, and still be easily met.

We have the land available to make America the greatest game producing country in the world. Utilize it, and everyone will have more opportunities to indulge in field sports. There will be more shooting for all of us, whether or not we have access to a preserve, because game that is raised for sporting purposes can not be confined in any restricted area. Wherever game is intensively cultivated, we find improved shooting in all the surrounding territory.

To anyone who has a small amount of land, game farming will prove profitable. The demands for eggs and for breeding stock is much greater than the supply, and will be for years to come. Pheasant eggs sell today at from $20 to $25 a hundred. Live birds bring from $5 to $7 a pair.

To those who own large acreage, game farming either provides sport, or profit from those who will pay for sport. To the city man, it opens the possibility of enjoying good hunting near home.

To everyone who shoots, it brings increased pleasure afield. Game farming means an addition to our food supply that will be welcome to all.

But this subject is too big to be properly treated in this space. If you are interested in it, either as a sportsman, as a prospective breeder, or simply because you believe in the movement as constructive and progressive, write for the book, "Game Farming for Profit and Pleasure," which will be sent to you without cost. It tells of the subject in a most interesting and informative manner. It is well worth reading. Fill out the coupon below and a copy will be mailed you at once.

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Gentlemen—Please send me a copy of Game Farming for Profit and Pleasure. I am interested in game breeding from the standpoint of.

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Let us send a floral token to those you left at home

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Relation of the Government
(Continued from page 400)

storage, marketing, and distribution of eggs.

Finally, the question may be asked whether Government might not very properly function in the gathering and quick dissemination of information regarding perishable products which would be helpful to producer and consumer alike. The United States has developed one of the best weather services in the world. Its daily weather reports, obtainable now in every little hamlet and farm home, are of incomparable value to agriculture, to commerce, and to all industries. There has also been developed a most thorough and efficient system of crop reporting. Some preliminary work has been done by the United States Department of Agriculture in this informational marketing field. This work, to be effective, must necessarily be expensive, and it is a question whether the lack of knowledge on the part of those who most need it will not keep them from knowing how to use it. The knowledge will come, however, and a combined climate, crop, and market informational service is something that should be looked forward to in the consideration of any questions having to do with the relation of Government to the marketing problem.

Chicks—Little Chicks—

Chicks

The time has arrived for all persons interested in Poultry, to make plans for their Baby Chick Campaign—

SEASON of 1916

The demand for day-old Chicks will be enormous, greater than ever before. We are manufacturers of Eaton's Life-Saver Little Chick Feed, and handle a full line of Baby Chick requirements—would be pleased to quote.

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Dusting and Spraying Experiments with Apples

Results of recent experiments made by the Cornell University Agricultural Experiment Station indicate that the application of suitable powdered materials, with air used as a carrier, will control the apple scab disease and certain apple insects as well as does the commonly employed fungicide and insecticide applied as a spray with water as a carrier.

Last summer an experiment was conducted on an apple orchard in New York State, in which one plat was treated with lime-sulphur solution, one was treated with a dust application, and one was left untreated. The spraying solution was applied with a power spraying outfit having a pressure of about 150 pounds. Two men and a team were used to operate the sprayer. Two lines of hose were used, one man spraying from a tower and the other man from the ground. The dust mixtures were applied with a power outfit operated by an old gasoline engine rated at 2 horse power. All applications of spray and dust were made from both sides of the trees and were thorough. No effort was made to apply the dust to the foliage while it was still moist with dew, but on at least two occasions the leaves were moist.

The cost of the dust mixture was considerably more than that of the lime-sulphur mixture, and it would therefore seem that the total cost per tree would favor spraying but for the fact that the extra time spent in spraying raises the cost considerably. In this experiment the dusted trees were covered about four times as fast as were the sprayed trees.

The relative quantities of the essential fungicidal and insecticidal ingredients applied per tree are of interest. The amount of sulphur applied to the sprayed trees cannot be determined exactly, but was, on an average, ap-

(Continued on page 410)
Do These Questions Interest You?

1. Do you want to do your spraying in one-eighth the time it now takes you?
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Investigate at once the New Dusting Method of applying insecticides and fungicides. Write The Niagara Sprayer Company for full information concerning a new dusting machine. We manufacture an improved dusting outfit and the finest dusting materials it is possible to obtain.

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Also manufacturers of the Famous SOLUBLE SULPHUR COMPOUND, the Scientific Powdered Spraying Material which Dissolves Instantly in Hot or Cold Water
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For spray materials in 1916 rely upon the company that has always provided the best at reasonable prices.

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Lead Arsenate Paste
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"Caascu"—The well known scientific perfectly combined Insecticide and Fungicide, and
"London Purple"—The Improved Standard Insecticide that has uniform analysis and only half the soluble arsenic of Paris Green.

Note the following state analysis:

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<tr>
<td>BULLETIN No. 286 ANALYSIS of INSECTICIDES, etc.</td>
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<tr>
<td>&quot;LONDON PURPLE&quot; (No. 15062) Metallic arsenic Water soluble</td>
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We need an agent at every station. Write us about it.

Where you saw it will help you, them and us
Dusting and Spraying Experiments with Apples

(Continued from page 406)

approximately 4.6 ounces per tree, with 1.93 ounces of arsenate of lead. In the dusted plat, trees dusted with the smaller amount of the mixture received on an average 9.3 ounces of sulphur and 2.33 ounces of arsenate of lead per tree, and those dusted with the larger amount received 12.28 ounces of sulphur and 3.07 ounces of arsenate of lead per tree.

The results of the experiment showed that more than 29 per cent of the apples on the untreated plat were infested by the codling moth. On the sprayed plat, injury by this insect was reduced to less than 11 per cent, while on the plat treated with dust the injury was reduced to 5.5 per cent. The only possible explanation for the superior results obtained on the dusted plat lies in the better distribution effected by the dust method.

It now seems settled that a mixture of an insecticide and a fungicide can be applied in powdered form, using air as a carrier, with better commercial results in the control of preventable apple diseases are of apple insects than can be obtained by spraying. At the same time, the dust method makes it possible for the owner of a large acreage to protect his orchard at critical times, a thing that he has not been able to do with the slower liquid process.

Those who cannot cover their orchards in less than a week or in two weeks will find much needed relief in the dust method, which admits of operation with one team, or even two teams, less, and thus allows for more extensive and better cultivation of field crops with the team left free for such work.

The time of application of dust mixtures for the control of apple diseases and insects does not differ from the time of application of sprays. (For further information see Bulletin No. 369, published by the Experiment Station at the New York State College of Agriculture).
SPRAYING Insures Perfect Fruit and Vegetables

We sell Sprayers for everybody—Hand, Traction and Gasoline Engine machines. Call and look over our line and secure FREE copy of handsome Spray Book.

Watson 4-Row Potato Sprayer

for wide or narrow rows. Spray as fast as you can drive. Power always strong. Automatic Agitation of liquid and cleaning of strainers. Two nozzles to each row for thoroughly saturating foliage both top and bottom.

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Can be easily moved about. Adapted for spraying fruit and vegetables, also whitewash. Can be furnished on different size casks and also fitted for spraying 4 rows of potatoes.

The Leader Orchard Sprayers

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D., H. BURRELL & CO.
LITTLE FALLS, N. Y.

Why Not Make
COMMERCIAL BUTTERMILK
with
CHR. HANSEN’S DANISH LACTIC FERMENT CULTURE

We will Gladly send Copies of our booklet on this subject free to anyone interested.

You Will Make No Mistake by Using

CHR. HANSEN’S
Rennet Extract, Cheese, Color, Danish Butter Color, Rennet Tablets and Cheese Color Tablets.

HANSEN’S means QUALITY
Chr. Hansen’s Laboratory, Inc.
Little Falls, N. Y.

Western Office, 120 Jefferson St.
Milwaukee, Wis.

Student Labor
(Continued from page 381)
been unsatisfactory. This was an astonishing report. Professor King had taken up the work with the feeling that students made poor farm help, but he was forced to conclude that the ill report of the one man had remained in the community, while the satisfactory work of the nine was soon forgotten.

People in general have a peculiar idea of college students. Last summer another student and I went into New Jersey to work on a peach farm, and after we had been there for about a week we learned that the half dozen men employed there had all but quit the night before we arrived, simply because there were to be college students on the place. I do not know what their idea of us was, but I do know that they were extremely shy of us for the first few days. However, after they had seen us in overalls and we had worked side by side with them and they had heard us say the same things they said when the stepladders broke under us, their shyness wore off. By the end of the summer we were pretty good friends and they as much as admitted that we were almost human.

In taking students to work, the farmer should rid himself of the idea that the individual is a student. He is a boy going out for experience, and at a boy’s wages. The farmer should not expect as much of a boy as he does of an experienced farm hand who receives twice the wages. Allowance should be made for the fact that the boy has not had the experience that would make him do the right thing at the right time or in the right place.

What the student needs is a varied experience. He wants to become as familiar as possible with the different farm activities, and as important as any thing else is the personal contact with the farmer himself. His place is not on a great business farm, where he is placed under a foreman and hardly gets to know the owner. He should take a job on a

Where you saw it will help you, them and us

(Continued on page 416)
Arsenate Lead Dry and Paste
Tree Wound Paint

Bordo Pulp and Bordo Lead Mixture

PRATTS "SCALECIDE" the Orchard Success

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"Acme" Harrows
Waterloo Boy Engines

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BEERS, THE WATER SYSTEM SPECIALIST

SUPPLYING Water Systems for Country Homes, also private Electric Lighting Plants. Specialists usually charge high prices; the only ordinary part of my water systems is the price, but the superior equipment supplied and the experience that fits each item to your needs is where my specializing helps you.

L. F. BEERS, "Water Systems,"
711 Powers Building
ROCHESTER, N. Y.

"When you want Water call for Beers."

In writing to advertisers please mention The Cornell Countryman
no rain in October and the wheat is small and does not look like it would stand the winter well.

We finished husking yesterday. From the acre where we tried your theory about bone-meal and clover making the Potash available, we harvested 50 bushels of rather chaffy corn, and from the rest of the field, where we used bone, clover and 50 lbs. Muriate of Potash per acre, we husked out 70 bushels per acre of tip-top corn that is nearly all fit to sell on the ear for seed corn.

I figure that a ton of Muriate of Potash on 40 acres of corn will pay for a year's post graduate study for you and leave you a little spare change to chip in for athletics.

Mother and the girls are going to make a few days' visit to Aunt Sarah's

"Plant Food" is the title of a carefully compiled, comprehensive and scientifically accurate compendium of crop feeding, fertilizer mixing and conservation of soil fertility. Sent without charge upon application.

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The Publications of our Service Bureau and other departments should be on the desks of all agricultural students. These publications are helpful and they are free. Study the plant food problem from every angle. Address

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PASTE AND POWDERED

**BORDEAUX MIXTURE**
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**CALCIUM ARSENATE**
PASTE AND POWDERED

RICHES, PIVER & CO., 30 Church St., NEW YORK

Works and Laboratory, Hoboken, N. J.

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Salesmen Wanted

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**We Grow** Hardy Healthy High Grade

**TREES and PLANTS**

Quality - Service - Price

Thirty-five years fair dealing with the public places us in the lead.
Let us supply you with

Fruit Trees, Ornamental Trees, Roses, Shrubs and Plants

If its Nursery Stock, we have it. Our prices will interest you.
Write for Special Spring '16 Prices.

Old Reliable Nurseymen

Rice Brothers Company, The Geneva Nurseries

Established 1880 "The Name that Stands for Quality" GENEVA, N. Y.

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In writing to advertisers please mention The Cornell Countryman
Student Labor
(Continued from page 412)

farm where he can work side by side with the owner himself.

For these reasons, if you have a big nursery and all you have to offer is a ten-hour-a-day job hoeing nursery stock, it would not be advisable to hire a student. If you are a big commercial fruit grower and all you need is a man to nail apple boxes all summer, it would not be advisable to hire a student. If, on the other hand, you think you have a place on your farm next summer for a student to become familiar with the different farm practices and with farm life, if you think you can give a student new inspiration for his life work and make him a better farmer or a better man, then write the College and tell what you have to offer.

Thus far I have spoken only of students from cities—those who are without experience but who feel that country life holds something of promise in

store for them. I should be greatly disappointed if any one got the idea that this class of students is typical of the students in the College. There are scores and scores of students who have been born and reared on farms and are already highly experienced; there are scores of students who have been reared in cities but who have spent their summers on farms and are now reasonably familiar with country life and country methods. But, being familiar with farms and farmers, these students find employment for themselves. The College, therefore, becomes interested in placing inexperienced students on farms.

The fruit grower must cooperate with the College in this work. Owing to your efficient organization, you make frequent requests of the College for help and advice. You ask for help in fighting the insect and the blight, you ask for advice on questions of the culture and the marketing of your fruit and on all

(Continued on page 420)

Cabbage Maggots
Often Destroy Entire Crops of Early Cabbage and Cauliflower

Every Grower of Early Cabbage knows the Cabbage Maggot Fly,—its habits and destructive power.

The Only Sure Remedy is the A.B.C. Tar Felt Pads.

This is not an experiment,—Irondequoit and Greece Farmers were large users last year.

We have had only good reports from early Cabbage Growers in all parts of the United States.

One said: "Used 2,000 pads—95% of crops marketed—many heads weighing over 10 lbs. No crops for several years previous, all were destroyed by the Cabbage Maggots." Another big user said,—"We cannot grow Cabbage without them." A farmer from Ohio said—"Save me 10,000. Had fine success last year."

Who wouldn't go to a little extra expense and trouble to insure their crops that they may feel certain that it will yield 95%.

Write for samples, circulars, prices, etc. We want to tell you more about the pads and their use. If we can it will be of mutual benefit.

PLANT PROTECTOR CO., 25 S. Water Street
ROCHESTER, N. Y.
### 34 Packets of the Best Garden and Flower Seeds for $1.00

**The WASHINGTON COLLECTION**

With this collection a family can have fresh vegetables from May to October. With this collection we also send one of our Annual Seed Catalogues.

<table>
<thead>
<tr>
<th>Packet</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Beans, Bolgiano’s New Wax.</td>
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<td>1</td>
<td>Beans, Valentine Green Pod.</td>
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<td>1</td>
<td>Beets, Crosby’s Egyptian.</td>
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<td>1</td>
<td>Beets, Detroit Dark Red.</td>
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<td>1</td>
<td>Cabbage, Jersey Wakefield.</td>
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<tr>
<td>1</td>
<td>Cabbage, Bolgiano’s New Early Flat.</td>
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<tr>
<td>1</td>
<td>Cabbage, Large Late Flat Dutch.</td>
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<td>1</td>
<td>Carrots, Rubicon Half Long.</td>
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<td>1</td>
<td>Celery, White Plume.</td>
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<td>1</td>
<td>Celery, Golden Self Blanching.</td>
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<td>1</td>
<td>Corn, Ideal Sweet.</td>
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<tr>
<td>1</td>
<td>Corn, Golden Bantam.</td>
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<td>1</td>
<td>Corn, Country Gentleman.</td>
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<td>1</td>
<td>Cucumber, Early Fortune.</td>
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<td>1</td>
<td>Lettuce, Grand Rapids.</td>
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<td>1</td>
<td>Lettuce, Big Boston.</td>
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<td>1</td>
<td>Muskmelon, Rocky Ford.</td>
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<td>1</td>
<td>Muskmelon, Sweet Air.</td>
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<td>1</td>
<td>Onion, Yellow Globe.</td>
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<tr>
<td>1</td>
<td>Peas, Extra Early, Long Podded.</td>
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<td>1</td>
<td>Peas, Telephone.</td>
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<tr>
<td>1</td>
<td>Pepper, Ruby King.</td>
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<td>1</td>
<td>Pumpkin, Sugar Pie.</td>
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<td>1</td>
<td>Radish, Extra Early Scarlet Globe.</td>
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<td>1</td>
<td>Radish, Lady Finger.</td>
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<td>1</td>
<td>Radish, Strasburg.</td>
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<td>1</td>
<td>Spinach, Bloomsdale Savoy.</td>
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<td>1</td>
<td>Squash, White Bush Scallop.</td>
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<tr>
<td>1</td>
<td>Squash, Golden Hubbard.</td>
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<tr>
<td>1</td>
<td>Tomato, John Baer, Earliest Grown.</td>
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<tr>
<td>1</td>
<td>Tomato, Bolgiano’s Grand.</td>
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<tr>
<td>1</td>
<td>Turnip, Purple Top White Globe.</td>
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<tr>
<td>1</td>
<td>Asters, Finest Mixed.</td>
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<tr>
<td>1</td>
<td>Nasturtium, Dwarf, Finest Mixed.</td>
</tr>
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</table>

Now the above seeds are all of the best quality and what we are willing to put out knowing that if you use our stocks of seed once, you will always be our customers. This offer will actually bring us a loss so our only hope to make a profit is to give you the best so that you will come again for future wants. We are large distributors of

- **99% Pure Clover Seed**
- **99% Pure Alfalfa**
- **99% Pure Timothy Seed**

and other Field Seeds at market prices. We will be pleased to quote you.

**Boone County Pedigree White Field Corn @ $2.00 per Bushel**

grown under the supervision of experts from the United States Department of Agriculture, at Washington, D. C.

**F. W. BOLGIANO & COMPANY, Inc.**

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Where you saw it will help you, them and us.
Seed of Quality
FOR THE
Field, Lawn and Garden

We have our usual good stocks of ALFALFA, SOY BEANS, CLOVERS, CORN, and other field seeds.

Our GARDEN and FLOWER SEEDS, PLANTS and BULBS are selected with the same care that has built our large trade in Field Seeds

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ZENOLEUM
Makes Poultry Pay

A louse-stered hen can't lay eggs, can't eat right, can't thrive. Don't let lice cut your profit. Kill the lice with Zenoleum, before they kill your hens. Big poultrymen, thousands of them, are using Zenoleum regularly to keep lice off of their chickens. They use it in curing nearly all forms of poultry diseases.

Money Back Guarantee. It is the most powerful coal tar disinfectant and germicide for use inside of poultry houses and on nests. It's harmless and not inflammable. Use it freely in your incubators. Increase your hatches. Carbolic acid is poison and dangerous (unsafe).

CURES DISEASES OF ANIMALS
You want Zenoleum always handy if you own cattle, sheep or hogs. It kills lice, cures mange, itch, scours, sore eyes. Use it in your barns, pens or stables. Send a dollar bill for a can of Zenoleum, postpaid, sufficient to make 80 gallons of positive disinfectant. Use it in your animals, $1.50 parcel post paid. Quart can 60 cents, postpaid. Must do all you want it to do or your money back. No argument—just money.

Zenner Disinfectant Co.
580 Lafayette Ave. (19)
DETOUR, MICH.
"Electro" Brand Spray Chemicals

Do you dust or do you spray your fruit trees? We can give you the highest quality of either material for this work. All we ask is that you give us a chance to quote on your requirements. Quality gets results, and "ELECTRO" means quality!

"ELECTRO" ARSENATE OF LEAD PASTE and POWDER, and DUST MIXTURES.

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THE WEAVER HARDWARE CO.
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Do not accept substitutes!
Be sure you get "Electro" Brand Arsenate of Lead

Peerless Check Writers

We show above the Peerless trade mark and style of imprint.

A Peerless writes checks and produces them, all in one operation. At the speed of shorthand, it prints each word clearly, cuts it into shreds, and forces acid-proof ink into the very fibre of the paper.

Write us for free Book No. 46 of Burns and Pinkerton advice regarding check-raising, showing how best to handle checks. Shows why, in 1914 alone, one-sixth of all users of check protection turned to the new and safer idea. Write.

Peerless Check Protecting Company
Originators of Exact Protection ROCHESTER, N. Y.

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Student Labor  
(Continued from page 416)  
the problems with which the fruit grower is confronted. In return the College expects you to take these students on your farms and give them the training that is essential—these students for whose education the institution was established and for whose education the College is now maintained.

Campus Notes  
(Continued from page 394)  
and store rooms. The drill hall, measuring 88 feet from floor to ceiling, will be absolutely free from columns or obstructions of any kind. The west end of the building is to be of two stories, with towers on the northwest and southwest corners. The exterior is of native bluestone, trimmed with light buff Onondaga litholite.

Dedication exercises were planned for Founder's Day, but the plan could not be carried out owing to the accumulation of building material in and about the building.

Farmers' Week at Cornell comes this year from February 7 to 12, according to an announcement just made by the College of Agriculture, which has provided for 5000 visitors. During this week the College endeavors to condense into practical form all the information that it has on better farming and the management of the farm home. There will be lectures, exhibits, and practical demonstrations on various farm subjects such as potato growing, poultry raising, dairying, forestry, home making, farm man

(Continued on page 422)
A School Change
Vitally Needed

Banish the Degraded Outhouse

It educates children to filthy habits and filthy thoughts. It spreads disease. It undoes the best teaching of the school. It is condemned by everybody. You wouldn't tolerate such conditions at your own home.

Dirty tramps use it often. It is marked up with foul suggestions. It causes harmful exposure. It breaks school discipline.

It's important. Don't wait. Write for particulars.

Kaustine System

Effects It. Requires no water or sewer.

Kaustine turns sewage to germless fluid and destroys the odor. Cheap in price, easy to install, simple to care for, guaranteed, both in material and results. Equally good for sewerless homes, lodge halls, churches, factories.

Kaustine Co., Inc. Buffalo, N.Y.

Burpee's Seeds Grow

For forty years we have rendered faithful service. For forty years we have tried to make each year's service more nearly ideal. This unflagging effort has built for us not only the World's Largest Mail Order Seed Business, but also a world-wide reputation for efficient service and undisputed leadership.

Much more opportune than anything we ourselves may say about Burpee Quality Seeds, are the many remarkable things our thousands of customers and friends have said and continue to say about them. These customers return to us year after year, not because seeds cannot be found elsewhere, but because of our superior quality and service.

Anyone who is not thoroughly satisfied with the products raised can have his money back any time within the year, for such is the guarantee that protects all who plant seeds bought from Burpee of Philadelphia.

Fortieth Anniversary Edition of Burpee's Annual

"The Leading American Seed Catalog" for 1916 is unlike any other catalog. The front cover illustrates in nine colors the greatest novelty in Sweet Peas, the unique "Fiery Cross." The back cover shows the two famous Burpee Bantams, Golden Bantam Corn and Blue Bantam Peas. The colored plates, six other Burpee Specialties in Vegetables and the Finest New Burpee Spencer Sweet Peas; also the New Gladioli, Fordhook Hybrid. This Silent Salesman is mailed free. A postcard will bring it. Write to-day.

W. Atlee Burpee & Company
Seed Growers
Burpee Buildings Philadelphia

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Campus Notes
(continued from page 425)
agement, insect control, vegetable gardening, and flower growing. Rural schools, churches, and community organizations will also come in for a large share of attention. At the same time there will be held a number of conventions or conferences of societies that deal with agriculture and allied interests. Among others there will be meetings of the State Department Association, the New York State Federation of Floral Clubs, the New York State Poultry Association, the Rural Engineering Society, the Homemakers’ Conference, the New York State Vegetable Growers’ Association, and the Country Church Conference.

A norwegian expedition
An expedition to study the evergreen trees of the northern Pacific coast, from Oregon up through British Columbia, is to be sent out next spring by the Norwegian Government, preparatory to reforesting the barren Norwegian coastline.

Years ago the Norwegian coast was well timbered, but shipbuilders and loggers have cut away the firs and the pines without planting new ones in their places. Such trees as sprang up were killed by the cold as they lacked the protection of the old trees. The result is that the coast has become desolate and a source of wealth has been destroyed.

Within the last fifteen years, a national forestry society has been distributing pamphlets, giving lectures, and planting nurseries. But the native varieties are not so hardy as the evergreens of the northern Pacific coast, where climatic conditions resemble those of Norway.

The expedition will study American forestry methods in the former region during its visit, which will last from six to eight months.

Purebred Registered
HOLSTEIN CATTLE

With 30 common cows, each giving 3000 pounds of milk per year, introduce a pure-bred registered Holstein bull. In two years you will be milking grade Holsteins yielding with first calf 4,000 to 5,000 pounds. In 3 years, you’ll have 6,000 pound cows and will need to keep only fifteen cows to get the same amount of milk. In seven years, you’ll have 8,000 to 10,000 pound cows and a ten-cow herd will produce as much milk as your thirty cows do now. Quite a saving in labor, feed and equipment to say nothing of the increased value of your cows and calves. Investigate the big “Black-and-Whites.”

Send for FREE Illustrated Descriptive Booklets
The Holstein-Friesian Association of America
F. L. Houghton, Sec. Box 196
BRATTLEBORO, VERMONT

Where you saw it will help you, them and us.
KING OF THE WALKERS

NO. 136512

His seven nearest dams have made records which average 31.04 pounds butter in a week and six of the seven have records which average 126 pounds for thirty days. 22 heifers and cows, each carrying from 50-80% of the same blood recently sold for $24,000. Write for his pedigree and get your order in for a son.

NEWTON FARM or SHERBURNE STOCK FARM
Sherburne, Chenango Co., N. Y.

Where you saw it will help you, them and us
Prove It By Making This Test

Put a bunch of hogs or shoats in a separate pen or enclosure—feed them SAL-VET 60 days as directed, and you will get the best proof of its merits as a conditioner and worm destroyer. Wormy stock cannot thrive on the choicest of rations—balanced or unbalanced. Worms annoy—keep animals ravenous—run-down—ill-natured—discontented—unthrifty—liable to any disease.

Hon. A. J. Lovejoy, Roscoe, Ill., writes: "Please send us two barrels of SAL-VET at once. This is the best thing we have ever used. We use it for sheep, horses, and over 100 head of hogs and find it all you claim."

J. E. Snell, Flora, Ind., says: "SAL-VET is a wonder. I had 14 shoats that would not fatten. I fed them SAL-VET and I was much surprised to see come from them rolls of worms from 12 to 14 in. long. These shoats mended at once, and are now doing finely."

REG OFF—is not a food, but a medicated salt, fed with the ration, or separately according to directions. I guarantee it to rid stock of stomach and free intestinal worms, to aid digestion and to condition the animals so fed. All stock look better, do better, act better. Every animal having free access to SAL-VET is a standing advertisement of its value. I'll prove its value to you at my own risk.

Send No Money—Just the Coupon

Tell me how many head of stock you have, and I'll ship you enough SAL-VET to last them 60 days. You simply pay the freight charges when it arrives and feed it according to directions. If it does not do as I claim and you make a specific report in 60 days, I'll cancel the charge—you won't owe me a penny. Address SIDNEY R. FEIL, Pres.
THE FEIL MFG. CO.
Chemists
Dept. 29
CLEVELAND, OHIO

Look For Label on all SAL-VET Packages. Don't be deceived by imitations, this or 'Sal' that. Get the original genuine Sal-Vet.

PRICES

40 lbs., $2.25
100 lbs., 8.00
200 lbs., 14.00
500 lbs., 21.12

No orders filled for less than 40 lbs. on this 60-day trial offer. Never sold in bulk; only in Trade-Marked SAL-VET packages. Shipments for 60 days trial are based on 1 lb. of Sal-Vet for each sheep or hog, and 4 lbs. for each horse or head of cattle, as near as we can come without breaking regular sized packages.
Heberle Brothers Nurseries
BRIGHTON, N. Y. Nurseries at Brighton, Penfield and Morton

We carry a full line of Guaranteed Nursery Stock

The New Rochester Peach, Founded and Introduced by Heberle Brothers. Large yellow and red; free and small stone; flesh yellow very highly flavored; to eat out of the hand or canned it cannot be equalled as a table delicacy and will ship as good as an Elberta.

The peach comes into ripening when there is no other yellow and red free stone on the market, two weeks before the Early Crawford.

The original orchard has borne its sixth annual crop, being the finest quality the trees have ever produced, some specimens measuring twelve inches in circumference and weighing twelve ounces.

The fruit sold at the orchard and to local grocers at One Dollar per 11-quart basket.

The tree comes into bearing very young. The accompanying picture is an illustration of one of 500 trees planted by Mr. Yarker, Greece, N. Y., in the spring 1914, which produced 17 peaches in the month of August 1915. Mr. Rudman of Irondequoit, N. Y., informs us that he has one the same age in his orchard of 3500 Rochester trees bearing 27 peaches.

Where you saw it will help you, them and us
FRUIT GROWERS!

We carry a wide line of

Fruit Packages
Baskets
Crates, Etc.

COLES & CO.

115 Warren St.
NEW YORK

TREES at WHOLESALE

W. & T. Smith Company, Geneva, N. Y.

Write for Catalogue and Prices

Our trees are not lowest in price, but we guarantee

Quality and Purity of varieties, and such
nursery stock is the cheapest
FOR SOME TIME

For some time it has been known that soap compounds left un-sanitary greasy residues. It has also been known for some time that

Wyandotte
Dairyman's Cleaner and Cleanser

does easily and does safely the work for which soap is often used—that of washing milk cans and other milk containers.

“Safety first” is a profitable principle to follow in caring for milk. Why not ask your dealer for Wyandotte Dairyman’s Cleaner and Cleanser, or write your regular supply man.

THE J. B. FORD COMPANY
Sole Manufacturers

WYANDOTTE, MICH.

This Cleaner has been awarded the highest prize wherever exhibited.

IT CLEANS CLEAN

To Farmers’ Week Visitors

Established in 1868 with the University

The Corner Bookstores

have supplied every class that ever entered Cornell

Thousands of Agricultural Books are on our shelves—both Required and Reference.

We deliver the goods to your room---

Books at our Sheldon Court Branch, in College Ave.---Required supplies for your work for all departments : : :

INVESTIGATE OUR PROFIT SHARING PLAN

In writing to advertisers please mention The Cornell Countryman
Former Student Notes
(Continued from page 396)
moved last October, at San José, California, to Miss Flossa M. Roper, daughter of Dr. and Mrs. P. B. Roper, of Cleveland, Ohio. They are now living at 1417 Belmont Street, Washington, D. C.

12, W. C.—Ellwood Douglass spent one year on a fruit farm in New York State after leaving Cornell, and then went on his own fruit and vegetable farm in New Jersey. Since November, 1914, he has held a position as county agent for Atlantic County, New Jersey, with headquarters at Mays Landing.

13, B. S.—Burr C. Copley is manager of the York Brook Farm at Canton, Massachusetts, where he is engaged in the breeding of purebred Guernsey cattle and thoroughbred Clydesdale horses and Berkshire hogs.

13, B. S.—Wesley Heebner took a course in photography at Bissell College, Illinois, after leaving Cornell. He has a large studio in Lansdale, Pennsylvania, where he is said to be very successful in his chosen profession.

13, B. S.—George Lamb, who won his “C” in cross country, is farming with his brother and father at Hubbardsville, breeding purebred Holsteins.

13, B. S.—E. D. Vosbury, who is in the Pomology Division of the United States Department of Agriculture, visited the College last term. Mr. Vosbury was for a time stationed in Florida, where he was especially interested in the marketing of fruits, including citrus fruits and apples. He is now engaged in similar work in Oregon.

13, B. S.—Kenneth A. Boynton has charge of the herbaceous perennials in the New York Botanical Gardens, New York City.

13, B. S.—W. M. Peacock, of the Department of Farm Crops, resigned on January 1 to accept a position as in-

(Continued on page 430)
Manufacturers and Distributors of the Famous CORNELL Poultry Appliances

GASOLINE BROODER HEATERS

- Trap Nests
- Drinking Fountains
- Blood Cans
- Hoppers
- Poultry Knives
- All Poultry Appliances

Sold in every State in the Union, Canada, and abroad.
Recommended and used by the New York State College of Agriculture.

Treman, King & Co.
ITHACA, N. Y.

CORNELL GASOLINE BROODER HEATER IMPROVED
Showing the location of the Burner Box (under the floor); the Radiator (under the hover); and the Tank (under the peak).

FARMS - FOR - SALE
— IN THE —
Famous Finger Lake Region
Of New York State
TOMPKINS, TIOGA, SENECA and CORTLAND COUNTIES

Being a Member of The Farm Brokers' Association State of New York, which has for its motto—
"A Square Deal for Buyer and Seller"

"You're Safe in Our Hands"
Ithaca Realty Company
202 North Tioga Street
Ithaca, N. Y.
H-O POULTRY FEEDS

Send for a sample of the feed that interests you most—and a circular that describes these poultry feeds. We want you to know why H-O Poultry Feeds make your chicks live to grow healthy and become good producers.

H-O Poultry Feeds include:
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BEEF
CRACKLINGS
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THE FLAVELL CO.
ASBURY PARK, N. J.

Former Student Notes

(Continued from page 428)

structor in farm management at the Massachusetts College of Agriculture, at Amherst.

'13, B. S.—W. C. Stokoe is teaching agriculture at Towanda.

'13, Sp.—T. J. Marshall is doing cost accounting work for the Funck Brothers Farm Company, where a specialty of growing seed corn is made. His address is McLane, Illinois.

'14, B. S.—T. W. Wardle has recently purchased a farm of one hundred and seventy acres near West Coxsackie. Since Mr. Wardle has taken possession of this farm, which has orchards containing 1200 bearing trees, he has sold 350 barrels of pears and apples and 600 baskets of plums.

'14, B. S.—Andrew Van Benschoten is running his father’s farm at Margaretville.

'14, B. S.—The engagement of A. B. Dann, instructor in the Department of Poultry Husbandry, to Miss Maude Muriel Keys, of Elmira, has been announced.

'14, B. S.—Charles Thornell is farming with his father at Batavia.

'14, M. S. A.—L. F. Gieseker is in charge of soil investigations in the Montana State College at Bozeman.

'14, B. S.—Alexander Lurie is head of the Department of Floriculture in the Maine College of Agriculture.

'14, B. S.—M. F. Carr, of West Lebanon, New Hampshire, is supervising records for the Animal Husbandry Department of the State.

'14, B. S.—Sarah A. Nicholson is teaching chemistry in the Skidmore School of Arts at Saratoga Springs.

'14, Sp.—H. C. Ballard is lime agent for the Solvay Company, of Syracuse.
The Dryden Road Cafeteria

We invite all Junior or Farmers’ Week guests to visit our place of business and inspect our kitchens with their up-to-date appliances. After the evening lectures and entertainments, you will enjoy a lunch in our cozy and attractive dining rooms.

Music - Magazines - Dancing

We send greetings to the new students

Hours of Service

<table>
<thead>
<tr>
<th></th>
<th>WEEK DAYS</th>
<th>SUNDAY</th>
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<tbody>
<tr>
<td>Breakfast</td>
<td>7:15 - 8:45</td>
<td>12:00 - 2:00</td>
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<tr>
<td>Dinner</td>
<td>12:00 - 1:45</td>
<td>5:30 - 6:45</td>
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<tr>
<td>Supper</td>
<td>5:30 - 6:45</td>
<td>6:45 - 12:30</td>
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<tr>
<td>Night Lunch</td>
<td>6:45 - 12:30</td>
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A Cow Kicked Over a Lantern

Result: The Chicago Fire

Don’t risk the destruction of your home and barns. Protect your family from the danger of fire that is always present where oil lamps and lanterns are used

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RESOURCES OVER ONE MILLION DOLLARS

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<table>
<thead>
<tr>
<th>P</th>
<th>pure Milk and Cream.</th>
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<tr>
<td>E</td>
<td>every department under my personal supervision.</td>
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<td>A</td>
<td>always ready to fill orders.</td>
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<td>R</td>
<td>regular and careful delivery.</td>
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<td>S</td>
<td>systematic inspection of dairies.</td>
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<tr>
<td>O</td>
<td>our equipment is modern and adequate.</td>
</tr>
<tr>
<td>N</td>
<td>now, let us serve You.</td>
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of HIGH PRODUCING S. C. WHITE LEGHORN STOCK is open to the public at the present time. Write for particulars

The following records are productions of our flock:

<table>
<thead>
<tr>
<th></th>
<th>1st yr.</th>
<th>2nd yr.</th>
<th>3rd yr.</th>
<th>Total eggs laid 3 yrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lady Cornell</td>
<td>258</td>
<td>200</td>
<td>191</td>
<td>649</td>
</tr>
<tr>
<td>Madam Cornell</td>
<td>245</td>
<td>181</td>
<td>158</td>
<td>584</td>
</tr>
<tr>
<td>Cornell Prolific</td>
<td>243</td>
<td>162</td>
<td>146</td>
<td>551</td>
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<td>Cornell Laywell</td>
<td>205</td>
<td>165</td>
<td>159</td>
<td>529</td>
</tr>
<tr>
<td>Cornell Supreme</td>
<td>242</td>
<td>188</td>
<td>225</td>
<td>665</td>
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<tr>
<td>Cornell Surprise</td>
<td>180</td>
<td>186</td>
<td>196</td>
<td>562</td>
</tr>
<tr>
<td>Cornell Persistent</td>
<td>192</td>
<td>197</td>
<td>178</td>
<td>567</td>
</tr>
</tbody>
</table>

Department of Poultry Husbandry, N. Y. State Col. of Agr. Ithaca, N. Y.

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Dairy Tubular bowls save a lot of expense and labor. They do not wobble and bind—do not need repairs—do not clog. They produce perfect cream—are light—may be washed clean in three minutes. Dairy Tubular bowls have but one tiny piece inside—are the only simple bowls made.

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150 East State Street  Ithaca, New York
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Peaches of Harrison Quality deserve a good package. They bring any prices.

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Harrison Fruit Trees Meet Every Requirement

BECAUSE: We sell only trees we grow. Every tree you buy from us is Harrison grown and is so guaranteed.

BECAUSE: Three generations of Harrisons are devoting their entire time and energy to the production of Harrison Quality Trees for you.

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BECAUSE: Our trees are bigger than most others. They are hardy with well ripened, firm wood when we ship them. And, they are budded from bearing trees.

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By JAS. B. MORMAN

MARCH
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<table>
<thead>
<tr>
<th>Packet 1</th>
<th>Packet 2</th>
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</thead>
<tbody>
<tr>
<td>1 packet Beans, Bolgiano's New Wax.</td>
<td>1 packet Muskmelon, Rocky Ford.</td>
</tr>
<tr>
<td>1 packet Beans, Valentine Green Pod.</td>
<td>1 packet Muskmelon, Sweet Air.</td>
</tr>
<tr>
<td>1 packet Beets, Crosby's Egyptian.</td>
<td>1 packet Onion, Yellow Globe.</td>
</tr>
<tr>
<td>1 packet Beets, Detroit Dark Red.</td>
<td>1 packet Peas, Extra Early, Long Podded.</td>
</tr>
<tr>
<td>1 packet Cabbage, Jersey Wakefield.</td>
<td>1 packet Peas, Telephone.</td>
</tr>
<tr>
<td>1 packet Cabbage, Bolgiano's New Early Flat.</td>
<td>1 packet Pepper, Ruby King.</td>
</tr>
<tr>
<td>1 packet Cabbage, Large Late Flat Dutch.</td>
<td>1 packet Pumpkin, Sugar Pie.</td>
</tr>
<tr>
<td>1 packet Carrots, Rubicon Half Long.</td>
<td>1 packet Radish, Extra Early Scarlet Globe.</td>
</tr>
<tr>
<td>1 packet Celery, White Plume.</td>
<td>1 packet Radish, Lady Finger.</td>
</tr>
<tr>
<td>1 packet Celery, Golden Self Blanching.</td>
<td>1 packet Radish, Strasburg.</td>
</tr>
<tr>
<td>1 packet Corn, Ideal Sweet.</td>
<td>1 packet Spinach, Bloomsdale Savoy.</td>
</tr>
<tr>
<td>1 packet Corn, Golden Bantam.</td>
<td>1 packet Squash, White Bush Scallopded.</td>
</tr>
<tr>
<td>1 packet Corn, Country Gentleman.</td>
<td>1 packet Squash, Golden Hubbard.</td>
</tr>
<tr>
<td>1 packet Cucumber, Early Fortune.</td>
<td>1 packet Tomato, John Baer, Earliest Grown.</td>
</tr>
<tr>
<td>1 packet Lettuce, Grand Rapids.</td>
<td>1 packet Tomato, Bolgiano's Grand.</td>
</tr>
<tr>
<td>1 packet Lettuce, Big Boston.</td>
<td>1 packet Turnip, Purple Top White Globe.</td>
</tr>
</tbody>
</table>

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Cornell Co-op.

Morrill Hall

Ithaca, N. Y.
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A frjrrtt made o/ / * 1 pieces til corercd w/th /"mesjl p ou/try uJ/rc /o Aeep r/)L hens from up on thi wmdows.

A board 156" is fastened to the studmg on eatch ary of the window to det as a wind wind.

Front is hung wth a hooks on sides. Station to hold window in the window closed.

3" cleats to hold window in place when open.

No hinges required.

Wires /"W/A/D BAFFLER Arrows how throuyh bayfJe*

FLOOf? F>/_A//

Bull on ho/d wmdov p/jee whzn dosed.
x! chats to hole/ Wmdo* place w/ien open.

No hinges required

A board J'itG" n fastened to the studmg on eatch ary of the window to det as a wind wind.

FLOOf? F>/_A//

END VIEW

FLOOR PLAN

Concrete floor

END VIEW

FRONT VIEW OF COMPLETED HOUSE.

FRAMEMORK FOR FRONT

Concrete floor even with top of wall.
ONE of the essentials for obtaining a large egg production is that we keep our hens contented and happy by providing them with a bright, cheerful home, free from dampness and other unsanitary conditions which cause sickness and weakness in the flock. These conditions are obtained by providing plenty of light, well distributed, a correct system of ventilation, and by having the interior fixtures well arranged. To obtain these conditions the Department of Poultry Husbandry at Cornell has combined in one house the most desirable features of various types of houses which it has used in recent years, and also of poultry houses in use in different parts of the State which have come under its observation.

This house, as designed by the Cornell authorities, is 20 feet deep and 24 feet long and will accommodate from 125 to 150 hens, depending somewhat on the breed. By adding more pens in units of 24 feet the house can be made to accommodate as many birds as one desires to keep and the construction is such that the house can be built at a reasonable cost in most localities in New York.

Ventilation

One of the most important features of this house is the method of ventilation. The house is ventilated mainly by the use of the Cornell wind baffler, a device designed to take the place of muslin curtains. The muslin curtain, when used for ventilating a poultry house, has some serious drawbacks. Cloth of any kind, when used for this purpose, has a tendency to become quickly filled with dust which prevents much of the air from passing through it. Curtains require considerable attention during the winter months because it is necessary that they be used when snow and rain would blow in the house. The wind baffler does away with this trouble for it needs no further attention after it is once installed. Rain and snow can not beat in and strong winds are reduced to gentle air currents which can not be felt a few feet away. In addition to the wind baffler, increased ventilation is furnished by means of the windows, the sashes of which are arranged to drop back a few inches at the top, thereby allowing a current of air to enter in an upward direction rather than towards the floor where it would strike the birds. The sashes are not hinged and can be easily removed and put away during the summer months.

Above the windows are large doors
A CORNELL POULTRY HOUSE
Constructed from plans reproduced on frontispiece

which can be kept open during warm weather. Thus a circulation of air in the upper part of the house is created which will cause the warm air under the roof to pass out. To keep the house as cool as possible during hot weather, an opening 10 inches wide and extending the full length of the house is made in the rear under the eaves. Doors are provided for closing this opening when desired. Air currents which pass through this opening are prevented from striking the birds on the perches by means of the shield or ceiling which encloses the perches at the rear and overhead. To carry off the odors from the droppings boards and for providing a more rapid change of air in the roosting compartment, an opening 4 inches wide and extending the full length of the roosting compartment is made in the ceiling about 3 inches above the droppings boards.

The interior is well lighted by means of eight 9-light glass sashes along the front which faces the south. The lower row of sashes are quite near the floor so that they furnish plenty of light in the front part of the house. The upper sashes alternate with the wind bafflers and serve the purpose of providing an even distribution of light in the rear of the pen.

Interior Equipment
The perches are placed fourteen inches above the droppings boards so that there will be no possibility of any draft striking the birds on the perches. The perches are also hung by chains to prevent, so far as possible, red mites from reaching the birds at night. If these perches are painted twice a year with a good creosote wood preservative they may be kept almost entirely free from this parasite.

The nests are placed on the walls at each end of the house. Nests arranged in this way are more convenient to care for than are those placed under the droppings boards and the eggs can be gathered more rapidly. The objections to nests under the droppings boards are that they are usually too near the floor, that the space is not well lighted and that the hens are likely to lay eggs on the floor. In addition it is difficult to keep the nests free from lice and mites when they are in close contact with the droppings boards. Good ventilation for the nests is provided by the openings between the slats which support the nest boxes. The frames of the nest boxes are easily removed for convenience in cleaning and spraying.

It is believed that one of the essential features of a poultry house is one
or more broody coops to provide a place for breaking up broody hens. These coops should be located where they will be most convenient and at the same time be out of the way. With the nests placed on the walls, a convenient place for the broody coops is provided above them. The broody coops are built with bottoms made of poultry wire netting which allows the droppings to fall through to a platform a few inches below and also permits the air to circulate underneath the bird in order that she may be broken of her broodiness as soon as possible.

A Dust Wallow
Another desirable feature is the outdoor dust wallow. The old style indoor dust box never proved entirely satisfactory on account of its causing too much dust in the house. With the outdoor dust wallow very little dust enters the house, and it can accommodate a large number of hens at one time. The outdoor dust wallow has the advantage of permitting the sunlight to enter from three sides, thereby allowing a maximum of sunlight to enter the house during the winter months when the hens are more or less closely confined. The additional floor space provided by the outdoor dust wallow usually costs considerably less, per square foot, than it would within the house itself.

Attention should be called to the fact that in designing this house the Cornell policy has been followed in not permitting any of the interior fixtures to occupy floor space. All these fixtures are detachable and removable with the exception of the dry mash hopper. (Those who desire plans and specifications of the Cornell poultry house can get them by sending twenty-five cents to the Poultry Department, College of Agriculture, Cornell University, Ithaca, N. Y.—Ed.)

### Materials for 20x24 Foot Model Poultry House

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x4 16 ft. sills and plates</td>
<td>7</td>
</tr>
<tr>
<td>2x4 12 ft. sills and plates</td>
<td>2</td>
</tr>
<tr>
<td>2x4 14 ft. studding</td>
<td>2</td>
</tr>
<tr>
<td>2x4 12 ft. perches</td>
<td>6</td>
</tr>
<tr>
<td>4x4 12 ft. roof support &amp; center post</td>
<td>3</td>
</tr>
<tr>
<td>2x6 22 ft. rafters or 2x6 12 ft.</td>
<td>10</td>
</tr>
<tr>
<td>2x3 13 ft. dropboards &amp; dust wallow</td>
<td>12</td>
</tr>
</tbody>
</table>
| 1200 sq. ft. NC pine—D and M roof ceiling, partition and dropboards | 700 sq. ft.  
| 1x6 12 ft. braces front                      | 2        |
| 1x6 16 ft. pine—nests—bottoms               | 2        |
| 1x8 16 ft. pine—nests—bottoms               | 2        |
| 1x8 16 ft. pine—nests—sides                 | 2        |
| 1x8 16 ft. pine—nests—doors                 | 2        |
| 1x6 16 ft. pine—nests—partitions            | 1        |
| 1x6 16 ft. pine alley slats                  | 4        |
| 1x8 16 ft. pine—broody coops                | 2        |
| 1x8 12 ft. pine—broody coops                | 2        |
| 1x6 16 ft. pine—broody coops                | 1        |
| 1x6 12 ft. pine—cornice groupings            | 2        |
| 1x6 12 ft. pine corner groupings             | 2        |
| 1x8 16 ft. pine window wind shields          | 6        |
| 1x2 12 ft. pine window guard frames          | 8        |
| 1x3 12 ft. pine window facings              | 4        |
| 1x3 12 ft. pine door casings                | 2        |
| 1x12 12 ft. pine rear ventilator            | 1        |
| 2x12 12 ft. pine window casings—dust wallow | 1        |
| 1x6 12 ft. pine window sills                | 5        |
| 1x6 12 ft. pine rear ribbon                 | 2        |
| 9-light sash 8x10 glass                     | 3        |
| 8-light sash 8x10 glass                     | 5        |
| 4x12 16 ft. dressing cypress—wind bafflers   | 6        |
| 5x15 16 ft. dressing cypress—wind bafflers   | 6        |
| 9-18x4 10 ft. dressing cypress—wind bafflers | 1        |
| 9-18x4 12ft. dressing cypress—wind bafflers  | 1        |
| 1 pr. 8 inch Tee hinges—door               | 1        |
| 1 thumb latch—door                          | 3 pr. 5 in. strap hinges—front ventilators | 3        |
| 4 pr. 4 in. strap hinges—rear               | 3 pr. 5 in. strap hinges—drop board ventilators | 4        |
| 4 pr. 3 in. strap hinges—broody coops       | 4 pr. 3 in. strap hinges—mash hopper | 6        |
| 6 pr. 2 in. strap hinges—nests              | 6 pr. 3 in. strap hinges—nests | 3        |
| 20 lin. ft. 1 in. mesh poultry wire 3 feet wide—window guards | 25        |
| 4 24 in. chains—perches                     | 5        |
| 40 30 in. chains—perches                    | 4        |
| 40 pounds 8d nails                          | 4        |
| 10 pounds 10d nails                         | 25        |
| 25 sacks Portland cement—sill walls and floor | 5 squares 2-ply tar paper and cement |
Poultry Keeping for Farmers

BY JAMES B. MORMAN, Kensington, Md.

THERE were 6,361,502 farms in the United States in 1910. Of this number 5,585,032 farms reported that fowls were kept thereon. Therefore, 776,470 farms had no poultry at all. The number of fowls reported were 295,880,190. The production of eggs, however, was reported for only 4,833,759 farms, the number of fowls being given as 273,255,924. The number of eggs produced was 1,457,385,772 dozen, or a little more than five dozen per fowl a year. Since the males are undoubtedly included in the number of fowls reported, the estimated average production of eggs per fowl of farm flocks in this country has been placed at about six dozen, or 72 eggs a year. The average farm price received for eggs was 19.3 cents per dozen, so that the total income from eggs produced on the average farm was about $1.15 per hen. If the cost of feed be deducted from this income, it would show an exceedingly small balance of profit coming from the sale of eggs.

Similarly, the total number of fowls raised in 1909 was 488,468,000 and their value $202,506,000. This would give an average value to farm fowls of about 40 cents each. It would indicate an exceedingly small type of fowl, since the wholesale prices as quoted for poultry as meat range from 13 to 18 cents a pound. It would not take a very heavy fowl, therefore, to be worth only forty cents.

These census statistics have been presented as an introduction to what I have to say about poultry keeping for farmers. It is my conviction, after many years of experience in developing this line of farm work and livestock raising, that it offers a good opportunity for a steady cash income at all seasons of the year; that it has been sadly neglected by the average farmer in many parts of the United States; and that it furnishes a means of profitable labor during the winter months when many other lines of farm work are at a standstill. This article, therefore, will be largely a chapter out of my own experience in poultry raising for egg production and meat.

The Basis of Improvement.

For several years before 1907, I did not give very much attention to my flock of fowls with a view to increasing the profits from keeping them. I had, it is true, kept a standard breed of fowls, the popular White Plymouth Rocks, but no special attention was given to breeding for egg production or to increase the size of the fowls as a meat bird. Perhaps, as a whole, the flock was better than the average farm flock, but there was plenty of room for improvement.

Many experts in our agricultural colleges and experiment stations maintain that the ordinary farm-yard fowl is not the most profitable fowl to keep. The statistics presented above would seem to support this position. A standard breed of fowls has many advantages over the mixed and indefinite breed. These advantages may be enumerated as follows: (1) better results in breeding; (2) more opportunities to sell setting eggs at a higher price; (3) more uniformity in color, size and shape of eggs; and (4) a better appearance of uniform fowls on a meadow or in an orchard.

During the past ten years my aim has been to keep practically fifty laying hens and pullets. The number of pullets would vary from year to year. In 1911, the flock consisted of 32 hens and 22 pullets. The next year it was composed of 20 hens and 34 pullets. In 1913 the flock consisted of 26 hens and 27 pullets; while in 1914 there were 54 pullets and no hens. In the latter year, I desired to determine the value of pullets as egg producers and their effect on
POULTRY KEEPING

decreasing the profits from the flock. The results in both these particulars will be shown later.

In the year 1906 I had a few pullets which began to lay a little earlier than normal. It occurred to me that it would be a good plan to keep these early layers separate from the others and breed from them with a view of increasing the egg yield from the flock in future years. From this simple plan which I put into practice, I found that some fowls laid more eggs than others. But this was not the only feature. I also found that breeding from early layers with the most vigorous males had a tendency to produce more prolific layers. The result was that I began to take more interest in the poultry side of farm work. A systematic method of keeping poultry was adopted. These data included records of income and expenditures, the increase or decrease of profits according to the composition of the flock in hens and pullets, how to produce winter layers, and whether the egg production of the flock could be increased. Apart from the gratification of keeping the records, the financial results have proven that it has been worth the trouble. The work has thus made progress from 1907 to the present time.

Successful Egg Production

As stated before, the work in egg production has been studied since 1907. For the purpose of comparison, let us take the egg production of the flock of 50 fowls for that year. The number of eggs laid in that year was 3,966. The annual egg production by years up to and including 1914 is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Eggs</th>
</tr>
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<tbody>
<tr>
<td>1907</td>
<td>3,996</td>
</tr>
<tr>
<td>1908</td>
<td>5,135</td>
</tr>
<tr>
<td>1909</td>
<td>5,511</td>
</tr>
<tr>
<td>1910</td>
<td>5,499</td>
</tr>
<tr>
<td>1911</td>
<td>5,573</td>
</tr>
<tr>
<td>1912</td>
<td>7,314</td>
</tr>
<tr>
<td>1913</td>
<td>6,197</td>
</tr>
<tr>
<td>1914</td>
<td>8,014</td>
</tr>
</tbody>
</table>

The egg production in 1915 can not be presented in comparison for the reason that I decided to keep the bulk of my hens over from 1914 to 1915, besides the pullets that were raised that season. Consequently, I had a much larger number of fowls in 1915 than in any preceding year, with an egg production of more than ten thousand eggs.

The above figures, however, become interesting from the fact that, as a result of keeping pullets only in 1914, the egg record that year shows a gain of 1,817 eggs over the record of 1913, and 700 eggs increase over 1912. The yield of 7,314 eggs in 1912 was the highest in the history of the flock up to that time. It so happens that

A FARM FLOCK OF STANDARD WHITE PLYMOUTH ROCKS
1912 was also the year in which the greatest number of pullets had been carried previous to 1914. The ratio of egg production to number of pullets seems to have been quite uniform, since the egg yield increases fairly proportionately with the increase in the number of pullets. The superiority of pullets over hens for egg production, therefore, seems to be fairly well established with this flock of White Plymouth Rocks.

If we take the annual total egg production for the first four years after 1907, in which the egg yield is fairly uniform, there is seen to be a large increase each year. The average of these four years is 5,429 eggs, or an average annual increase in egg production of nearly 37 per cent. After 1911 the egg yield is much larger, increasing to 8,014 eggs, or more than 100 per cent increase over the record of 1907 with practically the same number of fowls.

The main secret of success in thus building up the flock in egg production was the maintenance of the health and vigor of the fowls. Care was used in selecting only the strongest males for breeding purposes, and the most vigorous, healthy and early-laying hens to mate with them.

Moreover, the fowls were well fed and managed at all seasons of the year, but particularly in the winter season when every effort was made to keep the fowls active on cold days. Each pen was provided with a suitable scratching pen in which clean litter was placed. Into this litter grain was thrown two or three times a day, and the fowls were made to work for their feed. This kept them active and is an important factor in keeping up the egg supply during the winter months. There is nothing mysterious about the process, and there is not a farmer in the country who cannot do precisely as I did in increasing greatly his supply of eggs from his flock.

Now, if every farmer in the country who keeps fowls and sells the eggs as part of the farm income should increase his egg yield from 25 to 50 per cent, the basis would be laid for the economic production of eggs that would mean millions of dollars more annually to American farmers than they now receive from this particular branch of their industry. That these results are neither impossible nor imaginary, the above figures of increased egg yield speak for themselves.

Breeding Larger Fowls

But, in addition to increasing egg production, the size of the fowls can also be increased. In the selection of pullets, hens and male birds for breeding purposes, a little attention has to be paid to their manifestations of vigor, their shape and size, and their health. Characteristics of vitality and form can be transmitted. Birds with long bodies, good width between the thighs, and long breast bones are typical breeding birds for increasing the size of the offspring from generation to generation. When these physiological traits are in-

A TYPICAL WHITE ROCK PULLET
She was ten months of age and weighed exactly nine pounds when photographed
Inherited by the progeny, the basis is laid for the production of larger hens with a greater proportion of meat. The succeeding generations may be expected to have a little larger frame than their progenitors had. The males are selected with the same characteristics of form as the females, but with a greater length of leg.

By these simple principles of selection, which any intelligent farmer can practice, I have been able to increase the weight of fowls slowly from year to year. The average weight of a Plymouth Rock pullet at laying age is about six-and-a-half pounds; during the season of 1915, I raised pullets which at ten months of age weighed just nine pounds. The photograph of the flock, where pullets and hens are permitted to run together for the purpose of being photographed, shows a group of fowls which average over eight pounds in weight. This gain in weight has been brought about by a few years of careful, continuous breeding by selection.

From the standpoint of meat production, this increase in weight of fowls is very important. Other kinds of meat besides poultry have become high in price and are beyond the reach of a large number of our population. The minimum estimate of poultry production gives a total of about 900,000,000 fowls a year.

On the basis of an increase in weight of one and one-quarter pounds to a fowl, the production of poultry in the United States on its present limited supply offers the possibility of an annual increase in meat production of 1,125,000,000 pounds. At an average price of twenty cents a pound, the increase in value of poultry as meat would be about $225,000,000 a year.

Now, so far as I can see, there is nothing to prevent the farmer from increasing his income by paying more attention to poultry on the farm. A little time given to the busy hen when other work on the farm cannot be performed will not only give every farmer a new interest in poultry keeping, but will add materially to his income. Some profits from my own flock will be appended later. The chief requirements for improving farm flocks as to egg production and body weight are the following:

1. The selection of some good general utility breed of fowls as a basis.
2. The selection of the best layers for breeding purposes.
3. A little extra time in the housing and care of the fowls, especially in winter.
4. The selection of the most vigorous and largest birds as breeders.

There is not a farmer in the country who produces eggs and poultry for sale or for farm consumption who could not easily fulfill every condition above stated without materially interfering with other farm labors. It is not always best or right to leave the care of poultry to the women on the farm. They have plenty of household duties to perform. But that it will financially pay to give attention to poultry, the following figures show.

Income, Expenses and Profits

It must not be forgotten that the producing power of a good flock of farm poultry is not limited to eggs alone. One of the best farm manures is poultry droppings. It contains the three essential plant-food elements—nitrogen, phosphoric acid, and potash. But this is merely an incidental source of income from poultry keeping.

The meat side of the poultry industry, as shown above, is becoming a very important subject. Not only can hens be sold for meat after their greatest usefulness in egg production has passed beyond the profitable stage, but young cockerels can be fed to yield a good profit over cost of production. In hatching to maintain the number of fowls desired in a flock, a great number of cockerels are necessarily raised. If hatching begins early, the cockerels can be sold as spring broilers at a high price. Later cockerels can be fitted for a roaster trade; but the best birds may always be sold for breeding purposes.
Sometimes, too, fowls may be sold for breeding or hatching purposes. To this end, the dual-purpose breeds, that is, fowls which are not only good layers, but also make a first-class table fowl, are especially adapted to the making of profits. The accompanying figures for three years show what a small farm flock of poultry can be made to do in yielding profits:

<table>
<thead>
<tr>
<th>Year</th>
<th>Eggs at retail</th>
<th>Profit on sittings</th>
<th>Poultry sold</th>
<th>Fowls for table use</th>
<th>Increase in flock</th>
<th>Manure</th>
<th>Total income</th>
<th>Expenditures</th>
<th>Profits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1912</td>
<td>$184.59</td>
<td>21.08</td>
<td>29.25</td>
<td>20.45</td>
<td>6.00</td>
<td>5.00</td>
<td>$266.37</td>
<td>108.92</td>
<td>$157.45</td>
</tr>
<tr>
<td>1913</td>
<td>$163.02</td>
<td>22.82</td>
<td>57.33</td>
<td>21.00</td>
<td>33.25</td>
<td>6.00</td>
<td>$346.31</td>
<td>126.28</td>
<td>$220.03</td>
</tr>
<tr>
<td>1914</td>
<td>$167.25</td>
<td>167.25</td>
<td>220.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On the basis of 54 pullets in 1914, the records show a profit of about $4.00 per pullet, as compared with $3.16 per fowl in 1913, the highest profit from the flock in any preceding year.

Farmers' Week at Cornell, 1916
A "PHENOMENON OF THE EMPIRE STATE WITNESSED AT ITS COLLEGE OF AGRICULTURE"
BY WALTER H. MAIN in the Utica Saturday Globe, February 12, 1916

THERE used to be an old square piano in the sitting-room with an F sharp gone bad. The blue-eyed little girl who played it for us Sunday afternoons learned after a while to shun pieces in one sharp and play in four flats. We folks weren't much on singing, but there was always something satisfactory about those old songs. We don't get it now. Now they wind up a machine and put on a Caruso record and we sit around and silently wonder how a human voice can make such noises; but we never sing the old songs any more. They'd call us old-fashioned if we tried Lead, Kindly Light, to the accompaniment of the old square piano.

There was one who sat there in her straight backed rocker and hummed the tunes the others sang so lustily. Her hands that were worn with toil were the hands that had borne full half their burden to make that square piano possible, the hands that had made the rag rugs on the floor, that had given to the old sitting-room its homey atmosphere, hands that have long been stilled.

It didn't matter if the songs were old-fashioned, we sang them again this week. They brought it all back. It was so dark in the tremendously big auditorium that no one could tell who sang so out of tune. We didn't care if they did; they didn't know us and might never see us again, and when they began to throw on the screen marvelous pictures, each with a line of an old song; when a big chorus of fresh-voiced boys and girls sang them so well; when the magnificent grand piano, under magic touch wove a melody all about them, everybody there just couldn't help singing, too. Some voices had not been lifted in song for many years; some, may be, were a wee bit cracked; some of the vocal cords were stiff from long disuse; but Greenland's Icy Mountain shimmered with full harmony, the thin treble resonant in that throng against the deep diapason that rolled out from great chested men, who would have been ashamed to be caught displaying emotion enough to sing. But it was dark there and nobody could see them. Nearer, My God, to Thee—the same we used to sing around the old piano—started them going.
There was one piece—"selection," they call 'em now—that she in the straight backed chair used to want for the "just one more, and this'll be the last." It breathed again this week deep and low as it used to:

Now the day is over,
Night is drawing nigh.
All these songs in the dark, remember, were with marvellously colored pictures, each with a line or two of verse. The sunset tints glowed on the screen as they used to glow over the back meadow, when birds twittered their vespers. Then came the picture of an old, old lady, in a straight backed rocker, her tired, worn hands folded in her lap. Up from unfathomable depths came

Jesus, give the weary
Calm and sweet repose;
With thy tenderest blessing
May our eyelids close.

Full many an eyelid has closed on this world since we sang that about the square piano; full many a voice quavered just a trifle as we sang it this week.

EMOTIONAL? WHAT OF IT?
Then the singing school ended; they opened the doors and in flooded the noonday light of the bright February day; the picture of the past faded before the glare of the present; singing school was over for the day; out flocked the crowd, the last strains still vibrating deep, if silently. Over the crisp snow of the windswept hill they scattered from the magnificent Bailey Memorial, the stupendous horseshoe hall at Cornell University. Emotional? Of course, it was emotional. What of it? Who needs emotion more than humanity in this day when everything is coldly calculated and you have to watch everybody out of the corner of your eye or he'll put something over on you?

It was Farmers' Week at the College of Agriculture, and the great State of New York was entertaining 5,000 men and women and children right from the soil. Nowhere but at singing school each noon, just before dinner, did all hands meet. Then for an hour, wearied with the whirl that they had been in since early morning, two or three thousand people sank back into the seats in the splendid amphitheater and lost themselves in song. Here throbbed the great heart of the commonwealth. From one end of the State to the other; from the rugged foothills of the Adirondacks to the smiling plains of the lake-sloped vineyards; from the southern tier, from the apple belt and the great pasture land where thousands of herds graze they had come for a week of inspiration.

Yes; inspiration. That seems a word for poets. But a farmer is essentially a poet, a man of great imagination. Next to nature's heart, he sees visions and dreams dreams. He is the man who does deeds; who translates his visions into action. His is the great, silent voice that moves the nation. When he enters business, he captures the cities; when he enters politics, he captures the nation; the farm-bred boy has made America. And here he gets his inspiration. When you listen to hundreds of them breathing deep into old-fashioned song the emotions that are so infrequently uttered, you have felt the breath of the Empire State, you have touched its pulse and heard its heart throb.

FIVE THOUSAND FARMERS AT SCHOOL
There were about 5,000 of him and his wife and his boys and girls. Even the authorities of the New York State College of Agriculture on the windswept hill at Ithaca didn't know how many there were exactly. Thousands registered; but hundreds didn't. A man of directness, the farmer as likely as not made a bee line to the thing he wanted most, the cattle barn, the henry, the horse stables or what not without bothering to go to sign his name. By the same token you could not get him grouped in mass for a great picture. If you pictured him, it must be motion picture. The farmer is impatient of delays when there is something worth while to be done. He will sit for an hour to sing; but he won't stand 10 minutes for a picture. Music is worth while to him; the picture isn't.

LEARNED EVERYTHING UNDER THE SUN
And they gave them everything under the sun. From shoeing a horse to bacteria in a baby's digestive tract; from potato blight to picking chickens; from cooking tough cuts of meat to raising a colt; from cheese cookery to lengthening the life of fence posts—if you can think up a question that has not been threshed out this week at the State College of Agriculture, there's a job waiting for you. Every hour saw a dozen lectures. Hundreds of class rooms, in the most modern of buildings with the most learned men the country can muster to instruct, were constantly occupied with hundreds of hungry-minded farmers and their wives drinking in knowledge, making notes, firing questions, discussing pros and cons. Some-
times they became experience meetings; sometimes they waxed hot with all the fervor of the debate in the country store. Politics and religion were of necessity, barred; but they got into the marketing business; they excoriated the middleman; they discussed ways and means of getting better wages for their unremitting toil, and of increasing their crops.

AND THE WOMEN!

And women—say, you ought to have seen the women, hundreds of them swarming over that great modern Home Economics building, the last word in domestic architecture! They explored the great shining kitchens. They are some kitchens, too, believe me! They feed 500 students every school day, students as hungry as the lankiest hired man you ever saw. Do you suppose a thousand or two visitors feazed them? Not on your life. They took on a thousand more people there Tuesday, before Farmers' Week had fairly started, without batting an eye lash. Thrashing time never saw such piles of provisions go as this week saw go at the State College of Agriculture. Don't think, because they study calories and protein four years and get a B. S. degree for knowing how to make a balanced ration, that these girls in big white aprons don't know how to cook. Um! Um! They may do it according to science, but it's good.

They just formed you in double line, a lanky student chap in a white coat did that. Then they gave you a tray and a paper napkin and started you down the line, cafeteria style. There's no hotel in the land that could feed such crowds so expeditiously as they did at Ithaca this week. The cafeteria, by the way is the thing now at Cornell. Old student boarding houses have gone. The man with the tray, picking up his fare as he goes, is de riereur. Breakfast costs you about 13 cents; dinner from 23 to 44, and prunes and cake about 8.

You could write a book about that wonder house, the Home Economics building, and about its presiding genius, Miss Martha VanRensselaer—fine, old aristocratic name, that. The VanRensselaers took the manor of Rensselaerwyck from their high mightinesses the states general of Holland and started an aristocracy up the Hudson where Albany and Troy now stand. Here is one of them helping establish an aristocracy of brains on the same land.

A DISTRRACTING ARRAY OF LEARN-ING

Just 24 hours of Farmers' Week left my head in a whirl. If you've seen a placid pool in summer with water spiders darting hither and yon without number, you have a picture of that great rarified atmosphere of brains. Scurrying in every direction over the snowy windy plain, on top of the hill, in the campus of magnificent distances you could see black figures, like Peary's Arctic explorers seeking the pole. Only the pole these black figures sought was the lodestone of learning.

ORGAN RECITALS AND POULTRY KILLING

But we weary. Would you know all they talked about, send for the book that gives the mere skeleton of the week's program and let your imagination run riot among organ recitals, potato raising, apple bugs and markets, poultry killing contests, dressmaking, until your head swims—then you'll have a fair picture of the farmers of New York State at school for a week. It is an amazing school the State has there. Agriculture has made enormous strides in five years. Dean Beverly T. Galloway, "the man from Missouri" in more senses than one, gave me a courteous half hour. He told me in 1910 there were 967 students in the New York State College of Agriculture. In 1911 there were 1,451; in 1912, 1,779; in 1913, 2,305; in 1914, 2,557; in 1915, 2,830.

Of all the colleges connected with Cornell University, the College of Agriculture is largest. The great wave of engineering is past; the wave of agricultural training is near its crest. In the eight other great agricultural colleges in the country there is similar showing.

I could tell you a bookful about this college which the people of the State of New York own and which 5,000 of them have been enjoying this week. I could tell you of its three deans—the pioneer, Isaac P. Roberts, who cleared the land and planted the poet, Liberty H. Bailey, who nurtured, inspired and showed. I could go on and tell how the demands of the times brought forth from nothing this great educational plant that stands you in millions of dollars. I could go on and on; but you never would get deeper into the matter than when you sat in that vast darkened amphitheater, and heard the great heart of the Empire State pour itself out in song; for, after all, unless you've a song in your heart and a vision in your soul you can't be a successful farmer.
The Poultry Packing Industry of the Middle West
BY E. C. HEINSOHN '15
Food Research Laboratory, Bureau of Chemistry, United States Department of Agriculture

The Secretary of Agriculture of the United States, in his report for 1914, announces that the annual value of the poultry products in the United States aggregates half a billion dollars. Poultry and eggs therefore represent an agricultural product nearly equal in money value to the hay or the wheat crop.

Though the production of poultry and eggs is widespread, only the States of Ohio, Indiana, Illinois, Iowa, Minnesota, Nebraska, Kansas and Missouri (the Corn Belt States), and Texas, Tennessee and Kentucky, produce more than are consumed within their own borders. As a result, these States ship vast quantities of their product to the Eastern markets. It has been only in the last few years that the great improvements in the preparation and shipping of these important foods has made it possible for the Easterner to receive his products in a first-class condition although they have been raised on farms a thousand miles or more away.

In order to handle this business of centralizing and preparing the poultry and eggs for the markets, the tremendous poultry packing industry of the Middle West has sprung up in a miraculous way. From a few small, scattering houses of twenty-five years ago, this industry has increased until to-day it represents a capitalization of many millions of dollars. To illustrate, several companies have built feeding stations, used entirely for fattening poultry, which alone cost over $75,000.

It is the purpose of this article to tell something of the story of the chicken from the time it leaves the farm, down through the fattening, killing and picking, cooling, grading, packing and shipping, to the consumer's table. The average resident of New York City, when he has a delicious, milk-fed roaster put before him, little realizes the many difficulties that must be met and overcome before it is possible for him to enjoy this tempting morsel.

The live poultry is brought to the small poultry house, either by the farmer himself or by hucksters who travel through the country buying from the farmers on a commission basis, usually a cent a pound. The small houses ship their birds to the large, centralized packing houses, where they are to be prepared for market. When the birds reach the packing house, the culls—or, in other words, the scrawny, weak-looking birds, which will not take weight no matter how well they are fed—are separated and the others are put into feeding cages, called batteries. In some feeding plants these batteries are stationary, but in the most efficiently constructed establishments they are portable. A portable battery is made of wood or galvanized iron wire and has four layers, each divided into four compartments. These batteries each hold from sixty to one hundred and eighty head of poultry, depending on the size of the individuals. The birds are fed, for periods varying from six days to three weeks, on rations composed of ground grains of various kinds, buttermilk, and skimmed milk.

The poultry packers have found it necessary to establish these extensive and expensive feeding stations because the average farmer will not sell his poultry in the condition most desired by the markets. If any one doubts this, let him take a trip through the markets and the butcher shops of our towns and cities, and he will be impressed by the poor quality and appearance of most of the poultry offered for sale.
The fattening season starts about the first part of June, with the broilers. It extends on through the summer, fall and early winter, and ends in January after the famous milk-fed roasters (young male birds weighing 3 ½ pounds or over) have made their appearance. The advantages of these milk-fed birds are obvious: there is more food material in the carcass and the meat is more tender and of a very delicious flavor; moreover, the produce is much more uniform in appearance.

After the feeding period is over the birds are starved for about twenty-four hours, having a plentiful supply of clean water only. This practice results in the emptying of the intestinal tract of foods in the process of digestion and of waste products to be thrown off.

The birds are now ready to be killed and picked. Dry picking is the best method of preparing poultry for market. When this method is used, the killing operation is accomplished by cutting the jugular vein through the mouth with a slender, straight-edged knife. Then that part of the brain tissue which controls the muscles holding the feathers in place is destroyed by a thrust of the same knife, and the feathers are so loosened that they are easily pulled out dry. There is another method of picking, known as scald picking. In this the bird is killed by cutting the jugular vein from the outside of the neck. The bird is then dipped into hot water, and the feathers come out very readily.

The dry-picking method is much the better of the two, for many reasons. Scald-picked birds do not keep nearly so well, because the hot water has so injured the skin tissues that resistance to the entrance of bacteria is greatly lowered. Moreover, scalding toughens the skin and dissolves out much of the delicious flavor.

It may be said here in passing that the viscera are not removed from the bird at this time. The United States Department of Agriculture has found, through very extensive investigations, that full-drawn birds will deteriorate much more rapidly than undrawn birds. Therefore it is more sanitary to leave the bird undrawn until it reaches the housewife's kitchen.

Cleanliness being one of the watchwords of modern poultry dressing, the heads must be freed from blood and...
neatly wrapped in paper. This is usually done just before the birds are put into the chillroom. The up-to-date packer no longer uses ice water to remove the animal heat from the birds. They are hung by the feet on racks made entirely of metal, and put into clean, insulated rooms in which a temperature of about 32° F. is maintained. The temperature of live chickens is about 103° F. This must be reduced to 32° F. before the birds can be packed for long hauls in refrigerator cars. Unless this is done, the stock will quickly spoil and will arrive on the market in a condition which the commission men call “green-struck.”

After cooling, which takes about twenty-four hours, the grading and packing of the birds is the next step. This is done in rooms cooled down to about 30° F. The birds are separated into the various grades, the commonest of which are as follows:

- Broilers—Young birds of either sex, weighing 2 pounds or less.
- Fryers—Young birds of either sex, weighing between 2 and 3 pounds.
- Roasters—Young birds, weighing over 3 pounds.
- Fowls—Hens more than a year old.
- Cocks—Male birds over a year old, or young males that show too much development of comb and spur to be sold as roasters.

Each grade is put into a separate container. The prevailing method at the present time is to pack the chickens in boxes holding a dozen each. If the birds are broilers, they are placed with their breasts up and their feet hidden; if fowls or roasters, they are packed two layers to a box and laid on their sides. Care is taken that all twelve birds in a box are uniform in size, quality, and color of skin. The boxes are lined with parchment paper to protect the skins and to prevent evaporation. The product is now loaded on the refrigerator car.

The best packers are rapidly abandoning the old method of ice-packing their poultry. In this, after being killed and picked, the birds are thrown into tanks containing ice water. They are left here until the animal heat is removed, and are then packed with ice in sugar barrels, in which layers of chickens alternate with layers of ice and on the top is put a “header,” or piece of ice weigh-
ing from 50 to 75 pounds. These barrels are put in refrigerator cars and shipped. This system of cooling and packing has many disadvantages. The birds will not keep, because the moisture breaks down the bacteria-resisting power of the skin. Much of the soluble protein is dissolved out and in its place the water is soaked up; it has been estimated that in a carload of ice-packed poultry some four hundred dollars' worth of food value is dissolved out and lost in the ice water.

We must return to the packed box, which we left in the refrigerator car ready to start on its long journey to market. The loading of a car containing 20,000 pounds of poultry, the car lot of the Middle West, can be accomplished in half an hour if the work is properly planned. It is done as quickly as possible in order to prevent a rise in temperature of the car. For best results the load is not made any higher than four feet, for above that height the temperature of the car is not low enough.

Having loaded the car and observed the temperature, so that the packer may know under just what conditions his goods start on their journey, the doors are closed and sealed. At intervals varying from two hundred to four hundred miles, the car stops at icing stations and the bunkers are refilled with ice and salt. The doors of the car remain closed until the market is reached. If the birds have been properly dressed and chilled, if the refrigerator car is well insulated and built, and if the cars are re-iced as needed during the haul, the poultry will reach its destination in first-class condition.

Usually the car is consigned to some commission man. As soon as he receives it he transfers it to his refrigerator rooms, kept at about 32° F. In the handling of poultry the facilities of the middleman and the retailer for holding the goods in a chilled condition are of great importance. Refrigeration in the packing house may give excellent chilling facilities, the railroad refrigerator car may maintain the necessary low temperature throughout the haul, and yet inadequate refrigeration between the arrival of the poultry at the market and its final sale to the consumer may render the previous good work valueless. Once having been chilled, the poultry must be kept at a low temperature until it is ready to be consumed, because fluctuating temperatures cause a condensation of moisture and a consequent activation of bacteria and enzymes, with resulting decomposition.

The commission man, in his turn, sells the poultry to the retail butchers. The better stores now all have some kind of refrigerator in which they hang the product until it is sold. The former method of using zinc-lined, drained

(Continued on page 508)
Methods I Have Used in Making a Success of Poultry

Factors by which a Cornell student has made good in the business

BY SOLOMON YADLOVKER, W. P. C. '13

Since the "back to the land movement" started about eight years ago, poultry raising has attracted more "back to the landers" than any other branch of farming, but the per cent of those who succeeded is rather small. Nearly all the failures can be attributed to lack of experience, starting in too extensively and not being in a position to give proper care and attention to the foundation stock.

That there is a good margin of profit in poultry, there can be no dispute, but to be successful it is absolutely necessary to have love and enthusiasm for the work in addition to thorough knowledge of poultry farm management. All these coupled with good business judgment will lead to success.

There are three ways of starting in the poultry business; first, buying yearling breeding hens and using the eggs for hatching; second, buying hatching eggs; and third, starting with baby chicks. For the beginner with limited capital and experience the easiest and safest way is to start with baby chicks. For the beginner with limited capital and experience the easiest and safest way is to start with baby chicks, and brood them in a coal burning colony brooder of 350 to 400 capacity. From three years experience with coal burning brooders on a large scale I find that it is best to put from 350 to 400 chicks under one heater, instead of 500 as recommended by some manufacturers. The results will be far better and more satisfactory than the old way of brooding in long brooder houses.

In purchasing the foundation stock either in the form of breeding hens, hatching eggs or baby chicks, it is of utmost importance that the parent stock be of strong vitality and free from disease, because upon the foundation stock depends the success or failure of the poultry farmer.

For over three years we have been using the following methods in carrying on the work on the Hudson River Farms and have obtained good results. All our 7,200 fowls, 3,500 of which are breeding hens, are fed according to the Cornell formula of grain and mash, except during the breeding season when the amount of beef scraps is reduced for the breeding hens and the amount of grain increased to induce exercise. This assures stronger germs.

Handling Hatching Eggs.

Hatching eggs are gathered three times a day during cold weather to prevent the eggs from being chilled. Only eggs of medium size, perfect in shape and color, are selected for hatching. Until we get the desired number of eggs to fill the machines, they are placed in regular shipping cases and kept at a temperature of 50 degrees. The cases are turned daily to prevent the germ from sticking to the shell.

Putting Eggs in the Incubators.

Before placing the eggs in the machine, the compartments are thoroughly sprayed with a one per cent solution of coal tar disinfectant. The eggs are placed in the machine directly after the spraying and while the compartments are still steaming.

Beginning on the third day, the eggs are turned and cooled until the nineteenth day. There can be no set rule as to how long to cool the eggs as it all depends on conditions and environment, and must be left to the judgment of the operator. The eggs are tested on the seventh and sixteenth days.

Before closing up the machine after the last cooling, the compartments are liberally sprayed with warm water to insure a more uniform hatching. We
have found that the chicks are stronger as a result and do not stick to the shell. After hatching, the chicks are kept in the machine for 36 hours.

**Brooding.**

Before moving the chicks to the colony brooders the brooder heaters are run for a week at a temperature of 102-103 degrees to insure a steady and uniform heat during the first week of the chick's life. More chicks die from chilling than from any other cause. The floors are covered with short cut straw. A mixture of fine grit and charcoal is sprinkled in the litter and on pie tins. Care must be taken not to put too much grit and charcoal for the chick to eat, but just enough should be fed to clean the digestive system. Fountains filled with sour skimmed milk are set on one inch boards about eight inches from the curtain, every effort being made to enable all the chicks to get their portion of sour milk. To prevent the chicks from wandering away from the heat, a one-half inch wire, twelve inches high is placed in a circle from the curtain. After the second day, the circle is enlarged gradually, and on the sixth day the wire is taken away and the chicks are given the full run of the 12x12 house. Care is taken to have all the corners cut off by tacking wire in a semicircle. By that time the chicks have sufficiently learned where to look for heat when uncomfortable; consequently the loss from chilling is practically eliminated.

We always make it a point to move the chicks to the brooders in the afternoon, because by the time the entire hatch of 3000 chicks is moved to the brooders, it is nearly dusk. At this time it is easier to teach the chicks where to look for heat and comfort. If the chicks are moved to the brooders in the afternoon, the first feed is given the next morning after all the fountains are filled with fresh sour skimmed milk. The feed consists of one part by weight of crushed table oat meal to two parts of bran, fed five times a day in little troughs made of lath. The mixture is sprinkled with a little fine grit and charcoal. On the third day, the noon feed of oatmeal and bran is omitted and chick grain is fed in the litter morning and in the afternoon. On the fifth day, the noon feed of oatmeal and bran is omitted and the Cornell mixture of mash is fed instead. Beginning with the sixth day, grain is fed in the litter in the morning and in the afternoon with Cornell mash, grit and charcoal in hoppers before them all the time. Sour milk is given exclusively as a drink for the first two weeks. We found that it repaid us many times even at the price of 90 cents for a 40-quart can of milk. On the seventh day, cut sprouted oats are fed sparingly at first and more liberally thereafter.

After the first week the heat is gradually decreased and the chicks are induced to go outside. To prevent the chicks from straying away and from huddling in corners, a semicircle wire fence is put two feet from the house for the first two days. It is taken away altogether after a week or ten days after which we have no trouble in getting the chicks to go to their houses.

During the first three weeks of brooding, the chicks are closely watched and are induced to exercise as much as possible because we find that all the "idlers" are a source of trouble. All the chicks that show a lack of vitality are destroyed. During the fifth week, roosts made of 1x2 inch strips are put six inches from the floor. The heat is usually discontinued between the sixth and seventh week depending on weather conditions, but the heaters are not removed. When seven weeks old, nearly all the chicks are on the roosts. Then the heaters are taken out.

When the chicks no longer need heat, the cockerels are put in a large house provided with roosts, a very large run and plenty of hoppers. The cockerels have access to fresh water, mash and grain all the time. They are marketed at the age of eight to ten weeks and weigh about one and one-fourth pounds.
After removing the cockerels, big hoppers containing the Cornell mash and grain mixture are placed before the pullets at all times. They have a 10-acre run in a field seeded to wheat and hay. Fresh water is provided several times a day and changed more frequently during the hot weather. Under these conditions and with plenty of shade the pullets make rapid growth.

**Moving Pullets to Laying Houses**

The pullets are kept on the colony range until they are six months old, when they are moved to winter quarters, the object being to get them accustomed to their environment and their attendant before they begin to lay. The attendant is required to spend all his time in walking slowly and cautiously through the houses to get the pullets "tame."

For a few nights a lantern is hung in the houses for a half hour after dusk in order to get the pullets accustomed to the light. This we find very helpful in detecting colds.

**Diseases of Poultry and Their Prevention**

During cold damp weather in the fall and spring a poultryman must always be on the lookout for colds which cause serious trouble and great loss. It is advisable to walk through the houses with a small light and remove all birds which show symptoms of colds. This can easily be detected by the sneezing of the fowls or by watery eyes. If properly attended to at this stage, the fowls are easily cured, but if neglected, roup may develop. When colds are detected in the flock a few crystals of permanganate should be put in the water.

The most common diseases in poultry are colds, roup and chicken pox all of which can be prevented in a great measure by keeping the houses dry, clean and sanitary.

Chicken pox can be treated with glycerin and a two per cent solution of carbolic acid.

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**A Venture in Poultry**

**BY E. K. MULLER, ’98, M. E.**

EIGHT years ago a nervous trouble attacked me rather suddenly, and as a result it became difficult for me to walk. Following the advice of leading neurologists of the country, I gave up my profession of mechanical engineer and retired to the country. Never before had I lived outside a city, and I was so uninformed about things rural that I could brag of a speaking acquaintance with but two grains, corn and oats. On the other hand, my wife had been born and brought up in the country, and to her judgment and cooperation should be credited any success that we have attained.

While living in Brooklyn we always had great difficulty in obtaining eatable eggs and poultry, these products being so unreliable in quality that we had been forced to give up their use for table purposes. Having in mind this scarcity of desirable poultry products, and having always had a desire to raise chickens, we decided to try the business.

Late that fall we bought forty Single Comb White Leghorn pullets and ten hens, built a 12x16-foot house in which to keep them, and then proceeded to spend most of the winter on a soap box in that house watching and studying those hens. They became so friendly that it was not unusual for a hen to lay an egg in the open end of the box. When eggs began coming we wanted to give our relatives in Brooklyn a treat, and so we shipped them a few dozen. Since that time we have never had any difficulty in selling eggs at a fancy price. Our relatives went wild over them, their neighbors heard about them and wanted some, the neighbors’ friends next came
in line, and finally the grocers who catered to these people. There was nothing for us to do but go out and buy from the surrounding farmers.

As we received at least thirty cents a dozen when eggs were cheapest, and as we bought them at the wholesale local market price, we made some profit. During freezing weather we bought chickens, ducks, and turkeys, which we dressed and shipped to the home of my sisters, where the neighbors would go to get what they had ordered the previous week. In my later visits to Brooklyn I have been thanked most effusively many times for "those lovely eggs" by persons who had been good customers for several years but whom I had never before met.

It became evident that with a representative in New York and Brooklyn willing to spend one or two hours a week in disposing of our products we should be warranted in expanding the business just as fast as experience would permit. My brother-in-law took up that work, and by the fifth year we reached the limit we had set—a plant of sixteen hundred laying hens, arranged so conveniently that one man could do all the outside work the year round with extra help about once a week during two or three months in the spring. My wife took charge of the incubation and brooding—except the heavy work—while I attended to the cleaning, sorting and packing of the eggs, and the bookkeeping end of the business. Arrived at this stage, we dropped all customers taking less than half a crate at a shipment.

We now have an outlet among grocers, delicatessen stores, restaurants, steamships, and summer resorts, at a standard price of five cents above New York quotations. Eggs for the groceries to get what they had ordered the previous week. In my later visits to Brooklyn I have been thanked most effusively many times for "those lovely eggs" by persons who had been good customers for several years but whom I had never before met.

Our incubating outfit consists of a 13x16-foot cellar containing four 390-egg and one 240-egg Cyphers machines, giving a nominal capacity of 1800 eggs—the actual capacity is about 1730. We have persistently and conscientiously set large, well-shaped eggs from mature stock—never from pullets.
The result is that the strain has increased in average weight from six to seven ounces, as nearly as we can judge. The pullets lay very few eggs below the standard size, whereas formerly these diminutive eggs came in such numbers that they had to be sorted out and sent to a commission merchant for what they would bring. From all eggs set during the last three years we have obtained 63, 50 and 60 per cent of good chicks, respectively. During the same period, 25.2, 19 and 21.6 per cent, respectively, of all eggs set have resulted in pullets housed; or, 38.3, 35.3 and 35.6 per cent of all chicks hatched have resulted in pullets housed. While the percentage of all eggs hatched resulting in vigorous chicks is only fair, there must be taken into consideration the fact that the incubators were running comparatively early in the season; the first machine was set in March and the last one the latter part of April. If we were to postpone incubation for one month, this percentage would undoubtedly be much higher. Our object in early hatching is to have the chicks at a safe age by the middle of June, when the fine weather begins. We plan to spend several afternoons a week then in driving and studying nature. It would please me to relate how much more we are getting out of life than we did when we lived in the city—but this is a chicken story and the space allotted me is limited.

The brooding apparatus consists in part of ten Cyphers hovers in a 55x17-foot double-wall brooder house (where the first hatch is placed). The general temperature of this is kept between 60° and 70° F. by a coal-burning stove in the center. With this arrangement it is very necessary to have a window at each peak, so regulated as to provide positive circulation at all times. We also have three Cornell gasoline brooders and four Hall coal-burning brooder stoves in 10x7-foot colony houses. There are three yards, one for each hatch (group of machines set), for it is out of the question to expect success if one mixes chickens of different ages. We have enough brooding apparatus to make it unnecessary to remove the pullets from their original brooders during the season. The changing of chicks from their original quarters entails a large amount of labor, much worry, and some loss.

As we are limited for room, we dispose of the cockerels as soon as their
Water is supplied at required points from pressure system run along fences.

Weight reaches one and a quarter pounds. The commission merchants will accept them at one pound, but we allow the extra quarter pound for shrinkage during transportation. There is another advantage in shipping cockerels early: the market drops as the season advances. Before shipments are made, we pick out and yard away from the pullets, those cockerels that give promise of making fine breeders.

As we use Cornell methods of feeding there is very little to say concerning this point, except to emphasize the great importance of sprouted oats and the mixing of curdled milk with the mash. We prefer to incorporate granulated charcoal in our dry mash rather than feed it in separate hoppers.

In the fall the pullets remaining after the culls have been weeded out are placed in a house 184x16 feet in size, where they run in one flock. Our breeders are selected in October by the eye method (external characteristics), in which we have been instructed by Cornell experts. Since adopting this system the stock has made a better laying record during the late summer and early fall.

The mature stock is also fed according to Cornell formulas. In this connection it might be of interest to state how much grain should be fed—a question always asked us. For layers, when wheat and corn are the only ingredients, we use eight quarts, and when oats are added to the ration, ten quarts, to a hundred hens. This may have to be decreased or increased slightly according to the appetites of the flock or the season of the year. Of course, the greater part of the ration must be fed in the late afternoon, just enough having been scattered in the litter during the day to keep the birds working. We buy all grains, ground feed, winter greens and even straw for litter, in the open market. The straw we prefer in bales, as it is then easily and quickly handled in all kinds of weather.

It has been our experience that the amount of winter greens (beets or cabbage) fed may easily be overdone. Some prominent authorities advise as much as twenty-five pounds to a hundred hens, or a quarter of a pound to a hen. This would be disastrous to our egg record, five pounds to a hundred hens, when all of it is eaten, being what we consider the right amount. Our pullets lay eleven dozen eggs a year, our hens nine and a half dozen. It must be taken into consideration in this connection that the record per hen could be much improved if the layers were divided into small flocks. In this case, however, one man could hardly take care of one-half our total; and as we are after tangible results, we are willing to sacrifice egg records to dollars and cents.

Our total investment to date is close to $7,000; this includes houses, stock, fencing, tools, vehicles (not forgetting the “Flivver”), horse, and all other equipment. Our annual profits average safely over one dollar net per hen. This does not include interest on investment; on the other hand, no account has been taken of the eggs and poultry consumed in the home and given away, neither has any value been given to the manure, which of course is a big item. Profits could also be increased by a person able to do his own work, practically eliminating my labor bill of over $600.
Capron Production
BY W. J. BUSS
Ohio Experiment Station

The constantly increasing prices of all kinds of meat have given poultrymen an excellent opportunity to devote special attention to the production of fowls for meat. All poultrymen sell some chickens for meat but they are usually old hens which have passed their period of usefulness in laying eggs. Surplus cockerels are sometimes sold, but both the cockerels and the old hens are sold when low prices prevail, and when there is little profit. With the heavier breeds, the profit can be increased materially or a loss turned to profit, if they are caponized and sold during the winter, rather than being sold as cockerels during late summer or early fall when prices are very low. As a rule, caponizing cockerels of the lighter breeds, such as Leghorns, is not profitable. Such fowls should be sold as broilers when they weigh one to two pounds. As long as the prices for capons, which have prevailed up to the present time are maintained, capon production will usually yield a better profit than will the production of other kinds of market poultry.

A CAPON USED TO BROOD CHICKS

The production of capons has received considerable attention in relatively limited areas surrounding the two principal capon markets of this country, Philadelphia and New York. In Ohio, Indiana, Illinois, Iowa and Missouri where is to be found more than one-third of the poultry of the United States, there is abundant opportunity for the production of a vast number of capons annually. In these states, the production of capons, with a few exceptions, is almost unknown. This scarcity of capons in these states is due to a lack of knowledge regarding the advantages of caponizing on the part of the farmers. If the production of capons were to become general on the farms of this great poultry section, it is probably true that more capons would be produced than the markets would absorb at the high prices which have prevailed for capons up to the present time. However, until produce merchants buy live capons at a price considerably higher than that paid for ordinary live poultry, the production of capons will not become general, because only a small percentage of the farmers care to take the trouble to kill, dress and pack capons in a way necessary to have them sell to the best advantage on the market, and the few who will go to this extra trouble will continue to reap the benefit of high prices that have prevailed for capons.

The American breeds are best adapted to produce capons on general farms. In my opinion the Plymouth Rocks rank first, followed by the Rhode Island Reds and Wyandottes. The Asiatic breeds, especially the Light Brahmas, produce larger capons, commanding a higher price on the market than those mentioned above, but because of their relatively slow maturity and the fact that they will not, as a rule, produce as many eggs as will the American breeds, the
METHOD OF PACKING CAPONS IN BOXES

When packed this way the capons show up to the best possible advantage

Brahmas are not so well suited for use on general purpose farms, where it is desired to produce as many eggs as possible in addition to producing meat. Some have favored a cross between the Light Brahmas and Barred Plymouth Rocks for capon production. In using cross breeds, it is always necessary to maintain three flocks—two of pure breeds and the cross bred progeny—which causes considerable extra trouble. There is also a lack of uniformity, both in color and size of the capons which is not the case to such a marked degree, when a single breed is used.

Chicks intended for the production of capons should be hatched as early as possible, so that they may attain a maximum size by the first of January and not later than the first of March. Where the natural method of incubation is used, it is not generally possible to hatch any great number of chicks before the middle of April. If incubators and artificial brooders are used, the chicks should be hatched not later than the middle of March.

Until they are caponized, the cockerels may be confined with the other chicks. The time of caponizing depends largely upon the breed. With the American breeds, the cockerels may usually be caponized at 12 to 15 weeks of age, or at a weight of 1 to 2 pounds. With the slower maturing Asiatic breeds, it is necessary to allow the cockerels to get somewhat older before they can be distinguished from the pullets. Instructions for caponizing are, as a rule, included with instruments sold for this purpose. Farmers' Bulletin 452, which may be secured upon request to the Secretary of Agriculture, Washington, D. C., will be found of interest in this connection.

It has been quite commonly recommended that the capons receive only soft feed for a few days after the operation. At the Ohio Experiment Station during the past three years, we have fed the capons, immediately after they were caponized, on the dry rations which they had been receiving before the operation, without any apparently bad results. It seems doubtful if it pays to go to the extra trouble of supplying soft feeds for a few days after
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the birds have been caponized.

Best results have been secured in growing capons when they are given range on a good grass plot and fed a ration composed of corn and scrap meat or corn and tankage. The following data taken from the Ohio Station Bulletin 284 may prove of interest in this connection.

Rations Used.
Proportions Are by Weight.
Lot 1—Grain—Shelled corn.  Mash—Ground corn, 2; meat scrap, 1.
Lot 2—Grain—Shelled corn.  Mash—Ground corn, 7; tankage, 3.
Lot 3—Same as Lot 1, but confined to house.
Lot 4—Grain—Corn, 11; wheat, 15; oats, 4.  Mash—Ground corn, 2; bran, 2; meat scrap, 1.

Lots 1, 2 and 4 had range on one-sixth acre of good blue grass and white clover sod. Lot 3 was confined to the house with no outside run. The grain was fed twice daily. The mash was fed dry in self-feeding hoppers. The amount of grain fed was so adjusted that the capons would consume half as much mash as grain. At times it was necessary to close the hoppers for a part of the day, to keep them from eating too large a proportion of mash.

The results show that there was practically no difference between Lot 1 which received a ration of corn and meat scrap (guaranteed to contain 50 per cent. of protein), and Lot 2, which received a ration of corn and tankage (guaranteed to contain 60 per cent. protein), except that, at the prices used in these calculations, the cost of feed per pound gain was slightly lower with the corn and tankage lot. Lot 3 which received the same ration as Lot 1, but allowed no range, gained 17 per cent less per bird and consumed 17 per cent more feed per pound of grain than did Lot 1. The gain per bird in Lot 4 which received the variety ration, was slightly lower than in Lot 1. The cost of feed per pound of gain was 30 per cent higher for Lot 4 than for Lot 1.

A ration of corn and skim milk would be expected to give as good, if not better, results than a ration of corn and meat scrap or corn and tankage.

The accompanying illustration shows the method of picking the capons and packing them for shipment. The capons should always be dry picked. It is customary in picking capons to leave the feathers on the neck about three inches back from the head; on the legs about two inches above the hock joints; on the two outer joints of the wings; on the tail; and on the back around the base of the tail. The box in which they are packed for shipment should be lined with water-proof paper. The first layer of six birds should be placed in the box with breasts down and heads and feet up. After placing paper over these, the upper layer of birds should be placed with breasts up, and heads and feet down. When packed in this way, the capons show up to the best possible advantage no matter from which side the box is opened.

Marketing Poultry Farm Products
BY EARL W. BENJAMIN
Professor of Poultry Husbandry, New York State College of Agriculture at Cornell University

THE marketing of poultry products is a problem involving questions only slightly different from those involved in considering the marketing of any farm produce. Studies of the so-called high cost of living have brought us to the point where we can at least see the problem more clearly even though we are far from understanding all of the details, nor can we be sure
of the advisability of changing certain of our present methods. We must, however, keep working for the development of a more efficient, more sanitary and, consequently, more satisfactory method of handling these products.

The experimenters, educators, producers and consumers should not feel that these business associates generally called middlemen are lacking in sympathy with this agitation for the improvement of methods. For the most part the middlemen are deeply in sympathy with such actions, but their ire is very often aroused by such unscrupulous ideas and actions as are frequently put forward by theorists and reckless agitators. Such unscrupulous actions are frequently found in the form of state laws, municipal rules or the actions of boards of public health, or other political officials who are catering to the general public opinion. This agitation has, in itself, been an incentive for the middlemen to be ever on the alert to improve their methods whereby they can give greater satisfaction to the two classes to whom they cater; that is, greater satisfaction to the shippers and the receivers, whether they are other middlemen or the producers and consumers themselves.

As we think of the work that has been done along this line up to the present time let us not look upon it as the struggle of the producers and the consumers on the one hand for a right cause, as against the struggle of the middlemen on the other hand for a wrong cause. As a matter of fact, all are working for what they believe the benefit of themselves; which, as a rule, means the benefit of their community. We must realize that it is the salvation of the middlemen to give satisfaction to their customers. Their customers are their assets. If we look at this question carefully for a moment I think we can at least realize that all of us are involved in this problem of improving market conditions. We must not condemn the other fellow because he is working along a different line of attack. He may be solving more efficiently than we.

Present Systems Developed by Competition.

The writer likes the comparison of the present routes of market products from the farm to tightly drawn entanglements of hard, twisted cords, each cord connecting a certain point on one side of the entanglement to another point on the other side of the entanglement. There may be a few cords which are not mixed in the entanglement joining such points, but for the most part, all of the cords must pass through this tightly drawn mass. We may consider that the cords represent the market routes; the two points connected, the producers and the consumers, and the fact that the cords are entangled signifies that there are no definitely established routes for the passage of these market products, but that they pass from dealer to dealer in various ways. The fact that the entanglement is tightly drawn signifies that competition requires every dealer to hurry his products through this marketing maze by as short a route as possible, always keeping the welfare of his customers in mind.

From the outside it looks very easy to cut out the great mass of this entanglement and to connect the producers and consumers direct by means of short routes, but as soon as we try to arrange such a route we find that every time we drop a middleman there is a certain piece of work which someone else must take up, but which no one can afford to take up without getting a living from it. For instance, the huckster who goes through the country from farm to farm gathering eggs, meets the farmer face to face on his own ground; he can exercise the appeal of personality in holding his trade; he gets the eggs regularly and if they are not clean, he can show the farmer this condition; he carries the eggs to a shipping point; he looks after packing the eggs so that they can be shipped without damage; he pays cash to the farmer or gives him other value so that the farmer is not taking any chance of a loss; he takes all responsibility for the quality of the products and of the profit
or loss to be made. For the most part the farmers are unwilling and unable to assume much of this responsibility.

We cannot drop the country huckster without dropping the work which he is doing. As contrasted to this example of the producer we have the consumers who wish to have a supply of eggs or other products just around the corner where they can get in touch with the dealer by telephone. They wish to have the supply handled in such a way that a half dozen eggs can be delivered before breakfast if needed, and if the eggs are not all satisfactory, more eggs must be furnished to them free of charge. The city grocery store has been developed for just this sort of trade. If we drop the city grocery store with its expensive management, we must drop the credit which it advances; we must drop the frequent deliveries; we must drop the availability of the supply; and these responsibilities must be taken up by other people.

A consideration of these conditions simply impresses us with the fact that our present market methods have been developed as our needs have changed. Competition has continually weeded out the inefficient people until we now have about as efficient a system as it is possible to obtain and still get the service which we are demanding.

One of the easiest things for a person to say is, "if I were doing that I would do it differently." The result of such statements and ideas as this has been the advancement of many theoretical plans for the change of our present methods of distribution. The result of several people getting together with such ideas as this has been the development of co-operative movements which have not been based upon sound business experience and which are consequently doomed to failure from general principles alone. Theorists who take pleasure in advancing new ideas have often been responsible for encouraging the organization of co-operative societies. These co-operative organizations have undertaken the work which middlemen have been doing and in a great many cases they have found that they could not do the work as efficiently as the middleman. The only place where a co-operative organization can succeed better than an individual is where the co-operative association actually does the work in a more efficient manner and gives better satisfaction to every one concerned. Such results as these can only come where the manager of the organization or the board of directors use better business methods than the original business man used.

Organizations Are Beneficial.

Successful co-operative organizations are very common. In comparing the results of several different co-operative organizations which have come under my observation, I have noted the following advantages, some of which are financial benefits and some of which are of much greater value in the establishment of a strong, virile community:

1. Organization tends to make the farmers feel that they are not alone. There is an opportunity and an incentive to exchange ideas. The problems dealing with the organization work often start discussions along other lines. These may be even more highly beneficial than the original question. The organization is usually a means of disseminating information, such as is contained in bulletins and circulars, and which might be obtained from lectures or demonstrations.

2. When individuals are thrown together in organizations they develop a certain pride in the products which they are producing, and make special efforts to produce a better quality, or a quality which will be at least as good as the average for the whole membership.

3. Better prices are usually obtained for the products at least after the organization has been doing business for a reasonable length of time. Better prices are the result of improving the quality and standardizing the products. Care should be taken, however, that the members do not depend upon better prices entirely for their loyalty.

4. If the prices received by the mem-

(Continued on page 506)
The Man on the Land on the Other Side of the World*

BY BEVERLY T. GALLOWAY
Dean, New York State College of Agriculture at Cornell University

V. TROPICAL AGRICULTURE

One does not usually associate Hong Kong with the Tropics; but with the November sun almost straight overhead, beating down on the decks of our ship, and with the temperature above the nineties, we began to feel that the equator could not be very far away.

Hong Kong was merely a stopping place, and after a glimpse of the wonderful city, built on the steepest of hills, we sailed away into the southern seas, glad of the fresh, life-giving air after the stagnant conditions in the landlocked harbor. In passing, it may be said that one of the most beautiful sights it was our lot to see was the view at night from the harbor of Hong Kong. The semi-tropical twilight is short, and as the outlines of buildings and shipping faded in the gloaming, a myriad of lights sprang into view. These lights, beginning at the water's edge, rose almost straight into the air on all sides; so that, located as we were some distance from shore, it was like being at the bottom of a gigantic bowl whose sides and top were lined with stars, for the lights on the steep hillsides merged so gradually into the stars themselves that one could not tell where the stars began and the lights ended.

So we sailed away into the night, and only the captain of our good ship knew that we were headed straight into the terror of these seas—a typhoon coming up from the Philippine Islands. For many years these typhoons have swept the seas, and the annual toll of human lives and property was formerly enormous. No systematic attempt had been made to study them until the time when, long before America came into possession of the Philippine Islands, a Catholic priest located there had done some wonderful work in looking into the causes of these storms, the paths taken by them, and their effects. This work has been a boon not only to seamen, but to the people on the coast of China and Japan as well, who always received the full shock of the winds. A warning sent out by this good father would reach the shipping points several hours ahead of the storm, giving every one knowledge of its approach. At one time there was some error in the transmission of the message, and as a result the storm broke over Hong Kong and more than ten thousand lives were lost. No ship is safe in Hong Kong harbor when one of these typhoons is blowing. With the boom of the warning gun, which is located on one of the high hills overlooking the city, every ship at anchor either puts to sea or seeks refuge in near-by safe harbors. We had thirty-six hours of this storm, and, in the language of an old Scotch lady, "It was a fair grand

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*This is the fifth of a series of articles on farming in foreign lands. The first article appeared in the October number of the Countryman.—Ed.
sight but a wee bit wearying to the flesh."

Our first glimpse of the real Tropics was at Singapore, where we stopped for a couple of days to take on coal and to ship a great mass of miscellaneous cargo for the ports of Europe. Immense quantities of rattan were taken aboard here, and we loaded enough zinc ingots to sink a fair-sized ship. This zinc came from up Burma way and was consigned to various ports in Germany. It is interesting to note how much material can be stored in the hold of a ship. In a harbor such as Singapore the warehouses are piled with material whose bulk sometimes appears to be greater than the ship itself. With the aid of donkey engines and a most polyglot lot of laborers, this vast quantity of goods is stored away, leaving room for equally large quantities to be taken on at other ports.

Long before we reached shore we could see evidences of tropical vegetation—palms of many species, mango trees along the roads. Most beautiful and wonderful of all was a great tree, as large as an oak, with flowers like gigantic scarlet tulips. This flaming tree, with its setting of vivid green, could be seen from a distance of four or five miles off shore. We found later that the tree was rather uncommon in the Tropics and had never been introduced into our country. The seed pods are very much like those of our milkweed and the seeds are very abundant. We procured a quantity of the seeds and sent them to Washington, where they were planted in the greenhouses, and later the little trees were sent to the extreme southern part of Florida. This year Mr. David Fairchild, to whom the seeds were forwarded, reports that the trees are doing well and have blossomed for the first time.

Singapore is one of the greatest shipping ports in the world, and the flags of practically every maritime nation may be seen there. There is a large Chinese population, and many of these thrifty and industrious people are found controlling the small shops and stores as well as the farms and gardens around the town. Singapore is the great meeting place and clearing house for laborers who are to take part in the management of plantations in the Straits Settlements. The rubber industry is one that has attracted a great deal of attention in these parts. Millions of pounds sterling have been put into rubber trees, and some difficulty was being experienced in getting sufficient help to take care of them. Chi-
nese, Malays, Singhalese, Hindoos, Japanese, and many other peoples, were flocking into the region, attracted there by the high price of labor.

The country about Singapore is flat and the soil seems to be very rich. Most of the gardens and farms observed were devoted to crops for the needs of the white population. Chinese cabbage, many kinds of beans, yams, lettuces and other salad plants, with here and there meager patches of potatoes and occasionally a patch of corn, were to be seen. Rice is the staple food. Much of it is imported, but a considerable proportion of it is grown near by.

It was here that we saw a unique method of bringing pigs to market. The pigs were brought in alive, confined in cheap bamboo baskets—or, rather, the pigs were rolled in this bamboo covering with their legs sticking through the holes. Trussed up in this way they are unable to move and are carted about like so much cordwood. The Chinese use large quantities of pork in their diet. In this section they seem to prefer it to fish.

Our next stop was at Penang, a tropical port about thirty-six hours journey from Singapore. Penang is on the Malayan Peninsula, which extends southward from Siam; Malakka is one of the chief cities of this peninsula. It is only a comparatively short distance from Penang across to the island of Sumatra. At Penang we had awaiting us a great cargo of Sumatra tobacco which had been brought over from several small ports on that island because the larger ships do not call at such ports. This tobacco was consigned for the most part to firms in Hamburg and Bremen. The tobacco taken on at this port was valued at over a million dollars.

As the United States imports a great many millions of dollars worth of this brand of tobacco, it may be of interest to briefly describe the industry. The Sumatra wrapper has long been known for its high quality for cigar making. It brings a very high price because of its uniform leaf, silky texture, and freedom from large veins. The leaves are so uniform, as to both size, shape, texture, color, venation, and other characters, that cigar makers can always tell just how far they will go in the manufacture of their product. The Sumatra wrapper leaf is characterized by peculiar spots which have come to be almost a trade-mark for high-grade cigars. High-grade Cuban fillers with Sumatra wrappers constitute the most expensive cigars made. Most of the tobacco plantations on the island of Sumatra are controlled by the Dutch and the English. As the land is plentiful and cheap, no special effort is made at soil improvement. When new land is needed, the jungle is cleared and the crop is put in. It was our understanding that the great uniformity in the leaf was due to special advantages of soil and climate. We found, however, that this is not the case. Most rigid hand sorting is resorted to after the crop is grown, and it is by this means that uniformity is secured. Every leaf is handled and inspected either by experts or
under the eyes of experts, and, as labor is remarkably cheap, all this work can be done without putting a prohibitive cost on the product. The same amount of labor applied to a similar product in this country would bring the price up to five, or six, or perhaps eight, dollars a pound, which would be entirely prohibitive. Cheap labor is therefore the controlling factor in this part of the world, as it is in many other sections and in many other industries. Numerous importations of Sumatra seed have been made into this country and the industry has been started in New England and in Florida. Most of this tobacco was grown under cheesecloth tents, but still it has not come up to the imported product.

It was interesting to note the great care given to every package of this tobacco. The packages were about the size of a steamer trunk, all uniform, and all marked with the grade and brand of the grower or the dealer. The container was made of a species of tough grass, and not a piece of this grass was allowed to be out of place. In some instances, when the containers had been slightly torn, men were engaged in weaving new pieces of grass into the cuts in order to make the packages perfectly uniform. It is attention to such details as this that has developed the excellent markets for some of the foreign products and has made the products themselves standards throughout the world.

From Penang we had sailing in the tropic seas for nearly a week before we reached the island of Ceylon, where we planned to spend some time in order to make a careful study of tropical agriculture. Ceylon is one of the most interesting of tropical countries for the reason that it has long been under cultivation and yet there are jungles, wild lands, and wild animals in many parts of it. The island is about the size of Ireland, containing something over 25,000 square miles. It is 270 miles long, and 140 miles wide at the widest part. The outer edges of the island are for the most part flat, but the center is made up of hills and mountains where one may see some of the grandest vegetation in the world. The highest peaks of the island are upward of nine thousand feet high. The great variety of topography gives unusual opportunity for agriculture. In some parts the climate is fairly steaming, but in the higher regions it is more comfortable. The story of the crops and the people who till and use them we must leave for the next issue of The Countryman.

THE OFFER OF THE COLLEGE

To be at home in all lands and ages; to count nature a familiar acquaintance and art an intimate friend; to gain a standard for the appreciation of the other men's work and the criticism of your own; to carry the keys of the world's library in your pocket, and feel its resources behind you in whatever task you undertake; to make hosts of friends among the men of your own age who care to be leaders in all walks of life; to lose yourself in generous enthusiasms and cooperate with others for common ends; to learn manners from students who are gentlemen; and form character under professors who are Christians this is the offer of the college for the best four years of your life.

WILLIAM DEWITT HYDE
AS TO EGGS

Why is it that in some cities white eggs command a distinctly higher price than eggs with brown shells? * * * The fact remains that white-shelled eggs are, as a rule, laid by small-bodied, non-sitting hens that begin to lay early and keep right on until they hit the pot. On the other hand, brown-shelled eggs are laid by larger breeds, which do not average two eggs in three days, but make up for lost time when they do lay.


Farmers are a great social class and have a worth and dignity as such. It has wealth of enormous proportions, approximating one-fourth of the nation’s wealth; numbers of still greater proportions, practically one-half of the nation’s population; characteristics and interests which are common to its members and which differentiate it from all other social classes. Its work is worthy, its position secure, its future promising. * * * What it needs is to develop a class consciousness which is self-respecting, potent for organization purposes relative to government and marketing, and which operates to secure a greater regard for its rights and responsibilities.

—John M. Gilette.

Figures taken from the government report on Work and Expenditures of the Agricultural Experiment Stations show that there are now within the United States 62 such stations, employing 1852 persons. California leads in the number of staff members and Ohio has the largest appropriation.

Current Opinion for February reviews two expressions of rebellion against the whole spirit of orthodox science. The first is an attack against the Atomic Theory, written by Professor Norris W. Rakestraw and published in The Scientific American. The second is an attempt to show that “modern science is completely astray with its cell, its protoplasm and its mist ages.” The author is J. Henri Faber, a distinguished French entomologist, recently deceased, whose book The Hunting Wasp has just been translated into English and published by Dodd, Mead, New York.

CONCERNING RURAL CREDITS

To put a national farm-credit scheme into extensive operation will be the work of years. Congress should keep that in mind in its legislation on the subject. A good many hopeful people think it can be done in a few weeks; but they are doomed to disappointment.

—Editorial, Saturday Evening Post.

To measure the efficiency of men by mechanical standards in the term of production will not be accepted by labor. Men do not live by efficiency alone, and particularly productive efficiency. If efficiency merely means a greater output, doubled productivity and a twenty per cent wage increase—is it at all worth while? If efficiency means a broadened life, a broadened opportunity for initiative and progress, a greater quota of social happiness, it is well worth while.

THE FARM FISHPOND

If there are springs, creeks, and swamps on your farm that are not being used, make them serve as the basis for a fishpond. The College of Agriculture has issued a publication telling all about it.

The largest fish-producing streams of this country, according to the college authorities, have been transformed into sewers; others have been dried up; and still others have been stripped of their inhabitants by too much harvesting. Because of the increased population, the demand for meat is becoming greater, while the supply is decreasing. More meat must be raised in order to satisfy the demand. This can be accomplished, in part, by stocking farm fishponds.

The college authorities state that there are three types of fishponds, classified according to construction: the pond formed by damming a stream, the excavated pond, and the dike pond. The location depends, in a large measure, on the topography of the land and the character of the water supply. The College does not particularly recommend the first of these three types.

The cost of building a pond will vary with conditions. If any great amount of excavation is done, the cost will be high. Nevertheless, this item will not recur; the pond once properly made and stocked will be permanently productive and will require practically no outlay for maintenance.

The selection of fish for the pond will depend on the temperature of the water. All members of the salmon family, including brook trout, lake trout, and whitefish, require water below 70° F. If the pond is fed by a creek whose waters are exposed to the sun in various shallows, it is suitable for warm water fish, such as perch, black bass, sunfish, rock bass, and the like.

The annual value of the food used on a thousand farms recently surveyed by the United States Department of Agriculture was found to average $448 per family, of which 58 per cent was furnished by the farm.

Writing in The Constructive Quarterly, Professor C. E. A. Winslow, educational director of the New York State Department of Health, calls upon the American Church to make war on disease and poverty. "The churches, if they will, can rouse our people and the people of other countries to a crusade against disease which would be the most fruitful war that the world has ever known."

The revolutionary outbreak in Russia will be of a rural nature. * * * The main issue will be fought out far away from cities, on the land. Never was time so favorable for an uprising of all the discontented elements. It is not going to be a charming affair, and there will be much in the nature of the horrible peasant uprisings of the late Middle Ages.


Inefficiency is not confined to rural districts, according to an article by Stanley A. Dennis who writes in January System of the result of a national canvass undertaken by the Federal Trade Commission. There are 250,000 business corporations in the United States; of these over 190,000 make less than $5,000 a year and more than 100,000 make nothing at all. Overbuying, Poor Location, Bad Accounting, Poor Collection Methods and Lack of Capital are the explanations advanced.

In a special report to the Secretary of Agriculture the Forest Service states that "18 corporations control more than one-half of the total water power of the United States, while 6 corporations control more than one-fourth."

The College of Agriculture of the University of Missouri is urging the farmer to "Grease That Plow!" They recommend a mixture of whiting and hard oil, to be applied to the mouldboard with a soft brush and allowed to stand until spring.
We are glad to announce the election to the business staff of the Cornell Countryman Board of Charles Walton Bolgiano, '18, of Washington, D. C., from the sophomore business competition, and Charles Ennis, '19, of Lyons, N. Y., from the freshman business competition. In addition, we are glad to announce the election to the editorial staff of Almon James Fowler, '19, of Wyoming, Pennsylvania, from the freshman editorial competition.

The period from 1910 to 1913 was one of remarkable development in all matters relating to agriculture. During this period the Federal Department of Agriculture, the agricultural colleges in the various States, and the Agricultural Departments of the States made tremendous advances. In the Federal government, there were great increases in appropriations and many new projects were undertaken; in fact, so rapidly were funds made available, that it was extremely difficult to properly organize the work, so as to efficiently and economically take care of it.

At the same time that these events were transpiring, there was a wonderful development in the interest in agricultural education, and this interest was manifested by a phenomenal growth in the attendance at agricultural colleges. Beginning with the early part of the year 1914, however, there has been evidence that the crest of this great wave of agricultural interest, growth and development was reached. There seems to be plenty of evidence at this time that in so far as the Federal Department is concerned, and the Colleges of Agriculture, their work is becoming more stabilized.
For the current year there is further evidence of this stabilization in the fact that in nearly all of the larger agricultural colleges there has been but a slight increase in the number of students registered. We believe this is a promising outlook for agriculture. We believe that the time has come when opportunity will be given to advance the quality of the work. So rapid has been the growth of agricultural institutions, that in many instances it has not been practicable to do the things that should have been done and would have been done if conditions had been more stabilized. We may confidently look forward, therefore, to a period of more mature and better work for all of our agricultural institutions.

It is interesting to note the results of a unique self-census taken by the agricultural student body of the University of California as published in the December issue of the University of California Journal of Agriculture. Of the 600 persons in the College of Agriculture at the California institution, 450 have answered a searching personal questionnaire in regard to their reasons for attending college, their sentiments toward their courses, and their aspirations for the future. These answers have been carefully classified and grouped so as to give an excellent composite picture of the student body. It will be interesting to note how the results at Cornell compare with those of our sister California institution.

Following are the questions asked and the dominating features of the collective reply.

Were you brought up on a farm or ranch? Forty-one per cent were brought up on farms; 59 per cent were not. Only 32 per cent came to the University direct from farm homes.

How many years or months of actual full day's farm work have you ever done? The average for the entire registration was one year, seven months, and two days. Seventy-five students had never done a full day's farm work.

What was the one primary reason that you came to an agricultural college? Three came because of "health;" 87 came because of a liking for the arts and practices of agriculture; 260 wanted a general agricultural education; 50 specified some set phase of agriculture in which they wanted knowledge; 30 came for a general education, not especially in agricultural subjects; and 8 thought an agricultural education the shortest cut to a sure job. Fourteen could not say why they were in college. The predominating reason given was the desire to be educated in agricultural subjects; such answers comprised 56.8 per cent of all.

Questioned as to their preference in method of instruction, 53 per cent voted for laboratory work, 21 per cent for farm practice, 12 per cent for lectures, 9 per cent for text books and recitations, and 4 per cent for travel trips to farms.
What is the ideal position or work you would like to secure at graduation? Of the men who answered, 64.8 per cent would like to start farming at once on graduation; the remainder were divided between the various forms of agricultural teaching and extension. Only 2.4 per cent were interested in college positions.

What do you hope to be doing when you are fifty years old? Sixty-five per cent hope to be spending their declining years on farms; only 5.9 per cent hope at this time of life to be still in the harness of public service, such as helping others, teaching and the like; 13.5 per cent hope to be retired and living at ease, or to be traveling. This tendency was most marked in the freshman and sophomore classes.

What one thing do you think would do most to improve American agriculture? The freshmen vigorously believed in some form of education as the panacea, but the opinion somewhat declined as the class progressed. Always, however, did the men of all the classes believe in agriculture of the scientific type, both taught and practiced. Of all the votes, 49 per cent were for education, 11 per cent for cooperation, 9 per cent for scientific agriculture, 8 per cent for social improvement, and the remainder were either indefinite or not conclusive.

There were 88.4 per cent of the students who expressed a hope “to make a contribution toward the permanent betterment of American agriculture.” Of these, however, only 40 per cent were able to say definitely what form this contribution would take. There were 3.3 per cent who expressed a lack of such hope or desire and the remaining 8.3 per cent did not answer the question.

Will you be financially able to commence farming on graduation or will it be necessary for you to work for wages? Thirty per cent of the students think they will be able to start farming immediately on leaving college; 70 per cent will have to work for wages. Here is a factor often overlooked by those who criticize the agricultural college man for not going directly back to the land on graduation. It will be remembered that 65 per cent of these 450 agricultural students expressed a desire to farm; of these we now find but 30 per cent financially able to do so at the end of their four years. And even if this scant 30 per cent may be too high. It is notable that 53 per cent of the freshmen believed themselves ready to start in, while the hopes of the seniors had shriveled to 20 per cent. “Either incoming classes are richer every year, or, more truly, the wish is father to the deed in the earlier years.”

The extension work being advanced by the States with the support of the Federal Government is doing much for the farmer. Evidences are at hand that it is also designed to do a great deal for the farm woman. The fundamental idea of the Lever Act is to make available a vast store of knowledge respecting the opera-
The author of the bill, Mr. Lever, in presenting the bill to Congress, stated that for fifty years the agricultural colleges and experiment stations had been accumulating and reservoiring knowledge and that the time seemed at hand when this knowledge should be more widely disseminated.

The great interest in the work for farm women has necessarily aroused much interest in the subject of home economics. Home economics, however, is a comparatively new field, and there has not been the opportunity for accumulating anything like the knowledge respecting the work involved in this field that there has been in the lines of work more particularly applicable to the farm and the man on the farm. Heretofore, a great portion of the work in home economics has been empirical. There is very serious need for investigational work in this field. The people of this country through Congress, have very wisely decided that there was need for research affecting the farm work through the passage of the Hatch and Adams Acts. The time is at hand when it would seem desirable that careful consideration be given to the question of the broadening of these acts or the securing of another act which would provide adequate funds through the Federal Government for research in home economics. This work might very properly be provided for on the same basis that has been done in the case of the Hatch and Adams funds; namely, providing a certain amount for each state, the work to be handled and conducted by the experiment stations already in the state, but to be specifically in line with the needs of home economics.

An appropriation of $10,000 a year for each state would be a comparatively small investment for such an important subject. Possibly the best interests would be served by making the appropriation $5,000 per year for each state to start with, and an increase of $2,000 a year for the next five years, until the total aggregated $10,000 for each state.

Farmers' Week is over; the signs are all torn down and Come Again all the guests have departed. The week was planned to benefit those who came in from their farms to their College. The College also gained. The faculty came into closer contact with their true employers; the students shared this contact and by it gained an insight into the hard, honest, useful future toward which they are working.

There will be no "eight-o'clocks" to this future; there will be many "four-o'clocks." There will be no all-night dances, nor will a hearty handshake carry one far. This prospect may discourage some and divert their talents to more ornamental and suitable pursuits, but to many of us the presence of these farm people has been a real inspiration. We hope they will all come back next year and bring their neighbors with them.
Miss Jennie T. Minnick '16 won the Seventh Annual Eastman Stage, held in Bailey Hall on the evening of Friday, February 11. Her speech was entitled "Farm Life and the Child." Speaking on the question "Does it Pay to Farm?" N. C. Rogers '16, was awarded second place. B. W. Kinne '16, spoke on "Community Spirit"; J. T. Owens '17, on "The Farm Bureau" and R. P. Sanford '16, on "Our Primary Ambition." Miss Ruth H. Smith '16, was scheduled to speak on "The Country Girl" but was prevented from doing so on account of illness.

These finals represent the culmination of a competition in which sixty-three students started. After the first try-outs this number was cut to twelve and finally to six. The prizes totalled a hundred dollars; the first prize being seventy-five dollars and the second twenty-five dollars.

President Jacob Schurman Sounds Gould Schurman addressed the Farmers' American Farmers Week visitors on Monday, February 7, in Roberts Hall. He welcomed them and told them that the College and all its facilities were at their disposal. After declaring that the work of the College is progressing and that he believed the crest of the wave of growth in registration has been reached, the President proceeded to discuss the relation of the farmer to business conditions and the problems which may arise at the end of the great war.

Although there will probably be a temporary lull immediately following the cessation of hostilities, during which time our industries which are engaged in supplying munitions to the warring nations will have adjusted themselves to the changed conditions, President Schurman believes that there will follow a period of increased prosperity with America as the main beneficiary. Our single possible rival, he said, will be the Japanese, for Japan is the only nation which is gaining materially from the present conflict.

President Schurman said in closing, "Japan has driven Germany out of Asia. It is the fixed policy of Japan to dominate the Far East, and if possible to dominate it alone. With the political aspects of this question we are not concerned, so long as Japan maintains the 'open-door' commercial policy. This domination of China, with no commercial restrictions, will open to American industry a vast and untouched field.

"With all Europe turning to us for help and with these opportunities in the Far East, America will be kept busy. The farmer is bound to share in this great prosperity, for agriculture is the foundation of civilization. The farmer is finding better modes of production, larger markets are being thrown open with increased facilities for distribu-
SPEAKERS ON THE NINTH ANNUAL EASTMAN STAGE
B. W. Kinne, '16; N. C. Rogers, '16 (Second); J. T. Owens, '17; Miss Ruth Smith, '16; R. P. Sanford, '16; Miss Jennie Minnick, '16 (Winner)

The future for the American farmer is bright."

An informal banquet in the Home Economics Cafeteria on Thursday evening during Farmers' Week afforded an enjoyable and profitable hour to the present Countryman Board, who entertained several of the Alumni formerly connected with the paper. After the banquet the company adjourned to the Countryman Office. Much of interest was contributed to the conversation by those who recalled the earlier days of the publication. The visitors evinced much interest in the paper as it is today, and expressed wishes for its future success. Among those present were: Former Editors N. R. Peet '10, F. W. Lathrop '14, Former Business Managers C. F. Ribsam '11, J. J. Swift '14 and A. W. Wilson '15; G. N. Lauman '97, R. D. Anthony '08, E. P. Smith '12, and M. C. Burritt '08.

The Countryman sought to reach all former board members by mail previous to the meeting, but as several letters were returned undelivered it is believed that some of the addresses of the men have been changed. The present board would deem it a favor if any former board members who did not hear from them last month would send in their present addresses for future reference.

In the short course speaking contests the team of the Van Rensselaer Club defeated teams from the Craig Club, the Poultry Club and finally the Dairy Club, thus winning the Morrison Trophy Debate Cup. The final subject debated was "Resolved, that man's influence is more important to the rural community than that of a woman." The members of the victorious team were Mrs. Morehouse, Miss Ambler and Miss Coles.

Mrs. L. D. Fox, representing the Van Rensselaer Club, also won a cash prize of $10.00 offered by the Extension department for the best individual address. In this competition A. M. Butler represented the Stone Club, P. A. MacFarland the Dairy Club and R. B. Stevens the Craig Club.
Morse Hall Destroyed by Fire

Fire entailing a material loss of over $350,000 and a loss in research data beyond price, completely destroyed Morse Hall, the home of the Department of Chemistry, early in the morning of Sunday, February 13. The destruction was the worst in the history of the University. Insurance amounting to $206,000 will reduce the material loss to the University to slightly over a hundred thousand dollars.

The fire started before 6 a.m. on the third floor over the main entrance of the building. The flames gained great headway before the arrival of the firemen and even then the blaze continued its course almost unhindered, because of lack of sufficient pressure.

The Department is making strenuous efforts to give its various courses and is receiving the cooperation of other faculties in obtaining the use of lecture rooms and laboratories. Expressions of sympathy and proffers of aid have been received from institutions and individuals throughout the country. Lehigh University has offered to take a number of students temporarily to aid the department. In addition, offers of help have come from the University of North Carolina, the University of Pittsburgh, and Lafayette College.

Pageant to be Presented by University Women

On May 26, Friday before Spring Day, the women of the University will present a pageant symbolizing the various lines of work in which Cornell women are now engaged, such as Agriculture, Home Economics, Law, Medicine, Architecture, Science and Arts. In the fourteenth and fifteenth centuries, the Guilds in the old English towns presented a yearly play, each Guild presenting a scene characteristic of its work. This idea has been used as a setting for the pageant, which has been written by Miss Marjorie Barston '12.

The Pageant will open with a prologue consisting of English maids and boys who are engaged in a dance. They are interrupted by the entrance of the Town Crier on horse-back who announces the meaning of the scenes to follow. Agriculture and Home Economics, which forms the opening scene, is interpreted by a dramatic version of the last chapter of Proverbs of the good woman who does all things well. This will be es-

MORSE HALL AFTER THE FIRE

Courtesy Cornell Sun
especially spectacular with many maidens carrying water jars and bright colored scarfs.

After this follows the scene of Medicine which is based on a passage from Percy’s Reliques; Law which is based on an old Italian story which Shakespeare uses for his Portia scene, and Architecture which takes the audience back to the hanging gardens in Babylon. The closing scene shows the fulfillment of Plato’s charm as expressed in his Republic and represents the work done in the College of Arts. It is Grecian and by far the most elaborate scene. The Pageant closes with a processional and an epilogue. More than 300 women will take part. They will be coached by Mrs. Emma Gibbs of the Boston School of Dance who recently assisted Professor Granville Baker of Harvard in Pageant production. Mrs. Gibbs spent a week at the University during January in organizing the preparatory operations and will return to resume her duties about the first of May.

Miss Helen Spaulding ’16 has drawn up plans for a simple outdoor theatre to be erected on the eastern side of the women’s athletic field. The theatre is expected to seat 2000 people. The following committee has been appointed to take charge of the organization work in connection with the presentation of the Pageant.

- Araminta MacDonald ’17, Student Chairman.
- Helen Irish ’16, Business Manager.
- Lila Stevenson ’16, Chairman Authors Committee.
- Helen Spalding ’16, Chairman Staging Committee.
- Florence Wilbur ’16, Chairman Dramatic Presentation Committee.
- Vi Graham ’18, Chairman Costumes Committee.
- Bonydell Karns ’16, Chairman Dancing Committee.
- Marion Gushee ’16, Chairman Music Committee.
- Harriet Parson ’19, Chairman Publicity Committee.
- G. Marion Hess ’17, Chairman Alumnae. Faculty Committee.

Mrs. Gertrude Martin, Mrs. Barbour, Miss Nye, Prof. Sampson, Prof. Andrews, Prof. Adams, Miss Warner, Prof. Burr, Prof. Curtis, Prof. Parsons, Dr. Needham, Prof. Kimball, Prof. Bristow Adams and Prof. Everett.

On Saturday, February 5, Miss MacDonald ’17 attended the annual luncheon of the Cornell Women’s Club at Hotel Martinique, New York City, with the purpose of securing the interest and support of the alumnae. She also addressed some alumnae at Philadelphia.

Hearty support is desired as this is the first attempt made by Cornell students to present outdoor dramatics on a large scale similar to what western colleges and some eastern Women’s Colleges have done in the last few years.

All alumnae desiring to return to Cornell for the Pageant are asked to notify Marion Hess ’16, Sage College, Chairman of Alumnae Entertainment Committee.

HOUSE ECONOMICS NOTES.

In our January issue there appeared in this department an article on “Demonstration Schools for Homemakers” by Miss Miriam Birdseye of the College staff. In the February issue the same title appeared by mistake over an article contributed by Miss H. W. Freeman of Glen Ridge, N. J. The title of the article should have been “Home Making in Vocational Schools.”

Miss Jennie Jones of Paris Hill, gave an address on “Rural Recreation,” at the Rural Problems Class, Sunday, February 13.

The “Eight Weeks Club” of the Y. W. C. A. held their first meeting of this term on Saturday afternoon, February 19, at the home of Dr. L. H. Bailey, who talked on “The Appeal of the Country.” Meetings will continue to be held every Friday from 5 to 6 p.m. at Barnes Hall. Every girl interested in “The Girl Back Home,” is invited and urged to come to these meetings.
The principal feature of the Kirmess this year was the play "Omlet and Oatmelia" presented by Frigga Fylge, under the direction of Miss Huff. It was a burlesque on Shakespeare's Hamlet. The various characters represented pure foods, the general plot following that of Shakespeare's play.

On Friday evening, February 25, the Cornell Women's Dramatic Club presented "Quality Street" in the Lyceum Theatre at Ithaca. This is the first production given by the Women's Dramatic Club and was in all respects a great success. Several pictures were taken of the cast and the scenes, which will be published in the New York Tribune.

On Friday, February 11, the Department of Animal Husbandry held their regular Farmers' Week Sale in the stock judging pavilion. About three hundred farmers were in constant attendance during the sale and the bidding was brisk. On Saturday the Tompkins County Breeder's Association held a sale of thoroughbred Guernseys. Fifty individuals were sold at a total of over thirteen thousand dollars. The females brought an average of $235.

MISCELLANEOUS NOTES

Three Cornellians were elected to represent New York State in the House of Representatives of the sixty-fourth Congress. They are Norman J. Dauph '89, D. L. Haskell '98 and Norman J. Gould '99.

Seventeen fraternities entertained one hundred and ninety girls, representing twenty-two states, and sixteen chaperones representing sixteen states, during the past Junior Week. In the number of houses entertaining and in total number of guests, there was a decrease, while the number of guests per house showed an increase over previous years.

On January 17 Professor John Bentley of the department of forestry addressed the Round-up Club on the subject of "Forestry Problems of the Stock Farmer."

The State Leader announces the appointment of E. R. Eastman as Farm Bureau Manager of Delaware County and the transfer of T. M. Averick to the Nassau County Bureau. L. R. Symons, the former manager of this bureau, has resigned to take up work under the federal department at Washington.

Professor R. W. Curtis '01, of the Department of Landscape Architecture is in Boston visiting the Arnold Arboretum. He will not be back at his desk until the latter part of May.
The registration for the new term indicates an appreciable increase in the popularity of those elective courses in Forestry designed primarily to give information to men not specializing in that department. Forestry 5, a new course in which Professor Bristow Adams discusses national conservation, has an enrollment of 150 students. "The Field of Forestry," another general course given by Professor S. N. Spring, shows another record enrollment. As there is no room in the Forestry Building available for so large a class it has been necessary to give the lecture in the Poultry Building.

Pursuant to its policy of sending students out to do a term of actual teaching whenever possible, the department of rural education announces that this term it has placed the following seniors as assistant teachers of agriculture in various high schools in the state: P. R. Young, H. F. Smith, W. B. Cookingham, H. L. Marcus, L. R. Hart and H. J. Curtis.

The University Board of Trustees has announced that the raising of a fund of at least $3,000,000 as an addition to the endowment of the University will be one of the chief aims in connection with the semi-centennial celebration of the University, to be held October 6, 7 and 8, 1918. The fund will most likely represent the gift of the 27,000 alumni for the support of their Alma Mater. A chief feature of the celebration will be the unveiling of a statue of Ezra Cornell, the founder of the University, by Andrew D. White, the University's first president.

Professor C. H. Tuck, B. S., '06, left the College January 17 for Japan and China, where he will conduct an investigation of the oriental methods of education and economics of agriculture. Professor Tuck is on sabbatic leave and will not return until the opening of the fall term.

S. L. Allen, B. S. '16, is now instructor in the Animal Husbandry department, succeeding Mr. E. R. Zimmer, Sp. '13, who recently resigned to take up his new position as Manager of the Tioga County Farm Bureau. Mr. Zimmer's headquarters will be at Owego.

The Cornell Dairy Students' Association held their eleventh annual meeting in the dairy building on Thursday, February 10. One hundred and seventy-five students attended. Dean B. T. Galloway, Dr. L. L. Van Slyke of the Geneva Experiment Station and Doctor L. P. Brown, director of the department of foods and drugs of New York City, were the three principal speakers. An enjoyable feature of the program was the music furnished by the Dairy Students' quartette. Luncheon was served by the dairy department.

THE WORLD'S CHAMPION JERSEY

Sophie 19th of Hood Farm, the world's champion Jersey cow, has completed another year's record, which stamps her among the greatest dairy cows in the world.

In 1914 "Sophie" broke the Jersey breed record with a production of 17,557.8 lbs. of milk, 999.1 lbs. of butterfat. She calved on August 21, 1914, and was started on September 20th on the test which she has just completed. Milked but twice a day, and carrying a calf 175 days of the test, "Sophie" completed her sixth lactation and sixth year's record with a production of 11,915.4 lbs. of milk, containing 680.5 lbs. of fat, or 500.6 lbs. of 85 per cent. butter.

Her six records are as follows:

<table>
<thead>
<tr>
<th>AGE AT START OF TEST</th>
<th>MILK</th>
<th>BUTTER (85 P.C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YEARS</td>
<td>MONTHS</td>
<td>LBS.</td>
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<tr>
<td>2</td>
<td>2</td>
<td>7,050.2</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>9,924.8</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>14,373.2</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>15,099.4</td>
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<tr>
<td>7</td>
<td>11</td>
<td>17,557.8</td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>11,915.4</td>
</tr>
</tbody>
</table>
'90, B. S.—James Edward Rice, professor of poultry husbandry at Cornell, was born in Illinois but was brought up on a farm in Washington County, New York. His preparatory education was at the Granville Military Academy. In 1886 he entered Cornell University and after graduating took advanced work and during this time gave the first definite course of instruction in poultry husbandry ever given in an American agricultural college. From 1893-1903 Professor Rice was engaged in poultry, fruit and truck farming at Yorktown. During this time he took an active part in Farmer's Institute work and was a regular lecturer in New York State and spoke occasionally in New Jersey, Maryland, Minnesota, Connecticut, Rhode Island and Pennsylvania. For the last 13 years Professor Rice has been head of the poultry department and has at the same time contributed much to the agricultural press.

'01, W. D.—James A. Reyburn, whose address is Box 585, Lenox, Massachusetts, is superintending the estate of W. A. Slater of Washington, D. C. On this farm 20 head of Jerseys are kept, the surplus milk being sold retail at eight cents a quart and the cream at seventy cents a quart. Mr. Reyburn bred and sold 140 Yorkshire pigs last season.

'03, W. C.—F. H. McLaury is superintendent of the grounds and farm of Fleishman Park House and Estate at Fleishmans. The estate covers 200 acres. Mr. McLaury has charge of the landscape gardening.

'04, B. S. A.—W. S. Brown is engaged in extension work for the horticultural department of the Oregon State College of Agriculture.

'04, W. C.—C. C. Osborne was superintendent of a canning factory for three years after leaving College. After this he conducted experimental work for Purdue University. Mr. Osborne is now engaged in growing potatoes and alfalfa on his father's farm at Irvington, Indiana.

'05, Grad.—J. S. Gates was in the Department of Farm Management, Washington, D. C., until 1912, when he resigned to accept a position as editor of the "Southern Planter." In 1914 he returned to the Office of Farm Management and is now agriculturist in charge of farm organization investigation in the Northeastern and Middle Atlantic States.

'06, B. S. A.—F. H. Button has resigned as head of the Department of Agriculture at Vincennes University to become head of the Department of Soils and Crops at the New York State School of Agriculture at Farmingdale, Long Island.

'08, B. S. A.; '11 Ph. D.—E. Wallace is in charge of the laboratory of fungicide investigations for the Insecticides Board, Washington, D. C.

'08 B. S. A.—Thomas H. Desmond is a landscape architect with offices at Hartford and Simsbury, Connecticut.

'09, B. S.—George H. Miller was married last November to Miss Edith Roefle, daughter of Mr. and Mrs. G. H. Roefle of Albion. They will make their home at Washington, D. C.

'10, W. C.—Frances M. Crenling is on her father's farm at Milford, New Jersey.
'10, W. C.—C. W. Newell is engaged in dairy farming at Durham, where he is making butter and building up a herd of Holsteins. Mr. Newell is endeavoring to develop a new strain of dent corn suited to the 1800 foot altitude of his locality.

'10, B. S. A.—Ethel Gowans is employed by the Department of Home and School Gardening, Washington, D. C.

'10, B. S. A.—H. L. Sanford is an entomologist inspector for the Federal Horticultural Board, Washington, D. C.

'11, B. S. A.—E. W. Thurston taught vocational agriculture in the high school at Lowville for two years after leaving Cornell. Since 1914 he has been living at Chateaugay.

'11, Sp.—R. E. Clark and his father have a combined fruit and dairy farm at Peru.

'11, B. S. A.; '14, Ph. D.—J. Davidson is employed by the United States Department of Agriculture, making a study of the influence of climates on the composition of cereals.

'11, B. S. A.—Fred Perl, who was formerly superintendent of parks in Minneapolis, Minnesota, is now in business with his brother in the same place. He was lately called upon to give a lecture before the students in Landscape Art in the University of Minnesota.

'12, B. S.—J. R. Van Kleek is a landscape gardener at Cleveland, Ohio.

'12, Ph. D.—C. E. Leighty is employed by the United States Department of Agriculture to make wheat investigations in the eastern states.

'12, B. S.—Maurice Van Kleek, who is employed by A. D. Taylor of Auburn, has been in Ithaca recently on a furlough.

'12 Sp.—Thomas Milliman has been reappointed manager of the Orange County Farm Bureau with an increase in salary.

'12, B. S.—H. E. Alger, who was formerly in the ice cream business in New Jersey, is now teaching dairy industry and chemistry in the State School of Agriculture at Delhi, N. J.

'13, B. S.—Francis C. Smith is farm bureau manager of Allegany County with headquarters at Belmont.

'13, B. S.—George L. Fischer is making investigations for the United State Department of Agriculture in the storage and transportation of fruit. His address is 305 West 123d Street, New York City.

'13, B. S.—Elizabeth Banks is visiting dietitian in the Family Welfare Department of the New York Association for Improving the Conditions of the Poor. Miss Banks has charge of the dietaries of forty-three families, her work consisting of examining their budget books, criticizing the food expenditures, helping the women market, and giving cooking lessons.

'13, B. S.—George H. Newbury has been working his home farm at Wolcott, since the spring of 1914. General farming is carried on, fruit, grain, and livestock being the principal items of production. Mr. Newbury is secretary and treasurer of the Wolcott branch of the Eastern Fruit and Produce Exchange and also a lecturer of Huron Grange, No. 124.

'13, W. C.—Carl F. Martin manages and owns half interest in a farm at Big Flats where he grows large fields of alfalfa, corn and tobacco. His live stock consists of five horses and forty Holsteins.

'13, B. S. A.—E. D. Strait is with the United States Department of Agriculture engaged in the study of logged-off lands.

'13, B. S.—L. W. Kephart is studying the problems of weeds and tillage for the Federal Department of Agriculture, Washington, D. C.

(Continued on page 510)
Marketing Poultry Farm Products
(Continued from page 487)

bers should be based upon the quality of the products furnished by each, it is of considerable moral value. Such an arrangement is bound to keep the producer interested in increasing his net profits from the products.

5. The interchange of ideas and accompanying discussions nearly always develop a more intelligent purchasing of supplies, such as feed, fertilizers and machinery. One member's experience with certain purchases will help to guide the others.

6. By proper management some of the necessary supplies can be purchased in combination so that one large order can be sent to the supply dealer and reduced prices can be obtained with a standard quality guaranteed.

7. Other pieces of co-operative work may be carried on in order to secure expert help in mating up the stock; doing the hatching and possibly the brooding; supplying breeders for the community; inspecting and possibly testing the cocks for health, vigor and productivity.

8. A community which is thoroughly organized usually develops a reputation for certain definite products which it is producing and guaranteeing. Such a reputation gradually becomes the pride of all residents; and, if the work can be continued through the early and discouraging stages, it will gain the helpful support of everyone.

Responsibility of the Producer.
The producers of poultry products who live within five hundred miles of such markets as Boston, New York and Philadelphia, are woefully neglecting their opportunity if they do not produce such a high class product, that it is absolutely impossible for more distant producers to compete with them in the matter of quality. It is very surprising to note how careless the producers of our northeastern states are. An inspection of the eggs received regularly in New York City from the farms of the nearby states during the summer months opens one's eyes to the need of improvement. Cases of eggs are received by the commission men in most disgraceful condition; poor cases are used; the cases are not nailed up properly; cracked eggs are included originally or they have been broken en route on account of bad packing; a great percentage of the eggs contain partly developed embryos; some are rotten; and the whole mass is hardly fit for any thing other than the garbage can. Just such eggs as these are often received direct from the farms, not often from the country store, the country huckster, nor the wholesale dealer, who have to bear much of the responsibility for these losses, but from the farmers themselves who, it is usually thought, sell nothing except the purest of food products. Every influence should be brought to bear to show the farmer how he can improve the quality of the eggs which he sells and see that he gets paid on the basis of the quality sold. Then we are ready to look after the other details of the selling.

Selling the Products.

Just as the farmers are individuals and have their individual locations, individual classes of products, individual abilities, individual desires, so our consumers are distinctly individual in their demands and conditions. The average farmer is certainly unable to deal direct with the consumer. The farmer is accustomed and willing to deal with a business man. The consumer is also accustomed to and willing to deal with a business man. In the majority of cases, therefore, it seems that a business man, or the equivalent of a business man, is necessary as an intervening factor between the producer and the consumer. Certain large producers may take over the activities of this business man, but only when they can do the work better. Certain large customers, on the other hand, may take over the activities of the business man, but likewise they can only do it when they can do the work better. Such adjustments as these will not be made wholesale, but will come gradually and will come first where they are most justified.
MORE De Lavals are being sold than all other makes combined—nearly 2,000,000 are now in use. Year by year an ever increasing proportion of farm separator buyers reach the conclusion that the De Laval is the only cream separator they can afford to buy or use.

In fact, about the only excuse ever offered for buying any other separator nowadays is that its first cost is a little less than the De Laval's.

But they soon find out that the last cost of a cream separator is what really counts, and when they realize that the De Laval gives the most and best service for the money they buy a De Laval.

Over 40,000 users of inferior machines discarded them for De Lavals during the past year in the United States and Canada alone.

Better be right in the first place and start with a De Laval.

The DeLaval Separator Co.
165 BROADWAY, NEW YORK
29 E. MADISON ST., CHICAGO
50,000 Branches and Local Agencies the World Over
This is a really GOOD LEG BAND

We only ask that you WRITE US FOR SAMPLES AND PRICES and if it is not too much trouble please mention "The Cornell Countryman"

NEWELL & GORDINIER
TROY, N. Y

Poultry Packing Industry
(Continued from page 476)

boxes, in which poultry and fine ice are mixed together, is rapidly passing away, and the use of the mechanically chilled box is taking its place.

Including the time consumed in the haul, the time required by the commission man to dispose of his stock, the time the retailer keeps his goods before all are sold, and the day or two that the housewife may keep the fowls before cooking them, about three weeks elapse between date of killing and time of consumption. But if the proper conditions of refrigeration have been maintained all through the chain of handling—and this, it is encouraging to note, is rapidly becoming the common practice—the consumer will receive a food product of very high quality, even though the bird was killed three weeks previously.

1916 GARDEN AND FARM ALMANAC.


The tenth issue of this "guide, reference book, and annual for all who have to do with the farm, the garden, and the country home" maintains the same high standards which placed its predecessors so far above the general run of agricultural almanacs. The book contains a great variety of rural fact, sensibly selected and carefully edited to compose, on the whole, a very valuable practical reference for farmer or agricultural student.

A. E. Wilkinson, B. S., extension instructor in vegetable gardening, has published a book on apples. In the preface he states that it has been his purpose to present "in a logical manner the most essential of the recent practical ideas and methods" concerning the apple business.
The Martling Silver Campines

at both sides of the Continent at once

Greatest Winners

at TWO of the GREATEST SHOWS

of the WORLD

The most phenomenal record in the history of Silver Campines. It has never been approached by ANY BREEDER of any variety

Madison Sq. Garden, N. Y.

WINNINGS

FIRST AND BEST DISPLAY
1st, 2nd, 3rd, 5th, Cockerels
1st, 2nd, 4th, Exhibition Pen
2nd, 3rd, 5th, Cocks
2nd, Pullet
More Male Birds than all other competitors combined.

Los Angeles Poultry Show, Cal.
Jan. 5th-11th, 1916.

WINNINGS

Every First Prize and First Display
1st, 2nd, 3rd, 4th, Cockerels
1st Cock, 1st, 3rd, 5th, Hens
1st, 2nd, 3rd, Pullets
1st, 2nd, Exhibition Pens.

All Specials and Cups offered.

To own MARTLING SILVER CAMPINES means

YOU ARE A WINNER

They will WIN for YOU as easily as they have for us; they simply cannot help it: they are too well bred to do otherwise.

SEVERAL YEARS of concentrated effort and an enormous amount of money have been spent, in developing, not only the BEST SHOW BIRD, but also the very BEST UTILITY BIRD possible. EVERY BIRD is bred under the Personal supervision of MR. MARTLING.

THE MOST ECONOMICAL BREED of fowl known: Cost 1-3 LESS than any other, to raise and keep: they mature very rapidly.

“LIVING EGG MACHINES”: Thus they are JUSTLY FAMED. For the past five years wherever exhibited, they have WON FIRST PRIZE for the LARGEST and WHITEST EGGS.

We have the LARGEST STOCK OF PRIZE CAMPINES in the WORLD: When you buy from MARTLING, you get PRIZE STOCK, guaranteed to WIN in any competition.

PRICES REASONABLE: We believe A PLEASED CUSTOMER is the best advertisement. LET US PLEASE YOU.

Circular upon request

EGGS: From the finest matings in the world. $10.00 per setting (15).

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RIDGEWOOD, N. J.

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JOHN DEERE

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Light Tractors

High and Level Lift

Practical and the right size for the average farm. Work with any standard, light tractor. Controlled by the man on the tractor.

Pull the rope and all bottoms raise high and level. Another pull lets them down. Plows raised or lowered in 14 inches ground travel. Makes square headlands. All bottoms raise high, plows do not clog or gather trash on the turn.

Extra beam and bottom, readily attached, increases a regular two bottom plow to three bottoms or a regular three bottom plow to four. Size of the plow can be increased or decreased to meet conditions.

Famous John Deere Bottoms with Quick Detachable Shares that are taken off and put on in one-fifth time ordinarily required.

John Deere, Moline, Ill.

John Deere Dealers Everywhere

Former Student Notes

(Continued from page 505)

'13, Sp.—Curry Weatherby is secretary of the Tompkins County Farm Bureau Association and is managing his father's farm near Trumansburg.

'13, B. S.—Gilmore Clarke is now employed by Charles D. Lay of New York City. For the past year Mr. Clarke has been working on a series of parks for the Jersey City Park Commission of Jersey City, New Jersey, where he handles 500 men.

'13, B. S.—E. G. Lawson, who was formerly instructor in Landscape Art, left last year for Rome, Italy, as a winner of the Rome Prize. He writes that when he first arrived in Rome, he was not allowed to make any sketches or take any photographs because of the war. However, by means of permits from the government and the American Minister in Rome, he was allowed to proceed with his work.

'14, B. S.—Beth Pritchard is in charge of home economics in one of the Gary System schools at Gary, Indiana.

'14, B. S.—S. M. Robinson is head of the poultry department at the Agricultural and Technical College for Negroes, Greensboro, North Carolina. Great interest in poultry raising is shown by the students, who publish monthly poultry bulletins. The poultry department was awarded blue ribbons on all exhibitions at the Negro State Fair at Raleigh.

'14, B. S.—L. G. Howell is assistant agriculturist in the office of farm management, Washington, D. C.

'14, B. S.—L. C. Treman is dealing in onions at Pine Island. During the month of December he shipped twelve carloads.

'14, B. S.—Jeannette Evans taught domestic science at Greigsville during the year 1914-15. She is now teaching sewing in the High School of Commerce, Springfield, Massachusetts. Her address is 888 Union Street.

(Continued on page 514)
"Buckeye"

"The Best Incubator Made"

HATCHES MORE CHICKS
AND
HATCHES BETTER CHICKS
Than any other incubator regardless of size, price or method.

Recognized by the largest breeders and the largest poultry supply dealers as the safest and surest incubator ever built. Every machine a guaranteed success.

It's the Best Incubator Made

Not the cheapest incubator but the best.

It's the incubator that is built up to a standard and not DOWN to a price. That's why the "Buckeye" is sold by more reliable dealers than all the others combined — that's why so many of the large, successful breeders will use no other. The "Buckeye" is sold by more than two thousand of the largest poultry supply dealers and there are over 400,000 in successful operation! Let us send you a list of some of the big breeders who use the "Buckeye" and their reasons for using it. Let us send you the names of the largest dealers and their reasons for selling it. Let us tell you about the wonderful success of the "Buckeye" system and why so many have tried to imitate it. The "Buckeye" is made in seven sizes — 60 eggs to 600 eggs.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
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<tbody>
<tr>
<td>600 Eggs</td>
<td>$50.00</td>
</tr>
<tr>
<td>200 Eggs</td>
<td>17.50</td>
</tr>
<tr>
<td>110 Eggs</td>
<td>12.50</td>
</tr>
<tr>
<td>60 Eggs</td>
<td>7.50</td>
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</table>

SOLD ON 40 DAYS TRIAL
and guaranteed to hatch every hatchable egg.

Try a "Buckeye" in the same room with any other incubator and if it doesn't hatch more chicks and better chicks the first time you try it, we'll take it back.

Write for "Buckeye" Catalog and Proof of "Buckeye" Superiority

The Buckeye Incubator Co.
600 Euclid Ave.
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The Standard

COLONY BROODER

Broods 100 to 1500 Chicks

Only $15.00

The Greatest
Coal Burning Brooder
Ever Invented

Self Feeding—Self Regulating—Everlasting. Heavy cast iron stove that requires coaling but once in 24 hours in any temperature.

Fifty-two inch hover that will positively brood 1500 newly-hatched chicks.

30 Days Free Trial

The Standard Colony brooder is the most practical brooding device ever invented. It will do anything and everything that any other brooder will do and do it better. It is infinitely more satisfactory than brooders selling at twice the price. We are so positive that it can not fail that we will permit you to try one for thirty days and

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Sold and guaranteed by dealers everywhere at $15.00. Insist on the "Standard" and beware of imitations. Write us for a "Standard" Catalog and we will tell you how to grow three chickens where one grew before.

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Thousands Have Asked for

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**1916 Poultry Book—Have You?**

**T**his big book is recognized throughout the poultry world as an authoritative guide for Poultry Raisers. Thousands have asked for it—send for your copy today. Read the big opportunities there are for poultry profits. Learn the importance of using proper equipment. Ask for your free copy today and get our offer on Cyphers-built, Popular-priced Incubators, Brooders and dependable Poultry Supplies. Write for this fine, illustrated, authoritative book today.

**Big Profits in Poultry—NOW**

There is more money in poultry raising today than ever before. This condition will continue and doubtless intensify from year to year. The yearly consumption of poultry and eggs in the United States runs into the many millions of dollars, yet the demand is always far in excess of the supply. Start raising poultry for profit now—but start right. Send for Cyphers Co.'s 1916 Poultry Book and learn all about Big Profits in Poultry—NOW.

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Don't handicap yourself by using inferior, trouble-making equipment. Avoid incubators whose sole recommendation is their low price. Cyphers-Built Incubators are Guaranteed—backed by a company that for 20 years has equipped the people who have made the BIG successes in poultry raising.

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Is maintained at big expense to advise and assist poultry raisers. Start you right and keeps everything going right, solves your poultry problems. This personal letter service is free of all charge. Tell us your problems. Write today for big Free Book and ask us all about our Free Service Bureau and our 34 Bulletins on poultry raising—free to our customers.

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Oakland, Cal., 2127 Broadway

**Cyphers Balanced-Ration Poultry Foods**

Keep up the egg yield in winter, and increase your profits by feeding Cyphers Laying Mash and Scratching Food. Get a supply of Cyphers Chick Food to insure success with the early hatches. Thousands of poultry keepers depend entirely on Cyphers Balanced-Ration Foods—would not try to keep fowls without them. Write for current prices and for our valuable book—"Poultry Foods and Feeding"—free on request.
Hens Lay More Eggs!

Chicks Make Better Broilers
When Kept Free From Lice and Mites

Keep hens and chicks thriving, free from torturing lice and mites! They'll pay back bigger profits in eggs and meat! Zenoleum is an amazing germ-killer and destroyer of all insect pests that prey on hens and chicks. Use it freely for spraying the inside of poultry houses—it's safe to use, does not burn. Put Zenoleum in the whitewash instead of dangerous carbolic acid. Increase the hatch by using Zenoleum inside the incubator—spray nests and roosts to destroy all lice and mites.

Used by 50 Agricultural Colleges in U.S. and Canada.

COAL-TAR

ZENOLEUM

DISINFECTANT-DIP

This wonderful disinfectant and germicide not only helps poultry-men increase egg-production and get more live, healthy chicks, but is the most reliable remedy for all live stock disease. Every owner of cattle, sheep or hogs needs Zenoleum every day. Sold under an absolute guarantee to do all you want it to do—or your money back, no argument, just money.

Special Trial Offer! Send 25 cents for eight ounces—or 50 cents for quart—full gallon, $1.00—parcels post prepaid. Use it as directed for any purpose, absolutely at our risk. If it fails to meet severest test, it doesn't cost you a penny. We will return your money upon request. Surely that's safe!

Zenoleum Lice Powder, big package, 35c parcels post prepaid.
Write for Poultry Book, "Cause, Symptoms and Home Treatment for All Poultry Diseases"—FREE for the asking.

Zenner Disinfectant Company

Incubators

brooders, brood coops, exhibition coops, egg cases, egg boxes, shipping crates, shipping coops, feed troughs, mash hoppers, food and water cups, grit and shell boxes, water fountains, etc.

A complete line of the very highest quality.

Write for catalogue and price-list

OTSELIC Mfg. Co.
Whitneys Point, N. Y.
WHAT WOULD MACHINE MILKING SAVE YOU?

This Burrell Machine milks two cows at one time and keeps the milk of the 2 cows separate. One man can operate two machines. With them he can milk 24 to 30 cows per hour according to conditions. That's about what 8 hand milkers will do. But the BURRELL (B-L-K) MILKER has a still further advantage. It keeps dust and dirt out of the milk. It raises the standard of milk produced in ordinary stables.

Send for Illustrated BURRELL Booklet FREE
D. H. BURRELL & COMPANY
Manufacturers also of "Simplex" Cream Separator and other "Simplex" specialties—"The Best in the World."

BLATCHFORD'S CALF MEAL

Should be used by all farmers who desire to raise their calves cheaply and successfully with little or no milk. Send for actual feeding records of Quick Calf Raising

Blatchford Calf Meal Factory
Waukegan, Ill.

Former Student Notes
(Continued from page 510)

'14, Sp.—J. G. Clark is engaged in general farming near Geneva.

'14, B. S.—Earl G. Brougham is manager of the farm carried on in connection with the J. N. Adam Memorial Hospital, near Perrysburg. Diversified farming is practiced, special effort being made to produce such crops and products as can be consumed at the hospital.

'14, B. S. A.—T. M. Yu is with the China-American Produce Company. His address is 9 Szechuen Road, Shanghai, China.

'14, B. S.—T. S. Kuo is dean of the school of agriculture at Nanking, China.

'14, B. S.—W. Lee Allen is running a nursery farm with his two brothers and his father, near Salisbury, Maryland. Their business is organized as the W. F. Allen Company. This year they have 185 acres of strawberries, 75 acres of other small fruits, and 70 acres of peach and apple orchards, and expect to plant 80 acres of cantaloupes in the spring.

'14, B. S.; '15, M. F.—C. W. Strauss is in the agricultural department of the Great Western Sugar Company, Sugar Building, Denver, Colorado.

'14, B. S.; '15, M. S.—J. D. Lamont was married last August to Miss Frances Thayer Carr, daughter of Mrs. W. T. Carr, of Plainfield, New Jersey. Mr. Lamont has just been appointed a forest assistant in the Indian Service, United States Department of the Interior, and will work on the Jicarilla Indian Reservation in northern New Mexico. His address is Dulce, New Mexico.

'15, B. S.—Elizabeth E. Calvert was married last November to Mr. A. E. Schaffel of Philadelphia, Pennsylvania.

'15, B. S.—Wendal Brown is managing a 300 acre farm at Oxford Depot.

In writing to advertisers please mention The Cornell Countryman
DAY-OLD CHICKS
$12.00 per 100

EGGS for Hatching
$8.00 per 100

SINGLE COMB WHITE LEGHORNS

From carefully selected utility stock that have long been bred for high egg production, also for size, shape and color of the egg. Write now for further particulars.

Genesee Valley Poultry Farm
CASTILE, NEW YORK

Luther H. Robinson, '14, Prop.

WINDBLOW FARM
REDDING RIDGE, CONN.

S. C. White Leghorns Exclusively

Our ten bird pen in last year's International Egg-laying Contest at Storrs College laid an average of almost 194 eggs per hen in the year. Is this the kind you are interested in? If it is, better write us; that is the sort we are breeding here.

HATCHING EGGS, $ 8.00 per hundred
DAY-OLD CHICKS, 15.00 per hundred

All breeding females tested for white diarrhea by Storrs Experiment Station. A few cockerels left if you speak quick.

HERBERT S. BARNES, Owner
F. WM. ROSENAU, Poultry Supt.

Where you saw it will help you, them and us.
Dean Mumford says:

"The investments of the farmer which pay the largest interest are the investments in fertilizers, in good livestock, in good machinery and other forms of equipment.

"One of the most important steps which must be taken by the average farmer of the Middle West is the purchase and application of fertilizers to be used along with a rational rotation. The intelligent use of fertilizers will increase farm profits and benefit directly the individual farmer..."

Dean F. B. Mumford, University of Missouri, in The September Banker-Farmer.

Our free bulletins point the way to better and more profitable crops.

Soil Improvement Committee of the National Fertilizer Association
977 Postal Telegraph Bldg.
CHICAGO

Former Student Notes
(Continued from Page 514)

'15, B. S.—Ray D. Baty was married recently to Miss Beatrice M. Ellithorp, daughter of Mr. and Mrs. G. A. Ellithorp of Binghamton.

'15, B. S.—Olive Tuttle is teaching in the College of Agriculture at the University of Minnesota, Hamline, Minnesota.

'15, B. S.—T. W. Vann is superintendent of the Hurricana Farm at Amsterdam. This is a 700 acre thoroughbred horse farm with 28 brood mares, 8 stallions, 12 two year olds and 20 foals on the place. Sufficient hay, rye, oats and corn are grown to feed the stock. A propagation field of Cornell timothy and alfalfa has been started for trial. The greatest problem is to produce and maintain a good permanent pasture. Owing to the fact that many horses are kept on the farm the soil has become "horse sick." To remedy this condition a pure bred Guernsey herd is maintained.

'15, B. S.—E. F. Hopkins, who is doing graduate research work with Professor Whetzel, is assistant instructor in the winter course in plant pathology.

'15, B. S.—M. B. McCargo is testing for the Department of Animal Husbandry in addition to running his mother's farm at Holly.

'15, B. S.—I. F. Hall is teaching animal husbandry, arithmetic, and English in the Delhi State School of Agriculture at Delhi.

'15, B. S.—E. H. Priest is managing a Poultry Producers' Association at 98 Front Street, Binghamton.

'15, B. S.—W. H. Sheffield is planning to return to the College next year to work for his Master's degree in Landscape Art.

'15, B. S.—Estelle Church is teaching domestic science in the Worcester High School.
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Ruhm Phosphate Mining Co.'s Finely Ground Phosphate Rock

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“The Leading American Seed Catalog” for 1916 is unlike any other catalog. The front cover illustrates in nine colors the greatest novelty in Sweet Peas, the unique “Fiery Cross.” The back cover shows the two famous Burpee Bantams, Golden Bantam Corn and Blue Bantam Peas. The colored plates, six other Burpee Specialties in Vegetables and the Finest New Burpee Spencer Sweet Peas; also the New Gladioli, Fordhook Hybrid. This Silent Salesman is mailed free. A postcard will bring it. Write to-day.

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E. I. du Pont de Nemours & Co.
Powder Makers Since 1802
Wilmington, Delaware

Former Student Notes

(Continued from page 516)

'15, B. S.—Seth L. Wheat is manager of an estate of 1500 acres in Porto Rico.

'15, B. S.—William and Christian Houch are running a farm of 800 acres at Black Creek, Ontario.

'15, B. S.—J. S. Cobb, who is an instructor in the Massachusetts College of Agriculture, lives at 5 Allen Street, Amherst, Massachusetts.

'15, B. S.—James A. Crawford is a graduate student in the University of Illinois.

'15, B. S.—The engagement of Irving S. Warner and Miss Irene A. Tuthill, of Jamesport, is announced. Miss Tuthill is a graduate of the Ithaca Conservatory of Music. Warner is secretary of the Burlington County Young Men's Christian Association of New Jersey, with headquarters at Mount Holly.

'15, B. S.—Alice Snow assisted in the course in nature study at Cornell during the summer school.

'15, Sp.—R. H. Kent is in charge of engineering work in connection with the fruit and vegetable utilization project of the Bureau of Chemistry, United States Department of Agriculture. His address is 55 Rhode Island Avenue N. W., Washington, D. C.

'15, B. S.—Walter Funk is in the employ of the Henry A. Dreer Nurseries, at Riverton, New Jersey. His address is Box 323, Riverton.

'15, B. S.—L. L. Andrus is in the oil business at Rixford, Pennsylvania.

'15, B. S.—Constance Badger is teaching agriculture at Morrisville, Vermont.

'15, Ph. D.—M. A. Klein is in the research laboratory of soil chemistry at the University of California.

(Continued on page 524)
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4-Row Potato Sprayer
for wide or narrow rows. Spray as fast as you can drive. Power always strong. Automatic Agitation of liquid and cleaning of strainers. Two nozzles to each row for thoroughly saturating foliage both top and bottom.

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The peach comes into ripening when there is no other yellow and red free stone on the market, two weeks before the Early Crawford. The original orchard has borne its sixth annual crop, being the finest quality the trees have ever produced, some specimens measuring twelve inches in circumference and weighing twelve ounces.

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R. D. EATON
GRAIN and FEED CO.
Norwich | New York

Former Student Notes
(Continued from page 520)

’15, B. S.—C. A. Comfort lives at Washingtonville, where he is tester for the Blooming Grove Cow Testing Association, the first association of the kind in the county. The association was organized last June by T. E. Milliman, ’12, B. S., who is farm bureau manager of Orange County.

’15, B. S.—Howard P. Ryan is with the Continental Can Company, of Syracuse. His address is 312 Waverly Avenue.

’15, B. S.—D. P. Morse, jr., is in the shoe business with the Edwin C. Burt Company, Jay and Walter Streets, Brooklyn.

’15, B. S.—Estelle L. Church is teacher of home making in the high school at Worcester, where she organized the department.

’15, Ph D.—F. J. Plummer is assistant soil chemist in the experiment station of the North Carolina College of Agriculture and Mechanics.

’15, M. S.—R. W. Wilkins is instructor in poultry husbandry at the University of Kansas.

’15, B. S.—Paul W. Wing is with P. R. Ziegler & Co., 37 Merchants Row, Boston, Massachusetts. This company has the wholesale agency for dairy supplies, including the D. H. Burrell milking machine, which Mr. Wing has recently been demonstrating.

’15, B. S.—T. B. Charles is instructing and doing graduate work in the Department of Poultry Husbandry. He is working on the comparative anatomy of types and varieties. As an undergraduate, Mr. Charles was prominent in student activities. He served on the Honor System Committee, and was president of both the Agricultural and the Poultry Association during his senior year.

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Write for Catalogue and Prices

Our trees are not lowest in price, but we guarantee Quality and Purity of varieties, and such nursery stock is the cheapest

1000 ACRES 70 YEARS

70,000 Fresh Dug Fruit Trees at Wholesale Prices

Apple, Plum, Pear, Cherry, Peach and Quince, one and two year old, guaranteed true to name, Genesee Valley grown, direct from nursery to planter.

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<td>Very department under my personal supervision.</td>
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If you are in a hurry, order from this advertisement. You will find each book is worth many times its Price

<table>
<thead>
<tr>
<th>Breed</th>
<th>Price</th>
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<tbody>
<tr>
<td>The Plymouth Rocks, All Varieties</td>
<td>$1.00</td>
</tr>
<tr>
<td>The Leghorns, All Varieties</td>
<td>$1.00</td>
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<tr>
<td>The Wyandottes, All Varieties</td>
<td>$1.00</td>
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<tr>
<td>The Asiatics, Brahams, Cochins, Langshans</td>
<td>$0.50</td>
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<tr>
<td>The Bantam Fowl</td>
<td>$0.50</td>
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<tr>
<td>The Rhode Island Reds</td>
<td>$0.75</td>
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<tr>
<td>Turkeys</td>
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<td>The Orpingtons</td>
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<td>Campines</td>
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<tr>
<td>Campines</td>
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Either of the above 50-cent books with one year's subscription to R. P. J. for 75 cents.

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Send for circular, prices and the name of your nearest dealer. Also on exhibit at Cornell.

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The patented trays inverted, one above the other, hold the eggs in double pyramid cushion pockets and prevent the eggs from coming in contact with one another or with the outside walls of the container.

2-Piece Corrugated Boxes

<table>
<thead>
<tr>
<th>Doz.</th>
<th>Per Doz.</th>
<th>Wt.</th>
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</thead>
<tbody>
<tr>
<td>15 Egg Size</td>
<td>$1.15</td>
<td>12 lbs-</td>
</tr>
<tr>
<td>20 Egg Size</td>
<td>2.00</td>
<td>23 lbs-</td>
</tr>
<tr>
<td>1 Dozen Egg Size</td>
<td>.85</td>
<td>10 lbs-</td>
</tr>
<tr>
<td>2 Dozen Egg Size</td>
<td>1.45</td>
<td>17 lbs-</td>
</tr>
</tbody>
</table>

Also 4 and 5 Dozen Egg Sizes.

Patented

2-Piece Corrugated Boxes (as illustrated).

- 1 Dozen Egg Size: $ .75 per doz.
- 2 Dozen Egg Size: 1.35 per doz.
- 15 Egg and 2 Dozen Size: 15c
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Sample Box, 1 Dozen Size: 15c
Sample boxes postpaid in first four zones. Add postage for other zones.

The Superintendent of Mails, Washington, D. C., Post Office, states: “Have been using one of your containers continuously for three months shipping from Washington to points in Pennsylvania and Virginia and have not yet had a single egg broken, although the outside of the container is about worn out.”

“SURETY CUSHION” Returnable Wooden Egg Cases
Saves Money—Saves Breakage

<table>
<thead>
<tr>
<th>Dozen Egg Size</th>
<th>Price</th>
</tr>
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<tbody>
<tr>
<td>2 Dozen Egg Size</td>
<td>$ .75</td>
</tr>
<tr>
<td>3 Dozen Egg Size</td>
<td>.95</td>
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<tr>
<td>4 Dozen Egg Size</td>
<td>1.10</td>
</tr>
<tr>
<td>5 Dozen Egg Size</td>
<td>1.35</td>
</tr>
<tr>
<td>6 Dozen Egg Size</td>
<td>1.60</td>
</tr>
<tr>
<td>9 Dozen Egg Size</td>
<td>1.75</td>
</tr>
</tbody>
</table>

10% discount on six or more cases.

Send for circular.

SURETY EGG BOX CO. HOHOKUS, N. J.

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Deep Seedbeds Properly Prepared

That’s what you get when you use the deep-cutting, double-turning, leveling and compacting “Acme” Pulverizing Harrow.

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Exhibition birds, Utility Stock or Eggs for Hatching. Anything to help you in either starting the poultry business or making the standard of your present stock better.

Fifteen years of scientific breeding makes our strain one of the very best in the States.

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Right now, greenhouse cucumbers are being shipped from the Mississippi Valley section of the West, to New York and San Francisco.

The market hasn't begun to be supplied.

One man who formed a stock company and built five of our big houses, netted a good profit the first year, and has steadily increased it ever since.

Of course, growing cucumbers requires skill—it's not exactly "finding money."

You put up the money and we'll put up the houses. You can hire a skilled grower; and with you on the job to look after things; it will be your own fault if your bank balance doesn't grow. Don't hesitate to write for any information. Do it freely.
Practical Tools for Farm, Garden and Orchard Work

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IRON AGE

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Fig. 1604— "New Alert" Double Acting, Hand Operated Force Pump for Pneumatic or Elevated Tank water supply systems. By use of Pump Jack, can also be operated by engine. Lift and force 75 feet.
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"Game Farming for Profit and Pleasure" is a carefully edited and profusely illustrated manual on the breeding of game birds. It describes in detail the habits, foods and enemies of wild turkeys, pheasants, grouse, quail, wild ducks and related species. It tells of the best methods for rearing. It discusses the questions of marketing and hunting.

The breeding of game birds is profitable and pleasant for many reasons. The demand for birds, both from city markets and from those who wish to raise game is much greater than the supply. There is also a continuous call for eggs by breeders.

Furthermore the birds you raise will afford you good sport in hunting, and also food for your table. If you own large acreage, you may lease the privilege of shooting over your land to those who will gladly pay for it.

If you cannot raise game yourself we will try to put you in touch with those who will raise it for you to shoot.

The more game raised the more good hunting there will be for you and the more often you will enjoy game on your table.

But the book tells the whole story. You will find it most interesting reading. Write for your copy today. Use the coupon below.

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But the book tells the whole story. You will find it most interesting reading. Write for your copy today. Use the coupon below.

Game Breeding Department, Room 36
Hercules Powder Company, Wilmington, Delaware


Game Breeding Department, Room 36
Hercules Powder Company, Wilmington, Delaware

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In Spite of Spring Fever
do a Little Extra Reading

VERY Spring the tendency is to get out of doors as much as possible and not to study until after dusk. There is a time, say, a half an hour after supper at night, when it is not safe to take exercise. During this time, you can read many of the books which are not required in your course, but are required of any well educated man. These are books which are found in the Everyman Library written by Aristotle, Tennyson, Thackeray, Dickens and others.

Afterwards go and
Take some Pictures

ON Saturday afternoons this Spring, when you go out for gym walks or on pleasure trips, you will find many beautiful places around the Campus within a radius of five to ten miles which you will want to preserve in your memory. Perhaps ten years from now, you will not be able to remember any of the delightful nature pictures, but if your album contains photos of the places, you could return to the pictures with ever renewed pleasure.

Cornell Co-op.
Morrill Hall
Ithaca, N. Y.
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ISAAC PHILLIPS ROBERTS, PIONEER

His recently published biography is reviewed on page 592 of this issue.
The Commercial Growing of Plants and Flowers in New York State

BY E. A. WHITE
Professor of Floriculture, New York State College of Agriculture at Cornell University

The production of ornamental plants and cut flowers is an industry that has always centered around the more densely populated sections, and therefore the states having the largest number of large cities lead in this industry. New York State holds the first place in this respect. As estimated in the census of 1910, her annual production of flowers and plants was valued at $5,110,221. There were 1398 growers who reported an income of more than $250 on glasshouse products of ornamental plants and flowers. The plants were grown in an area of 13,876,857 square feet of glass. Other states foremost in flower production are: Pennsylvania, the value of whose products is $3,760,644; Illinois, $3,680,973; New Jersey, $2,839,319; and Massachusetts, $2,432,000.

In New York State the industry centers about New York City. Other large cities are so distributed over the state, however, that the business is not wholly localized in that section, as is the case in states having but one or two large cities. Rochester has the distinction of being called the “Flower City of the United States,” while Buffalo, Syracuse, Utica, Albany, and several other cities produce and dispose of large quantities of flowers and plants.

Rochester has a great number of greenhouse establishments, but few large ranges. The growers raise varied products, and there is but little attempt toward specialization in any particular crop. Certain growers, however, produce some special crops better than they do others. Among the larger producers are J. B. Keller’s Sons, who have approximately 30,000 square feet of glass area; H. E. Wilson, who has 100,000 square feet; Ellwanger and Barry, with 50,000 square feet; Vick & Hall Company, with 25,000 square feet. Other prominent flower producers are George J. Keller, Henry P. Neun, Schlegel’s Sons, and Hugo Leute.

Buffalo has fewer growers in its immediate vicinity than has Rochester, due evidently to the fact that climatic conditions there are unfavorable, there being many cloudy days. Sunshine is a powerful factor, especially in the production of cut flowers; and unless there is an abundance of sunshine, the work of raising flowers proves discouraging. The largest range of glass near Buffalo is that of W. J. Palmer & Son. It is located at Lancaster, about ten miles from the center of the city. The glasshouses cover approximately 300,000 square feet of ground area. Miscellaneous plants are largely grown in these houses to supply the firm’s retail flower shops, but
plants for cut flowers, such as roses and carnations, are also grown in considerable quantities.

In Syracuse the largest establishment is that of P. R. Quinlan & Co., whose greenhouses cover approximately 100,000 square feet. Bannister Brothers, Bond & Davis, Bartholome, and Bellamy Brothers, are among other important florists.

The present tendency among flower and plant producers is toward specialization. An important limiting factor in specialization is the character of the soil. The ability of an individual to produce some one crop better than any other, is also an important factor.

The soil factor has been largely responsible for localizing violet production about Rhinebeck and that section of the Hudson River valley. A few growers made so pronounced a success of the business that it was entered into by a large number of men in that vicinity, many of whom had had little or no experience in flower growing. There are no large greenhouses devoted to this crop, but there are approximately eighty-five growers who have ranges covering from one to three thousand square feet; the majority of the houses cover an area averaging approximately two thousand square feet. Only double violets are grown and these are shipped to all parts of the State, especially to western New York, where violet growing is not successful. The violets are shipped also to other states.

Rose growing has become a specialized industry. The cultural demands of the crop are somewhat peculiar. The plants require soil and sunlight conditions that are found only in certain sections of the country. The American Beauty roses are especially difficult to grow unless there is maximum sunlight, which is essential to produce a clear, rich tint. If the variety is grown in inferior soil, the growth will be weak and the stems short and spindling. If there is a lack of sunlight, the petals will be purple in color, thus diminishing the value of the variety for cut flowers. The largest grower of American Beauty roses in the State is Paul M. Pierson, of Scarborough and Briarcliff. The Briarcliff establishment is a large one and the greenhouses are of modern construction. The output of American Beauty roses from this range supplies a large number of New York flower stores and is of an excellent quality. F. R. Pierson, of Scarborough, also grows this variety, but not so extensively. The majority of American Beauty rose growers, however, are located in northern New Jersey and eastern Pennsylvania, where excellent light conditions, combined with good soil and marketing facilities, make the crop a remunerative one.

Among the largest growers of tea and hybrid tea roses may be mentioned F. R. Pierson, at Scarborough. Mr. Pierson has a modern range of approximately 300,000 square feet of glass devoted exclusively to roses. There are few other establishments in the State where the crop so nearly approaches perfection. While a large number of varieties are grown, the principal ones are Ophelia, Mrs. Francis Scott Key, White Killarney, Killarney Queen, Lady Hillington, and Richmond. Many of the smaller cluster roses, such as Cecile Brunner, are also grown in large quantities. Other large establishments in the State are the Lake View Rose Garden, at Jamestown, and the United States Cut Flower Company at Elmira.

Carnation growing is more generally distributed over the State, but the industry is considerably localized in the eastern section of Long Island. Carnations thrive best in a medium light soil and in a section where the climate in summer is comparatively cool. These conditions are found on Long Island, and excellent carnations have for many years been produced there. In fact, it was on Long Island that the first carnations were grown in America. The firm of Dailledouze, Zeller & Gard, at Flatbush which is now the firm of Dailledouze Brothers, was among the first to grow carnations in America. This was about 1858. The firm now has approximately 100,000 square feet of glass and grows
some of the finest carnations sent into the New York market. Among other large carnation growers on Long Island are the Cottage Gardens Company, at Queens, and James Cockercroft, at Northport, Long Island.

Orchid specialists are not numerous in New York State. The New York market is supplied with orchids largely from growers located in northern New Jersey. There are also comparatively few sweet pea specialists in the State.

Within a comparatively few years there has been a revival of interest in the growing of potted plants. These were at one time the principal product in glasshouses, but with improved construction and methods of culture the cut-flower business became more important. A well-grown potted plant is a thing of beauty and admiration, but a poorly grown one is of little value. A few men in New York have seen the value of these plants from the commercial viewpoint and have aimed to produce them to perfection. The demand for potted plants is greatest at Christmas and at Easter, but a well-grown flowering plant will sell at almost any season of the year. Buyers often prefer a potted plant to cut flowers because as a rule they have better keeping qualities.

The potted flowering plants most generally grown are azaleas, cyclamen, primroses, ericas, or heaths, hydrangeas, genistas, calceolarias, cinerarias, begonias, and Easter lilies and other bulbous plants. One of the largest specialists in growing these types of plants is Antoine Schulthesis, of College Point, who has approximately 60,000 square feet of glass area devoted to their production. Mr. Schulthesis grows a larger number of ericas than of other species. His range, however, has very well-grown representatives of most species of potted plants. Louis Duprey, of Whitestone, is another large grower, and his remarkable plants have won many prizes at flower exhibitions.

There are no establishments in New York where palms and other exotics are grown on a large scale, and the New York market is supplied largely by Connecticut, New Jersey, and Pennsylvania. F. R. Pierson, of Tarrytown, however, makes a specialty of growing ferns of the Nephrolepis type, and his greenhouses are filled with many varieties, from the coarse-fronded Boston type to the finely divided elegantissima. They are in all stages of development, from the newly formed runner to the splendidly finished specimen plant.

Plant and flower production in New York is an important industry and the business is developing rapidly. Market conditions are prosperous, and it is many years since the florists have been as optimistic as at the present time. The demand is good and prices are high. Conditions in Europe are such that there is a lessened production there of azaleas, bulbs, and other plants which in years past glutted the market, especially in the spring.

"NOW WELL - APPAREL'D APRIL ON THE HEEL OF LIMPING WINTER TREADS."

—Shakespeare
Water Supply Systems for the Farm Home

BY HOWARD W. RILEY '01

Professor of Rural Engineering, New York State College of Agriculture
at Cornell University

The water supply system which has for man the least operating cost is the great pumping system of nature in which the sun does the elevating, the clouds act as storage tanks, and cold winds come to open the discharge faucets. The more directly the farmer can utilize the assistance of nature the greater will be the comfort which he can take in his supply system and the greater will be the economy of operation. Conversely, the more artificial the system, the greater are the troubles of operation and the greater the cost of maintenance.

Considered from the foregoing point of view, water systems may be divided into three classes, (1) natural, (2) semi-mechanical and (3) mechanical, the determining factor in any case being the level at which the water coming from the clouds is secured as a stored or flowing supply from which it is to be delivered by pipes to the house.

Before undertaking a discussion of the different systems we must pause for a moment to consider a few factors affecting the flow of water in pipes. Water will flow through a pipe whenever the pressure behind it is greater than that in front. Driving pressure may be secured by the weight of water in a higher pipe, in which case the force is that of gravity; it may come directly from the end of a pump piston; or it may come from the expansive force of compressed air acting on the surface of the water. Of these three sources of pressure the height or "head" of water is the most common and has become the recognized standard for measuring pressures. The real driving force, however, is the pressure on the water that is measured in pounds per square inch. A column of water one foot high will produce a pressure at its base of 0.434 pounds per square inch, or there will be required a column of water 2.30 feet in height to produce at its base a pressure equal to one pound per square inch. This rate of pressure is produced by a stationary column of any size from one inch to one mile in diameter. It is independent of the size of the pipe provided the water is not moving.

As soon as water finds the pressure ahead less than that behind, it begins to move and at once some of the available pressure or head is used up in getting the water in motion. The energy thus used in producing velocity can be measured in feet of pressure head and is known as the "velocity head." Again, as the water passes from a large reservoir into a pipe it crowds at the entrance thus using up more energy. This energy is known as the "entry head" or "loss of head in feet due to orifice of influx." After getting itself into the pipe and up to a reasonable velocity of travel the water finds itself retarded by the friction on the sides of the pipe. The longer the pipe and the faster the water flows the greater is the friction until presently the retarding effect of the friction is sufficient to prevent further increase in velocity. As the amount of frictional resistance increases directly with the length of pipe it is usually referred to as "loss of head in feet due to friction per 100 (or 1000) feet of pipe" or "friction head per 100 feet of pipe." The smaller the pipe or the rougher the inside surface, the greater is the friction loss, the general expression for this loss, as given by Prof. E. W. Schoder, of the College of Civil Engineering at Cornell, being \( H = K V^n \), in which \( H \) is the friction head per 100 feet of pipe; \( K \), a constant; \( V \), the
velocity in feet per second; \( n \), an exponent nearly equal to 2 (about 1.90); \( d \), the inside diameter of the pipe in feet; and \( m \), an exponent not much over unity (about 1.25). The value of \( K \), \( n \), and \( m \) vary for different kinds of pipe, and \( V \) must be taken for a considerable range of velocities, so it is evident that the computation of friction losses in pipes is too complex an operation to be undertaken by the individual who had better get the desired figures from a book of tables. These tables will also give the velocity head and the entry head for any condition, but for farm systems these two losses are so small as to be negligible, the friction head being the important item.

One more term of hydraulics should be briefly defined before we go on to water systems, and that is the term, “hydraulic grade line.” Assume that we make a drawing accurately to scale of the side view of a water reservoir and a discharge pipe leading diagonally downward from the bottom of one side as shown in Fig. 1. A horizontal line is drawn from \( C \), the center of the outlet of the pipe, under the reservoir. The vertical distance from this horizontal line to the water level \( A \), in the reservoir, is a measure of the total head available above the outlet of the pipe. If water flows freely from the pipe, part of this total head would be lost as velocity and entry heads, so these might be taken from tables and marked off to scale as the point \( B \) on the side of the reservoir below the water level \( A \), and add friction, or if constricting valves or fittings are introduced in its length, the “hydraulic grade line” will not be a straight line but will drop sharply at points to show the loss of head due to these obstructions as illustrated in Fig. 2.

We may now take up in detail the classification of water systems as given at the beginning of this article.

**Natural Systems**

Natural systems are those in which the water will flow by force of gravity alone from a reservoir at a high level to a point of utilization at a lower level.

Direct gravity systems are those in which the delivery pipe follows in general, a continuously downward direction. It may follow the contour of the ground and, in the descent to the farm buildings, may pass under intervening valleys of any depth, or over obstructing knolls on which the pipe line does not rise to a level higher than that of the “hydraulic grade line” defined above.
The pipe may rise somewhat above this grade line and still continue to deliver water, but there will be siphon action at this point which would throw the system into the next classification and, what is more important, cause it to be subject at this point to the troubles of a siphon system.

In order to find the free discharge capacity of a given length of a given size of pipe with a known supply head, find first the average fall per 100 feet of pipe; then, disregarding all losses except that of friction, find from the tables the velocity of flow in this pipe which will develop a friction head in 100 feet equal to the available fall per 100 feet. For this velocity the tables will give the flow from the pipe in gallons per minute and in gallons per 24 hours. If it is desired to reserve a certain part of the total head for use at the lower end of the pipe, as for power purposes or to give rapid discharge through faucets, the amount of head thus reserved should be subtracted from the total head before the average head available for overcoming friction is determined per 100 feet of pipe. For households, about five feet of head available at the highest faucet will give sufficient velocity of delivery, while for power purposes as little head must be lost in friction as is consistent with the cost of the larger pipe used to avoid friction.

Siphon gravity systems are direct gravity systems in which the delivery pipe rises above the hydraulic grade line. The amount of this rise should be as little as possible and should in no case exceed twenty feet as indicated for pipes A or B in Fig. 3. The reason for this is that in the pipe above the hydraulic gradient the pressure is less than atmospheric pressure, and as a consequence minute air globules are released from the water and accumulate at the top of the siphon forming a mechanical obstruction in the pipe which sooner or later will entirely stop the flow of water in it. All siphon systems should be provided at their high points with accumulation chambers opening from the top of the pipe in which these air bubbles may collect without hindering the flow. The chamber must be air-tight and valves should be provided at each end of the pipe line so that the chamber may at any time be easily emptied of air by filling it with water.

Artesian wells are essentially gravity systems because their flow is produced by a head of water coming from a direct gravity system flowing through a natural water tight passage under ground, instead of through a manufactured pipe. Where it is possible to restrain the pressure of artesian wells they are often made to deliver water through pipes to considerable heights.
Semi-mechanical Systems

Semi-mechanical systems are those in which the power of falling water is utilized in a suitable machine for elevating a smaller volume of water to a level higher than that from which the operating water originally came.

Hydraulic rams, the operation of which was described in the January number of the Cornell Countryman, are the best known devices for this type of service. For operation there should be available three to fifteen feet of fall and a supply of not less than two or three gallons per minute. The greatest delivery height for simple rams is ten times the amount of fall, while for larger, more expensive rams it can be as much as twenty-five times the fall. The amount of water delivered will vary from one-fourth to one-twentieth of the supply, depending on the conditions.

Water wheels driving pumps make a type of system to be preferred in some instances to the hydraulic ram. The condition under which they are most likely to show superiority over the ram is in the case where it is desired to use the fall of dirty water to raise clean spring water without the least possibility of the two being mixed. The type giving the greatest efficiency is the steel bucket overshot wheel which is now manufactured in small farm sizes by several different firms.

The hydro-pulsator is a machine resembling somewhat a hydraulic ram and a reaction turbine. The action is essentially that of the ram with the exception that the driving column of water is never brought to a complete stop as in the ram. With this machine water may be raised from a level lower than that at which water wastes from the pulsator, a characteristic which would make this device capable of using a limited supply of irrigation water falling through quite a drop from an irrigation ditch and by this means pumping an auxiliary irrigation supply from a well. So far as we know, the machine has never been made in this country. It is described in the files of the “Stevens Indicator” to be found in the Sibley Library.

(This article will be continued in the May issue.—Ed.)
Northern New York includes roughly all that part of the state north of the Mohawk drainage. It embraces all of eight large counties and a considerable part of six other counties on the southern side that belong mostly to more southern divisions of the State already described in this series of articles.

The total area of the region is approximately 14,500 square miles or one-third of the state, of which about 3,350 square miles are improved, and the remaining 77 per cent are unimproved and forest land. It is the “north country,” so-called by some of its enthusiasts residents.

The region divides into three main sections, namely the Adirondack Mountains proper, the central mass, and the valley or plains region that roughly form the east and west sides of the boundary triangle, namely, the Champlain Valley on the east and the lowlands around the east end of Lake Ontario and through the St. Lawrence Valley on the west. These two lowland regions join across the northern flank of the mountain section on a low ridge.

The topography is that of a great central mountainous dome reaching an elevation of more than five thousand feet, ironed out on its edges to form low plains only two or three hundred feet above sea level. Even these latter are more or less wrinkled and irregular so that the true plains areas are generally of small extent and are almost extensively developed in central Jefferson County, along the lower course of the St. Lawrence River and in small pocketed areas along the lower course of the St. Lawrence River and along the shore of Lake Champlain.

The drainage radiates out from the mountain area in a series of rivers, the largest of which are the Black, the Saranac, Ausable and the head waters of Oswagatchie, Grass, Raquette, Salmon, of the Hudson River. These waters find their way out in tortuous channels and then a succession of falls which develop a potential water power in this region greater than all the remainder of the State combined. The last line of falls on these rivers marks the location of the chief cities of the region such as Watertown, Gouverneur, Canton, Potsdam, Malone and Glens Falls. These cities in turn are not far from marking the division between the tilled agricultural lands on the lower side and the rough and mostly untilled lands on the higher side of the region. Ogdensburg and Plattsburg are water ports.

Geology. Geologically, this region includes the oldest part of the State, the central mountain dome being composed of plutonic rocks, mostly granite and norite, that are of Pre-cambrian Age. The slow emergence of this dome above sea level is marked by a succession of rock strata that lie in sloping folds around its flanks on all sides. Some of these have been more completely removed than others. Around the north edge is the very siliceous Potsdam Sandstones that form a wide exposure. Beyond this is a succession of limestones,
the Trenton through the St. Lawrence Valley, and the Beekmantown and Chazy on the upper end of Lake Champlain. On the southern side there are also small exposures of limestone in Saratoga County and in northern Oneida and Lewis Counties. Lapping on these latter are the Hudson River Shales and Sandstones most extensively developed in southern Lewis County.

This rock structure is deeply eroded to form a very rough topography that has been toned down by the subsequent incursion of glacial ice that deeply covered the entire area. The great diversity in elevation caused large deflection in the ice currents. The hardness of the rocks resisted abrasion and have developed large areas of very stony soil as well as much rough stony land with little or no soil covering. Subsequently the drainage from the melting ice settled in the hollows to form great rivers, extensive lake plains and numerous swamps and small lakes.

The ten or more important series of soils recognized reflect these different influences.

General agricultural conditions of the mountain region. All the central mountain mass is essentially non-agricultural. The Plutonic rock with their surface plained off by the ice lie uncovered over large areas on the exposed side. The deep valleys and protected coves are deeply filled with coarse siliceous sand often thickly strewn with boulders and occasionally finished with a thin yellowish brown stony silty loam soil. The till portion of this belongs to the Gloucester Series. The sandy stream terraces mostly of low agricultural value are of the Merrimack Series. In a few places, these soils with occasional narrow ribbons of first bottom are cleared and farmed to supply the summer tourist population of the region because of the great difficulty of getting in supplies. Only abnormal prices will justify the tillage of this land. Lakes, ponds and swamps abound in the hollows formed by the unequal filling of the valleys.

Lowland soil conditions. The northern and western flank up to an elevation of six or eight hundred feet bears a succession of glacial till soils related to the rocks of the region. Across the north front from Clinton County to St. Lawrence County, the Potsdam Sandstone gives rise to the
Coloma Series. For the most part the soils are thin and very stony, the rock being the local sandstone. Tilled areas are small and irregular in sheltered patches. It is a slightly reddish brown silty to sandy loam soil resting on a grayish subsoil. The surface is undulating to broken and reaches up to an elevation of 1500 feet. The drainage is uneven and the content of humus is low.

This series forms the broad divide on the Canadian line between the Champlain and St. Lawrence drainage.

In northern New York the Coloma Series is preeminently identified with the production of potatoes, especially in Clinton and Franklin Counties. The sandy loam is dominant, and when coupled with the climate that prevails makes the cool but active soil conditions most favorable to yield and quality in the potato. Two or three hundred bushels is the common yield.

Beyond the Coloma Series at a lower elevation are the Calcarious Series that vary in different sections according to the supplementary rock introduced with the limestone.

In Clinton and Saratoga Counties, where sandstone and granite occur, it is the Dover Series, grading over into the Mohawk Series in the latter area. Generally it is a rather stony dark gray till of loam to sandy loam texture with a compact subsoil. The soil has a dark brown color varying with the content of humus. It forms fairly large areas of smooth farm land and is generally the site of excellent farms.

On the west side of the region the Ontario and Farmingdale Series embrace the Calcarious till in southern Jefferson, northern Lewis and the west central part of St. Lawrence Counties. It also reaches into the northern part of Franklin County. The Ontario Series is dominant. The loam and silt loam types, prevail with more or less stone, but usually not in very troublesome amounts. The rolling slopes of the Ontario Series are smooth enough for general farming. The brown to gray finable soil grades into a rather compact gray sandy till. Trees thrive on this soil. Drainage is often deficient.

The Farmingdale Series best seen southeast of Watertown is a light brown loose finable soil and subsoil, rather thin and semi-residual from the underlying limestone.

All these Calcarious soils are fairly well supplied with lime, especially in the subsoil, and generally produce clover with fairly good success. They are very productive soils.
On the southwest flank in Lewis County and the adjacent regions the Hudson River Shales and Sandstones have given rise under glaciation to the Worth Series related to the Dutchess and Volusia Series in southern New York. The types range from clay loam to heavy sandy loam usually containing a good many sandstone boulders. In eastern Oswego County, the red material of the Medina Formation imparts a pinkish tinge to some of the soil.

The country is hilly and, owing to a deficiency in lime, is low in productivity because of a lack of humus. Most of the land including that which has been formed is now untilled.

Lake and terrace soils. Probably the most extensive series of tillable soils in northern New York is the Vergennes. The lake conditions that prevailed through the St. Lawrence and Champlain Valleys up to an elevation of about two hundred feet above the present water surface inundated the low stretches of country. The streams from the ice and from the mountainous part of the region discharged out into this succession of lakes and formed a series of great sand and gravel delta plains at their mouths. These were partially reworked into sandy, gravely beaches that mark the limit of the lake. The high velocity of the stream brought down coarse sand and gravel that came to rest in these deltas in successive courses as the flow of the stream was checked. The coarse material forms great semi-barren plains well exemplified below Carthage, Governor, in the vicinity of Malone, back of Plattsburg, in the sand plains back of Glens Falls and in northern Saratoga County.

As the finer sediments floated out into the deeper water of the lake, finer and better soils were formed. These heavy soils form extensive plains areas in Jefferson County and along the St. Law-

![Typical Farm Buildings and Topography in St. Lawrence District](image)

*Note the areas of heavy clay soils cut by rock outcrops*
heavy soils is nearly flat. However many rock masses extended up into the lake waters and either have no deposit or only a thin covering. They give a roll to the surface or cut the tillable soil into irregular pocketed areas. This condition is most extensively developed in northern Jefferson and southern St. Lawrence Counties.

The sandy and gravelly deltas and beaches have small agricultural value. The clay plains are troubled with wetness. This latter, coupled with short seasons, makes a serious handicap in the production of tilled crops and contributes to the large development of hay crops in the region.

The soil is a dark gray to brownish gray color with a rusty brown subsoil. The latter is compact and generally quite Calcarious below two or three feet.

**General agricultural conditions.** As a whole, northern New York is not intensively developed. Its suitability for hay and forage has led to the large development of dairying. Watertown has the largest butter and cheese exchange in the country. Market milk is collected throughout the length of both the over and is growing up in an indifferent way. Waste land occurs in large amounts throughout, due to stony soil, rough topography and wet land.

The most extensive sale crop from the clay soil is hay. Corn is better grown for silage than for grain because of the cool summers and short season. Oats is the prevailing grain crop and some barley is also grown. In northern Franklin and Clinton Counties potatoes are the leading money crop and, as noted above, are associated with the Coloma sandy soils.

Certain varieties of apples, particularly the Snow and the Esopus, are proving very successful on the eastern side of the area on the Dover soils both in Clinton and Saratoga County.

Around Malone, hops have been extensively grown on the Dover soils, but like those in central New York, are being
forced out by disease and by western competition.

In the line of improvement, better drainage of the soil is believed to be for the most pressing need. The extent of heavy soil, the short season and the poorly distributed rainfall lead to this conclusion. There is also a need of lime. The coarse sandy and gravelly soils should be devoted to forestry. As a whole the region should receive in a broad and public way of the best principles of modern forestry. The petty policy of tying up the State forest areas as game preserves and tourists play grounds for the people who need these least, coupled with the waste of the timber product that might better be utilized, is an instance of short-sighted selfishness that a less progressive commonwealth might well blush to own.

Legume Inoculation
Extension Work of the Laboratory of Plant Physiology
BY LEWIS KNUDSON,
Assistant Professor of Botany, New York State College of Agriculture at Cornell University

It is now approximately thirty years since the artificial inoculation of leguminous crops was first practiced, but up to 1905 the use of pure cultures for legume inoculation had been slight. This previous disinclination on the part of the farmer to use pure cultures for legume inoculation has been due in part to the lack of information upon the part of the farmer and to the discrediting of the idea of legume inoculation with pure cultures because of the failure of these cultures to produce the desired results. Within the past ten years, however, effective cultures of legume bacteria have been put on the market. That the use of these has greatly increased is evident from the fact that last year the sales of one company was reported to have reached a value of nearly one million dollars. The increase in the use of cultures for legume inoculation has been stimulated by the increasing emphasis placed upon the utilization of leguminous crops, the teachings of agricultural institutions with respect to inoculation, and the nation-wide propaganda of those commercial organizations engaged in the exploitation of legume cultures. Much information has been disseminated in this way, though some of it has been misleading. There is still, however, on the part of farmers in general a lack of knowledge respecting legume inoculation. For the primary purpose of educating the farmer to the value of legume inoculation, as well as to acquaint him with the limitations of the practice, the Laboratory of Plant Physiology has for the past four years distributed in limited quantity pure cultures of these bacteria. The educational value of this work is founded upon the fact that the farmer is enabled at slight expense and little effort to gain first hand knowledge respecting the relation of bacteria to nodule formation, and in many cases is able to discover by experimental means the value of these nodules to the plant.

While the primary object of this work is educational in nature, yet other purposes enter into the distribution of these cultures. By making available to the farmer the legume bacteria cultures at a nominal cost, he is encouraged to practice inoculation particularly when experimenting with a new legume crop. The immediate results of a practical nature obtained from this distribution of cultures have been the successful growing of crops which otherwise might have resulted in failure. Finally, the results secured by the practice of inoculation are reported
to the college so that in time there will be available a considerable body of data relative to the necessity and value of inoculation in New York State for the different leguminous crops.

The work of the Laboratory of Plant Physiology in the preparation of these cultures was begun in 1910 when an investigation was initiated with the idea of securing a satisfactory medium for the propagation of these bacteria. It appeared at that time that the pure cultures then available to the farmer were not entirely satisfactory. It was believed that the artificial media used were not quite suitable to the organism. As a result of a rather extended investigation it was finally decided to use sterilized sand for the propagation of the legume bacteria.

The form of cultures as now distributed was then adopted as being the most effective means for distributing the bacteria. The cultures in brief are prepared as follows: The bacterial organism is first isolated from a given species of legume. It is then propagated in test tubes on a nutrient agar medium and then the organisms from each test tube culture are sown in a can holding two pounds of sterilized sand. In the course of a few days the bacteria have multiplied so rapidly that a single gram of the soil may contain from 50 to 200 millions of bacteria. The writer has estimated that such a culture used for the inoculation of alfalfa sufficient for one acre, will contain approximately 6000 organisms for each alfalfa seed.

The method of inoculation remaining. The contents of the can is added to a quart or more of water and the water and sand poured over the seed to be inoculated. The seeds are then turned over until each individual grain is moistened. The sand and water coming into contact with the seeds impart to the seed some of the legume bacteria which adhering to the seed are carried with it into the soil. The organisms getting into the soil undoubtedly multiply, and as soon as the roots appear, contact of some of the organisms is made with the roots and the infection is then secured which results in nodule formation.

The main advantage of the sand cultures over other pure cultures is the increased viability of the bacteria and the entire lack of danger of injuring the culture. The cultures can be kept for at least a year without losing their effectiveness. Data obtained indicate that cultures two and three years old are still capable of inducing nodule formation. By yielding some colloidal materials and by its abrasive qualities the sand undoubtedly makes possible an increase in the number of organisms which become attached to the seed.

The distribution of cultures during the season of 1915 was as follows:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>3445</td>
</tr>
<tr>
<td>Alsike clover</td>
<td>173</td>
</tr>
<tr>
<td>Crimson clover</td>
<td>55</td>
</tr>
<tr>
<td>Red clover</td>
<td>838</td>
</tr>
<tr>
<td>Sweet clover</td>
<td>155</td>
</tr>
<tr>
<td>Field clover</td>
<td>557</td>
</tr>
<tr>
<td>Garden clover</td>
<td>23</td>
</tr>
<tr>
<td>Soy bean</td>
<td>394</td>
</tr>
<tr>
<td>Canada field pea</td>
<td>696</td>
</tr>
<tr>
<td>Cowpea</td>
<td>142</td>
</tr>
<tr>
<td>Spring vetch</td>
<td>66</td>
</tr>
<tr>
<td>Winter vetch</td>
<td>747</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7291</strong></td>
</tr>
</tbody>
</table>

The cultures were sent to approximately 1900 individuals, while during 1914 the number receiving cultures was approximately 1200 with a total of 5,045 cultures. The facilities of the laboratory have not thus far permitted of a greater distribution of cultures although it is expected to increase the work during the coming season.

Results of a noteworthy, beneficial character have been secured with the cultures for alfalfa, vetches, soy bean, sweet clover and field pea. The first four are relatively new crops for New York and, as expected, the organisms necessary for nodule production in these crops are not generally present in New York soils. With the field pea the influence of inoculation has been marked
in the cases where the crop has been grown for the first time. Beneficial results have been repeatedly reported from the inoculation of red clover, but the clovers have been so generally grown in New York State that inoculation for these crops is not to be recommended. The greatest demand has been made absolutely dependent upon nodule production on the roots. There is no doubt about this and since the organism for causing nodule formation on alfalfa is not generally present in New York soils, artificial inoculation is essential to success. Of course the proper soil conditions must be provided.

for cultures of alfalfa and, as indicated in the accompanying figure, the interest in the growth of alfalfa is wide-spread. It is yet too early to report on the success of the alfalfa trials throughout the State. In the limestone area of the State alfalfa is being grown successfully and the reports now at hand indicate a high degree of success in regions outside of the limestone soils. In any case successful growth of alfalfa is abso-

In conclusion mention should be made of the active interest and cooperation of the various farm bureau agents. It is in a large part through the active support and oversight of these men that many of the inoculation tests have been made and it is largely their judgment based on their observations and experiments that will decide for any particular locality the need for inoculation for any particular crop.
Coal-Tar Products Versus Carbolic Acid as Disinfectants

BY A. H. ZENNER, Detroit, Michigan

According to Webster, a disinfectant is an agent for removing the causes of infection. It is a conceded fact that infection is caused by disease germs; therefore, in order to be a true disinfectant, a substance must kill or destroy disease germs.

A few years ago the only well-known disinfectant was carbolic acid, and this came to be used very generally when a disinfectant was required. The term carbolic acid is employed in a lax way, as the acid is used in many strengths. The laity run great risk of using it either too strong or too weak, so that the results are not always dependable or satisfactory. Carbolic acid is probably responsible for more deaths by accident and suicide than any other drug, and it is always dangerous to use and handle. The greater part of the supply comes from Germany, and under present war conditions the price has reached $2 a pint.

Some years ago science took a hand to find what residue there was after carbolic acid had been distilled from crude oil. Experiments led to the discovery of the so-called coal-tar disinfectants, such as "zenoleum", "greso", and several others, and it was found that these were much greater in germicidal value than carbolic acid. In order to determine their germicidal value, it was decided to compare them with carbolic acid. This gave rise to the "carbolic coefficient," which means, for example, that if a disinfectant has a carbolic coefficient of three, it has three times the germicidal value of pure carbolic acid.

A disinfectant with three times the value of carbolic acid will perform the same work when diluted three times as will the same amount of undiluted carbolic acid. It was found that these coal-tar disinfectants could be manufactured at a much less cost than carbolic acid; the retail selling price on the two products named is $1.50 a gallon. It was found also, after repeated experiments, that the coal-tar disinfectants were not dangerous to handle. They are absolute disinfectants, and when properly diluted will kill the most resistant disease germ, by contact, in one minute. The typhoid fever germ was used for this test.

Coal-tar disinfectants not only will prevent disease, but in many instances will cure it. They will kill lice, mites and parasites, and cure skin diseases.

Compare the cost of pure carbolic acid at $16 a gallon, and the cost of one gallon of coal-tar disinfectant at $1.50. The coal-tar disinfectant has three times the germicidal value of carbolic acid; therefore it would take $48 worth of carbolic acid to do the same work that $1.50 worth of coal-tar disinfectant will do.

There are many products used as disinfectants which have little germicidal value. One of these is kerosene. It sells for fifteen cents a gallon and is used pure. The coal-tar disinfectants are to be mixed with 100 gallons of water; no boiling is required, and at $1.50 a gallon the cost of the diluted liquid would therefore be about one and one-half cents a gallon.

In choosing a coal-tar disinfectant, be sure to select one that is standardized, that is, always of the same coefficient. The Government requires that the contents of the package be on the label, and no variation from this rule is allowed. One can readily see, therefore, that the purchase of a trade-marked coal-tar disinfectant has the guarantee of the manufacturer and also of the United States Government. This is another strong point in favor of coal-tar disinfectants.

To sum up, the coal-tar disinfectants are cheaper, in many cases better, and safer to use, than carbolic acid, kerosene, and many so-called disinfectants that are not disinfectants at all.
The Man on the Land on the Other Side of the World *

BY BEVERLY T. GALLOWAY

Dean New York State College of Agriculture at Cornell University

VI. THE CROPS OF CEYLON

Lying, as it does, close to the equator, with an area in cultivation equal to about one-third that of the State of New York, the island of Ceylon offers an interesting study in tropical agriculture. Tropical agriculture differs in many respects from the ordinary farming practiced in temperate regions. The crops grown in the Tropics are mostly long-lived, and their cultivation partakes more of the nature of gardening than do the usual farming operations. Labor as a rule is cheap; hence it is practicable to do many things by hand which could not be done by machinery even if labor were not available. Double cropping, and even quadruple cropping, is frequently practiced, but this is made possible only by heavy rainfall, great activity of soil organisms, cheap labor, and comparatively cheap means of soil fertilization.

The island is shaped somewhat like a pear, with the stem end pointing toward the southern extremity of India, from which it is separated by only a short distance. The waters between India and Ceylon are very shallow, and trains are soon to run, if they are not already running, straight through from points in India to points in Ceylon. The engineering work here is similar to that on our Florida Keys, where a passenger for Cuba is carried most of the way by rail.

The principal crops of the island are rice, coconuts, and tea. Of the first, there are between 600,000 and 700,000 acres under cultivation; of the second, something like 800,000 acres; and of the third, between 300,000 and 400,000 acres. Rice is grown in Ceylon on both the hill and the flat lands. In the hills are to be seen some of the most wonderful of the terracing operations to be found in any country. These terraces are of all ages and have been used by primitive people in many countries for the cultivation of crops. The hillsides, running up sometimes for a thousand feet, are terraced by hand labor. The terraces follow the contour of the land, and in many cases they are only a few feet wide. By this method the land is leveled so that water may be readily applied. Rice growing is about the same in all these countries, involving much hand labor from seedtime to harvest. In Ceylon the growing of rice crops is practically continuous. Harvesting with the sickle may be in progress in one field, while in an adjoining field hand planting of individual plants or sowing of the seed may be going on.

There are many superstitions connected with the production of rice—superstitions affecting the time of planting, the time of harvesting, the character of the seed, methods of threshing, and other allied matters. A writer, speaking of these superstitions, says:

The farmer presents himself before the village wise man or astrologer on a Monday or Wednesday, with an offering of betel nuts, and expresses his wishes in a humble attitude. The wise man then informs his petitioner, after certain astrological calculations, upon what the success or failure of his undertakings depends. The farmer must then go out with his face turned toward the proper direction as indicated by the astrologer. Should the farmer on this journey encounter sights or sounds which portend fail-

* This is the sixth of a series of articles on farming in foreign lands. The first article appeared in the October number of the COUNTRYMAN—Ed.
ure, such as the cry of an owl, the growling of a dog, the sight of persons carrying weapons, he immediately turns back, as the portents are against him. If, when he goes out, he should meet a cow, men dressed in white, or women or children carrying vessels filled with water, it is a good omen, and he may then proceed with his planting.

Ceylon does not produce sufficient rice for her own needs, but must import large quantities from India. The threshing and cleaning of the rice is carried on in the most primitive way, the work being done by flails and by the old-fashioned method of using cattle to tread out the grain.

To the dweller in the Tropics the coconut is food, shelter, clothing and drink. There is no other plant in the world like it in this respect. Nearly every villager has a coconut palm or two. The open lands along the coast produce coconut trees in great abundance as a result of washed-up nuts, so that there are nearly always enough trees to furnish food for the natives. The large coconut plantations are owned by the English and the Dutch and are found chiefly in the lowlands.

Statistics as to the quantity of nuts produced on the island are not available. There are many billions of them, however, from which coconut oil, copra, desiccated coconut, coir, arrack, and other materials are obtained. Coconut oil enters largely into the manufacture of soaps, candles, and the like. Copra is the dried flesh of the coconut pressed into cakes for convenience in shipping; after the oil is pressed from the coconut there is a very useful residue known as poonac, which is used for cattle food. Coir is the material made from the long fibers of the husk, and is used extensively in the manufacture of brushes, mats, heavy ropes, and the like. Arrack is the fermented juice of the coconut and is strongly intoxicating. The young and tender leaves of the tree are used as a vegetable, and there is also made from the juice a kind of sugar which is very much in demand among the natives.

On the lower levels about Colombo and extending back for twenty or twenty-five miles may be seen large plantations of coconuts, and growing under the coconut trees are young rubber trees. Growing under the rubber and the coconut trees may occasionally be seen tea plants, with still other crops, such as plantains, arrowroot, and the like, inter-
mingled with the tea. Thus there is a mixed garden cultivation which at first sight appears to be more or less of a jungle.

Tea and Ceylon have become almost synonymous. The great tea plantations are found in the higher parts of the island. Leaving Colombo in the level country, one travels for twenty-five or thirty miles, and then the railroad begins to ascend a steep grade. The ascent is through wonderful tropical scenery, and after one or two hours of heavy climbing the train reaches Kandy, which is the center of one of the large tea districts. The hill and mountain sides about Kandy are covered with tea plants, which are kept rather closely pruned in order to facilitate picking. From Kandy to Nuwara Eliya, a distance of from seventy to one hundred miles, there is a very steep ascent. Kandy is only about 1600 feet above sea level, while Nuwara Eliya is at an elevation of nearly 8000 feet. All the region between these two points constitutes the great tea center of the island. Most of the tea estates are very large and are under the control of the English. Labor is cheap and consists mostly of coolies, who work for from 15 to 25 cents a day. The plucking, sorting, fermenting, curing, and general preparation of the tea is a rather elaborate process, requiring large, well-organized forces and good factory facilities.

The tea growers of Ceylon have made very rapid advances in the manufacture of their product. Many labor-saving machines have been introduced, eliminating a great deal of work formerly done by hand. Furthermore, these labor-saving machines have made it practicable to do the work much more cleanly than formerly. The general practice of making the tea is the same here as in other parts of the world. The leaf when gathered is brought into the central factory, and if it is to be made into green tea it is first wilted so as to make it flaccid. Then it is put into a roller and rolled for half an hour or longer. This rolling produces certain physical and chemical changes in the leaf which enable the fermenting agencies to act promptly. The large roll that comes out of the roller is broken up and the material is put immediately into the dryer so as to check all of the oxidizing ferments. The only difference between green tea and black tea is that green tea is not allowed to ferment, while black tea is permitted to ferment for a considerable time. Oolong tea is an intermediate form between black and green. The sorting, cleaning, and packing of tea are tedious processes, but

(Continued on page 620)
Bean Growing in Western New York
Results of a Bean Survey of Ontario County Made in 1915
BY F. W. LATHROP '14, Instructor in Agriculture, Canandaigua Academy

This survey in one of New York’s most prosperous counties and one which is well known for the specialty it makes of growing beans was made in the summer of 1915, but the data secured for the records was taken on 1914 crops. With but few exceptions all the information contained in this survey was taken from farms in Ontario County. Nearly all of the survey work was done in four sections, namely, Bristol Valley, Middle Cheshire and West Lake Roads, Bloomfield and Rochester Roads, Reeds Corners and Rushville.

The Culture of Beans
The common practice of growing beans in these sections is to plant them on land which was in sod the previous fall and was plowed up either in the fall or in the early spring before planting. Of forty growers visited, thirty-one planted on sod land, six planted after the land had been used for corn, two planted their beans in the orchard and one planted after the land had been covered with quack grass. In many instances the plowing was delayed until one to three weeks before planting time. Growers apply manure to the land during the winter or in the spring and they usually cover only the spots which are most barren. The spring tooth harrow and the roller were the only “fitting” tools used by twenty-five of the forty growers. The seed is never treated to prevent anthracnose or bacteriosis because no effective seed treatment has yet been devised. Formalin treatment was tested but it was ineffective. Although the seed is often cleaned and handpicked no real selection is practiced. The writer found only one grower who had a seed patch. The amount of seed differs with the variety; for kidneys the amount is usually six pecks, for contract beans, marrows and yellow eyes five pecks, and for pea beans three and one-half to four pecks.

The beans are drilled in twenty-eight-inch rows. An eleven-tooth drill with a seven-inch spacing, for example, is used with the second, sixth and tenth tubes open. The wheel mark serves as a guide. Commercial fertilizer is sown by the drill at time of planting. Thirty-five of the growers used either manure, or fertilizer, or both. The seed is drilled to a depth of two inches. The time of planting varies with the season as is shown in Table 1 which gives an idea of the general practice in 1914.

<table>
<thead>
<tr>
<th>Time of planting 1914</th>
<th>Date</th>
<th>No. growers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>June 1-10</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>11-20</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>21-30</td>
<td>6</td>
</tr>
</tbody>
</table>

Usually the middle of June is bean planting time. Too early planting results in poor germination and uneven maturing of pods which is a serious matter. A weeder is rarely used after the plants are up. Twenty-nine of the growers had two-horse cultivators which are the favorite tool for cultivation. Eighteen growers straddle every row so that they go twice between rows while eleven straddle every other row and go once between rows. Six growers use one-horse cultivators and five use both kinds. The first cultivation is deep and close to the row while the succeeding ones are shallower and not so close. Only eleven growers hoed their beans. At the last cultivation thirty-two of the growers threw the dirt toward the rows so that the bean puller would work more effectively.

Spraying is not practiced because it is difficult to effectively spray beans. Furthermore it is not profitable except
where the crop is threatened by some insect pest. Some growers could have profitably sprayed for striped flea beetle and snails during the 1915 season.

Harvesting is done with a bean puller which is made of two blades placed like the blades of a half-opened pair of shears. These blades, which are attached to a standard, cut just beneath the surface bringing two rows of beans together into one.

A team of horses will pull six to ten acres a day. The rows of pulled beans may be raked and forked into bunches or may be bunched without raking. Of the growers visited, twenty-two used a hay fork. The following table will show the dates of harvesting beans in 1914. Certain varieties like the pea beans and marrows are earlier than the kidneys and may be harvested in time to prepare the ground for wheat. Some crops of kidneys are harvested in time and some are followed by oats the next spring.

The beans are kept in the mow or in the stack until the threshers come. The usual price for threshing is seven cents per bushel, but for a small job a set price is asked. The threshed beans are then put in grain bins until it is time to sell them. Table 3 shows the

<table>
<thead>
<tr>
<th>Date of Harvesting in 1914</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
</tr>
<tr>
<td>Sept. 10-20</td>
</tr>
<tr>
<td>Oct. 1-10</td>
</tr>
<tr>
<td>Nov. 1-10</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th>Date</th>
<th>No. of growers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept. 10-20</td>
<td>5</td>
</tr>
<tr>
<td>Oct. 1-10</td>
<td>12</td>
</tr>
<tr>
<td>Nov. 1-10</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Miles</th>
<th>No. of Growers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>4</td>
</tr>
<tr>
<td>1.1-2</td>
<td>6</td>
</tr>
<tr>
<td>2.1-3</td>
<td>5</td>
</tr>
<tr>
<td>3.1-4</td>
<td>8</td>
</tr>
<tr>
<td>4.1-5</td>
<td>0</td>
</tr>
<tr>
<td>5.1-6</td>
<td>7</td>
</tr>
</tbody>
</table>
**Factors Affecting the Yield of Beans**

Since the cost of production and profits depend largely on yield, an effort has been made to study carefully the factors which affect the yield. These factors are, (1) variety (2) soil (3) time of planting (4) rotation (5) preparation of the ground (6) seed (7) diseases and insects (8) fertilizers and manures (9) cultivation and (10) rainfall.

**Varieties**

Red kidney is the most widely grown variety. It is a good yielder when anthracnose is not prevalent and brings a higher price than other varieties. In certain localities contract beans are grown for seed houses. In this case the grower is supplied with seed which is later taken from his crop. The price of the beans is agreed upon when they are planted and no charge is made for cleaning. Black Valentine, Refugee Wax and Bountiful are the most common varieties found. The acreage of pea beans found was smaller than expected. Contrary to the general idea the average yield was found to be lower than that of the red kidney, but perhaps the small number of acres does not furnish a fair comparison. During a year when anthracnose is common, white beans will make a much better showing because they are not as susceptible to disease as the red varieties. The red marrows are similar to the red kidney in everything except they are smaller and weigh heavier to the bushel. On the thirty-three acres surveyed these beans yielded better, than the kidney variety. The yellow eye is a fair yielder which is resistant to anthracnose, but the market demand is limited. Consequently the price is never the highest. White marrow and white imperial are two promising varieties because they are anthracnose resistant and their price is usually higher than that of pea beans.

Red kidneys are found in all parts of the country where beans are raised, red marrow having the same adaptation. Most of the contract beans were found west of Canandaigua Lake on the Middle Cheshire Road. The soil there is mostly Ontario loam. Many pea beans were found north of Canandaigua on the Bloomfield Road. There the Dunkirk clay and silty clay loam are the predominating soils.

Yellow eyes are most common in the vicinity of Rushville. One field of fifty acres was observed there. The most common soil types were Ontario and Volusia loams. The following table compares the yields of the different varieties. Where the acreage of a variety is small the yield cannot be considered representative in comparing one variety with another.

<table>
<thead>
<tr>
<th>Variety</th>
<th>No. of growers</th>
<th>No. of acres</th>
<th>Ave. yield in bu. per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Kidney</td>
<td>27</td>
<td>356</td>
<td>15.1</td>
</tr>
<tr>
<td>Contract</td>
<td>7</td>
<td>89</td>
<td>11.1</td>
</tr>
<tr>
<td>White Pea</td>
<td>7</td>
<td>76</td>
<td>14.1</td>
</tr>
<tr>
<td>Red Marrow</td>
<td>4</td>
<td>33</td>
<td>18.5</td>
</tr>
<tr>
<td>Yellow Eye</td>
<td>2</td>
<td>17</td>
<td>11.2</td>
</tr>
<tr>
<td>White Marrow</td>
<td>1</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58</strong></td>
<td><strong>586</strong></td>
<td></td>
</tr>
</tbody>
</table>

Average yield for all varieties in bushels per acre, 14.5

With the exception of red kidney beans there are not enough fields of any variety to draw conclusions as to the effect of variety on yield. The writer believes that the strain within the variety is as important as the variety in its effect on yield. There are therefore great possibilities in selecting high producing strains for seedsmen who can give time to it.

**Soils**

Most of the records were taken on Ontario loam. This loam type is suited to beans because of its high lime content and medium texture. There is a strip of this soil east and west across the county at about the latitude of Canandaigua. There are also strips of it part way down on both side of Canandaigua Lake. The Dunkirk types are found north of Canandaigua. They are heavier than the Ontario types with a predominance of silty clay and clay. These types have not the lime content of
the Ontario soils. On the whole they are not as good for beans.

The records taken on Genesee soils came from the Bristol Valley below Bristol Center. The types are a silt loam, a shale loam and a loam. These soils are rich, not too heavy, and may or may not have a rich lime content. Table 5 compares yields on these three soils. Only the fields were included which are on farms having one soil type since on farms having several types it is difficult to tell on which type the bean field is located because of the gradual merging of one type into another.

Table 5

<table>
<thead>
<tr>
<th>No. Growers</th>
<th>Ontario</th>
<th>Dunkirk</th>
<th>Genesee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield in bu. per acre</td>
<td>15</td>
<td>5</td>
<td>14.7</td>
</tr>
</tbody>
</table>

Time of Planting

The time of planting is a factor affecting the yield. Too early planting may reduce the yield materially. Bean seed does not germinate evenly or strongly below a certain temperature, consequently early planting results in a thin stand and an uneven ripening of pods. No correct time of planting can be given since it is determined by the season, the texture of the soil and the location of the field. In the description of the culture of beans the dates of planting of forty growers are given for 1914.

Table 6

Rotations and Yield

<table>
<thead>
<tr>
<th>Rotations</th>
<th>No. growers</th>
<th>No. acres</th>
<th>Av. yield in bu. per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay, beans, wheat</td>
<td>25</td>
<td>117.5</td>
<td>15.8</td>
</tr>
<tr>
<td>Hay, beans, oats or barley, wheat</td>
<td>11</td>
<td>104</td>
<td>15.6</td>
</tr>
<tr>
<td>Hay, corn, beans, wheat</td>
<td>5</td>
<td>78</td>
<td>14.3</td>
</tr>
<tr>
<td>Hay, corn, beans, oats, wheat</td>
<td>1</td>
<td>10</td>
<td>10.8</td>
</tr>
<tr>
<td>Orchard</td>
<td>2</td>
<td>14.5</td>
<td>19.2</td>
</tr>
<tr>
<td>After quack grass</td>
<td>1</td>
<td>7</td>
<td>5.3</td>
</tr>
</tbody>
</table>

Rotations

The records for one year are not enough to judge whether one rotation is superior to another. No doubt the rotation has a relation to yield. Difference in the yield of varieties might affect the yields shown in Table 6 as well as rotations since certain varieties are used with certain rotations. For example, nine of the eleven men who used the rotation, hay, beans, oats, wheat, used the red kidney bean because this variety is later than the others. Many growers cannot get red kidney beans harvested early enough in the fall to sow wheat and therefore plant oats or barley in the spring. As can be seen in Table 6 there are three rotations which are most used. These are hay, beans, wheat; hay, beans, oats or barley, wheat; and hay, corn, beans, wheat. Table 6 does not give a wholly accurate comparison of rotations as to yields because growers often change rotations to fit conditions and the beans do not always come in their regular place. One of the arguments for growing beans is that it makes a very good crop to precede wheat. The length of bean rotations may become important if the root rot, so common in Wyoming County, becomes prevalent in Ontario County. A long rotation is said to be one remedy for this disease.

Two of the growers raised beans in the orchard. These and several other farmers in this locality think that beans make an excellent orchard crop. The crop yields well, adds nitrogen to the soil and does not hurt the trees.

Preparation of the Ground

The plow, spring tooth harrow and the roller are the most frequently used implements. The usual plowing depth is six to eight inches. Growers commonly harrow the land three to five times and roll from one to three times. The disc harrow is sometimes used and occasionally the big cultivator.

Growers plow six to eight inches for beans. It is unsatisfactory to compare
the yields of those fields plowed at different depths because of the difference in soils. Table 7 compares the yields of those who plowed six, seven and eight inches.

**Table 7**

<table>
<thead>
<tr>
<th>Depth of Plowing in inches</th>
<th>No. of growers</th>
<th>No. of acres</th>
<th>Ave. yield per acre in bu.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>9</td>
<td>134</td>
<td>13.9</td>
</tr>
<tr>
<td>7</td>
<td>14</td>
<td>244</td>
<td>13.2</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
<td>127%</td>
<td>17.3</td>
</tr>
</tbody>
</table>

In comparing the yields of the growers plowing six and seven inches, the difference favors those who plowed six inches. Those who plowed eight inches averaged over four bushels more per acre than the growers plowing seven inches. It is safe to say that under identical soil conditions deeper plowing until the subsoil is reached will result in larger yields. Comparing depths in different fields is a more difficult matter.

The time of plowing is important. For example, if a field is plowed a week before planting and is dragged at intervals of two days and another field is plowed a month before planting and dragged the same number of times, but with longer intervals between draggings, the latter field will be in better condition to plant. Table 8 gives the yields of growers whose time of preparation varied. Note that seven of the growers practiced fall plowing and their average exceeds that of any other group.

**Table 8**

<table>
<thead>
<tr>
<th>Days between Plowing and Planting</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of days</td>
</tr>
<tr>
<td>No. of growers</td>
</tr>
<tr>
<td>No. of acres</td>
</tr>
<tr>
<td>Ave. yield per bu. per acre</td>
</tr>
</tbody>
</table>

In attempting to find a relation between the amount of preparation and the yield both the number of times the ground was worked and the time spent in preparing one acre are considered. Neither plowing or drilling is considered as preparation.

Table 9 shows that the growers worked the soil from five to nine times in most cases. In considering all these tables less weight should be given to columns of figures representing a small number of growers. With this caution in mind the number of times the ground is worked has a close relation to the average yield. In studying the time required to plant an acre, horse hours are used rather than man hours; otherwise a man using two horses would have to be compared with a man using three.

Does good preparation pay? A considerable number of growers worked their fields five and nine times. Table 11 gives the average labor cost per acre which includes man, horse and machine labor, for each group and also the average yield. The average increase of cost per acre for those who worked the land nine times was $2.90 and the average increase in yield eight and four-tenths bushels.

**Table 9**

<table>
<thead>
<tr>
<th>Effect of Preparation on Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of times worked</td>
</tr>
<tr>
<td>No. of growers</td>
</tr>
<tr>
<td>No. acres</td>
</tr>
<tr>
<td>Ave. yield bu. per acre</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Horse hours per acre for Preparation and Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horse per acre</td>
</tr>
<tr>
<td>No. of growers</td>
</tr>
<tr>
<td>No. of acres</td>
</tr>
<tr>
<td>Ave. yd. bu. p. acre</td>
</tr>
</tbody>
</table>
Table 11

<table>
<thead>
<tr>
<th>No. of growers</th>
<th>Ave. yield bu. pr. acre</th>
<th>Lab. cost 1 acre, horse, man, mac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worked ground 5 times</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>20.4</td>
</tr>
</tbody>
</table>

Seed
Very little attention has been paid to the improvement of bean seed. New York bean growers might benefit by pedigree beans just as Wisconsin farmers have by pedigree barley. Although there are no figures to prove it, there is no doubt that the quality of the seed has no effect on the yield. Seed selection is important for two reasons; first, anthracnose and bacteriosis, two serious bean diseases are carried from one year to the next with the seed; second, selection of seed from high yielding plants will increase the yield. Just how much selection the average bean grower can practice profitably has not been demonstrated, but there seems to be an opportunity for men who will make a specialty of this work. The average grower has his seed cleaned at the elevator. He may clean it at home. The occasional grower cleans out runner beans from the patch where he is to get his seed. This is as far as selection goes.

The yields of the growers of red kidney beans who sowed five pecks of seed to the acre and those who sowed six pecks are shown in Table 12. There seems to be practically no difference in the average yield and this fact raises the question as to whether it pays to sow the extra peck. The germinating quality of the seed and the fertility of the land will always have to be considered in determining the amount.

Diseases and Insects
During some seasons diseases and insects are more important than any other factor affecting the yield. In 1915 anthracnose caused heavy losses. The disease, being in the second, disseminated very rapidly because of hot days following wet weather. A season having rainfall above the average favors anthracnose. The striped flea beetle became serious before the beans podded in 1915 and in some fields large areas were eaten almost bare. Snails began work about the same time.

Fertilizers and Manures
Seven-eighths of the growers used either fertilizers or manure. Twenty-nine used commercial fertilizers ranging in amount from forty to two hundred and fifty pounds per acre. Most of the growers used from one hundred and fifty to two hundred pounds. Seven of the growers did not know the formulas of their fertilizers, ten used a 2-8-10, nine used a mixture in which phosphorus predominated, two used a 10-8 and one used acid phosphate. In comparing the yields, where a 2-8-10 was used and where a phosphorus fertilizer was used, little difference was noted, the averages being slightly in favor of the phosphorus fertilizers. This conclusion agrees with the fertilizer experiments on beans made by Professor J. L. Stone. These figures and other facts noted during the field work indicate that a large amount of potash is not necessary. Of the three fertilizer elements potash is the most plentiful in the soil. If the ground is well prepared and cultivated and contains sufficient organic matter, a large amount of potash need not be supplied.

Table 12

<table>
<thead>
<tr>
<th>Amount per acre</th>
<th>Growers</th>
<th>Acres</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 pecks</td>
<td>7</td>
<td>103 1/2</td>
<td>16.1</td>
</tr>
<tr>
<td>6 pecks</td>
<td>10</td>
<td>155</td>
<td>16.4</td>
</tr>
</tbody>
</table>

Table 13

<table>
<thead>
<tr>
<th>Value of fertilizer and manure per acre</th>
<th>No. fertilizer or manure</th>
<th>1.01-1.50</th>
<th>1.51-2.00</th>
<th>2.01-2.50</th>
<th>2.51-3.00</th>
<th>3.01-3.50</th>
<th>3.51-4.00</th>
<th>4.01-4.50</th>
<th>4.50 &amp; above</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of growers</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>No. of acres</td>
<td>50</td>
<td>68</td>
<td>42.5</td>
<td>79</td>
<td>158</td>
<td>77</td>
<td>48</td>
<td>24</td>
<td>59.5</td>
</tr>
<tr>
<td>Av. yld. bu. per acre</td>
<td>16.7</td>
<td>12</td>
<td>13.3</td>
<td>15.1</td>
<td>13.5</td>
<td>15.2</td>
<td>18.6</td>
<td>21.4</td>
<td>11.3</td>
</tr>
</tbody>
</table>
in the fertilizers. A common practice is to apply barnyard manure in certain parts of the field where it is most needed. It is applied on sod in small amounts. In estimating the value of the manure used by the bean crops it is assumed that during the first year 40 per cent of the manure is used and 30, 20 and 10 per cent during successive years. Using this basis, it was found that the values of manure used varied from a load to ten loads per acre, a load being valued at one dollar.

Is the application of manures and fertilizers to the bean crop profitable? The above table indicates that the judicious use of fertilizers is effective in increasing the yield. Eighteen of thirty-five growers used fertilizer and manure valued at $1.50 to $3.50 per acre. Note the yield of the five men who used neither fertilizers nor manure. These yields are due to good preparation, frequent cultivations, and a sufficient amount of organic matter. Two growers used lime and obtained good results. This is to be expected since the bean being a legume has a high lime requirement. It is quite probable that experiments in liming beans will give surprising results.

Cultivation

There are four reasons why Table 14 does not show more clearly the effect of cultivations is worth considerably more than one double cultivation because of the better mulch which results. Fourth, the thoroughness of preparation affects the amount of cultivation necessary for the best results. Good preparation clears the soil of weed seeds.

![FIG. 1]

**Table 14**

<table>
<thead>
<tr>
<th>Times cultivated</th>
<th>1.5</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Over 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. growers</td>
<td>2</td>
<td>5</td>
<td>9</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>No. acres</td>
<td>9</td>
<td>71</td>
<td>132.5</td>
<td>140</td>
<td>109</td>
<td>71</td>
<td>107</td>
</tr>
<tr>
<td>Av. yield bu. per acre</td>
<td>18.2</td>
<td>17.5</td>
<td>16.9</td>
<td>15.7</td>
<td>12.4</td>
<td>19.4</td>
<td></td>
</tr>
</tbody>
</table>

Although Table 14 proves little, the writer believes that cultivation of beans is important and that shallowness and timeliness are as important as the number of cultivations.

**Rainfall**

**Table 15**

<table>
<thead>
<tr>
<th>Rainfall and Yield</th>
<th>Av. yield</th>
<th>Av. yield per bu.</th>
<th>Av. June-July r'fall in inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911, 1913 and 1914</td>
<td>10.1</td>
<td>$3.29</td>
<td>3.3</td>
</tr>
<tr>
<td>1909, 1910 and 1912</td>
<td>16.1</td>
<td>1.79</td>
<td>5.1</td>
</tr>
</tbody>
</table>
The figures in Table 15 are taken from an article in The Rural New Yorker of May 8, 1914, by M. C. Burritt showing the relation of rainfall to yield.

Figure 1 shows the relative size of the costs graphically, taking the average cost per acre as 100 per cent. The four biggest costs in order are horse and equipment labor, man labor, rent and seed. This does not agree with the common idea that the main costs in raising beans are seed and fertilizer. Since labor is such a large cost, labor efficiency has a big influence on the cost of production. Among the things which increase labor efficiency are size of field, (a large field giving lower costs per acre in labor) the use of horse labor and machinery wherever possible. The two-horse cultivator, the three-horse plow and the side delivery rake are examples of this. The effect of the acreage of beans on labor efficiency is well shown in Table 18. A difference of $2.63 per acre is shown between the acreages above fifteen acres and those below. There is also a marked difference in the number of man and horse hours necessary to produce an acre of beans.

Table 16

<table>
<thead>
<tr>
<th>Cost of Production per Acre</th>
<th>Cost</th>
<th>No. growers</th>
</tr>
</thead>
<tbody>
<tr>
<td>$16-20</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>26.01-24.00</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24.01-32.00</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>32.01-36.00</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>36.01-40.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40.00+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average cost per acre $29.71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Cost of Production

The cost of production can be studied more easily per acre than per bushel. The cost per bushel depends largely on the yield. Table 16 shows the cost per acre of production for forty growers. Note that the cost of production of thirty of them is between twenty-four and thirty-six dollars, the average being $29.71. The costs include rental value of the land, fertilizer and freight, manure, seed, man, horse and equipment labor, equipment costs, rental value of storage and miscellaneous costs.

Rental value of the land is charged at the rate of $5\frac{1}{2}$ per cent of its value. Manure is estimated on the theory that 40 per cent of its value is used the first year and 30, 20 and 10 per cent the succeeding years. The value was estimated at one dollar a load. Man labor was charged at the rate of seventeen cents per hour, horse labor at fifteen cents and equipment labor at five cents. The rental value of the storage was estimated. The other items are self explanatory. The figures for labor, rent and manure are those used by the Farm Management Department of Cornell University.

The cost of production per bushel is given in Table 17. For most growers these figures vary from $1.50 to $2.50, the average being $2.04.

Table 17

<table>
<thead>
<tr>
<th>Cost of Production per Bushel</th>
<th>Cost</th>
<th>Less than $1.40</th>
<th>1.41-1.60</th>
<th>1.61-1.80</th>
<th>1.81-2.00</th>
<th>2.01-2.20</th>
<th>2.21-2.40</th>
<th>2.41-2.60</th>
<th>2.61-2.80</th>
<th>2.81-3.00</th>
<th>$3.00+</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. growers</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average cost per bushel $2.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 18

<table>
<thead>
<tr>
<th>Relation between Acreage per Grower and Cost of Production per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growers</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>Cost per acre</td>
</tr>
<tr>
<td>Horse hours per acre</td>
</tr>
<tr>
<td>Man hours per acre</td>
</tr>
</tbody>
</table>

In cases where wheat follows beans in the rotation, it is the common practice not to plow for wheat because it does well without plowing. There is much to be said in favor of charging half the cost of plowing for beans to the wheat crop.
Table 19

<table>
<thead>
<tr>
<th>Price Received per Bushel</th>
<th>2.00</th>
<th>2.25</th>
<th>2.50</th>
<th>2.75</th>
<th>3.00</th>
<th>3.25</th>
<th>3.50</th>
<th>3.75</th>
<th>4.00</th>
<th>4.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Kidney</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>&quot; Contract</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>&quot; Red Marrow</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>&quot; Yellow Eye</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* Seed

**Gross Returns**

Returns per acre depend on the yield, the price received, the pick and the value of the pods. The factors which determine the yield have been discussed. Table 19 shows the prices received per bushel.

Kidneys averaged $2.75 to $3.00, contract beans $2.00 to $2.25, pea beans $2.00 to $2.25.

Table 20

<table>
<thead>
<tr>
<th>Amounts of Pick</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pounds</td>
</tr>
<tr>
<td>No. of crops</td>
</tr>
<tr>
<td>14</td>
</tr>
</tbody>
</table>

Table 21

<table>
<thead>
<tr>
<th>Gross Returns per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount growers</td>
</tr>
<tr>
<td>$0-$20</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

Average gross returns per acre—$42.94

The amounts of pick for the growers visited is given in Table 20. Many growers believe that the charge made for picking (cleaning the crop) is a big item. The actual figures show that the amount charged for picking is 1.68 per cent of the total value of the crop.

Each grower was asked at what value he estimated his bean pods. The majority estimated $8.00 per ton. Pods are therefore credited at this price if in good condition. The average yield of pods per acre was found to be .638 tons, and at $8.00 per ton, the value of pods produced on an average acre is $5.10.

Table 22 shows the gross returns per bushel and gives the average returns when the value of pods is included and when the value of pods is not included.

**Table 22**

<table>
<thead>
<tr>
<th>Gross Returns per Bushel including Value of Pods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount growers</td>
</tr>
<tr>
<td>Less than $2</td>
</tr>
<tr>
<td>Growers</td>
</tr>
</tbody>
</table>

Table 23

<table>
<thead>
<tr>
<th>Profit per Man per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cents growers</td>
</tr>
<tr>
<td>Loss</td>
</tr>
<tr>
<td>Growers</td>
</tr>
</tbody>
</table>

Many persons object to this method of figuring profit, because they believe that interest or rent and man labor should
not be charged. The answer is that a man does not really make a profit until his crop pays wages and interest; if he cannot make wages and interest or rent he would do better to sell his field, put the money at interest and work in his neighbor's field. He would make wages and interest and in addition be relieved of risk. The average grower in addition to all expenses made 38.9 cents for every hour of labor on the bean crop. (Table 23).

2. What soils and rotations are best adapted to the varieties of beans and to beans in general? This question can best be answered by long time field trials under uniform conditions.

3. Is drill row, check row, or hill planting the most productive? The bean planter which can plant in check rows and hills is unknown in this section. Why not try it?

4. Does it pay to lime land for beans. Growers who have used good lime are well pleased with the results. Since the bean is a leguminous plant and has a high lime requirement, lime should be tried, especially on soils low in lime.

5. What is the best fertilizer for beans? Each grower must decide this question for his own conditions. Many of the growers have never compared two or more fertilizers for beans under similar conditions.

6. Is the use of a weeder on beans advisable? Some growers think the weeder kills too many plants; others use it regularly.

7. Does deep cultivation decrease the yield? This point should be demonstrated for the benefit of many who are not convinced.
Book Review
The Autobiography of a Farm Boy

By Isaac Phillips Roberts, Professor Emeritus and for thirty years Dean of the College of Agriculture at Cornell University. Published by J. B. Lyon Company, Albany.

Here is a book to interest the Cornell agriculturist, a story of the beginnings of his College and a revelation of the personality of the man who started it. The man tells the story of his life from a chair by the fire; conversationally, informally, as one who speaks to friends. He speaks of his father—"a dignified country squire in his high light-colored hat stored with papers, high boots and a shad-belly coat"—and of his mother—"commanding, handsome, but not beautiful, with that large benignity which comes from a well-spent, unselfish life." As he rambles in reminiscence of his boyhood the reader gets rare glimpses of pioneer days in northern New York; the toil, the sport, the frugal abundance of it all; and he comes to realize that only such an environment could have produced such a man.

At twenty-one he had, by summer carpentry, won his way to graduation from the winter sessions of the Seneca Falls Academy and successfully subdued and taught for a year a district school "advanced in deviltry." Then he packed his carpenter's kit and went West, settling in the vicinity of La Porte, Indiana. Here at the end of three years of winter schoolteaching and summer carpentry, with an average wage of a dollar and a half a day, he found he had saved enough to buy a farm and marry. But those economic conditions which preceeded the outbreak of the Civil War made farming in that part of the country a task without hope. The farm was sold at a slight loss, "the two-horse wagon 'bowed,' two stout horses inspanned," and the Roberts family trekked West to settle again near Mount Pleasant, Iowa. This was in 1862 when the prairie was hard to till and harsh to live upon and when corn, the crop of the prairie brought ten cents a bushel. There may be more colorful tales, but certainly there can be none braver than the story of the uphill fight made against natural and economic adversity by these two pioneers. It was hard and it took time, but on the first of January, 1864, he says, "my wife and I took stock and found that we were out of debt and the farm was paid for." Later in the same month the house and all its contents burned up. They moved into a nearby tenant house and started again. Six years later the board of trustees of Iowa State College elected Isaac Phillips Roberts superintendent of their college, despite his lack of college education. They elected him because he had succeeded as a pioneer and as a farmer.

In 1869 the Iowa board of trustees voted a full professorship and later bestowed upon him the honorary degree of Master of Agriculture. He spent five years in Iowa, resigning in 1873 to come to Cornell, where he remained until 1905. Then he retired to his present retreat at Palo Alto, California. Concerning this thirty years of work at Cornell, Former Dean L. H. Bailey in a signed introductory statement speaks as follows:

"For thirty years Professor Roberts and his associates stood for agriculture, always for agriculture—not for a natural science under the name of agriculture nor for some pleasant combination of studies that would satisfy the law. In an eastern university, with the great tide of immigration sweeping by him to the West, with decreasing values, with old fields, with hindering traditions, he stood—stood like a prophet."
Meat Pies
BY WINIFRED MOSES, '15.
Instructor in the Department of Home Economics

In every household there are scraps of left-over meat,—bits of chops, steaks, roasts, stews, and often quantities of soup meat. Even if one is careful to make the initial order small, there are still left-overs. Because of the small quantity of some and the lack of flavor in others, it is often seemingly difficult to utilize them in an acceptable manner. When one considers the present expenses of living, the growing scarcity of food, and the number of people who suffer from hunger, it seems essential that every scrap of food be utilized. And if one has imagination, ingenuity, and a delight in the mysteries of cooking, it is not a task, but a pleasure to change these flavorless and unappetizing looking scraps into delectable dainties.

When left-over meat is taken from the table, unless there is enough of it to serve cold, it should be freed from bones and fat and put into a jar. The bones can be put into the soup pot and the fat may be tried out, clarified, and used for various purposes. All left-over gravies and the water in which the meat is cooked should be reserved for making sauces to be used with left-over meals.

Owing to the fact that the extractives, which give meat its characteristic flavor, are soluble in water, the left-overs of the tougher pieces of meat, which are usually cooked in water to soften the tough connective tissue, are apt to be lacking in flavor. Therefore, dishes made from these should be highly seasoned. The meat should be cut in small pieces, ground in a meat chopper for croquettes and diced for other dishes. It can then be heated more readily. This is desirable, for cooking meat at a high temperature tends to toughen it.

Left-over meats may be served in a variety of ways, namely, creamed on toast or in bread boxes; scalloped, in souffles, timbales, or casseroles; and prepared in chafing dishes as croquettes in salads, or in meat pies.

The meat pie is one of the easiest and best ways of serving left-over meats and one in which endless combinations can be made. If the quantity of meat on hand is large make the pie of meat, adding the other ingredients mainly for flavor. If, however, only a small quantity is available, combine with other materials and the mixture can thus be increased to the requisite amount.

Meat for meat pies may be combined with starchy foods, as rice, macaroni or spaghetti; with such vegetables as potatoes, carrots, celery, cauliflower, turnips, or mushrooms; or with the flavor vegetables, pimentos, green peppers, tomatoes, onions, olives, pickles, or caper; or combinations of these. It may be flavored with such herbs or spices as sage, thyme, pepper, paprika, cayenne, bay leaf or sweet majoram.

The crusts served with these pies can also be varied. Ordinary biscuit crust is very often used. Bits of left-over pastry may be utilized in this way. A bean crust may be made after the following recipe:

1 cupful boiled bean pulp
½ teaspoonful salt
1 teaspoonful baking powder
1 egg beaten
2 tablespoonfuls of melted fat

Flour enough to make a soft dough

This is as easily made as biscuit crust and it lends variety to the ingredients of the pie. Plain mashed potato or a potato crust is often used. Occasionally, plain boiled rice or buttered bread crumbs can be utilized as a covering.

Perhaps one of the most important ingredients of a meat pie is the sauce.

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Leadership

As the world grows more densely populated and as social conditions become more complex, the demand for leaders among the people more and more exceeds the supply. There is an unparalleled need all over the land for men who are thoroughly honest, thoroughly unselfish and who are, withal, men whose capability to do things well, stamps them a superior type. Whether it be in the country or the city, this demand for leaders is keenly felt.

The best example of leadership is to be found in John R. Mott, the Cornell alumnus who has reached the pinnacle of leadership. While Mr. Mott is interested primarily in religious work, he exemplifies the leadership in society to which everyone, and especially college students, should attain.

Every college graduate should be a leader in his community. He should have those high ideals, inbred in his college career, which would make him fit for leadership and then he should have the ability and personality to impress upon his fellows the ideals for which he stands. College men are generally looked up to; they are naturally above the average. Undergraduates should look ahead and try to fit themselves for the leadership expected of them. Make use of opportunities here to make yourself worth something to your country, to your community and to yourself.

Twenty-five Years of the Babcock Test

Twenty-five years ago Stephen Moulton Babcock perfected his milk test and gave it to the world. Wisconsin, his home state, is holding a “Babcock Silver Jubilee” and all over the country men are honoring him. We desire to add a sincere word in appreciation of this
man who might have made a fortune but who preferred to make a great gift to agricultural science. Had he taken out a patent on his invention, the price of the apparatus would have risen far above the means of the man who most needs it. His unselfish gift has revolutionized dairying all over the world and made it a business and a science.

An Idea That Works

All over the country agricultural clubs are trying to help their members make more money and be better men. In Maryland there is one club more powerful than the average and more successful. As originally organized, this club was called the Gunpowder Agricultural Club, but as the members died and their sons took their places it became known as the Junior Gunpowder Club. Recently a third club has been started. Throughout all these years the organization has dominated the rural affairs of the community and been of good use. No other local institution has enjoyed a greater influence or wielded it more effectively.

Because of the success of this organization The Countryman is moved to tell briefly of the unique plan by which it is run, in the hope that here may be other persons to whom it might be of use. Whether the scheme be practical in all cases is for those who read with a definite community in mind to decide, but we believe that the principle is sound.

The club has no officers, no constitution, no dues. Meetings are held at the homes of the members once a month on the Saturday of the full moon. A quaint idea, this, but none the less practical. It is most easy and pleasant to drive at night when the moon is full.

In the late afternoon the members and their wives drive to the farmstead whose turn it is to entertain, and the men make a tour of inspection over the farm while the women prepare what the county papers call a “collation,” but which in reality is a first-class farm dinner. After dinner the men gather in easy chairs and exchange ideas on some topic set at the previous meeting. The subject may range from “What is the Best Way to Buy Fertilizer?” to “Do We Want Latin in Our High School?” but it always has to do with practical and definite problems at hand. Later in the evening any member may bring up questions and all will try to answer them. The women are gathered somewhere else discussing something else—who knows what?—and getting just as much out of it as the men do. The masculine side of the discussion fills a column in the next issue of the county papers. Farmers all over the county turn first to this column and follow out its suggestions.
This scheme works because it provides a means toward agricultural and social excellence as simple as the farmer himself and as free from red tape. In this one community, at least, it has fostered hospitality, co-operation, farming, friendship and all the other fine arts of country life. Can you use it?

It is stated that no plant disease causes more loss each year to the farmers in certain sections of the State than does oat smut. The loss in many fields last year was reported to have been as high as twenty-five per cent. Besides the direct loss it is known that smut makes threshing excessively unpleasant. Now is the time to think about riding seed of this disease. The formaldehyde treatment will practically eradicate the smut with the cost of only a few cents per acre. Can we ask for a better, for a cheaper insurance than this? Such work as the farm bureau managers are doing is highly commendable. In many counties of the State the farm bureau managers are planning to conduct an oat smut campaign this spring. In counties where these campaigns are carried on at least two meetings will be held in each town at which time the method of treating the oats will be demonstrated.

One of the greatest if not the greatest problem that confronts the College of Agriculture today, is how to bring the confidence of its graduates before the agricultural public. Reports from men in the various departments of the College show that the average farmer has too little faith in the college man. Those students who are planning to work this summer to gain agricultural experience, especially those who are getting experience through the Department of Farm Practice, should do their best to remedy this condition. Such students have a special opportunity to influence the attitude of the farmers toward the value of college men's services. Although there may be an excuse for lack of quality on the part of the student's work there is no reason for lack of quantity.
Campus Notes

J. C. Corwith, '16, was elected president of the Agricultural Association at the semi-annual elections held February 29. P. R. Chappell, '17, was elected vice-president; Miss M. S. Albertson, '17, secretary; and C. B. Loudenslager, '17, athletic director.

Of the 36 men from the Varsity track squad, who were selected by Coach Moakley to compete at the indoor meet of the I. C. A. A. A., held at Madison Square Garden, March 4, fifteen were students in the College of Agriculture. These entries were as follows: M. G. Cheney, '16; J. C. Corwith, '16; L. E. Gubb, '16; A. H. Main, '16; H. Millard, '16; R. J. Moore, '16; G. M. Taylor, '16; W. C. Bartsch, '17; F. G. Burke, '17; W. D. Crim, '17; A. W. Richards, '17; L. V. Windnagle, '17; A. F. Van Winkle, '17; A. B. Kelly, '18; J. M. Watt, '19. Of these men Richards won first place in both the high and broad jump and second place in the shotput. Burke came in second in the 24-lap team race, followed by Corwith as third. Gubb took third place in the high hurdles.

H. E. Babcock, Assistant State Leader of Farm Bureaus, made a special visit to South Dakota and Minnesota during the past winter for the purpose of investigating conditions of the alfalfa seed supply. From Mr. Babcock's report and from the reports of others who made trips through other northwestern states indications are that these states produced not over ten percent of the normal supply. Mr. Babcock has this to say, "Information indicates that farmers should be extremely careful in purchasing alfalfa seed for use next spring. Unless one can be absolutely sure of purchasing northwestern grown seed, we believe it would be better to defer sowing until good hardy northwestern seed can be secured."

The Cornell University Christian Association held a five-day campaign among the faculty and undergraduates of the University from March 9 to 13. This campaign was carried on with a two-fold purpose: to unite the religious interests at work among the students, and to deepen their religious life and acquaint them with the development and progress of Christianity throughout the world. Fifty men prominent throughout the country assisted in the campaign by speaking in the various fraternities and clubs "on the hill." Cornell's famous alumnus, John R. Mott, '88, director of the World's Student Christian Federation, was the leader of the campaign. He gave six addresses in Bailey Hall.

Agricultural Association Elects Officers for Year

Fifteen "Ag" Students in Recent Track Meet

Babcock Warns N. Y. Farmers on Alfalfa Seed
Glista Coreva, one of the Holsteins owned by the College, made a record of 34.52 pounds butter February 12-18. This record, which was supervised by an official from the Massachusetts Experiment Station, is the highest ever made at the College. Glista Coreva has seven half sisters, all of which were bred at the College and five of which have records from 30 to 32 pounds butter production in seven days. It is thought that the sire of these cows, Prince Ybma Spofford 6th, has a higher per cent of daughters with records above 30 pounds butter production for a week, than any other sire in the world.

There is placed between the main stairways on the first floor of the Poultry Building a chart upon which the poultry market quotations are being recorded each day. The records date back to January 1, 1912. Some interesting facts become evident by the comparison of records displayed. Upon studying this chart the first thing noticed is the remarkable uniformity in the price of eggs for analogous months during each of the four years. In general, prices reached their lowest point during the month of April and their highest during November. It is also interesting to note that while on April 1, 1913, eggs reached the lowest price recorded during the four years, twenty-one cents, that on November 12, the same year they reached the highest price recorded, sixty-five cents. This chart enables one to predict poultry market prices with considerable accuracy.

The Students' Loan Committee of the College of Agriculture has initiated a campaign among the undergraduate body of the College for funds sufficient to raise the amount available for needy students to a total of five thousand dollars. The Student Loan Fund was started two years ago with a thousand dollars. Since then this sum has dwindled to $326. It is stated that forty-one students are now in need of aid. Subscriptions to the fund may be made to any of the following: E. P. Schlicter, '16, H. L. Adams, '17, F. P. Cullinan, '17, A. D. Fonda, '17, M. S. Clement, '18, E. Grimes, '18, Miss M. M. Selden, '19, F. C. Wilbur, '18, A. A. Baker, '19 and F. J. Hopkins, '19.

MISCELLANEOUS NOTES


The College of Agriculture won the intercollege basket ball title this year without losing a game. The team was composed of the following: J. E. Houck, '17, captain; H. J. Karr, '18; W. Palmer, '18; S. J. Schwartz, '18; J. B. Wilson, '19.

On Wednesday evening, March 8, Warwick S. Carpenter, Secretary of the New York State Conservation Commission, spoke in Roberts Hall. His lecture, which was illustrated with motion pictures, dealt specially with fish and game on State forest lands.

C. P. Alexander, '13, of the department of Entomology, recently spoke to the Jugatae Society on “The Cruise of the Ecphora,” the geological expedition taken last summer under the direction of Professor G. D. Harris, '86, of the Department of Paleontology and Stratigraphic Geology.

On the afternoon of Monday, March 13, Elbert W. Baker, publisher of the Cleveland Plain-Dealer, spoke informally to the members of the Country-
man board and a few invited guests. Mr. Baker told of the farm which he operates at Gates Mill, Ohio, and of the country life projects of the community in which he has a part. He declared his belief in the college-trained farmer and in the moving force of cooperation. Above all, he emphasized the conviction that "honesty is the best policy" and cited as an example the growth of the Plain-Dealer under his eighteen years of management.

The 'Varsity Wrestling Team won its fourth straight victory and second perfect score by defeating Lehigh in the last dual meet of the season on March 11.

Donald Bain Vail, of Ridgewood, New Jersey, a junior in the College of Agriculture has been elected editor-in-chief of the Cornell Sun.

H. W. Peters, '14, has resigned from his position as secretary of the University to accept a position with the Packard Motor Car Co. of Detroit. Peters was appointed secretary in his senior year and has been in that capacity ever since.

On the afternoon of March 13 Jugatae met in Room 392 of Robert's Hall and heard papers read by Mr. R. C. Smith and Mr. J. S. Gutsell, of the Department of Entomology. Mr. Smith's subject was "Insects in Relation to Health and Sanitation, as Shown by a Study of an Ohio County" and Mr. Gutsell spoke on "The Fish Culture Survey of a Stream."

"The Spirit of Audubon," a motion picture of bird life featured the meeting of the Cayuga Bird Club, held on the evening of March 1 in Roberts Assembly. Incidental pictures of bird life were shown by Mr. H. K. Job, an international expert on such topics.

One hundred and thirty undergraduates have been dropped from the University because of deficiency in first term work. This is a decrease of fourteen from the number "busted" last year. Agriculture was second losing 26 this year as compared to 47 last year. The College of Arts and Sciences dropped 41 undergraduates, the same number as last year.

On March 6, 7 and 8 Professor H. E. Ross of the Dairy Department held meetings in Erie County with W. L. Markham, who is farm bureau manager of the county. Meetings were held at Springfield, Chaffee and Hamburg where such subjects were discussed as regards the care and handling of milk and the disposal of other dairy products.

H. E. Ross, Professor of Dairy Industry and T. J. Mcinerney, instructor in dairy industry have recently edited the Cornell bulletin on "Methods of Cooling Milk."

Professor C. G. Bradley of the Department of Entomology has arranged to carry on his work here during the first and third terms rather than, as usual, during the first and second terms. He is spending his second term at the Academy of Natural Sciences, in Philadelphia, where he is taking up special work.

Professor A. W. Gilbert, '05, of the plant breeding department will spend the summer at the Graduate School of Agriculture at Amherst. The work there will be given under the auspices of the Association of American Agricultural Colleges, its purpose being the study of recent development in national, social, and economic sciences as applied to agriculture.

The second Annual Good Roads Week was held at Ithaca during the week of February 21, the College of Civil Engineering, the Federal Office of Public Roads, and the New York State Highway Department cooperating. The fifty-one lectures were attended by
more than three hundred visiting engineers and contractors. Interest in this movement is so high that this convention, which was temporarily inaugurated last year, has been made into an annual institution.

Recent extensions and improvements to the Home Economics cafeteria have increased its capacity from 550 to 700. Extensions have been made on the east and west ends and the east wing has been arranged so it may be used for private banquets, luncheons and similar private affairs. It is also under consideration as a possible place for varsity training table.

R. G. Bird '16 has been elected president of the Forestry Club. The other officers are: G. M. Taylor '17, vice-president; A. A. Manchester '17, secretary; H. O. Johnson '17, treasurer. Plans are under way for the publication of a Forestry Club "Annual."

The State Commissioner of Agriculture recently called upon the dairy department to formulate a law for licensing milk testers. The purpose of such a law is to protect the dairymen against inaccurate testing by inexperienced men, and was first approved at a conference recently held in Albany. It is expected that a bill covering this matter will be introduced at the present session. Professor W. A. Stocking went to Albany March 16 to hold a conference with the Commissioner of Agriculture in regard to this matter.

With the additional greenhouse area allotted to the vegetable gardening department, making an approximate total of 16,000 square feet, a number of experiments have been started, the result of which is believed will be of considerable value, not only to the student, but also to the commercial greenhouse man. One of these experiments is a combination variety and spacing test with tomatoes, the object of which is to find what spacings give maximum returns per unit area and also to try out some of the leading varieties. It is planned to follow this work up by some breeding work in the endeavor to develop a variety of tomatoes which will be better adapted to greenhouse culture than the present varieties. Cucumber plants are being grown in a training experiment, the object of which is to find which method gives the maximum yield per unit area and which produces the earliest crop. The department has also started on a small scale breeding work with greenhouse lettuce with the aim of developing a better variety of leaf lettuce for greenhouse culture.

Miss Miriam Birdseye of the Extension Department conducted an Extension School in Home Economics at Lowville, N. Y., from March 6 to 10.

The annual "Night School" in Home Economics began Monday, March 6, with a registration of forty women in advanced cookery and eight in sewing.

Following is the program for "The Eight Weeks Club" which meets every Friday afternoon in Barnes Hall:

April 14—"Flowers"—Miss Minns.
April 21—"Service"—Discussion.
April 23—"What the State is doing for Country Girls"—Miss Van Rensselaer.
May 13—"Week-end and House-party Guests"—Miss Anna Clark, County Secretary.
May 15—"With Birds"—Professor Allen.
'81, B. S. Agr.—On January 15 delegates from a number of scientific societies met in Washington to arrange for a memorial to the late Doctor Joseph A. Holmes. The memorial has been proposed with a view toward advancing those ideals which Doctor Holmes held in regard to increased safety for mining and metallurgical workers and for the conservation of the mineral and natural resources of the United States.

'82, B. S.—Harvey B. Jones may be reached at 930 St. Nicholas Avenue, New York City. For twenty-two years he has been custom's inspector of the port of New York, and in addition he has supervised a farm in Delaware County.

'97, B. S.—Louis Agassiz Fuertes, of Ithaca, recently lectured in Detroit before the Institute of Science and the Detroit Athletic Club. It was hoped that a contemporaneous exhibition of Mr. Fuertes' paintings might be held at the Detroit Art Museum, but he had already arranged for an exhibition of his whole collection in the Arnott Art Gallery, at Elmira. A recent number of Bird-Lore remarks that “the Smithsonian Institutes pays Mr. Fuertes a well-deserved compliment in asking permission to republish his series of Impressions of the Voices of Tropical Birds.”

'99, Sp.—Edgar Salinger is living on his 200 acre farm at Brewster. He has 80 acres in fruit trees, but is specializing in poultry, keeping a flock of 1800 single comb white leghorns and marketing eggs by parcel post in five-dozen lots.

'00, Ph. D.—Kary C. Davis on leaving Cornell went to Durum County, Wisconsin, where he became principal of the first country life school in America. Later he returned to New York to assume the duties of Dean of the State School of Agriculture at Canton, and from there went to the New Jersey College of Agriculture, where he directed the short courses and was professor of agronomy. He is now head of the agricultural department of the Knapp School of Country Life, Peabody College, Nashville, Tennessee. His duties there include general supervision of the school farm, which maintains herds of dairy Shorthorn and Holstein cattle, Duroc-Jersey swine, and Percheron horses. In addition to his teaching, Doctor Davis has found time to do outside work along educational lines. He is editor of the Lippincott Farm Manual series of agricultural text books.

'00, B. S.—John Ihlder has resigned the office of field secretary of the National Housing Association to become secretary of the Ellen Wilson Holmes Company, a five per cent limited dividend corporation organized to build dwellings for the wage earners of Washington, D. C. This is a phase of housing work in which he has specialized for the last three years and he now proposes to give most of his time to it.

'05, W. C.—Arthur L. Cook is engaged
in diversified farming at Cincinnatus. He is specializing in dairy work and has a herd of pure bred and high grade Holstein cows, which gave an average of ten thousand pounds of milk last year. In 1906 Mr. Cook was married to Miss Vera A. Foster, of Cincinnatus. The couple have three children.

'05, W. C.—C. E. Greene is farming at Greene. He raises pure-bred Jerseys.

'09, M. S. A.—Doctor Jacob Taubenhaus, associate plant pathologist of the Delaware Agricultural Experiment Station, has accepted an appointment as head plant pathologist and physiologist at the Texas Agricultural Experiment Station. Doctor Taubenhaus recently delivered the John Lewis Russell lecture before the Massachusetts Horticultural Society, speaking on "Diseases of Sweet Peas."

'09, W. C.—Since his marriage in 1912, E. L. Chapman has been farming near Albion. His chief crops have been wheat and red kidney beans, with yields of 45 and 18 bushels per acre respectively. He also grows apples and fattens steers.

'10, B. S. A.—B. D. Gilbert is extension representative in charge of the Lackawanna County Farm Bureau at Clark's Summit, Pennsylvania.

'11, B. S.—Willis Corwin is teaching agriculture in northern Minnesota.

'11, B. S.—Lewis H. Schwartz is father of a baby girl, Martha Jane, born August 15, 1915. He is teaching in the department of poultry husbandry at Purdue University, Lafayette, Indiana.

'14, M. S. A.—M. V. Barnes is principal of the school at Bethlehem, New Hampshire.

'10-'11, Sp.—In the issue of February 6 of the Knickerbocker Press, published at Albany, there appeared an article on the success of the Herkimer County Farm Bureau. This article concludes with the following personal sketch of the farm bureau manager, Mr. Charles A. Taylor:

"He has been manager just a year, but he is already a prime friend of the farmers and his influence is felt throughout the county. Taylor is a short, sturdily built man with just a trace of gray on his temples. He is a tireless worker. "He is a native of Norwich, where his father was superintendent of a chair factory. As a boy he was raised on a farm near McLean, and when he was seventeen years old he took over the entire management of the farm from his father. But Taylor decided to complete his education, and so finished his course in the McLean High School and entered Cortland Normal College. After finishing his course at Cortland Normal, Taylor entered the State College of Agriculture at Cornell University. He likes to tell how he began life at Cortland with $36.16 and still had the sixteen cents when he left Cornell six years later. During this time he was entirely dependent on his own efforts, paying the greater part of his expenses by the photographic work he did for the different departments of the university. Leaving Cornell, he organized the agricultural department in the high school at Hancock, remaining there three years until he went to Herkimer.

"Mr. Taylor was married in 1912 to Louise Ferris of Groton. They have two children, Charles A., Jr., born in 1913, and Florence Louise, born last summer."

(Continued on page 604)
The milk in pail the cow kicks over is lost forever

And the butter-fat that goes into the can through the skim-milk spout of a cheap, inferior or worn-out cream separator is just as surely lost as the milk in the pail the cow kicks over.

The farmer who is trying to get along without a cream separator, or with an inferior or worn-out machine, is losing butter-fat right along, and butter-fat is money.

Thousands of Babcock and other tests have proved that the De Laval skins closer than any other cream separator under any condition, and particularly under the more difficult conditions so frequently experienced.

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It doesn't matter whether the cow kicks the milk over or the cream separator doesn't skim clean, the waste is there just as truly in one case as in the other. The former is bound to happen once in a while but it is always possible to guard against the latter by buying a De Laval Cream Separator.

We will be glad to send one of our handsomely printed and illustrated new catalogs to any farmer or student interested in dairying, upon request.

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Pull the rope and all bottoms raise high and level. Another pull lets them down. Plows raised or lowered in 14 inches ground travel. Makes square headlands. All bottoms raise high, plows do not clog or gather trash on the turn.

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Famous John Deere Bottoms with Quick Detachable Shares that are taken off and put on in one-fifth time ordinarily required.

John Deere, Moline, Ill.

John Deere Dealers Everywhere

Former Student Notes

(Continued from page 602)

'12, Sp.—Frank W. Beneway is managing the Wile-Alder Fruit Farms at Ontario on a profit sharing basis. He writes as follows:

"We are trying to establish a brand of fruit with the farm title. Although our main crop is apples, we grew last season twenty tons of cabbage to the acre, sixty bushels of potatoes, eighty of oats and a fair crop of wheat. Our peaches, however, were a loss. We are conducting some experiments on nut trees."

'13, B. S.—M. B. Goff is managing the Guern-Weal Farm at Sturgeon Bay, Wisconsin. He has a son, Charles Davis Goff, born May 31, 1915.

'13, B. S.—Duane W. Hadsell is at Orlando, Florida, managing orange groves for a New England concern. He spent the year after his graduation studying methods of fruit growing in Oregon and Washington. He is one of the editorial staff of the Florida Grower.

'13, B. S.—Bruce P. Jones, a former business manager of the Countryman, is now with the college department of the Macmillan Company, Publishers, having charge of the agricultural publications of that department. His work necessitates visiting all the agricultural colleges of the country at least once a year. His headquarters are at 64-66 Fifth Avenue, New York City.

'14, B. S.—W. H. Bullock is associate editor of the American Agriculturist. His address is 315 Fourth Avenue, New York City.

'14, B. S.—Albert T. Combe, jr., is representing the Standard Oil Company at Soerabaya, Java. His territory extends from Singapore to New Guinea and from Borneo to Australia. He writes that things were not so bad in the early part of the year 1915, as eighty per cent of the American population of Soerabaya were Cornell men. These Americans were Herbert Bertel '10, A. W. Hart '12, and A. W. Loudon, a graduate of Yale.

(Continued on page 606)
Rumsey "Terror" Water System

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For pumping from cistern, well, spring or lake where the water level is not more than 20 feet vertically below the pump. For supplying country houses, suburban homes and summer cottages.

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The American Jersey Cattle Club
307 West 23rd Street, New York City

Former Student Notes
(Continued from page 604)

'14, B. S.—Richard T. Cotton recently sailed for Porto Rico, where he is to be employed as an entomologist in the government service. Mr. Cotton has been a graduate student at Cornell since September, 1914.

'14, B. S.—P. C. King, dean and director of the school of agriculture at Nganching, China, has been appointed forester by the governor of Ngan-Hwei Province.

'14, B. S.—J. E. McGolrick is in the real estate business with his brother, Paul A. McGolrick, at 261 Broadway, New York.

'14, Sp.—D. Burt Smith is about to take possession of a forty-acre fruit farm, situated two and a half miles east of Fredonia, on the main road to Buffalo.

'15, W. C.—James T. Streeter's address is South Coventry, Connecticut, where he is managing a 400-acre farm. He writes that he is working with seventy Guernseys and expects to build up a pure-bred herd.

'14, B. S.—J. S. Woolen is farming in Anne Arundel County, Maryland. His address is Lothian.

'14, B. S.—C. C. Woolston is engaged in farming with his father at Pittsford.

'15, W. P. C.—Samuel G. Kroneck is working on a dairy farm at Frankfort.

'15, B. S.—C. E. Cornwell is with the American Telephone and Telegraph Company, 24 Walker Street, New York.

'15, B. S.—J. Richard Dorn is in the wholesale wine business at 408-426 Water Street, Sandusky, Ohio.

'15, B. S.—Robert Dean Edwards has left the University of Wisconsin and has entered the graduate school of the University of Illinois.

(Continued on page 610)
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Send for actual feeding records of Quick Calf Raising

Blatchford Calf Meal Factory
Waukegan, Ill.

Former Student Notes
(Continued from page 606)

'15, B. S.—Mrs. G. Albert Mays, of Glencoe, Maryland, has announced the engagement of her daughter, Marion, to Arlyn W. Coffin of South Somerville, New Jersey. The wedding will take place in the early summer. Since his graduation Coffin has been teaching agriculture and science at the Agricultural High School, Sparks, Maryland.

'15, B. S.—G. L. Fuller, who has been with the soils department at Cornell, is now managing the George A. Fuller Estate.

'15, B. S.—H. S. Gabriel is teacher of agriculture in the high school at Greene.

'15, B. S.—A. W. Gibson is instructing in the Department of Farm Practice.

'15, B. S.—W. J. Hall is farming near Canandaigua.

'15, B. S.—John Kruesi has left Schenectady and entered the sales department of the Detroit Edison Company at Detroit.

'15, B. S.—Howard Lynch was married to Miss Josie Adelaide Poyer, of Marlboro, on January 22. Mr. Lynch was attended by William Creifelds, jr., '15, and the ushers were C. F. Neergaard '15 and T. T. Newbold '14. Mr. and Mrs. Lynch will make their home in Brooklyn.

'15, B. S.—A. S. Montague is enrolled in the law school of the University of Michigan.

'15, B. S.—J. S. B. Pratt, jr., is assistant agriculturist at the Hawaiian Sugar Planters' Experiment Station, Honolulu. His address is Box 686, Honolulu.

'15, B. S.—C. H. Reader is living at 238 Fort Washington Avenue, New York City. He is research assistant in the Department of Health of the City of New York.

(Continued on page 616)
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Giving all the comfort and sanitary advantages of a city home

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SUPPLYING Water Systems for Country Homes, also private Electric Lighting Plants. Specialists usually charge high prices; the only ordinary part of my water systems is the price, but the superior equipment supplied and the experience that fits each item to your needs is where my specializing helps you.

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"The coulters do the work." They cut and crush clods, turn the soil twice, pulverize and mulch at one operation. There's an "Acme" for every purpose—sizes 3 to 17½ feet in width. Send for free book—now—and learn more about these most dependable of all seedbed builders.

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the most efficient and durable products obtainable. So should you—it pays. The Department of Poultry Husbandry uses Carbola in its demonstration work—a credit to us and an example to you.

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Former Student Notes
(Continued from page 610)

'15, Grad.—A. M. Ritchie, Carnegie Fellow of the Imperial Bureau of Entomology, who was registered in the Department of Entomology of this college, is now imperial entomologist of Jamaica.

'15, B. S.—B. H. Stasch, who was in the dairy business in Vermont, has returned to Ithaca where he intends to enter horticultural and vegetable gardening work.

Meat Pies
(Continued from page 593)
The usual way is to use the left-over gravy as a sauce to mix with the meat and other ingredients, but many other sauces may be used. The simplest sauce is the plain white or velocié sauce, made by melting one tablespoonful of butter, stirring into this one tablespoonful of flour and gradually adding either one cupful of milk, or one cupful of stock. If the butter and flour are browned before the liquid is added, we have a brown sauce. If we use tomato juice for liquid, we have a tomato sauce. The addition of pimento makes a pimento sauce. These sauces may be varied by the addition of chopped pepper, mushrooms, celery, oysters, pickles, capers, or eggs.

The general rule for making a meat pie is to dice the meat and the vegetables. If these are to be combined with the meat, mix with plenty of sauce, put into a buttered baking dish, add the crust and bake until crust is done. If raw vegetables are to be used, dice them and mix them with stock or sauce, the flavor herbs or spices, and cook on top of the stove until nearly done. Add the diced meat, which has been seasoned, transfer to a buttered baking dish, put on the crust and bake.

A meat pie may be served in a large dish, but it is more attractive when served in individual casseroles or ramekins.
Insures Perfect Fruit and Vegetables

We sell Sprayers for everybody—Hand, Traction and Gasoline Engine machines. Call and look over our line and secure FREE copy of handsome Spray Book.

Watson 4-Row Potato Sprayer
for wide or narrow rows. Spray as fast as you can drive. Power always strong. Automatic Agitation of liquid and cleaning of strainers. Two nozzles to each row for thoroughly saturating foliage both top and bottom.

The Empire King
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Can be furnished on different size casks and also fitted for spraying 4 rows of potatoes.

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are typical modern machines for large spraying operations. Combination mounted outfits, consisting of gasoline engine, spray tank, pump, platforms, spraying appliances, all complete and ready for work. Engines adapted for other power work.

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There is a difference between fruit growing and forestry, yet most of the directions for fruit growing are directions for producing rapid wood growth only. This means coming into bearing late and irregular bearing on account of lack of enough available mineral plant food to raise a crop of fruit and to set strong fruit buds in the same season.

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Two years before the trees are expected to come into bearing, the annual application of minerals should begin, using 50 to 100 pounds Muriate of Potash and 100 to 200 pounds of bone, acid phosphate or basic slag per acre.

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Write for sample and prices.

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The Crops of Ceylon
(Continued from Page 561)

where labor is so cheap as it is at Ceylon it can be done with comparatively little cost.

One of the most recently introduced crops in Ceylon is rubber. The introduction and successful cultivation of this is due largely to the efforts of Dr. J. C. Willis, who was for a number of years director of the Botanical Gardens at Peradeniya. Dr. Willis began his experiments with the seed of the rubber plant in 1897. Setting out plants in one of the botanic gardens of the island, it was soon found that an annual return of one hundred pounds or more of rubber per acre might be expected. About this time Dr. Willis made a discovery which more or less revolutionized the production of rubber, namely, that if a tree is tapped for rubber, and then ten days later is tapped in the same spot, the yield of rubber is about twice as large. Tapping is done by means of V-shaped cuts in the tree made about six or seven feet above the ground. The sap, or milk, runs down these cuts, and is collected in tins and brought into factories, where it is coagulated, or clotted. It is then ready for export.

The rubber industry of the Tropics has grown to enormous proportions in the last ten or fifteen years. There are in the neighborhood of 200,000 acres planted to rubber in Ceylon alone. Although the prices are not so great as in former years, the profits are still very satisfactory.

In walking about through the beautiful, narrow lanes everywhere found in Ceylon, over the mountains, and through the hills, one frequently comes upon small, picturesque huts in which the natives live. It is not uncommon to find spread out on the ground, but protected from the ground by a large palm leaf, quantities of seeds of the cacao, from which our cocoa is made. While there are some plantations of cacao of considerable size, the industry after all is a sort of family affair, each family seeming to be able to procure the fruits from the roadways and

(Continued on page 622)
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PASTE AND POWDERED

BORDEAUX MIXTURE
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"WE-HA-CO" Power and Hand Sprayers

These are the light weight power sprayers so well and favorably known all through the fruit growing districts.

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Write for descriptive printed matter and prices on all our lines.

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**H-O Steam-Cooked Chick Feed**

Cuts out the uncertainty of home-mixed feeds, the fuss and trouble of mixing, etc. H-O Steam-Cooked Chick Feed saves a larger per cent. of every brood because it is a feed that chicks can digest.

One big breeder says, "I haven't lost a chick this year." Why not try it on your next brood? Write for sample, prices and descriptive folder.

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For Purity, Strength and Reliability

**Chr. Hansen’s Danish Dairy Preparations**

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are the Leaders and indorsed by most of the Prize-Winning Butter and Cheese Makers.

**HANSEN’S means QUALITY**

**Chr. Hansen’s Laboratory Incorporated**

Box 1204, LITTLE FALLS, N. Y.

---

**The Crops of Ceylon**

(Continued from page 620)

jungles, and to save and have ready for market a certain quantity of the bean-like seeds.

The jungles, of course, are filled with many kinds of tropical fruits which at all times furnish plenty of food for the natives. The jak fruit is found everywhere, sometimes growing two feet in length and weighing from forty to fifty pounds. The jak is to the natives of Ceylon what the cabbage is to our southern Negro population—the standard vegetable product. Mangoes, camphor, bamboos of many kinds, cinnamon, coffee, bananas and plantains are found everywhere.

Nearly all the natives in these regions, including those from the Straits Settlements, Siam, Burma, Ceylon, Java, Sumatra, and the adjacent islands, are addicted to the use of the betel nut. The nut is obtained from the Areca palm. It is cut into thin slices, mixed with a little lime, sometimes sprinkled with spice, and wrapped in a betel leaf, and the whole is chewed like tobacco. The saliva is colored a blood red, and the teeth and lips of the natives show the marks of this rather disgusting habit. All along the roadsides one may notice, about four or five feet from the ground, on telegraph and telephone poles and trunks of palms and other trees, white finger prints. These are the marks left by the natives after they have prepared their betel nuts for chewing. The native always has a small quantity of lime left on his fingers, and he uses the nearest post or tree trunk as a cleansing agent. It is said that the use of the betel nut is conducive to health, as the lime serves a useful purpose in preventing a number of tropical diseases.
DO you realize the great interest there is in modern, profit-building dairy methods just now? At a big Farmers' Union Meeting, comprising 18 counties in North Carolina, 20 of our booklets, "Facts and Figures on Dairying," were passed through the crowd from man to man. Those desiring copies were asked to write to the Catawba Creamery, Hickory, North Carolina.

In 25 days, 462 requests for booklets were received.

Farmers are realizing that three cows with a good cream separator are as profitable as four without one. A good separator is one that gets all the cream down to one drop in each gallon of skim milk. That's efficiency—and that's the reason for the popularity of International Harvester separators, Lily and Primrose.

Lily and Primrose separators skim to this fine standard for years, because they are built on a sane design, strong, simple, reliable, sanitary. The few easy adjustments necessary, anyone can make. The single automatic oiling arrangement takes care of every bearing and sidesteps trouble.

"Facts and Figures on Dairying" will help you, too. Write for it and for a catalogue. See the I H C dealer who can furnish you with a Lily or a Primrose separator.

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Champion Deering McCormick Milwaukee Osborne Piano
Seed of Quality
FOR THE
Field, Lawn and Garden

We have our usual good stocks of ALFALFA, SOY BEANS, CLOVERS, CORN, and other field seeds.

Our GARDEN and FLOWER SEEDS, PLANTS and BULBS are selected with the same care that has built our large trade in Field Seeds

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Cleanliness is now recognized as an investment. We positively know that the more sanitary the creamery or cheese factory, the easier it is to produce products that pay, that increase our earning power.

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Dairymen's Cleaner and Cleanser

for reasons that are known beyond the boundaries of this or any other dairy nation, has done much to make factory and dairy cleanliness all that it should be. It is a harmless, non-soapy, non- caustic agent, with peculiar sweetening and purifying properties. It cleans clean, and is uniformly reliable and dependable in cleaning quality.

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All the leading dairy supply houses are distributors for WYANDOTTE DAIRYMAN'S CLEANER AND CLEANSER.

Your order for a barrel or keg will receive prompt attention.

THE J. B. FORD COMPANY
Sole Manufacturers WYANDOTTE, MICH.

This Cleaner has been awarded the highest prize wherever exhibited.

IT CLEANS CLEAN

Where you saw it will help you, them and us
For spray materials in 1916 rely upon the company that has always provided the best at reasonable prices.

**HEMINGWAY & COMPANY, Inc.**
BOUND BROOK, N. J.

Lead Arsenate Paste
Lead Arsenate Powder

"Caascu"—The well known scientific, perfectly combined Copper Insecticide and Fungicide, for Potatoes, Celery, Tomatoes, Etc.

"London Purple"—The Improved Standard Insecticide that has uniform analysis and only half the soluble arsenic of Paris Green.

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"LONDON PURPLE" (No. 15062)
Metalic arsenic Water soluble
Found 23.99%; guaranteed 21%. Found 1½%; guaranteed 7½%.

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In the Early Spring before you begin to put ice in the refrigerator you may have trouble in keeping milk. If purchased from a well inspected and well organized Creamery you will have no trouble.

This Creamery is conducted along Modern and Sanitary lines.

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Sweet is the scent of the orchard in May. When the apple trees array themselves in pink and white it is time for a great annual festival. The apple tree is host. In every one of its florets a place is spread for a little winged guest. The food is nectar and pollen, provided in lavish abundance. A brilliant company of bees and flies and butterflies are guests. The merry activity runs for days together, heightening when the sun shines. It is held at the opening of the summer season, and the serious work of producing an apple crop is dependant on the good will and patronage of these visiting insects.

—James G. Needham in The Natural History of the Farm
Composition, Food Value and Methods of Paying for Milk

By H. C. Troy, '96
Professor in Dairy Industry, New York State College of Agriculture
at Cornell University

This article considers first, the variations in the composition of pure milk; secondly, a comparison of the food values of milk varying in composition; and, thirdly, different methods of paying for milk illustrated by the use of tables.

Until a few years ago, practically all milk was bought and sold by volume or weight regardless of composition. In fact, the composition of milk was not known until about half a century ago when chemical methods for the analysis of milk were perfected.

About that time the practice of pooling milk to be manufactured into butter and cheese commenced. It was noticed that larger amounts of either butter or cheese could be secured from the milk produced by some herds than could from an equal volume of milk produced by some other herds. Then the demand for a practical method to determine the composition of milk became necessary. Several tests for determining the per cent of fat in milk were developed. In this country the Babcock Test has practically displaced all others.

It was then found that the per cent of fat varies oftener and more widely than do the other milk constituents. The principle factors affecting the composition of milk are: breed, individual, period of lactation, time between milkings, condition of the animal and nights' or mornings' milk.

The figures in Table I represent three grades of milk the composition of which would be classed as low, average, and high. They do not represent the widest range in composition that might sometimes be found in the milk from thirty or forty different herds, although a greater variation than here represented is not often found. The figures for the compositions represent the average per cent of the different solids not fat in the three grades of milk which contain 3 per cent, 3.8 per cent and 5.5 per cent of fat, respec-

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>88.80</td>
<td>3.0</td>
<td>2.10</td>
<td>4.60</td>
<td>.70</td>
<td>.70</td>
</tr>
<tr>
<td>Average</td>
<td>87.37</td>
<td>3.8</td>
<td>2.50</td>
<td>4.80</td>
<td>.71</td>
<td>.72</td>
</tr>
<tr>
<td>High</td>
<td>85.05</td>
<td>5.5</td>
<td>3.00</td>
<td>5.00</td>
<td>.73</td>
<td>.73</td>
</tr>
</tbody>
</table>
tively. It may be noticed that the percentage of each of the solids not fat increases as the per cent of fat increases, but the fat increases in greater proportion.

**Food Value**

It is profitable to compare the relative food values of average milk and some other foods. In order that this may be done conveniently, investigators have classified the different energy producing substances used as foods as fats, carbohydrates and protein.

The fats and oils are substances with which we all are familiar, and need no description. They are characterized chemically by having a high carbon content which unites with oxygen to form heat and energy. They do not assist directly in building up muscle tissue. The carbohydrates are made up of sugars, starches, gums and similar substances. They also produce heat and energy for the body, act more quickly than the fats, and are more easily utilized. The proteins are found in substances like lean meat, casein and albumen of milk, white of egg, and in the juices and seeds of many plants. They produce heat and energy and build up muscles.

In order to compare the value of different foods in satisfying body requirements, we should first know the composition of the food. Secondly, we must have a common standard or unit of measurement.

The chemist determines the composition by analysis. It has been found by careful experiments that, if we subject digestible substances to complete combustion, comparing the amounts of heat produced from each, we can secure a fair idea of the food value of each, since the different forms of energy are to a considerable extent comparable.

The amount of heat required to raise the temperature of one kilo (about a quart) of water one degree Centigrade or one and four-fifths degrees Fahrenheit is called a calorie. It is taken as the unit of heat measurement. It has been found that a pound of fat undergoing complete combustion produces 4220 calories, and that a pound of either protein or carbohydrates produces 1860 available calories. These figures are considered a fair measure of the food value of a pound of the substances.

The figures in the first column represent the retail price in cents per pound of each substance. The second column gives the heat units from a pound of each and the third column gives the cost in cents of 1000 heat units for each food.

It is interesting to note that the

<table>
<thead>
<tr>
<th>TABLE II</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost and Food Value of Various Foods</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cents per pound</th>
<th>Heat Units per pound</th>
<th>Cost per 1000 Units in cents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenderloin steak</td>
<td>28</td>
<td>1300</td>
<td>21.5</td>
</tr>
<tr>
<td>Corned beef</td>
<td>15</td>
<td>1295</td>
<td>19.7</td>
</tr>
<tr>
<td>Fresh lean veal</td>
<td>25</td>
<td>730</td>
<td>34.2</td>
</tr>
<tr>
<td>Roast leg lamb</td>
<td>22</td>
<td>300</td>
<td>24.4</td>
</tr>
<tr>
<td>Smoked ham (52.3 per cent fat)</td>
<td>22</td>
<td>2485</td>
<td>8.1</td>
</tr>
<tr>
<td>Chicken (fricassée)</td>
<td>22</td>
<td>855</td>
<td>25.7</td>
</tr>
<tr>
<td>Halibut steak</td>
<td>20</td>
<td>565</td>
<td>35.2</td>
</tr>
<tr>
<td>Blue fish</td>
<td>18</td>
<td>670</td>
<td>27.0</td>
</tr>
<tr>
<td>Boiled eggs</td>
<td>20</td>
<td>765</td>
<td>26.1</td>
</tr>
<tr>
<td>Wheat bread</td>
<td>5</td>
<td>1285</td>
<td>3.7</td>
</tr>
<tr>
<td>Oat meal</td>
<td>4.5</td>
<td>1860</td>
<td>2.4</td>
</tr>
<tr>
<td>Whole wheat flour</td>
<td>4.5</td>
<td>1675</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Protein  Carbo-  Fat
hydrates     hydrates

<table>
<thead>
<tr>
<th>Milk</th>
<th>3.3</th>
<th>5.0</th>
<th>4.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheese</td>
<td>25.0</td>
<td>33.7</td>
<td>20.0</td>
</tr>
<tr>
<td>Butter</td>
<td>35</td>
<td>3605</td>
<td>9.7</td>
</tr>
<tr>
<td>Boiled potatoes @ 75c bu.</td>
<td>1.25</td>
<td>440</td>
<td>2.8</td>
</tr>
<tr>
<td>Dried beans @ $3.00 bu.</td>
<td>5.80</td>
<td>1695</td>
<td>3.4</td>
</tr>
</tbody>
</table>
energy producing power, which is measured in terms of heat units, has little effect upon the cost, since 1000 heat units derived from halibut steak costs 35.2 cents, whereas the same amount of energy secured from oat meal costs only 2.6 cents.

It also appears that milk at seven cents a quart, cheese at twenty cents a pound, and butter at thirty-five cents a pound, each supply 1000 heat units at nearly equal cost. Corned beef and smoked ham are the only meat foods that furnish heat units as economically as those secured from dairy products. It would be difficult to devise a more economical diet than the farmer's, when it consists, as it usually does, of potatoes, salt meat, cereals and dairy products, all secured at first cost.

The first column of this table gives the percentages of fat in several samples of milk, differing normally in composition. The second column gives the heat units that may be produced from the fat in 100 pounds of the milk of each grade and the third column gives the money value of the fat at thirty cents per pound.

The fourth column gives the percentages of sugar and protein that would normally exist in milk of the different grades while the fifth column gives the heat units and the sixth column gives the value in cents of the sugar and protein calculated at five cents a pound. The seventh column gives the total heat units and the eighth column gives the total money value of 100 pounds of each sample.

It is probable that 30 cents per pound for the fat is relatively too low when compared with five cents per pound allowed for the sugar and protein. Some hold that the marketable value of milk fat is worth about ten times as much as the marketable value of the sugar and protein, but the figures here used serve to show the differences in food value that exist between rich and poor milk.

**Value of Milk by Different Methods**

### TABLE III

<table>
<thead>
<tr>
<th>Fat</th>
<th>Heat Value</th>
<th>Sugar and Protein</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per cent</td>
<td>Units 30c lb.</td>
<td>Per cent</td>
</tr>
<tr>
<td>3.00</td>
<td>13660</td>
<td>.90</td>
<td>7.70</td>
</tr>
<tr>
<td>4.00</td>
<td>16880</td>
<td>1.050</td>
<td>7.95</td>
</tr>
<tr>
<td>4.50</td>
<td>18930</td>
<td>1.200</td>
<td>8.20</td>
</tr>
<tr>
<td>5.00</td>
<td>21100</td>
<td>1.350</td>
<td>8.45</td>
</tr>
<tr>
<td>5.50</td>
<td>22210</td>
<td>1.500</td>
<td>8.70</td>
</tr>
<tr>
<td>6.00</td>
<td>25220</td>
<td>1.800</td>
<td>9.15</td>
</tr>
</tbody>
</table>

Thus, the milk containing 3 per cent of fat would have a value of $1.28 per hundred pounds, while the milk containing 5 per cent of fat would be worth $1.94 for each 100 pounds or a difference of 66 cents.

### TABLE IV

#### Value at Thirty Cents per Pound for Fat and Thirty Cents Per 100 Pounds for Skim Milk

<table>
<thead>
<tr>
<th>Fat</th>
<th>Fat Value</th>
<th>Skim Milk Value</th>
<th>Total Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per cent</td>
<td>3.0 x 30</td>
<td>.90 plus .30</td>
<td>$1.20</td>
</tr>
<tr>
<td></td>
<td>3.5 x 30</td>
<td>1.05 plus .30</td>
<td>1.35</td>
</tr>
<tr>
<td></td>
<td>4.0 x 30</td>
<td>1.20 plus .30</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>4.5 x 30</td>
<td>1.35 plus .30</td>
<td>1.65</td>
</tr>
<tr>
<td></td>
<td>5.0 x 30</td>
<td>1.50 plus .30</td>
<td>1.80</td>
</tr>
</tbody>
</table>

In this table the fat in the milk is given a value of thirty cents per pound as in Table III, but a flat rate of thirty cents is allowed for the skimmed milk from 100 pounds of the whole milk. This method of paying for milk has, to some extent, come into use recently. It does not take into consideration the differences in food value existing in different samples of skimmed milk; therefore, it works slightly to the disadvantage of the producer of rich milk. Figured on this basis, 100 pounds of the three per cent milk is worth $1.20, while
100 pounds of five per cent milk is worth $1.80, or a difference of sixty cents.

Table V compares two methods of arriving at the value of milk of different quality when the milk has been made into cheese. The yield of cheese given in the second column was taken from "The Science and Practice of Cheese Making," by Van Slyke and Publow. One hundred pounds of milk containing five per cent of fat produced 4.6 more pounds of cheese than 100 pounds of milk containing 3 per cent of fat. At fifteen cents per pound for the cheese 100 pounds of the richer milk would be worth sixty-nine cents more than 100 pounds of the poorer.

The fourth column gives the value of the milk calculated on the fat test basis. The total fat in the different lots of milk is thirty-six pounds and the total cheese made at fifteen cents per pound is worth $14.32. Then, if the value of the milk is calculated on the fat basis, each pound of fat would be credited with 39.77 cents. One hundred pounds of the milk containing three per cent of fat would then bring $1.19 as compared with $1.98 for 100 pounds of the five per cent milk. The fifth column shows the loss or gain in cents when the payment is based on the fat test compared with the values in column three.

### TABLE V

<table>
<thead>
<tr>
<th>Fat Per cent</th>
<th>Lbs. of Cheese</th>
<th>Value at 15c per lb.</th>
<th>Value on fat test basis</th>
<th>Cents Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.00</td>
<td>8.30</td>
<td>$1.245</td>
<td>$1.197</td>
<td>-5.2</td>
</tr>
<tr>
<td>3.50</td>
<td>9.45</td>
<td>1.412</td>
<td>1.392</td>
<td>-2.0</td>
</tr>
<tr>
<td>4.00</td>
<td>10.60</td>
<td>1.590</td>
<td>1.590</td>
<td>0.0</td>
</tr>
<tr>
<td>4.50</td>
<td>11.74</td>
<td>1.761</td>
<td>1.789</td>
<td>plus 2.8</td>
</tr>
<tr>
<td>5.00</td>
<td>12.90</td>
<td>1.935</td>
<td>1.988</td>
<td>plus 5.3</td>
</tr>
</tbody>
</table>

Contrasting Amount of Cheese Made from 100 Pounds of 5 Per Cent and from 100 Pounds of 3 Per Cent Milk
The fifth column in Table VI gives the difference in value measured in heat units between a pound of cheese made from the richer milk would also have an additional value because of its greater palatability, finer flavor, and aroma, and better texture.

In Table VII we have brought together for comparison the prices that would be realized for milk of different grades, if sold according to the methods discussed.
It has been shown that a wide range of values may exist in pure milk from different sources. These differences in value should be recognized and a more equitable method of paying for milk should be adopted than is in operation where a set price is paid per 100 pounds of milk, regardless of composition.

It appears that the method of paying on the fat test basis for milk that is made into cheese is probably the fairest method practiced when we understand that a greater amount of cheese is made from the richer milk, that such cheese has higher quality and, that pound for pound, it has greater actual food value.

### TABLE VII
Values by Different Methods Compared

<table>
<thead>
<tr>
<th>Per cent Fat</th>
<th>S. N. F. at 5c per lb.</th>
<th>at 15c per lb.</th>
<th>Test Basis</th>
<th>Skim Milk at 30c per 100 lbs.</th>
<th>from Cheese at 8c per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>$1.18</td>
<td>$1.245</td>
<td>$1.192</td>
<td>$1.20</td>
<td>$1.24</td>
</tr>
<tr>
<td>3.5</td>
<td>1.45</td>
<td>1.412</td>
<td>1.392</td>
<td>1.32</td>
<td>1.42</td>
</tr>
<tr>
<td>4.0</td>
<td>1.61</td>
<td>1.590</td>
<td>1.591</td>
<td>1.50</td>
<td>1.61</td>
</tr>
<tr>
<td>4.5</td>
<td>1.77</td>
<td>1.761</td>
<td>1.759</td>
<td>1.65</td>
<td>1.82</td>
</tr>
<tr>
<td>5.0</td>
<td>1.94</td>
<td>1.935</td>
<td>1.988</td>
<td>1.80</td>
<td>2.00</td>
</tr>
</tbody>
</table>

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The Road to Anywhere

Ho! roll your pans in your ponchos and swing them upon your backs;
For Anywhere is a day ahead, and we must be making tracks.
Whither or whither we do not know, and whither we do not care;
Wanderers we with footsteps free to take up Anywhere!

We toss our coins at the crossroads and follow the way they fall,
Or turn our back to its chosen track; it matters not at all
Whether our road run high or low, shaded it be or bare,
Since those we be whose footsteps free fall blithe toward Anywhere.

Our feet are free and our hearts are free, and we talk to the folk we meet.
Wonderful human adventures fall at our questing feet.
Thought for thought to the men we meet, and a word to the maiden fair:
These mark the way and make a day on the Road to Anywhere.

So now we swing at a four-mile clip through the breezy, sunny day;
And now we sprawl by a mountain stream to hear what the waters say.
Then again along to a marching song or a slower stroller's air,
Our footsteps fall to the errant call of the Road to Anywhere!

R. L. '18.
How Types of Farming in New York Are Determined *

BY K. C. LIVERMORE

Professor of Farm Management, New York State College of Agriculture at Cornell University

Alfalfa

The early colonists to North America brought with them alfalfa, or lucerne, as they called it. Throughout the early history of the country repeated attempts were made to grow it in the eastern part of the United States. But nowhere in the east did it become important until the present time, except in Onondaga County. In this county it has been grown continuously since 1812.

Most of the alfalfa in Onondaga County was grown on the drumlin formations in a belt several miles wide extending east and west just south of Syracuse. These steep sided and round topped drumlins consist largely of very gravelly loam and contain much limestone derived by the glaciers from the nearby outcrops of limestone strata. Because of the height and steepness of these drumlins it was impracticable to crop them as the more level lands of that section were cropped. Pasturing was not much more practicable because on such well drained gravelly soil, pasture plants were short lived and produced little or no feed in dry weather. But soil conditions on these drumlins were ideal and climatic conditions in the section were very favorable for alfalfa. The winters were not too severe, the seasons, averaging 160 days between frosts, were sufficiently long and the summer rainfall was ample for three or more cuttings in most years. Little tillage was necessary because the plants were long lived in the congenial soil, and the haying operations were not too difficult even on the steep hill sides.

Thus, alfalfa was more practicable on these drumlins than pasture or than any of the other profitable crops of the region, such as potatoes, tobacco, and cabbage. It should be noted, however, that on other more level limestone soils** of the State, almost if not just as favorable for alfalfa, the crop was grown very little. Until after the period of agricultural depression in the nineties this was the status of alfalfa in the State. The acreage was very small. As late as 1899 many counties were without a single acre of alfalfa and only three counties had over 100 acres of it.

Then, a great shift in economic conditions drew much attention to the crop and resulted in a tremendous artificial stimulus to its production.

Following the period of depression came a period of general prosperity with high prices for most farm products. Grain prices at first increased more rapidly than the prices of milk and hay and meat. This made profitable stock feeding a problem for study. Eastern dairymen were especially concerned, for they were buying most of their grain feeds. The agricultural colleges and experiment stations, the institute workers, and agricultural journals gave their attention to the problem. The importance of protein, the highest priced essential constituent of feed stuffs, was emphasized and cheaper sources of protein were sought. Thus, alfalfa, which had already proven its value as a cattle feed in the far west, came into prominence in

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*This is a continuation of the fifth article in a series dealing with the agriculture of New York.—Ed.

**The phrase, "limestone soils" as used in this article refers to any soil well supplied with limestone fragments.
the east. All the agencies of extension began an alfalfa campaign which has not yet ended. The result is that practically every county in the State now has some alfalfa. The acreage in Onondaga County increased from 767 in 1899 to 13486 in 1909, in Cayuga County from 39 to 2371, in Ontario from 42 to 1442 and for the State the increase in that decade was approximately sevenfold, and by now it is probably at least fifteenfold.

Changes in the relative prices of products have made alfalfa growing profitable in places where formerly it was not grown. On the other hand, this great stimulus to its production has undoubtedly led to its introduction in places where it will not add to the profits of farming. Therefore we cannot so readily draw conclusions as to the factors that determine its location from a study of its present distribution as can be done with longer established crops. However, the early history of the crop and the tendencies of its distribution indicate to a certain extent its probable place in New York systems of farming.

Chart I shows the counties of the State which had .5 per cent or more of the crop area in alfalfa in 1909. Although this is so small a proportion of the crop area, only eight counties were included and their arrangement is striking. The original alfalfa belt in Onondaga County has extended through Madison into southern Oneida, and westward as far as Genesee County, being closely associated in each county with the limestone soils, especially those in drumlin formations. (See Figures 1 and 2, pages 17 and 19, Vol. XII).

Without doubt, a deep well drained soil abundantly supplied with lime, not only in the surface six inches, but to the full depth to which the feeding roots penetrate, is the condition most important in determining where alfalfa shall be prominent in the system of farming. But why has not alfalfa production become as important in other parts of the State where may be
found deep limestone soils well drained naturally or artificially? The Ontario soils, some of the Dunkirk soils, and others apparently and by test, grow alfalfa well. Such soils, both north and south of this alfalfa belt, and in parts of the Mohawk Valley and the northern tier of counties, are well suited to this crop, but it has not become important there. The question is not answered by climatic factors because each of these regions has rainfall and length of season comparable to those of some part of the alfalfa belt. Market conditions are similar. Thus, by elimination, the second important factor must be competition.

In these sections where alfalfa might be grown but has not become important, it is in all probability limited by competition with the cash crops of the region and in many cases with clover hay. Good alfalfa conditions in this State nearly always mean good conditions for one or more of our most profitable crops provided the topography permits easy tillage. The competition is partly for land and partly for labor. While alfalfa profits usually compare very favorably with those of other crops for the labor concerned, they usually do not compare so well on the acre basis. When good alfalfa land is level enough to grow cultivated crops, farmers usually grow in preference to crops with tobacco also, exclude alfalfa on most of the more level land. On the good alfalfa lands of the Mohawk region hops have dominated. If hops continue to fail, probably some of these other crops will replace them, on the more level land and alfalfa on the steeper land.

Alfalfa conflicts more or less with most of these crops in labor requirement. The conflict is greatest, perhaps with the bean and wheat combination. It is bad also with tobacco, hops and potatoes. This explains further why alfalfa gives way to these crops on the more level land.

One other condition tends to limit alfalfa production away from the drumlins on land that is adapted to the crop. In these sections live stock is not important because so little land has to be pastured. This lessens the home requirement for hay and, more important, it increases the dependence upon a good sod for much of the
needed nitrogen and humus. The usual practice in the northern half of western New York is to plow under a clover sod (after cutting one season) for potatoes, beans or cabbage. This practice provides enough hay for the stock and furnishes a better sod more cheaply than could be done by growing alfalfa. In order to have an alfalfa sod every year that crop, if used, could be left down only one year at a time in most cases because of limited area. This would mean a higher seed cost than with clover. Further losses would result if an alfalfa sod were used because one seeding of alfalfa is ordinarily good for three to ten or more years and the latter yields usually are better than the first. Alfalfa roots give more trouble than clover roots in plowing for and cultivating the following crop.

The foregoing discussion is not intended to convey the idea that alfalfa has no place whatever in systems of farming on the more level limestone lands. While alfalfa probably will not become as important on such lands as on the drumlins and other hilly limestone lands, small fields will prove profitable on many farms so located and larger areas on a few farms. Since 1900 there has been considerable extension of the alfalfa crop be-

yond the belt indicated in the preceding chart. This has been due in part to the artificial stimulus and in part to the much higher prices of alfalfa hay. If prices go high enough, of course alfalfa can compete as a cash crop with the others even on the more level lands. It is doubtful, however, if this price condition could continue long because protein could be purchased more cheaply in other feeds and alfalfa could be shipped in from western points where prices are much lower. These factors are already checking the price advance.

The distribution of the labor requirements of alfalfa is such as to make it fit well into a cropping system which includes considerable oats and ordinary hay. Its feeding value would make it desirable on farms with such a system assuming that they were dairy farms as most of such farms are. But unfortunately either soils deficient in lime or drainage, or too short seasons and severe winters prevent the combination. It is an interesting fact that in this State most of the farms, on which alfalfa would contribute most to the business efficiency, are unable to grow it profitably. The alfalfa campaign has accomplished its original purpose only to a very limited extent. In

(Continued on page 690)
MECHANICAL water systems is a term under which will be described different arrangements of power-driven pumps, and also different methods of storing the energy delivered by these pumps so that this energy may deliver water when desired after the pumps have stopped. The essential parts of the elementary pump are a cylinder, the entrance to which is through an inwardly opening valve, and in addition, a water-tight free moving plunger carrying an upwardly opening valve. If the cylinder be immersed in water whenever the piston is drawn up in the cylinder, water will rush in to fill the cylinder by gravity. If the cylinder be located above the water we depend on the pressure of the atmosphere to push up in the suction pipe of the pump a column of water to fill the vacuum left by the plunger of the pump when it is raised. From figures previously given, atmospheric pressure should maintain a column of water thirty-four feet high, but because of mechanical imperfections of pumps twenty feet had best be considered the greatest practical lift. When we consider that this forcing power of the atmosphere can be used to deliver water directly up through 20 feet of pipe or directly up through 15 feet of lift, and then laterally through a length of pipe.
in which the friction head is 5 feet more, we then have the basis for the next classification.

Shallow well pumping systems are those in which the pump is at such a level that the total suction head made up of friction head and lift above the surface of the water does not exceed 20 feet. In this type of system, therefore, the pump may, if desired, be located at some point other than directly over the well as illustrated in Figure 4, care being taken to insure that the suction pipe is absolutely air tight, large enough to produce little friction loss, and, if the pipe is long, provided with a suction chamber in the line as near the pump as possible in order to render as uniform as possible the flow in the pipe under the intermittent sucking action of the pump.

Deep well pumping systems are those in which the water level is so low in the well that the cylinder must be placed in it in order to get near enough to the water. In these systems the engine may be near the well, as in Figure 5, or it may be remote from it and the power may be transmitted from the engine to the well by mechanical transmitting systems of various kinds. For instance, one alumnus of our college has operated such a pump from an engine some distance away by means of a rod working back and forth in a pipe laid under the lawn. The power is directed downward at the well by a bell crank below the cover, and nothing of the system is visible above ground.

Artificial gravity pressure systems are similar to the natural gravity systems described above, except that some prime mover as a windmill or gasoline engine must be used to force the water, either by a deep well pump or a shallow well pump as circumstances dictate, up into the storage reservoir. The windmill tower in Figure 6 might easily be made to support a storage tank for such a system instead of the hydro-pneumatic system shown. Concrete storage tanks built in the ground below frost on hills make excellent gravity reservoirs. The pipe leading from the pump to the tank can generally be used also as the sup-
ply pipe from the tank and so save expense.

Hydro-pneumatic pressure systems are those in which the motive power for forcing the water up above the tank to the desired height is secured by compressing air in a metal tank and then forcing in water which still further compresses the air. About one-third of the tank is filled with air so that the effective delivery capacity in water is about two-thirds the tank capacity. Air under pressure over water is absorbed by the water so that suitable means must be provided with these systems for replenishing the air supply. An extra cylinder for this purpose is shown just above the well casing in Figure 5. The hydro-pneumatic system is reasonably cheap, it is easily installed, the tank is safe from frosts, and leaks in the reservoir do not injure the plaster and paper in the house as would happen with a leaky attic gravity tank. These systems are subject to the limitations of the water pumps by which they are supplied, and in addition, water stored in them may become stale after a time. It is stated that when rain water is stored in a metal tank it becomes rusty because its action on the metal of the tank is more vigorous than that of well water, a contention which may be borne out by the fact that pure rain water introduced into a steam boiler has a very decided corroding effect on the boiler plates. When hydro-pneumatic systems are installed to deliver two kinds of water, one pump will suffice, but two tanks are necessary.

Pneumatic pressure systems are illustrated in Figure 7, and offer a means of obviating the objections just cited against the hydro-pneumatic systems. The pneumatic system delivers water fresh from the well, and in addition is admirably adapted for use in situations where the supply is so distant from the power plant and so much below it as to preclude the use of a shallow well pump installation. The distinctive feature of the system is the pneumatic pump which is submerged at least six feet in the water supply reservoir. This pump is operated by compressed air delivered to it from the power plant through a small metal pipe which must be laid with the greatest care to avoid leaks. Through valves which are automatically operated at the reservoir by suitable arrangements within the pump, the compressed air is caused to displace from the one or two chambers of the pump water which has previously rushed into the chambers by gravity. These displacement chambers in the pump are so small that the water in them is being constantly discharged and therefore always fresh. Their delivery capacity varies from two to fifty gallons per minute and a maximum lift of 200 feet may be obtained. Their practical range should be considered as from five to fifty gallons capacity with a maximum lift of 125 feet, as less than five gallons per minute is too slow. Delivery by

FIG. 6
HYDRO-PNEUMATIC PRESSURE SYSTEM
Automatic pressure regulation of windmill
this system to great heights is not efficient and involves the use of a type of air compressor that is rather expensive.

There are five makes of this type of system known to the writer, in three of which the pump has two displacement chambers controlled by automatic valves located on the pump and under water; in one of the other systems having but one displacement chamber in the pump, the valves are located above the surface to make them accessible. In systems of this type the engine runs an air compressor charging to a pressure of about 100 pounds per square inch an air storage tank at the power house. From this tank the air goes to the one or more automatic pumps, passing first, however, through a regulating valve which reduces the high storage pressure to an amount suitable for giving the desired discharge at the water faucets.

In addition to the advantages already mentioned, this type of system is well adapted to cases where rain water and well water are both to be pumped, a condition which, as we have seen, involves in other pressure systems the use of two tanks. In this system the only additional equipment necessary is a second automatic pump and the necessary pipe for making connections. Objections to the pneumatic system usually include first cost and the liability of trouble in the automatic valves, but these troubles by refinement of mechanism or radical change of design are gradually being eliminated to a large extent, and this type of system is becoming rapidly more reliable and consequently more popular than it has been in the past.

**Conclusion**

It has been the aim in these two articles to cover briefly the entire field of water supply systems, and reference has been made to the most simple and to the most elaborate. It is hoped that readers who do not have running water available in the kitchen and barns may by these descriptions be aided in the selection of a water supply system well

(Continued on page 666)
Unlike many of our garden flowers phlox may indeed be called an American plant, since all of its more than forty species are found growing wild in some section of North America. On the other hand, as in the case of many of our garden flowers, it has apparently been necessary for foreign hybridizers to improve on the wild types and develop the many beautiful forms of the American phlox before we could appreciate its value.

Because it is one of our native American plants and includes forms that are adapted for many purposes in the garden, should we not take a peculiar interest in phlox? And should we not take a still greater interest in it because it is of such easy culture, and because, by a careful selection of species and varieties, it will give a continuation of flowers from April until the blooms of the late-flowering varieties are destroyed by fall frosts?

Perhaps you have heard some one say that he can think of phlox as a weed only, having no place in the garden. We wonder whether such a person has seen some of the beautiful light-colored varieties that are so attractive. Possibly he is judging all phlox by an ugly magenta or a dingy lilac variety that he has seen. Surely he would not classify as weeds such exquisite varieties as Elizabeth Campbell and Aglae Adanson, or the trailing forms of Phlox subulata, which are beautiful carpets of bloom in early spring.

Before going further it might be well to describe what is meant by hardy phlox. Strictly speaking, the term includes all the forms of phlox that live over in the ground from year to year, that survive the winter—in other words, the perennial forms as distinguished from the annual form, Phlox drummondii, which must be raised from seed every year. The term hardy garden phlox, as commonly used, includes the early—and the late-flowering summer phlox. The former group begins to bloom in late May and early June and continue blooming throughout the summer. The latter, which is by far the larger group, begins to bloom in late June and early July and continue until killed by frost. It is with these two groups that we are especially concerned, since we are not attempting to include all the hardy forms of phlox.

It would hardly be fair, however, to pass unnoticed the low, trailing, spring-flowering species, which are so well adapted for planting as ground covers, in rock gardens, and on poor gravelly soil. These species seem to delight in the last-named situation as may be judged from the illustrations. Undoubtedly the most important of these forms is Phlox subulata, the moss pink of our grandmothers' gardens and a species found growing wild in certain sections of New York State. It is the earliest species to flower, beginning in April, and when in full bloom the plant is like a carpet of dark green, set with little flowers each about an inch in diameter, of a purplish rose color, with a darker eye at the center. There are several good varieties of this species: var. alba is white, with a slight reddish violet eye; var. nelsoni is better as far as color is concerned, as it is pure white, but it is not quite so vigorous in growth; for those who prefer lilac shades, the variety lilacina is one of the best; vivid is a beautiful salmon-pink variety.

Closely following Phlox subulata, in fact blooming at practically the same time, comes Phlox amoena, the "lovely phlox." This has the same habit of growth as Phlox subulata, but the leaves
are larger and less numerous, and the flowers are larger and are purplish rose in color.

These two species require very little care; they will almost care for themselves. The trailing stems or branches take root readily and in a few years one plant will cover considerable space. Since they are evergreen species and the flower buds are formed in the fall, they are benefited by being covered with light, strawy mulch from cold as to shield them from the bright sunlight until it is time for the flower buds to develop.

Of the summer-flowering group the early-flowering varieties are those belonging to the type, *Phlox glaberrima* var. *suffruticosa*. This name is not quite so formidable as it looks; it means that the plant is very smooth and has a stem which is suffruticose, or woody, at its base. The varieties of this type are seldom, if ever, over three feet in height. They have a smooth stem and thick, smooth, dark shiny green leaves. As already stated, they begin to flower in late May and early June and produce flowers intermittently until killed by frost. If the main truss, or flower cluster, is removed when it has finished blooming, many side branches will be produced; while these will not produce trusses as large as the main one, nevertheless they will give a satisfactory amount of bloom.

The late summer-flowering group, which includes the varieties most commonly grown, is without doubt the most important of all. Not only is there a great range of color in the group—white, pink, salmon pink, scarlet, red, and purple, and almost every imaginable com-

![A Bed of Low-Flowering Phlox](image-url)
The summer-flowering phloxes are at their best when grown in a rich and rather moist soil, although they will do fairly well in poorer soils. They are rank feeders, and therefore a liberal dressing of stable manure should be spaded in before planting. Planting may be done either in the spring or in the fall. If done in the spring, it is advisable to do it as soon as the ground can be worked easily, before the plants have made much growth. If fall planting is preferred, it should be done early enough so that the plants may become established before the ground freezes. Plants set out as last as October 25 have given excellent results the following season, but it is hardly advisable to plant much later than this. For immediate effect the plants may be set eighteen inches apart, but if they are to remain in the same location for several years they should be set thirty inches apart each way. Better flowers are obtained if the clumps are lifted and divided every third or fourth year; from three to five stems should be left on each piece and these should be planted at the distances mentioned above.

If it is desired to delay the blooming season, the tip of each stem may be pinched out about the first of June; this will cause the plant to send out many side branches, which will naturally flower much later. However, the trusses borne on these branches will not be so large as the main truss would have been had it been allowed to develop. If the main truss is removed as soon as its flowers have faded (on plants that have not previously been pinched), branches will be produced that will give a second crop of bloom.

Late in the fall, after the ground has frozen, the plants should be covered with a mulch. Strawy manure is the best material. This prevents injury to the buds and roots by alternate freezing and thawing. The mulch should be removed in early spring before the plants start into growth.

Mildew is the commonest disease of phlox, and is much worse in wet than in dry summers. Its presence is indicated by a white, powdery or downy substance on the leaves. Bordeaux mixture is frequently recommended as a preventive, but it has the disadvantages of discoloring the foliage. An ammoniacal solution of copper carbonate can be substituted, which is equally effectual while it remains on the plant but as it is easily washed off by rain the spray must be occasionally repeated. It is made by mixing three ounces of copper carbonate with three quarts of ammonia (or of sufficient quantity to dissolve the copper, the quantity depending on its strength), the mixture when used being diluted to make twenty-five gallons of liquid. This is better used as a preventive than as a cure, and should be applied before the mildew appears.

In some localities white grubs, the larvae of May beetles, or June bugs, often prove injurious to the roots of phlox. The easiest method of controlling these is to fork the ground over carefully before planting, and destroy all the grubs that are found.

HIGH-FLOWERING PHLOX OF A HARDY SUPERIOR TYPE
Cover Crops for the Peach Orchard

BY C. H. WELLS, '16

With the rapid advance in commercial fruit growing and the ever-present competition both in methods of management and in the marketing of the fruit, the progressive fruit grower of to-day is rapidly resorting to cheaper methods of keeping up the fertility of his soil. Stable manure is now widely used by many fruit growers as the only means of maintaining soil fertility. This is, of course, a good method and can be profitably practiced on small farms. On the larger farms, however, manure and the commercial fertilizers become a big item of expense which cuts into the season's profits.

The supply of plant food for the commercial peach orchard is one of the greatest problems of the peach grower. A thrifty peach orchard makes a heavy drain on the soil fertility, not only because of the large crops produced, but also because of the great amount of new wood growth that is made each year. Each year the peach tree is probably pruned the most severely of all the eastern-grown fruit trees. This severe pruning stimulates the tree, with a large amount of new wood growth as the result. The following summer this new growth which varies from several inches to six feet in length, bears fruit. If the tree makes the desired amount of new wood growth and produces a good crop of well-matured and well-colored fruit, it is necessary that a considerable amount of plant food be returned to the soil. This is accomplished by the use of cover crops, which are in many cases the cheapest of all fertilizers and which have many advantages that manure and commercial fertilizers do not possess.

A cover crop may be defined as any annual crop sown between the trees to build up the soil fertility. It is used for the particular purpose of securing the mulching and physical effect on the land in the intervals between regular fruit crops. The cover crop is sown in midsummer, usually about the last of July or the first of August, after the last cultivation and preferably just before a rain. The crop is not plowed under until the following spring. Crops like buckwheat, which make a tall growth before apple-picking time, should be laid flat by dragging with a couple of planks cleated together and loaded with stone. This will facilitate picking and will keep the windfalls clean.

The kinds of cover crops

There is no one best cover crop for all purposes and all conditions. The grower must study the conditions of his trees and his land, and then decide for himself as to the kind of crop to use; for the choice of the proper cover crop is largely a local problem, just as the method of tillage or the kind of fertilizer is a local problem.

All cover crops may be placed in either of two groups: those that have the power of appropriating and utilizing free nitrogen through the action of the root nodules, termed legumes; and those belonging to the non-leguminous group, which do not possess nitrogen-fixing root nodules. If the peach trees are making a vigorous growth it may be well to use the non-leguminous plants, as the increased amount of nitrogen which the legumes add to the soil may over-stimulate the growth of the trees.

The more important cover crops may be listed as follows:

<table>
<thead>
<tr>
<th>Leguminous</th>
<th>Non-leguminous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>Barley</td>
</tr>
<tr>
<td>Beans</td>
<td>Buckwheat</td>
</tr>
<tr>
<td>Clovers</td>
<td>Oats</td>
</tr>
<tr>
<td>Vetches</td>
<td>Rape</td>
</tr>
<tr>
<td>Peas</td>
<td>Rye</td>
</tr>
</tbody>
</table>

These may be sown alone or in combination. The combinations are prefer-

(Continued on page 700)
Book Reviews

The Standard Cyclopedia of Horticulture
(By Liberty Hyde Bailey, former dean of the New York State College of Agriculture. Published by the Macmillan Company, New York. Price 6.00.)

This is the fourth of a six volume series on which Dr. Bailey has been working for four years. The volume is illustrated with ninety-six full page colored plates and 645 figures. The cyclopedia is a discussion for amateur, professional and commercial growers, of the kinds, characteristics and methods of cultivation of the species of plants grown in the regions of the United States and Canada for ornament, for fancy, for fruit and for vegetables; with keys to the natural families and genera, descriptions of the horticultural capabilities of the states and provinces and dependent islands, and sketches of eminent horticulturists. This cyclopedia is considered by many as one of the most complete works on horticulture yet published.

The Cost of Producing Milk on 147 Farms in Delaware County, New York, by Professor A. L. Thompson of the Department of Farm Management. Free upon application by any resident of New York State.

Among men in the milk business there is a growing unrest and discontent with things as they are, coupled with a surprising lack of definite information as to just how things are. This bulletin, which forwards no further opinions but simply tells the results of two years painstaking effort to discover the cost of milk production in New York, should, therefore, be interesting and timely. "It is a study of the different costs of the dairy business, not an attempt to prove that dairying is either a profitable or unprofitable enterprise."

The field of the survey was 174 farms in Delaware County. The care with which the survey was planned and carried out can only be appreciated by a perusal of the report. Here we may only deal with the outstanding results.

"The net cost of producing 100 pounds of milk during 1912 was $2.35, or a little over 5 cents a quart. ** The average price received for this milk was $1.65 a hundredweight—an average apparent loss of 70 cents per hundredweight or one and one-half cents per quart.

The year 1912 was poor so, "for fear the results obtained might lead to the wrong conclusion," the survey was repeated over the same farms in 1913, a year in which "the chances for making money were above the average. Under these favorable conditions the average cow was kept at a loss of $12.50." The cost per hundredweight was $2.03 and the selling price $1.76—an average apparent loss of twenty-seven cents per hundredweight, or seven-tenths cents per quart.

The report makes it plain that while only 15 of the 174 dairymen made money in 1912 and only 52 in 1913, it does not necessarily follow that the remaining majority will be forced out of business, as the utilization of home labor, the feeding of farm products and the acceptance of a low rate of interest may yet maintain a cash balance in favor of the herd. It concludes with a discussion of the various factors of milk production and their relation to profit or loss.

Farm Shop Work
(By G. M. Brace, Director of Manual Training, Central High School, St. Paul, Minnesota, and D. D. Mayne, Principal of School of Agriculture and Professor of Agricultural Pedagogics, University of Minnesota. Published by the American Book Company, New York. $1.00 net.)

This book is written primarily for pupils taking agriculture in elementary and secondary schools, and for (Continued on page 710)
Vegetables for the Table During Spring

BY FRANCES E. VINTON
Instructor in Home Economics, New York State College of Agriculture at Cornell University

This is a season puzzling to housekeepers. Winter roots are withered, cabbages are spoiling, the supply of home-canned products is almost exhausted and summer vegetables are still far away. Our grandmothers balanced the uneven diet with spring bitters and nauseous tonics with fair results. The custom was not popular then, nor is it now. How can the need be met?

Jars of summer vegetables emptied during the winter, may be filled with roots of carrots, beets, or turnips and with winter squash or onions, which keep until Christmas when they begin to wilt. Canning on a cold winter's day, when a heavy fire is needed in the kitchen for warmth, is both pleasanter and cheaper than in summer. Economy of cans and store-room space is also effected. It is wise when canning stored vegetables to make them fresh by soaking them in cold water before removing the skin.

Serving vegetables becomes a problem when the same kinds must appear day after day. Left-over material from creamed and scalloped vegetables may be made into souffle, when eggs are cheap in spring, and served as a most acceptable meat substitute. The creamed vegetable should be rubbed through a sieve. For each one-third cup of pulp and white sauce mixture, the beaten yolk of one egg should be added and the whole mixed well. The stiffly beaten white should next be folded in. A buttered baking-dish or ramekins may be used, being filled half full. The dish should be placed in a pan of water and the souffle cooked in a moderate oven for forty minutes, or in the case of ramekins, for twenty minutes. It should be served immediately.

New England "vegetable hash" of beets and corned beef chopped together and fried without browning adds a bit of color to the supper table. The "vegetable dinner" of cabbage, turnips, parsnips, carrots and potatoes, all boiled together with corned beef, and with beets cooked separately, but served on the same plate, has both a flavor and odor all its own. This odor lingering on through the week has earned the just displeasure of careful housewives. An excellent soup can be made by dicing a mixture of canned vegetables, draining off the water, and stewing them in a sauce pan with a little beef or bacon fat, using one measure of meat to one of diced vegetables. After ten minutes cooking, they should be mashed for thickening. Raw diced potato and the juice drained off the canned vegetables should be added, with a bit of onion top for color and flavor should be added. The mixture should be stewed till the potatoes are soft, and served with toasted bread sticks.

Onion make good greens. An onion bulb set among some pebbles with water in a glass and kept on the kitchen window sill will produce garnish for several salads. Carrots, too, may be coaxcd to grow feathery leaves after the parsley, potted in the fall, has been entirely used.

A savory dish can be made by parboiling whole, a good-sized, well-formed cabbage, until the leaves are limp enough to be laid back one by one away from the center. It is then set
upright in a deep baking-dish, the leaves are closed again, and a few pieces of frankfurter sausage are placed inside each leaf. A cup and a half of white sauce is poured over the whole cabbage which is then baked for twenty minutes. Seasoning and garnishing of various sorts may be added. Bits of pickle, sweet red pepper, and bacon are most often used, as well as many leftovers.

Attractive salads can be made with cooked vegetables, sliced and well seasoned with French dressing before being served. This process of seasoning is called "marinating." It consists in soaking the material in a liquid made with one part of vinegar and three parts of oil with salt and pepper to suit the taste. This may be kept in a jar and used over and over. It is necessary to shake thoroughly before pouring it out and to strain it before returning it to the jar. Fresh vegetables which are likely to wither can not be so treated. They should have a few teaspoons of dressing sprinkled over them just before being served.

Raw cabbage shaved very thin makes a dainty succulent salad. The favorite dressing for it consists of mild vinegar, or vinegar and water, each cup of which is flavored with two teaspoons of sugar, one-half teaspoon of salt, and a little paprika. The liquid from horse-radish adds agreeable spice to the flavor of the cabbage.

Wild greens begin to show themselves early. Pepper cress, sour dock, dandelion, marsh marigold, and wild mustard are among the favorites. In cooking them, care must be taken to preserve both flavor and delicacy of texture. Cleaning is much simplified if the leaves can be left attached to the top of the root till the greens have been picked over and washed once. Then they should be cut near the base, the central bud being preserved, and the leaves should be separated. In cooking, very small quantities of water should be used, or better, the vegetables should be cooked over water in a steamer, excepting dandelions which may well have the water changed during boiling to reduce the bitterness. The leaves should be cooked only until well softened, not longer lest the color be spoiled. They should then be drained thoroughly, seasoned with butter, and served with a garnish of hard-cooked egg.

A good flavor is obtained by boiling a piece of salt pork with the greens. In this case, no butter is needed in serving. Cold greens, well seasoned with French dressing, make excellent salad. Early lettuce makes good greens. Left-over leaves may be rubbed through a sieve, and with the water in which they were boiled, may be added to a thin white sauce to make a cream soup.

Radishes, pared, boiled and creamed make a delicious substitute for young turnips. If the water is changed once during the cooking, they may be used in this way after they have become too strong and old to be served raw.

This carries the season up to the time of preserving for the following winter. After all, the solving of the problem lies here. The housewife who has time, facilities, and space for canning, drying and storing fruit and vegetables is the one whose winter table best serves the needs of her family.
BULLETIN ON POTATOES AVAILABLE

Edward Van Alsyne, Director of Farmers’ Institutes of the New York State Department of Agriculture, announces that there is ready for distribution Bulletin 77 on “The Potato Industry in New York State.” This was issued as Bulletin 57 in March, 1914. The demand for it has been so great that the supply has been for some time exhausted.

VALUE OF FARM LANDS INCREASING

According to reports from the Bureau of Crop Estimates the value of farm lands of the United States, without improvements, is estimated at $45.55 per acre, as compared with $40.85 a year ago. The census reported the value of farm lands in 1910 as $32.40, and in 1900 as $15.57 per acre.

In recent years the value of farm lands has been increasing at the rate of about five per cent a year, or approximately $2 per acre per year. The exceptional increase of the past year may be explained partly by the reaction in the southern cotton states following a temporary depression last year, and partly by the stimulus given by the war to prices, particularly of grain.

Increases have been general throughout the United States, the only noteworthy exceptions being orchard lands and some irrigated lands in the Northwest, which apparently had been overvalued before.

RANGERS CARRY TWO-AND-A-HALF POUND TELEPHONE

A portable telephone, made of aluminum and weighing two and one-half pounds, the invention of a Forest officer, R. B. Adams of Missoula, Montana, will be part of the regular equipment of patrolmen on the National Forests the coming field season. This instrument is regarded as a great improvement over the set formerly used, which weighed ten pounds.

It is said that a field man equipped with this telephone, a few yards of light emergency wire, and a short piece of heavy wire to make the ground connection can cut in anywhere along the more than 20,000 miles of Forest Service telephone lines and get in touch with the headquarters of a supervisor or district ranger.

Forest officers say that these portable phones are especially valuable in reporting fires and other emergencies with the least possible delay, and also in sending instructions to field men and keeping the district rangers informed as to the progress of work going on in the field, thus supplementing the regular telephone sets installed at lookout points, ranger stations, and at convenient intervals along Forest Service roads and trails.
AGRICULTURE HAS SMALL ENROLLMENT

There are now engaged in agriculture 375,000 persons in this State, out of the total population of 9,687,744. There are 57 cities in the State and 465 incorporated villages, both having a population of more than 8,000,000, leaving only twenty per cent in the rural districts, part of whom are engaged in agriculture.

High prices of farm products, the independence of farm life, good roads, improvement in educational advantages, prospective advance in land prices, and the assistance and instruction now given to agriculturists, is resulting, however, in a return to the land.

Professor H. A. Sill, in a recent lecture on the “Fall of Rome” said: “If any lesson is to be drawn from the fall of Rome, it is that there is no social problem more important than the agrarian question. The welfare of a state is dependent on the maintenance of an independent farming class. This is what makes the work of our College of Agriculture so significant and so important.”

CAN YOU BEAT THIS?

A novel plan of advertising Northwestern apples was recently inaugurated in New York City. An enterprising firm furnished 1400 apples of the Skookum brand for distribution to the congregation of Grace Methodist Episcopal Church of that city at a service in which the minister preached on “God and Apples.” The sermon was illustrated by moving pictures showing spraying, picking, and packing operations.

From Fruit and Produce Marketer, Portland, Oregon.

DEEP SNOW ON THE NATIONAL FORESTS

According to Forest Service officials the unusually heavy snowfall which has signalized the past winter in most of the West has materially affected National Forest business. Timber sale receipts have decreased in some regions because logging and milling operations have been hampered by deep snow and exceptionally cold weather. The same factors have given stockmen using the National Forest ranges much concern, although as yet there have been no severe livestock losses reported. The foresight of the stockmen in providing winter feed, which is now generally practiced, makes a recurrence of the former immense losses very unlikely. The damages caused by the snow and resulting slides and floods to Forest Service trails, telephone lines, and other permanent improvements were quite considerably heavier than usual and their repairs make much spring work for the rangers.

EXTENSION FUNDS

The Federal Department of Agriculture, in commenting on the sources of the funds for extension, says:

The total amount set aside for this work is $4,782,000, of which $1,080,000 is from Federal Smith-Lever funds, $925,000 from appropriations to the United States Department of Agriculture for farmers’ cooperative demonstration work, and $110,000 from other bureaus in the department. These amounts make a total from Federal sources of $2,115,000.

Of the funds contributed from sources within the State, $600,000 is from State Smith-Lever funds, made up mainly of direct appropriations of the State legislatures. In addition to funds used under the Smith-Lever Act, $628,000 is appropriated by the State legislatures for extension work, $225,000 by colleges from funds under their immediate control, $921,000 by county authorities, and $292,000 from miscellaneous sources.

The totals for other important items are as follows: Administration, $391,000; boys’ club work, $287,000; movable schools, $218,000; printing and distribution of publications, $108,000; extension work by specialists in the following lines—dairying, $148,000; farm management, $96,000; live stock, $82,000; agronomy, $70,000; horticulture, $58,000; rural organization, $32,000; agricultural engineering, $30,000; plant diseases, $28,000; and poultry, $23,000.
With the publication of this issue the 1915-16 board of editors and managers steps out and gives way to the recently appointed 1916-17 board. We feel sure that they will conduct The Countryman with great success and pave the way, as we have tried to do, for even greater successes in the future. We wish to thank all our readers and contributors for their support during the past year and we hope they will give the new board the same cooperation.

The retiring board looks back with a certain amount of pride to the following achievements:

It has kept The Countryman at the head of the publications of its type, in appearance, in editorial make-up, in advertising and in circulation.

It has presented in Dean Galloway's series on "The Man on the Land on the Other Side of the World," a set of papers which would have been notable in any agricultural publication. Just as notable have been the series under the title, "An Agricultural Survey of New York State," by Professors Fippin and Livermore, which have been continued throughout the year and which have furnished thoughtful discussions of interest to everyone who has the welfare of the farming business at heart.

It has kept its columns notably free of objectionable advertisements.

The whole trend of the year has been to present in popular form the best in recent agricultural development, from those who may be assumed to be authorities in their respective fields. If we have fallen short
in any particular we invoke on the part of our readers the sentiment expressed in the well-known couplet:

"Be to our faults a little blind,
And to our virtues very kind."

"What is the faculty advisory system and what is it for?" Thus asks the freshman at the close of his first year when the time comes for him to chose a professor for his next three years. This is a hard question for anyone to answer and if a census were taken of the under-graduate body there would be a very inconsistent lot of answers. The majority of the students would say that theoretically it is good, actually it is a failure. And to the average student a faculty advisor is a mere figure-head whose signature is all that counts. There are quite a few cases where faculty advisors have meant more than this, but they are the exception rather than the rule.

The inefficiency of the faculty advisory system probably has resulted from the excessive growth which the college has gone through during the past decade. It has simply been lost in the rush because the attendance to other matters was more urgent. The need of an efficient advisory system at this time is all the more urgent because of the many new courses which have been recently added to the University curriculum. It has come to a time when it is well nigh impossible for any student not well acquainted with this curriculum to choose a wise course of study for his work.

Since nearly all the students are unacquainted with most of the courses it is absolutely essential that we have a good advisory system. The Countryman proposes that a faculty committee be formed for the purpose of investigating the system and making recommendations for increasing its effectiveness. This committee should try to get the student view-point in the case and try to work out a system which would be of greater value.

Is the College of Agriculture a big corporation or institution, or is it, as it always has seemed to be, an organization where students and faculty meet on a friendly basis and feel at liberty to speak to them as friends? There is more or less a sincere desire on the part of most students to be intimately acquainted with their instructors, but it is a desire which will not carry them past the barrier of a series of closed doors behind which not a few of the faculty live on the campus.

An ideal condition to our mind would be one where, at specified hours, students of the College would feel at liberty to call on their professors with practically no formality. Secretary Betten of this College has set an example which might well be followed by others of the fac-

The Faculty Advisory System

The Open Door Policy
ulty. At specified hours any undergraduate can go into his office and walk direct into his sanctorum with no formality about it whatever. If the faculty want to come in closer touch with the students, as they ought to do, then it would be a wise plan for them to try the open door policy for a while at least.

In this issue of The Countryman is reviewed a recent publication of the local experiment station on the cost of producing milk in a dairy section near the New York market. The results come from a survey taken in an average dairying community, one which has stood the test of time and is thoroughly typical. The costs of producing the milk were figured according to recognized farm management standards which includes, as one of its most important items, five per cent interest on investment. It is a notable fact that in nearly every case milk was produced at an actual loss.

Here is a product which is such an important article in the food of city people that it has become a commodity which can not be done away with. Yet it is produced in this particular region at a loss. If this section is as typical as it is said to be, most of the milk of the State must be produced at a loss.

Dairying is one of the oldest and most stable systems of farming. It is one of the most fundamental, for diversified farming demands that livestock be kept on a farm to conserve the fertility. It might be well for those who expect to make a fortune in farming to consider such facts, rather than the fiction which tells how a city man made ten thousand dollars from a ten acre farm in ten months.

Courses may come and courses may go, but Agricultural Journalism has come to stay, it has filled a place in the studies of the College which had for a long time been vacant. Nearly all the other agricultural colleges throughout the country recognize the need for agricultural journalism and have met it by providing suitable courses, probably more comprehensive than the one here given.

Judging by the enrollment this term, it is one of the most popular among the students not merely because it is a one hour course which could be easily fitted to a course of study. Certainly those who registered for it with the idea that it would be an easy course have found it quite otherwise, and probably have had to work as hard or harder for that one hour than for many others. Its popularity is due largely to the fact that it gives good cultural training by one of the most competent members of the faculty. We hope that this course is here to stay as it is in the other state colleges, and that Cornell will lead in this department as it does in so many others.
Dear Mr. Vanderslice:

An Apology  As you will remember I revised Mr. Crocheron's article in the October issue of The Countryman at your request.

Mr. Crocheron has written me that the revisions did not meet his approval, and that he wishes to disclaim all responsibility for them. I hope you will allow me space to enter Mr. Crocheron's disclaimer and to accept, on my part, full responsibility for changes which were made to render the article acceptable to a New York audience. What I did was in the interests of The Countryman, and without full consideration of the magazine's California readers. For this I am most sorry and gladly apologize to the author.

Very sincerely,

(Signed) BRISTOW ADAMS.

The June issue of The Countryman will contain a keyed photograph of the senior class of the College of Agriculture. Every face will be clear and easy to recognize. In future years you will want this engraving to recall some of your classmates. This issue of The Countryman and a full year's subscription will be sent for the price of the regular subscription. You will need both. Better subscribe now and be sure of getting a copy of the June issue. It is to be printed in a limited edition.

Two Men Lost to Agricultural Press  Within ten months agricultural journalism in America has lost two of its greatest leaders, two who were humanizing it and bringing it to the people. First Joe Wing went and now we have lost "Uncle" Henry Wallace. These men were great rural writers because they were countrymen at heart and because they wrote from the heart. They did not pose, they did not use big words; they simply spoke of country things to country people. All of us cannot do this, but they have made us realize that their way was best.
The College of Agriculture has been especially active and successful in intercollege athletics this term. The basketball team won the championship, playing six games and losing none, and held the varsity to a 24-22 score in a hard fought benefit game on March 29. In the intercollege board track meet, held on April 1, the College easily took first in all three classes, Mechanical Engineering being second and Arts third. Agriculture also scored third in the indoor athletic carnival, held in the Armory on April 3.


A well attended Agricultural Assembly was held in Roberts Hall on the evening of Tuesday, March 28. Professor W. W. Rowlee '01 gave an illustrated lecture on "The History and Development of the University Campus." By means of slides depicting early scenes in the history of the University the speaker was able to show the gradual growth of the institution from a single stone building in the midst of deep gulleys to the present aggregation of colleges on a beautifully graded lawn. Practically all the older buildings and landmarks were depicted in the process of development.

A. H. Main, '16, spoke on college athletics and R. J. Davis rendered a piano solo. After singing several old-time songs the meeting adjourned.

Future assemblies will be held in Roberts rather than in Bailey Hall, the purpose being to make the meetings less formal and more homelike. The policy of having an illustrated lecture at each assembly will be retained. Next month Professor R. S. Hosmer will speak on "The Hawaiian Islands."

Jugatae is one of the oldest and most active clubs of the College of Agriculture. Founded in 1896, it has held meetings every week for twenty college years and in addition, special meetings during the summer months. This means that before long the club will hold its thousandth meeting.

The plan of the club is extremely simple and informal. There is but one officer, a chairman, who arranges meetings and programs. There are no fees nor "feeds", no constitution nor by-laws. Membership is automatically bestowed upon persons sufficiently interested in semi-technical entomology to attend the meetings. Ordinarily
these meetings are addressed by members who are doing special work in the department, but this rule is not iron-clad. Some of the most distinguished entomologists in the world have delivered addresses before the club.

The Journal Club is the formal semi-nary club of the department. Its meetings are held under departmental control from November to April of the school year, its members being left free for field work during the spring season.

The Department of Classes Take Dairy Industry went to Spring Trips Rochester during the Spring Recess in order to study the methods of ice cream manufacture employed by the largest concerns of that city. The party was in charge of Professor W. W. Fiske.

Immediately after spring vacation, students in “Market Products” course seven of the Poultry Department, took a three-day trip to New York, where they studied the most modern methods of handling food supplies. The produce houses, the public markets, the Mercantile and Produce Exchange and the commissary departments of some of the larger hotels were visited.

Representatives of the City Market Bureau, members of the State Commission of Foods and Markets, and members of the New York City Board of Health addressed the students. Professor E. W. Benjamin, T. B. Charles and W. S. Young were in charge of the party.

That prevalence of oat smut which caused a loss of more than two million dollars in New York State in 1915 and which threatens to be equally destructive this year, has caused the extension department to enlist the cooperation of various agencies about the State in an aggressive campaign of prevention. They have adopted the slogan, “Safety First: Better Be Safe Than Sorry.” As a means of showing the farmers how this safety may be secured they are sending a demonstration car over the New York Central Railroad, to reach more than twenty communities in Lewis, Jefferson, St. Lawrence and Franklin Counties. The car contains the Cornell exhibit of varieties of oats and other attractions of similar nature, but the main emphasis has been placed upon a demonstration of the proper methods of treating seed oats to prevent smut, arranged in cooperation with the Department of Plant Pathology. Moving pictures illustrating the same operation are shown wherever electric current is available.

The Department of Plant Pathology has enlisted the further cooperation of the Federal Department of Agriculture in the issuance of a leaflet which gives directions for the treating of the seed under the system which investigation has shown to be the most satisfactory—the formaldehyde treatment.

The greenhouses of the Department of Floricultural Greenhouses, which welcome all visitors on week days, are now filled with attractive spring plants. The bulbs, carnations, roses and sweet peas are all in bloom. In addition to the plants which are grown for purposes of class instruction, considerable work is being done of an investigational nature. Several of the students are working on various problems. Among these problems is one with Lilium longiflorum, or the Easter lily, to determine the value of plants grown from seed in comparison with those grown from imported bulbs. For several years the imported lilies have been susceptible to attacks of diseases which have made difficult their successful culture. If these plants could be produced from seed much of the disease might be eliminated. Consequently a large number of seedlings were obtained from the Department of Agriculture at Washington and the development of these plants is being studied. Crosses
are now being made preparatory to the production of seed for another year.

One student is investigating the varieties of the Boston fern. This species has such a tendency to vary that there are many crested and divided forms of the plants; somewhat over a hundred types of this fern are now under investigation.

Another study is being made of the Aquilegia, or Columbine family and many seedlings which have resulted from crosses made last year are now coming into bloom in the greenhouses. Similar studies are being made with the garden Iris, carnations and roses.

The orchids collected in the Philippines by Dr. A. B. Ward are in bloom from time to time depending upon the natural flowering season of the plants. The department is carrying on investigations with the newer varieties of Sweet Peas and there are now in flower over a hundred of the newer types and varieties. Many of the best seedling herbaceous perennials are now developing and these will later be planted in the herbaceous garden near the Countryman Building.

F. L. Griffen, formerly on the staff of the University of Oregon, is now at Cornell, engaged by the Department of Rural Education in the capacity of Professor of Junior Project Work. Professor Griffen has had wide experience in junior extension work on the Coast, where he worked with Boys' and Girls' Clubs. In New York the work will not be carried out through clubs but by the utilization of certain factors of the state education system already existing. The units of the scheme will be those schools which teach agriculture, supervision being by the agricultural teacher and district supervisor in cooperation with the college authorities. It is planned to allow Regents' Credits toward high school entrance for those members of elementary schools who successfully carry out projects.

On the evening of
Conservation March 30, George D. Lecture Pratt, State Conservation Commissioner, addressed an audience, which crowded Roberts Assembly, on the subject of, "Conservation Work in New York State." Moving pictures illustrated his remarks.

The Commissioner divided the state conservation work under four heads: fish, game, forests and water. He spoke of the eleven fish hatcheries already in operation but ventured the opinion that many of the fish which have been sent from these hatcheries for transplanting have been wasted by a lack of information as to habitat needs on the parts of the persons supplied. Amateur aquiculturists have attempted things approximate to growing palms in the polar regions. The state also maintains three game farms, upon which they have had particular success in raising the ring-neck pheasant. The speaker called attention to the still-present need of a wider understanding of the state game laws, citing an instance in which a judge of the New York bench was arrested and could only plead ignorance.

Forest hatcheries are maintained to restock parks or to furnish good stock at cost to persons who desire to make plantings. The Commissioner stated that several Cornell men were employed in this branch of the service and that he was looking for three more. L. A. Zinn, '16, has already been selected to do work in Forest Pathology.

Commissioner Pratt’s visit was under the auspices of the Conservation Committee of the College. He was a guest of the President during his stay here.

The extension department has brought to a close its series of extension schools throughout the State and has issued the following tentative figures in regard to the results of the work for the year. During the session of 15 weeks, 59 schools were held in 33 counties. The average en-
enrollment was 33, the average number of instructors three and the average age of those in attendance 39 years. The program of most of these meetings was of a general character but where a section demanded a specialized study of some particular phase of agriculture, it was supplied. These specialized meetings are said to have met with especial success. Two dealt exclusively with poultry and four with fruit.

The schools were held in any portion of the state where there was a demand for them. They lasted a school week and ran from nine until four o'clock, each day. In view of the results from this year's work it is likely that even a greater number will be held next year.

MISCELLANEOUS NOTES

The Department of Poultry Industry is seeking to co-operate with various farm bureaus throughout the State in the matter of obtaining better marketing organization for poultry products. At Collins Center, Erie County, a group of women have already organized an effective association. One of their number, appointed for the purpose, receives, grades, and ships the eggs under a special trade-mark.

Conflicts with the University calendar have caused the women of the university to postpone their projected pageant until next fall. This postponement has made necessary the election of Vi Graham '18, as General Chairman. Miss A. MacDonald '17, the original incumbent, becomes President of the Student Government Association in the fall and will not be able to devote time to the pageant.

W. S. Young '16, of the Poultry Department has been appointed to take charge of the Poultry Producers' Association of Ithaca, with headquarters at the corner of Cayuga and Cascadilla Streets. The association is now shipping about fifty cases of eggs every week.

Dr. J. A. Bizzel of the Department of Soils is spending his vacation at Fayetteville, North Carolina. He will return on May 10.

Professor E. O. Fippin, of the Department of Soils, spoke to the Farmers Club at Portland, Maine, on April 10. His subject was "Drainage: An Essential of Soil Improvement."

The plan to hold the spring boat races over a course on Cayuga Lake has been abandoned. The regatta will be held at Poughkeepsie as usual on June 17.

Spring Day comes this year on May 27. The circus idea will supplant the county fair idea of former years, and many original "stunts" are promised.

C. E. Curtis, Superintendent of Buildings, has promised that both of the new dormitories will be ready for occupancy by the opening of the University in the fall.

A. H. White '12, and Frank Lathrop '14, former editors of The Countryman, and A. W. Wilson '15, a former business manager, were among recent visitors to the campus.

The summer session of the University will open July 5 and extend to August 16. It is expected that last year's registration of 802 men and 707 women will be exceeded, and arrangements are being made to furnish accommodations for women in three dormitories and, if possible, place some of the men in the new dormitory units. Professor George P. Bristol, of the Department of Education, will be again at the head of the school. The German department will again maintain a rooming house for women students in which only German will be spoken as a basis for practice in conversation.

According to statistics compiled by the World Almanac, Cornell ranks sec-
ond among the universities of the United States in the matter of annual income, being surpassed only by Harvard. Cornell's income is $3,139,530, while Harvard's is nearly $700,000 greater. In the matter of endowment, Cornell stands sixth; in the number of students, Cornell ranks eighth, but is third in the number of instructors engaged, having a total of 750.

The late spring and a consequent shortage of mud postponed the traditional spring rush long after the usual time, but the Freshman Banquet was held as usual in the Armory on March 25. Six hundred were in attendance and the affair was thought to be one of the most successful in history. Doctor A. L. Sharpe, Doctor H. W. Van Loon '05, Lieutenant Twesten, and Weyland Pfeiffer '16 were the speakers of the evening.

On May first, H. A. Hitchcock '00, of New York City, will fill the place of H. W. Peters '14, Secretary of the University, who has resigned to accept a business opportunity.

On September 8, the Department of Military Science will open a two weeks summer camp at Ithaca. Instruction will be similar to that given at Plattsburg, but necessarily less intensive, and all students who can do so are being urged to attend the Plattsburg camp. If the capacity of six hundred men is not taken up by members of the cadet corp, registration will be thrown to the entire undergraduate body.

The first issue of the Cornell Bulletin appeared on March 28, 1916. This publication is issued daily by the following committee of undergraduates to meet the need of an adequate medium of communication among women students: Mary Albertson '17, Editor-in-Chief; Helen Carter '17, Frances Cuff '17, Florence Boochever '18, Vi Graham '18, Reba Beard '19, Eliza Pollock '19, Gertrude Bates '16, ex officio.

The office of the State Leader announces the appointment of three new farm bureau managers: E. W. Clever '07, to Warren County; J. H. Phillips '10, to Essex County, and R. F. Pollard '15, to Schoharie County. Mr. Pollard's place as instructor in the Department of Farm Management will be filled by C. V. Noble '15.

Miss Edna A. Rich, President of the State Normal School of Manual Arts and Home Economics at Santa Barbara, California, was the guest of the Home Economics Department at Cornell, Thursday, March 23. Miss Rich gave a talk, after which tea was served.

The Cornell Women's Student Government Association held a Tea Dance at Sage College on the afternoon of April first. Admission was by invitation only.

Star Song
The seeing stars swing on and on, Across the hills, across the sea. All round the earth they look for worth To tell to me. They move upon the wings of dusk, And stand their watches silently; Then go away at dawn of day More men to see. And when the busy day is done, They come to tell me tales anew. This may not be astronomy But it is true. A. P. N. '18.

A Seneca Legend
Old Gauwadine in his lodge Alone is he; He blows his breath across the fields—Ugh-ee! Ugh-ee! There comes a stranger to his deer, With yellow hair; The old man's face with fury frowns To see him there. Begone! he shieks. Thou are Gohay, Mine enemy. Go, or the death-frost of my breath Shall wither thee! The stranger smiles, and lo! the lodge Melts quite away And blossoms spring up everywhere; And reigns Gohay. Ludwig Stolz Mayer '18.
'83, B. Agr.—Harry N. Hoffman’s present address is 603 Hoffman Street, Elmira. He has been engaged in the growing of flowers and ornamental nursery stock.

'95, M. S. A.—Samuel H. T. Hayes writes that he is in charge of the bacteriological department of the pharmaceutical specialties manufactured by Hynson, Westcott & Co., at Baltimore, Maryland.

'02, W. C.—W. H. Langworthy is breeding Holstein-Friesian cattle at East Hamilton.

'03, W. C.—Since leaving Cornell Bruce M. Wilmer has been a member of the Maryland Legislature. With his brother he is interested in farming and lumber in that state.

'05, B. S. A.—Ray C. Simpson is in the nursery business with his brother near Monticello, Florida. Their 380 acres includes, beside the nursery stock, forty-three acres in pecan and orange groves.

'06, M. S. A.—J. W. Gilmore is Professor of Agronomy at the College of Agriculture of the University of California.

'06, B. S.—C. F. Shaw is Professor of Soil Technology at the University of California.

'06, B. S.—H. F. Button is now in charge of farm crops and soil fertility at the New York School of Agriculture, Farmington, Long Island.

'06 B. S.—Morgan W. Evans is Assistant State Leader for Oregon with headquarters at the Oregon State College of Agriculture.

'07, Sp.—Harry W. Meyers is managing the Pencoys Farm at Bala, near Philadelphia, Pennsylvania. The livestock includes thirty dairy cows whose products are sold in the adjacent metropolis. Alfalfa, corn, wheat, timothy and potatoes are grown. Registered stock is raised for sales purposes.

'07, Sp.—Miss Lena Thomas is in charge of the playground at Duquesne, Pennsylvania, which is maintained by the steel works for the children of employees. She plans to return to Cornell next year to continue her studies.

'08, W. C.—Earl F. Fowler is now managing his father’s farm at Baldwinsville, where he breeds Holstein cattle and grows grain and tobacco.

'08, B. S.—C. J. Hunn is now at the University of Porto Rico, Mayaguez, Porto Rico.

'08, B. S.—Vaughan MacCaughhey is Professor of Botany at the College of Hawaii, Honolulu. He has made scientific explorations of the islands of Oahu, Hawaii, Maui, and Kauai and has contributed much to the press in addition to his pedagogical endeavors. Each summer he has made lecture trips to Ithaca under the auspices of the Chautauqua Institution and the summer sessions of Cornell and California.
'08, W. C.—John C. White has an 85 acre general farm at Sagaponack. The livestock kept includes seven horses, two cows, eight hogs, and a large flock of chickens. The principal crops grown are hay, corn, wheat and rye with potatoes as a cash crop.

'06, Sp.—H. E. Haslett is managing a farm of 130 acres at Seneca. Hampshire sheep and large Yorkshire hogs are bred extensively.

'10, W. C.—George Sprague is running a farm at Ipsowich, Massachusetts. In the winter he teaches agriculture in a Vermont High School.

'10, Sp.—Ray L. Williams is superintendent of the estate of E. LeRoy Pelletier at Orchard Lake, Michigan. Holstein cattle, Shetland ponies, Mulefoot hogs, Kentucky saddle horses, Russian wolf hounds, bronze turkeys and white wyandottes are bred.

'11, Sp.—James G. Cochrane writes the Countryman that he is managing a farm at South Bayfield, Mass. He calls attention to the error of confusing him with Andrew J. Cochrane '12, who is farming with his father at Ripley, New York.

'11, M. S. A.—C. S. Wright is located at Riverton, N. J., where he is engaged in plant breeding and other experimental work on one of the Campbell's Soups farms. A. W. Sheets '14, Sp. is associated with him in this work.

'12, B. S.—Mrs. Floyd Bell (Mildred Dudley) is still at Texas College, Texas, where Mr. Bell '11, B. S. A. is Professor of Animal Husbandry.

'12, B. S.—E. L. Bernay is publicity agent for the Manhattan Opera Company of New York City.

'12, B. S.—D. C. Carpenter is with the Sharples Separator Company at Westchester, Pennsylvania.

'12, M. A.—Wm. H. Darrow was instructor in horticulture at the University of Maine during the year 1913-1914. Since then he has been horticulturist at the Leeds Manor Orchards, Markham, Virginia, and later started a fruit farm for himself at Putney, Vermont. During the past winter he has had charge of the pruning for the Potomac Valley Orchard Co. at Pearre, Maryland.

'12, B. S.—Harry Embleton is New York manager of the Sharples Cream Separator Company.

'12, B. S.—Claude Emmons is married and living at Hotel Latonette, Bayonne.

'12, B. S.—T. J. H. Grenier is with the Sharples Cream Separator Company at their Chicago branch office.

Ex. '12—Lester B. Hayes is living at Cortland. He is married and has two children.

'12, B. S.—Anna E. Hunn has remained at Cornell as manager of the home economics cafeteria and instructor of institutional management. Miss Hunn now lives at 923 North Tioga St.

'12, B. S.—B. Tyson is an auditor for Price Waterhouse & Co., New York City. His address is 5 Fifth avenue.

'12, B. S.—For two years after graduation, H. B. Munger was at the office of farm management at Washington D. C. In June, 1914, he accepted a position as head of the Farm Management Department at Iowa State College of Agriculture.

'12, B. S.—Hawley B. Rogers, former president of the College glee club and a member of the varsity glee club and C. U. C. A. Council is now Farm Bureau Manager of Chatauqua County.

'12, B. S.—L. W. Smith is at present working in the office of the University registrar.

'12, B. S.—S. H. Stephenson is managing a farm near Ithaca.

(Continued on page 706)
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How Types of Farming in New York
Are Determined
(Continued from page 664)

fact, many farmers in the alfalfa belt
find it more profitable to sell their
alfalfa than to feed it and the great
majority of the eastern dairymen still
buy the bulk of their protein. Pos-
sibly harder strains of alfalfa may
be discovered some day that will alter
this condition.

Climatic factors influence to a cer-
tain extent the distribution of alfalfa
in New York. In some parts of the
State severe winters probably limit
success with the crop. A growing sea-
son of at least 150 days seems to be
necessary for good yields and a longer
season often means one more cutting.
Rainfall influences the yield of alfalfa
very noticeably, especially the yields of
the later cuttings. Though the long
roots may be drawing moisture from
underground supplies, every alfalfa
farmer welcomes a good shower when
waiting for the third or fourth cutting.
Rainfall probably explains the greater
concentration of alfalfa in Onondaga
and Madison counties. In these coun-
ties the average rainfall for April to
August inclusive is eighteen to twenty
inches, while west of them it is only
fourteen to sixteen inches. The rain-
fall for this period averages nearly
twenty-five per cent greater in the
eastern part of the alfalfa belt than
in the western part. Better yields and
longer life to the stand of course re-
results from this.

A correlation between alfalfa pro-
duction and dairying is quite com-
monly supposed to exist. Syracuse is
said to owe its Holstein fame in part
to the nearby alfalfa fields. As a mat-
ter of fact, in this State there really is
very little correlation between the two,
desirable as it would be. As will be
shown in a later article, cows are kept
primarily where there is land that has

(Continued on page 692)
KNOWING the conditions in your harvest fields as well as you do, it will be an easy matter for you to pick out the right grain binder for your work. Note the details of construction—How is the main frame built? Is the main wheel large enough and wide enough to give plenty of traction? Is there a simple means provided for quickly and easily taking the strain off the canvas at night, or when the binder is out of use? Are ball and roller bearings provided to lighten the draft? Will the elevator take care of both light and heavy stands of grain? Is the knotter simple and sure in action? These are the things that count.

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How Types of Farming in New York Are Determined
(Continued from page 690)

to be pastured, but most of the alfalfa of the State is grown where there is relatively little of such land, or where, in fact, it has actually displaced pasture. In most of the New York dairy sections where people most desire to grow alfalfa, they have not succeeded in doing so profitably. In many sections where alfalfa is raised extensively, dairying is of little importance. In fact, many farmers raising alfalfa have discarded livestock. Onondaga County has fewer cows per farm than most of the adjacent counties. Apparently Syracuse owes its Holstein fame to the fact that it is the railroad center of surrounding dairy regions rather than to the nearby alfalfa fields.

Although alfalfa growing in New York is still in an unsettled condition, it seems safe to say that the place of alfalfa in the system of farming depends first upon the soil, second upon competition with other crops and third upon climatic factors. It requires a soil well supplied with lime, well drained and preferably deep. Competition with other crops has tended to limit alfalfa to the hillier limestone soils and especially to the drumlins of central and western New York. Heavier rainfall in central New York accounts for the greatest concentration of the crop there.

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Louden Hay Tools will save it. Will enable you to move bigger loads easier and faster than in any other way—avoid the danger of delay which often lets the rain catch your hay down, spoiling it for use or sale.

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Set the Louden Balance Grapple Fork across a load and it will take the entire width of an 8-foot rack at a single lift. Half a ton at a time will not strain it. You can put away the biggest load in five minutes. Moves straw, alfalfa, or clover as clean as timothy—grips it tight; no scattering or dribbling. What other hay fork will do this? Built of the finest steel, especially made for us. Light, strong, perfectly balanced, never fails.

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Water Supply Systems for the Farm Home

(Continued from page 688)

suited to their needs. The tendency will be to desire the more elaborate types with their many unquestioned advantages, and where these can be afforded they may well be installed. There are, however, thousands of homes now without water systems that could be so equipped if the owners only understood and would apply with ingenuity the facts that have been explained. On many a farm the only source of water is the outside pump from which water is carried in pails laboriously, day after day. Possibly the water stands high in the well and a shallow well pump located in the kitchen would save all these needless steps. Or, if the water is below the shallow well level, a force pump might be installed to deliver the water underground and below frost to the cellar of the house and from there to some cheap gravity tank located in an upper room, or even near the ceiling in the kitchen if need be to avoid freezing. Such a tank filled, if necessary, even twice a day, would be infinitely better than going out-of-doors with pails, and when the sink had been installed with its drain and disposal for the waste, the labor of the kitchen would have been so greatly lightened that days without running water at hand would seem like the dark ages and another household would have been added to the number that know from experience that a good water system is one of the blessings of the farm.

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Cover Crops for the Peach Orchard

(Continued from page 673)

Home experiments with cover crops

Buckwheat, clover, cowhorn turnips, and vetch were planted in six-years-old peach orchards of R. S. Rudman at Spencerport, New York, on August 4, 1915. These cover crops were sown alone in the following proportions per acre:

- Buckwheat 1 bushel
- Clover 8 pounds
- Cowhorn turnips 2 pounds
- Vetch 2 pecks

The following are the combinations and amounts of seed used per acre:

1. Cowhorn turnips 1½ pounds
   Clover 5 pounds
   Vetch 1 peck

2. Buckwheat 1 bushel
   Cowhorn turnips 1½ pounds

3. Buckwheat ½ bushel
   Cowhorn turnips 1½ pounds
   Vetch 1 peck

On November 26 these crops were carefully observed. The buckwheat had in all cases gone down with the frost, but the clover, the cowhorn turnips, and the vetch were still green and growing.

Turnips, whether used alone or in combination, make an excellent crop, for their long, deep roots work down and open the soil. Then they decay and add considerable humus to the soil. Many of the turnip roots measured 18 inches in length and from three to five inches in thickness. Mr. Rudman estimated that the roots and the tops of one acre of cowhorn turnips will weigh over fifteen tons. This shows the large amount of plant food that is plowed under in the spring from such a cover crop.

Buckwheat is also a good crop for adding humus, because it makes a rapid

(Continued on page 704)
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And what is of still more vital consequence is that the cleansing service obtainable from Wyandotte Dairy Cleaner and Cleanser is as superior to the service rendered by other materials as the peculiar qualities of cream are superior to other milk properties.

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1000 ACRES 70 YEARS

Where you saw it will help you, them and us
Cover Crops for the Peach Orchard
(Continued from page 700)
and abundant growth before it is killed by the frost, after which it decomposes.

Vetch, because of its creeping nature and its ability to make a more rapid growth than clover, is probably the best of the legumes.

Not only are cover crops the cheapest fertilizers, but they are also money and labor savers for the grower. Peach orchards that are not planted to cover crops are usually plowed in both fall and spring. When cover crops are used, the orchard is not plowed in the fall, which means a saving in time when the grower must devote his time to marketing the crop. In the spring, when it is time to spray, many orchards are so wet that it is extremely difficult to transport spraying rigs. Cover crops are a great advantage in this respect, because they permit transportation of spring rigs early in the season.
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Address Box ——
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Former Student Notes
(Continued from page 688)

'12, B. S.—Stanley H. White received his master's degree in landscape art at Harvard and is at present working with Mr. H. Steele at Boston. His address is 88 Broad Street.

'12, Ex.—Douglass G. Woolf has a position as research chemist with a firm in Wilmington, Delaware. His address is 1025 Trenton Place.

'13, B. S.—Edgar V. Beebe was married on August 18, 1915, to Miss Ruth M. Edmunds, of North Tonawanda, where he is now teaching.

'13, W. C.—Mrs. Julia R. Burden is engaged in dairy farming at Cazenovia. The necessary feed is grown in addition to twelve acres of peas which are sold to canneries.

'13, B. S.—J. S. Champion, assistant in Farm Management in 1913 is now teaching Agriculture in Honesdale, Pennsylvania.

'13, B. S.—J. H. Cogswell is now with the Department of City Parks in Rochester. His address is 192 Linden Street.

'13, B. S.—William B. Connor has changed his address from Good Ground, Long Island, to Attica, where he has charge of the Monticello Farm.

'13, B. S.—Geo. W. Hendry is occupying the position as instructor in Agronomy at the University of California.

Ex. '13—G. S. Rose is now in the employ of the Sharples Separator Company at West Chester, Pennsylvania.

'14, W. P. C.—J. G. Beswick is managing the poultry farm of the Clifton Springs Sanitarium. The flocks are largely single comb White Leghorns, together with Pekin and Indian Runner ducks which are fed according to the Cornell formulas.

(Continued on page 708)
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SPRING SCHEDULE
C. U. ATHLETIC ASSOCIATION

MAY—
3 Baseball—Rochester, 3:30 p. m.
5 Lacrosse—Stevens
6 Tennis—Princeton
Track—Harvard Dual Meet, 2:00 p. m.
Track—Interscholastic, 3:30 p. m.
Freshman Baseball—Tome School
Tennis—Colgate
11 Baseball—Vermont, 3:30 p. m.
13 Freshman Baseball—Lafayette, 3:30 p. m.
Lacrosse—Hobart
17 Baseball—Michigan, 3:30 p. m.
18 Baseball—Michigan, 3:30 p. m.
20 Baseball—Yale, 3:30 p. m.
2 Freshman Track—Pennsylvania, 2:00 p. m.
26 Concert—Musical Clubs, Lyceum Theatre 8:15 p. m.
27 NAVY DAY
Spring Day Circus, 10:00 a. m.
Baseball—Pennsylvania, 1:45 p. m.
Baseball—Pennsylvania, 1:45 p. m.
Navy—Yale-Princeton Varsity-Freshman, 5:00 p. m.
Tennis—Dartmouth

JUNE—
3 Baseball—Williams, 3:30 p. m.
16 Baseball—Colgate, 3:30 p. m.
19 Masque—"Amazons", Lyceum Theatre, 8:15 p. m.
20 Concert—Musical Clubs, Bailey Hall, 8:15 p. m.
21 Baseball—Columbia, 3:30 p. m.

Former Student Notes
(Continued from page 706)

'14, B. S.—Edna Becker has started the Green Witch Tea Room, at Greenwich.

'14, B. S.—Edna Brush is teaching Home Economics in the high school at North Grosvenordale, Connecticut.

'14, B. S.—Grace Chapman is training for dietitian in the Massachusetts General Hospital, Boston, Massachusetts.

'14, B. S.—T. D. Crippen is now located at the United States Agricultural Experiment Station at Rampart, Alaska. His work is mainly with small grains, legumes and potatoes.

'14, B. S.—William G. Frisbie is teaching vocational agriculture in the high school at Clymer. He is cooperating with the local farm bureau in extension work.

'14, B. S.—Mary Agnes Keene is teaching domestic science at Ogden, Utah. Her address is 34 Madison Ave.

'14, B. S.—H. C. Knandel is teaching agriculture and poultry husbandry in the high school at Segregansett, Bristol County, Massachusetts.

'14, B. S.—S. R. Lewis since graduation has been managing the Houghton Farm at Mountainville. He has about fifty acres in fruits and about ten acres started in alfalfa. He has also a herd of purebred Holsteins of the Pontiac strain.

'14, B. S.—Alexander Lurie, who has been instructing in the Department of Floriculture at the University of Maine, has accepted a position in the Shaw Botanical Gardens in St. Louis. In his new position he will have charge of the floricultural instruction work carried on by the Shaw Gardens.

'14, B. S.—Mrs. J. H. Reisner (Bertha Betts), now of Nanking, China, announces the birth of a daughter, February, 1916.

(Continued on page 710)
Harvest That Stream

Provide an abundant supply of fresh water in house and barns and for the irrigation of garden and truck crops. Franklin Lawson, Westerly, R. I., writes of his Rife Ram: "We have had more water than we needed without one cent expense or one moment's attention since it was installed."

The Rife Ram

Operates by the flow of any stream having a fall of 3 feet or more and a supply of at least 3 gallons a minute. Requires no fuel, labor or costly repairs. Made in all sizes. Installed at small expense and without skilled labor. Will maintain an air-pressure system and deliver irrigation water under pressure. Used at Cornell University and at many other leading universities and fine estates.

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Room without bath, 1 person, $1.50 up
Room with bath, 1 person, $2.00 up

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**Former Student Notes**
(Continued from Page 708)

'15, B. S.—Homer J. Brooks who was taking graduate work here last term is now with the Rosemary Creamery Company of New York City. He is located for the present at Adams.

'15, B. S.—W. W. Butts who has been with the Merrell-Soule Company of Arcade has recently been transferred to their Syracuse branch.

'15, W. C.—C. C. Calvert is in the farming and insurance business at Sterling. He specializes in early vegetables and small fruits for the Oswego and Syracuse markets.

'15, B. S.—Mabel Copley is a teacher of Home-Making at Westford.

'15, B. S.—J. M. Frayer is now bacteriologist and chemist for the Linden-ville Creamery at Lindenville, Vermont.

'15, W. P. C.—F. E. Herrington is managing the Binghamton Poultry Producers Association, an organization founded by Professor Benjamin of the poultry department at Cornell.

**Book Reviews**
(Continued from page 637)
pupils in the practical arts work of schools in rural communities; but it also has practical suggestions for farmers and others who have to deal in any way with the varied repair and construction problems of farm and village life. The book contains information concerning the care and use of shop tools, the repair and construction of farm implements, devices and buildings of all kinds. As the authors state, the purpose of the book is to provide a series of projects in wood-working, blacksmithing, cement and concrete work and harness mending. The exercises as laid out will not only furnish training in practical arts, but will also result in making of many things that are of use on the farm.

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A Report of Home Demonstration Schools Held Between September 30, '15 and April 1, '16

Number of schools held ........ 26
Number of counties in which schools held ............. 17
Average number of instructors 1
Total number enrolled ........ 882
Average number enrolled for each school ........ 33.9
Average percentage of enrolled members present ........ 81.1
Total attendance (including school children) ........ 1112
Average total attendance ....... 42
Number of schools scheduled between April and June ........ 9

The figures given above are taken from a report of the Home Demonstration School held so far during the season of 1915-16. While the farm demonstration schools closed about the middle of March, it will be noted that the "open season" for home demonstration schools is practically co-extensive with the college year.

On the whole, the percentage attendance for the women's schools is higher than that for the men's schools. This may be due to the fact that only one-session schools have been held this season. While a two-session homemakers' school would probably be more acceptable for the woman from the country whose husband is attending an all-day school in agriculture, it is easier for the village housekeeper, who must provide a warm dinner at noon for husband and children, to attend a one-session school.

The great difference in enrollment between the largest and the smallest school deserves consideration. Experience with both men's and women's schools has shown that the size of the school depends more upon the experience and ability of the person who is in charge of working it up than upon any other single factor. A chairman who

(Continued on page 715)
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A Report of Home Demonstration Schools Held Between September 30, 1915, and April 1, 1916

(Continued from page 713)

commands the confidence of the community, who lives in a central position, who makes herself familiar with the character of the work of the coming school, who systematically districts the entire community, including both the village and the outlying farms; who chooses a large and representative committee, and intelligently directs its activities; above all, a person who understands the value of personal interviews over the telephone or at the front gate; such a chairman will secure a satisfactory membership, even in a small and apathetic neighborhood, while a less experienced person may fail in a larger and far more fertile field.

The schools for home-makers are planned for all the home-makers of the rural districts, whether they live on a farm or in the village. For this reason the constituency of the homemakers’ school is far larger in the average neighborhood than is the constituency of the farm school. This must be kept in mind in working up a membership.

With the single worker in the Home Economics Department staff available for extension school service, it has been possible this year to meet only about one-half the requests for homemakers’ schools. They are hoping that next year they shall be able to expand their force so that it may be more nearly commensurate with the magnitude and the fertility of their field.

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Out from the busy ways of men;
Over the ridges and ever yonder,
Back to touch with the earth again.

A. P. N., '18

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PRACTICAL PROBLEMS OF SCHOOL CONSOLIDATION

"The problem of regrading and consolidation may relate to the topography rather than to the ownership lines; to state roads; to whether the boys can ride in to the central schools on bicycles or milk wagons, or whether they must board in town from Monday until Friday."

See Page 754
For days we had sailed the tropic seas with only occasional thunderstorms to break the monotony of the voyage. Just at daylight we came quietly into a little harbor that was a veritable dreamland of tropic beauty. The white strip of beach, the green-clad hills beyond, the cluster of picturesque little houses, the gorgeous vegetation, and the even more gorgeous-plumed birds, made a picture not soon forgotten.

This first little port was Sabang, on the island of Sumatra, and it was through this gateway that we were first introduced to the Dutch possessions in the Tropics.

Sabang is a mere coaling port for Dutch ships. A great deal of Sumatra tobacco, however, is assembled here from the interior of the island for shipment to Dutch and German cities. The tobacco is the fine wrapper-leaf, a description of which has been given in another article. The population is mostly Chinese, with a sprinkling of Dutch and Malays. Evidently the Chinese were celebrating one of their many festal days, for they were collected in groups, smoking and chatting and having a good time generally. Everywhere was to be seen evidence of a holiday, in the gorgeous paper decorations which the Chinese are so prone to use. Presently there arose an extra excitement, and the natives were soon all streaming toward a little shop from which there came some extraordinarily weird sounds. By dint of considerable manoeuvring we finally reached a point of vantage where we could both see and hear very well, and great was our surprise when we discovered that the sounds were coming from a little American phonograph which had been set up in the shop and which was doing its best to the tune of "Any Old Place in Yankee-land Is Good Enough for Me."

Having listened for days to Dutch and Malay talk, and having not even seen the suggestion of an American flag for weeks, that squeaky tune, played on a five-dollar phonograph, was worth all the trouble of landing and manoeuvring in order to get within hearing.

After a day spent at Sabang we were off for our real destination, the port of Batavia on the island of Java. I have never been able to understand why captains in these seas all seem to plan

*This is the seventh and last of a series of articles on farming in foreign lands.—Ed.
their voyages so as to reach port about the middle of the night. Naturally, persons who have been on a ship for several weeks are all excited at the end of the voyage, and there is very little sleep the last night, even if one is allowed to go ashore. When the voyage is so planned as to reach the outer harbor about midnight, most of the passengers sit up until land is sighted; then they sit up for the remainder of the night and have all kinds of celebrations because land is sighted. About eleven o'clock rockets began to ascend from our ship, and these were answered from shore, indicating that we were getting into port. Actual landing, however, was not effected until next morning about eight o'clock, when the customs office was opened and the official life of Java began.

The landing place, known as Tanjong Prick, is about an hour's journey from Batavia. All this part of the coast of Java is low and flat, so that the scenery is rather uninteresting. The wonderful, rank vegetation, however, is very attractive, especially the enormous specimens of poinsettias and crotons seen everywhere.

After the customs formalities were completed, we journeyed in a diminutive train through a rather flat and uninteresting country to Batavia. The region between the port and Batavia had the appearance of being agriculturally prosperous, and, unlike most tropical sections, there was good grazing land. Much to our surprise we saw, for the first time in the Tropics, some very fine cattle of the humpback Indian type. Rice was to be seen in many places, cultivated in the usual way in the Tropics, namely, in small areas and terraced. As a rule the terraces are similar to those found in Ceylon and parts of Japan.

Batavia is a quaint and interesting city. There is an odd mixture of Dutch, oriental, and occidental types of architecture; the buildings, however, are predominantly Dutch, as are the general characteristics of the entire city. The Dutch seem to be unable to get along without canals, so that Batavia is cut up with many canals through which water from the near-by mountains is conducted. These canals are used for all kinds of purposes. They act as the chief sewerage system of the city, and also serve as places wherein the natives bathe, wash clothes, and perform other domestic duties. One would suppose that the conditions under which the natives live, and the manner in which they must necessarily come in contact with the white residents, would cause diseases of many kinds such as a...
tropical climate would breed. The data at hand, however, show that Batavia is a comparatively healthful city.

On reaching Batavia one is immediately struck with the numbers of small, active ponies everywhere in evidence. These ponies are of a distinct type—very hardy, very fiery, and very active. They have been used for many years in Java, and have come to be a recognized necessity for various lines of work. The native jehus use a quaint vehicle for the transportation of passengers. This they call a "sado." The native sits in front and drives, and the passenger or passengers sit with their backs to him. At a pistol-like crack of the whip, the little pony is off like a shot, and goes at a gallop until one's destination is reached. The natives use a peculiar kind of whip, which makes a great noise but is very seldom used to touch the animal. These little ponies are so fiery and tricky that they are usually backed into their stalls, where they stand with their heads out. They can then be fed without their drivers having to run the risk of coming in contact with their heels. The animals seem to be able to live on a very meager diet, consisting usually of rice bran with green grass brought in from the jungles and fields by natives who make a business of this work.

It is of interest to note that the Dutch have brought out with them many of their ideas in regard to housekeeping. In the hotels one finds the characteristic large Dutch beds, which would seem to be very inappropriate and out of place in the Tropics.

We reached Java the first of the year, or about the middle of the rainy season. The rains come regularly every day, starting usually about twelve o'clock and lasting for two or three hours. The people rest or sleep during this period and become active again about half-past four o'clock. Then they begin to come in from the outlying districts, bringing fruits and vegetables of various kinds, all of which are sold at ridiculously low figures. Mangoes are abundant, but were out of season at the time we were on the island. Mango-stoons, said to be the queen of all tropical fruits, were being sold everywhere by native boys. This fruit is about the size of a common walnut with the hull on. The outer husk is of a purple color, about half an inch thick, and when it is cut and pulled apart the inner flesh
is exposed. This is of a clear, almost crystalline whiteness, and has a delicious, sprightly taste. Another fruit, the doekoe, is collected and sold in great numbers for a few cents a quart. This fruit is smaller than the mangoe-steen and has a thin outer husk, which is easily peeled away, exposing the delicate whitish flesh, which has a taste like lemon ice with a dash of bitter almonds in it. There is another fruit which is very abundant on the island and is used very extensively by the natives, but because of its very pungent and strong odor it is not, as a rule, admitted to polite society. It is very seldom allowed in the European hotels. This fruit is known as the durian. It somewhat resembles a large pineapple, and when cut is found to be made up of good-sized cells containing a custard-like flesh. The odor is very rank and strong, and the taste is said to be something like that of a rather sweet custard flavored with onions.

A few days were spent at Batavia, studying the fruits and other crops of the vicinity, and then we left for the real point of interest in the island, Buitenzorg, at which place is located the wonderful botanical garden known the world over. Buitenzorg is about one thousand feet higher than Batavia, but even this slight elevation is refreshing after a short stay in the lowlands. It takes over an hour and a half to reach Buitenzorg by train from Batavia. The trip is made through a most wonderfully interesting country. Tropical vegetation of the rankest kind is seen on all sides. Everywhere may be observed the rice fields, or rice paddies as they are called, the little gardens containing many kinds of "mannihots," plantains, bananas, Chinese cabbages, Chinese radishes, and many kinds of salad plants. Buitenzorg is reached late in the afternoon, as a rule, so that full opportunity of seeing the wonderful country is not given before nightfall. When daylight comes, one has a wonderful vision of perhaps the most beautiful region in the world. At least many who have visited the place seem to be of this opinion. All around are tiers of mountains, clothed to the very top with the most gorgeous tropical vegetation. Standing as a monarch among these mountains is the extinct volcano Salak. One stands in the portico of the hotel, and, looking off across the tropical forests, sees Salak in the distance over twelve or fifteen miles away. At one's very feet is a beautiful, crystal, tropical river, lined on either side with a great variety of tropical vegetation. Snuggling under this vegetation may be seen here and there the roofs of picturesque little houses of the natives. Usually twice a day the mountain stream is filled with natives bathing.

As a rule the mornings are extremely hot, and about eleven o'clock vapors begin to collect around the apex of Salak. By noon these vapors have formed an encircling ring, and by one or two o'clock the entire top of the mountain is obscured by heavy, dense, threatening clouds. Soon a rumble of thunder may be heard, and in a short time the storm starts on its journey across the valley toward the town. The rain lasts for two or three hours, and then the clouds break away and as a result most wonderful sunsets follow. Looking out from the hotel portico, one faces the west and the gorgeous sunsets. All the colors of the rainbow are reflected upon the clouds, and so altogether it is a most beautiful and awe-inspiring sight. This same formation of clouds, followed by rain, takes place every day regularly for several weeks.

"Every morning at sunrise the little men come out of their fragile toy houses, stretch their arms to the sky, yawn, and then take a swim in the river. After this they gather in the dewy shade to eat their morning curry and rice from plantain leaf plates. Then breakfast dishes and cooking utensils are held in the swift flowing stream and the little community turns again to its daily vocations. The men go away to work or sit hammering and
hewing with implements strangely like those of Japan, and held, in every instance, in the Japanese way. The women pound and switch clothing to and fro in the stream, or spread it out on the bank to dry; and the happy, brown children, in nature's dress, roll and play under the trees, or spring, like young frogs, in and out of the stream."

The famous botanical garden at Buitenzorg was founded in 1817, and is the great show place of all that part of the world. When it is understood that it rains on an average of 219 days in the year in this region, and that the climate is more like a steaming greenhouse than anything else, one can understand why the vegetation is so rank. The Dutch Government has spent a large amount of money on this garden and has every reason to be proud of it. In the early days it was distinctly a botanical garden, but more recently it has been made the central feature for the development of a real department of agriculture, organized and conducted very much like our own federal department. There are different divisions therefore the agricultural work is limited to the available tillable land. The area actually in tilled land is about thirteen million acres, about two million acres less than is cultivated in the State of New York. The largest acreage is in rice, of which the latest records indicate over six million acres. Java is peculiarly rich, however, in a great variety of crops, such as cotton, maize, indigo, cinchona, and rubber. All these crops together aggregate another six million acres. There is about half a million acres each of sugar cane and tobacco.
Life is extremely easy on the island, and therefore the natives are not inclined to work very hard. The average wage is about twenty or twenty-two cents a day, and in two days a native can earn sufficient, with what he can get without cost from the roadsides and the jungle, to live for a week or more in perfect contentment. Clothes cost little or nothing, and shoes are not worn.

In going about through the botanical garden, one is impressed with the ease with which plants are propagated. It is not uncommon to see many species of dracaenas and rubber plants propagated directly in the open by merely ringing the branches and tying around the ringed places some sphagnum moss or other absorbent material that will hold the moisture until new roots are formed. These are formed in a comparatively short time, when the branches are cut off and a new plant is the result. All this kind of work in our country must be done in special greenhouses, and frequently in special propagating cases in special greenhouses.

One accustomed to cooler regions cannot very long stand the tremendous strain of the steaming, humid climate at Buitenzorg. Hence, after visiting the laboratories and spending some time in the gardens, we went farther into the interior of the island in order to get out of the heat. Soekaboemi seemed to be the ideal place for a study of matters of botanic and agricultural interest, as well as to obtain some relief from the extreme temperatures of the lower valleys. Soekaboemi is a small town located several hours' journey from Buitenzorg, at an elevation of about two thousand feet. Here the nights are comparatively cool, while the days are not unbearably hot. There is the same amount of rain, however, every day, but the vegetation is not so tropical. The cultivated vegetation, as a matter of fact, is interesting in that it consists of many of the things grown in our own country. Although it was the second week in January, roses, dahlias, fuchsias, geraniums, begonias, and pansies were all in magnificent growth and showing wonderful bloom. One can hardly realize that begonias would reach such growth and show such magnificent bloom as they do in this region out of doors. The dahlias were exceptionally fine, and the roses were equal to any of those grown under the most careful conditions in greenhouses.

Here again the horticulturist or botanist has a most unusual opportunity and advantage in the way of propagating plants. One day we found a man putting out what we supposed to be fence posts. They were real posts about eight feet long and six inches in diameter. He was digging holes and tamping the supposed posts into the holes. On inquiry, however, we were informed that he was planting trees and that the supposed posts would in a few years become trees. As evidence of the truth of the statement, our informant pointed to a row of trees in the near distance which, he stated, were planted twenty years before. The trees were fifty or sixty feet high. Many common plants, such as dracaenas, crotons, and the like, are readily propagated by cutting up the parent plants and putting the cuttings directly in the ground.

As in all thickly populated oriental countries, livestock is scarce on the island. This is not true of poultry, however, for chickens of many breeds are seen everywhere. As a matter of fact, in all these out-of-the-way places where nearly everything else is strange and new, Old Biddy is just the same old fowl, looks the same, cackles the same, and makes just as much ado over her chicks, as does her sister on the other side of the world.
Rural Credits*

BY HON. DAVID F. HOUSTON, United States Secretary of Agriculture

The Federal Department of Agriculture, up to the middle of 1913, had no funds for the work of investigating rural credits and, so far as I know, very little definite study was made of farm finance in this country until this time. In that year, a small fund enabled us to begin making some studies. At that time, too, a commission was appointed to study conditions abroad, and it seemed especially important to study the conditions in this country. Then Congress gave additional funds and a force of men, with Dr. Thompson, of Minnesota, was placed in charge of the investigation.

Since that time, they have covered the field of rural finance in the United States; they have examined state laws to see what limitations, if any, there were on the formation of credit unions. They have investigated the activities and functions of banks, of insurance companies, and of mortgage companies in the field of farm-mortgage credit; and they have attempted to get reliable data as to the volume of loans through these various agencies, and the terms on which the loans were made, including the rate of interest and commissions. They have also undertaken a study of the relation to the farmer of those who made advances—the merchants and landlords. They have gone further than that, and have asked themselves the question, “How far can specific financial legislation solve the problems involved, and to what extent must reliance be placed on broader, more fundamental agencies and forces?” They have advised with many individuals and groups of individuals, and have consulted in some instances, by request, with state authorities concerning the directions which their efforts should take. They have issued information in the form of bulletins, press notices, and an extensive correspondence. Their studies have covered not only the personal credits but also the land-mortgage side of the matter. This, in general terms, has been the direction of the effort and the scope of inquiry.

As the result of an experiment conducted in the Middle West in land-mortgage banking, farmers have succeeded in securing money at one or two per cent lower rates than those secured by other people in the same community, and there are other instances of a similar kind. In one community, a bank has had associated with it a farm adviser. He gives the bank information as to the undertakings of farmers in the community, whether they are likely to be successful, and the ability of the farmer to undertake the enterprise. The banker, not being an agricultural expert, can not form a satisfactory judgment, but when this farm adviser recommends the enterprise, the banker, in a constructive and sympathetic way, undertakes to aid it.

A Possible Solution

While I have thought a great deal about this matter of personal credits, there are many phases of it on which I suppose no one has final opinions; and I do not pretend to have final opinions on some of them. For example, I do not see how any specific piece of Federal financial legislation could furnish a partial solution for the personal credits problem, unless perhaps it be one; and that solution might be the establishment of branch banks. Bear in mind that I am speaking of specific financial legislation and of the Federal Government.

One defect in this country, as I think any student in agriculture will recognize, is that banking machinery,
especially the national banking machinery, is not sufficiently in touch with the farmer. The rural population is scattered and that is, in itself, an inherent difficulty, as we all recognize. One of the essential needs of agriculture is to inject business into it, and hence to provide machinery that shall reach the farmer intimately and assist him in placing his operations on a business basis. The managers of banks should know the farmers in their community, and the character of their security; should be in sympathetic touch with them, and should assist them in placing their securities before the banks and before a wide community in a responsible and reliable way.

The national banks have a minimum capital of $25,000. The state banks may have a smaller capital and they exist in some communities where the national banks cannot exist. As yet, they have not come into the federal reserve system in considerable numbers. The discounting facilities of that system are not fully available, therefore, for those who are in touch with only the smaller banks. I recognize the difficulties of providing for national banks with small capital. The overhead charges are heavy, and some small banks give this fact as one of the reasons why their rate of interest must be high. I do not know how to remedy this defect, if it seems unwise to lower the capital stock of national banks, unless a national bank in a given district where no national bank exists be permitted to establish branches.

A congressional district might be taken as the area. I say "in a given district" because I recognize the difficulty of permitting national banks to establish branches anywhere. It is conceivable that, in communities not now served, a large bank might have agencies which would establish more intimate touch with farmers and give their paper more fully the advantage of the rediscount privilege. This is the only piece of federal financial legislation I can think of which might aid in the solution of the personal credits problem.

Problem Belongs to the States

So far as financial legislation goes, the problem is primarily one for the states. The enactment of laws in the several states providing for the formation of personal-credit unions, and to encourage their formation, would be desirable. The six states which have passed laws relating to such unions are: Massachusetts, Texas, Wisconsin, New York, North Carolina, and South Carolina. They are called co-operative credit unions in Wisconsin and credit unions in the other five states. However, these laws appear, in the main, to be better models for credit associations for urban workers than for farmers. They do not provide three things which are necessary to make them better instruments for farmers: In the first place, they provide only for organizations with capital stock, yet such associations should be permitted with or without capital stock, because farmers' enterprises are seasonal, the turnover is seasonal, and it is difficult at times for the farmers to get capital to subscribe; in the second place, I believe that all of them provide only for loans to individual farmers, yet I can see no reason why they should not permit collective loans for collective purposes; in the third place, they limit deposits to members though I know of no good reasons why they should not permit deposits from outsiders. If such laws, wisely drawn, were in operation, I believe that associations would be formed by farmers who are mutually agreeable to one another, who possess a foundation of trustworthiness and character, good farming ability, and collateral—it might be small—and that they would be able to secure capital at lower rates. Branches permitted to national banks so as to bring them closer to the rediscount privilege would, I believe, be helpful agencies. Their security would be available for purchase by state banks. The particular thing that would be lacking in
that case would be the rediscount privilege of the Federal Reserve System. The men I have in mind in making these statements are men whose operations are on a small scale, who do not know much about such things, and whose case does not in most cases receive the affirmative attention and sympathy of the banker. I think if such organizations were formed, these particular defects would be removed.

The Man Who Most Needs Help

Many of the people, however, who are in the minds of most of us when we are thinking of this problem, and who really present an acute situation are not people who have well established characters which commend them to lenders of money. These too frequently have little or no collateral and are not good farmers. Some of them may be fairly good farmers, but not good business men; and too often at the close of the year's operations, they have little or nothing left over and move on to some other community. There are in the section of the country where the problem is more acute—in the South—three classes of tenants in nearly equal numbers. The first class is composed of men who are enterprising, good farmers, men of industry, in the process of becoming farm owners; these have very little more difficulty in their financial problems than the smaller farm owners. There is a second class of tenants who are fairly good farmers, who can produce things fairly well but have little business ability, less marketing ability, and just about maintain their position. Then there is a third class of tenants whose standard of living is low, whose producing ability is very inferior, who usually get the less satisfactory land, are in the hands of the exacting landlord or merchant; and perhaps make a failure of it and move every two or three years. This class excites our interest and our sympathy; but I do not see how any financial arrangement is going to reach it immediately. I think the great thing we must do for this class is the things we are trying to do for all classes, but must do for it with peculiar zeal. The solution of the financial difficulties of this class of society is an educational solution, involving better schools, better health arrangements, better methods of farming, better marketing, and greater sympathy and constructive aid from the merchant, from the business man, and from the banker.

What the Banker Should Do

I think if we could induce bankers and the merchants in the town and city peculiarly dependent on the rural districts to do more than they have done, to realize that the salvation of their communities depends on the development of the back country, to see that from a purely selfish point of view, it would be very much better for them and their communities to receive smaller margins of profit on a greater volume of business and to place their organizing ability at the disposal of the farmers, a good part of the problem would be solved. In this, as in all other directions, we must recognize that communities and the individuals must do a larger part of the work.

General legislation, in addition to financial legislation, will help solve this rural credits problem. We already have many agencies which are helping to solve it. All the work of the Department of Agriculture, of the land-grant colleges, of the state departments of agriculture, and of the better farmers are aiding. These agencies are bringing about a more profitable agriculture and better distribution, and are essential for the solution of the whole rural credits problem. In fact, for the poorer farmers, this personal credit problem will be solved in part through existing public and private agencies, supplemented by legislation such as I have indicated. But those other classes mentioned would be greatly benefited by State Laws to encourage credit unions.
Potatoes on Muck Soils in Washington County

BY H. B. DALY, '14, Hudson Valley, New York

At the outset, I want to make it clear that I am writing this article with reference to our immediate section, considering the conditions and facilities as they affect us, and dealing with muck soils, which are not as a rule adapted to potatoes. This article should not be misconstrued as representing the general potato industry of Washington County.

We make a specialty of growing seed potatoes—planting annually seventy-five acres, and harvesting for the last ten years an average of 10,000 bushels per year. This season, having purchased more land, we expect to plant 100 acres. As a matter of interest, let me add here that this spring muck land in our locality sold at $400.00 per acre.

Our farm is situated in that portion of Washington County known as the Champlain Valley, where generations ago an abundance of peat and muck soils were formed and made fertile by the decay of plant life. Here, year after year, on 700 acres of this muck soil, in defiance of all the laws of modern tillage regarding rotation of crops, potatoes are raised. Eventually the soil may deteriorate and refuse to grow the tubers but until that time comes we shall continue to grow them, trusting that the manures and fertilizers used will maintain fertility. At present, however, with the yields well above the average of the State, the soil seems to be in good condition.

I shall state rather briefly our method of planting, harvesting and marketing the crop. Our fields are divided into lots of from three to six acres for drainage purposes. The lots are separated by ditches which vary from four to five feet in depth and from three to four feet in width. In the spring these ditches are of great importance, carrying away rather quickly the excess water formed from the spring thaws and at the same time drying out the soil and hastening the planting season.

On the fields where manure is used it is drawn during the winter or spring and spread with a manure spreader, if possible, at the rate of about twelve tons to the acre. This is plowed under to a depth of six or eight inches. The ground as a rule is very easily worked, there being few bogs and no sod to contend with. One man and a team can usually plow two and one-half acres per day. The ground is harrowed once or twice with a light, spiked tooth drag. This puts the soil in a loose, mellow condition, after which it is marked both ways, or in the check system as we call it, the marks being thirty-four inches apart.

Before planting we treat our seed with a formalin solution in order to prevent Common Scab and other diseases. For this purpose we make use of a water tight, flat bottom boat having a capacity of thirty bushels. The seed are run over a screen into the boat and sufficient formalin solution added to completely cover the potatoes. We allow them to soak fully two hours, after which they are shoveled into baskets by means of a wire scoop, and spread on a barn floor to dry. One ought not to spread the potatoes in the open to dry after treating, as the hot rays of the sun are liable to cause black spots on the tubers, making them unsafe to use for seed purposes.

After drying, if the treatment has been given early enough, the seed remain on the barn floor in order to sprout. The short, thick sprouts thus formed are not easily broken when hand planted, and the seed piece has the advantage of a good start when placed in the ground. The seed are cut care-
fully, by men who understand cutting, into good sized pieces with about two eyes on each piece. If the "cuts" have to stand long before being used, we dust them with the loose, dry muck which tends to prevent the moisture from escaping and the seed from wilting.

due to the lack of sufficient plant food in the soil, or to the difference in cultivation when planted in drills. I believe, however, that it is due to the fact that, on account of there being such an abundance of humus and nitrogen in our soils, when the seed are planted closely together, as in drills, there is produced a strong vegetative growth of tops at the expense of the tubers. Our muck soils contain, by actual test 2.57 per cent nitrogen. This spring professors from the State College of Agriculture are co-operating with us in some experiments with fertilizers, seed selection and drainage. We shall at the same time work on the drill system problem. Suffice it to say that we shall continue to use the check system as giving better yields until a more profitable method is established.

Spraying is not practiced as much as it should be in our locality. This is because our fields are so small and the rows so short, that it is a question with us whether it pays to run a heavy two horse sprayer back and forth through a field, as turning so often causes considerable injury, and tears out many plants. Last summer our land was so wet that spraying machines could not be used. To control the potato and flea beetles we used very successfully a

A Yield of 300 Bushels to the Acre on a Muck Soil Planted 40 Consecutive Years to Potatoes

As a rule we obtain better results by planting the seed immediately after cutting.

Planting begins about the tenth of May, the check system being used for the most part. The seed are dropped at the intersection of the marks and stepped on. This forces the seed piece down about two inches and the loose dirt falls over it. Commercial fertilizer is then distributed around each hill by a special distributing machine, to the extent of 400 to 500 pounds per acre. If, however, manure has been spread on the field, no commercial fertilizer is used. A disc coverer does the covering, but if the ground is dry and in good condition, a plank does the work fully as well, covering five rows at a time.

On twenty-five or thirty acres of our heavier soils we can use a planting machine to advantage, but the deep muck soils when planted in drills give smaller yields and smaller tubers than when the check system is used. I do not know just why this is. It may possibly be

As a rule we obtain better results by planting the seed immediately after cutting.
light, one horse, six row dusting machine. This machine was similar to the one used by the Cornell experimenters last season in connection with their successful experiments on dusting apples.

We begin harvesting our crop about September 5. A machine is used as much as possible but on some fields, if the season has been wet and drainage poor, the machine sinks deep into the ground and becomes useless, as the potatoes and soil can not be separated under such conditions. In this case digging is done by hand. We practice hill selection during the digging season, picking out good hills having a uniform type of tubers, and planting them on a separate breeding plot the following year. Every potato seed grower should select his seed. I agree with Mr. Daniel Dean of Nichols, New York, who says: “The expense of time and trouble necessary for hill selection is very small and the profits very large. Not only is the yield greatly increased but the price is also better for improved appearance and quality.”

After the tubers are dug and allowed to dry they are packed into bushel baskets, placed in rows across the field, loaded into wagons, and drawn to the storehouses along the Barge Canal. When the harvesting is completed the potatoes are taken from the storehouses, run over a screen, and dumped loosely into canal boats. The boats have a carrying capacity of about 6000 bushels. When loaded they are towed down to New York City and docked for the winter in the East River near the foot of Broadway. From here the seed are sold. We grow three varieties for the New York market. One is the Peerless Junior, a late potato, which is sold the latter part of December and shipped to Cuba for the Cuban seed trade. In the Spring, generally the latter part of March, the other two varieties, the Irish Cobbler, an early potato, and the Giant, a late one, are sold. The Cobblers go to the Long Island seed trade, while the Giants are taken by the exchanges in New Jersey.

The potato industry in our locality has become a well established one. In a short time we will undoubtedly be able to improve our methods both as to selection and spraying. As it is, however, the tubers grown in this section are always in good demand, bringing full market prices, and the seed from our muck soils when planted in warmer climates give yields comparing favorably with seed from any other section of the country.
Cost of a College Course for Women

BY EDITH CUTHBERT FLEMING
Assistant in Home Economics, New York State College of Agriculture
at Cornell University

The question of living expenses at Cornell is one that interests many prospective students. Frequent inquiries are made of former students in an attempt to gain information on this subject. The question can be answered only in a general way, because of the existence of such contributory factors as the natural or acquired tastes of the individual, the amount of laboratory fees involved in the courses chosen, the payment or non-payment of tuition, and railroad fares for holiday seasons.

The data collected for this article have been contributed by several students in Home Economics and were taken from their expense accounts for the year 1914-15. The following is a statement of a freshman of that year and is fairly representative:

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<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board</td>
<td>$180.00</td>
</tr>
<tr>
<td>Lodging</td>
<td>110.00</td>
</tr>
<tr>
<td>Laundry</td>
<td>20.00</td>
</tr>
<tr>
<td>Fees and dues</td>
<td>85.46</td>
</tr>
<tr>
<td>Books</td>
<td>19.13</td>
</tr>
<tr>
<td>Transportation, including street car fare</td>
<td>33.65</td>
</tr>
<tr>
<td>Clothing</td>
<td>9.95</td>
</tr>
<tr>
<td>Medicine and toilet articles</td>
<td>1.55</td>
</tr>
<tr>
<td>Outside interests</td>
<td>15.99</td>
</tr>
<tr>
<td>Sundries</td>
<td>20.31</td>
</tr>
<tr>
<td>&quot;Spreads,&quot; etc.</td>
<td>12.33</td>
</tr>
<tr>
<td>Stationery and stamps</td>
<td>5.03</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$513.40</td>
</tr>
</tbody>
</table>

Board, lodging and laundry are included in the charge of $310 made by the University residential halls for the college year. A common means of decreasing this cost is by renting rooms outside the halls at a slightly decreased rate. It is, however, the present policy of the University to allow women students to live in organized houses only because of lack of accommodation in the halls, so that a decrease in rent is not usually possible. Students living in such houses may, however, slightly reduce the cost of board by arranging to prepare their breakfasts individually or in groups, and to take other meals at the cafeterias. Co-operative housekeeping is another means of cutting down expenses. This has been successfully carried out by groups of students who have thus been able to reduce expenses to a marked degree. In such a system there is opportunity to make use of supplies received from home if the students live in the vicinity of Ithaca. In all cases, however, care should be taken to give the student credit for the value of supplies thus contributed. In this type of living, laundry may be done by the students if suitable arrangements can be made with the landlord, or it may be sent home.

Fees and dues are increased $100 in the College of Agriculture for students who are non-residents of New York State. The total of these items varies each year according to the courses chosen.

The cost of clothing in the accounts studied was small because of the fact that it was purchased chiefly during the vacations, so that the account books included only minor charges. It will be readily understood that the actual charge for this item varies greatly.

The amount spent for medicine and toilet articles also varies, but the average was low in the records studied. This is, perhaps, evidence that the standard of health is high and that other supplies included in this heading were brought from home.

"Outside interests" includes amusements, and possibly gifts and donations to various organizations which every year require support.
"Spreads" takes into consideration expenditures for picnics, dormitory suppers, and refreshments in general.

The consideration of such data as the above makes apparent the difficulty of obtaining absolutely accurate records of expenses. The ideal to be attained is that each student shall record all expenditures made for her by her family and others, as well as those made from her allowance. In this way the keeping of such accounts will be of economic value to her in the future.

Among the factors that tend to reduce the cost of living at Cornell, the most important is the ability to earn money while carrying on college work. It is possible that in the past young women have laid too much stress on this, with the result that students who have just graduated from high school come to college with wrong impressions regarding the ease with which they may find positions. It is of great importance that a student who contemplates doing "outside work"—that is, remunerative work—shall possess a strong constitution and the ability to do the type of work she undertakes. The lack of either or both of these qualifications has greatly decreased the benefit derived by many girls from this college work. The types of remunerative work in which women at Cornell have usually engaged are:

1. Dormitory positions of waitress, telephone operator, and substitute for the bell boy during the late hours.
2. Positions in the homes of faculty members where assistance is given with housework or in caring for children. In such cases a student may live with the family and receive board and lodging in return for four hours of work daily, or she may be engaged for certain hours at fifteen or twenty cents an hour and live elsewhere.
3. Cafeteria positions such as cashier, or those involving service of food to patrons.
4. Skilled personal service of various kinds, arrangement for which may be made in the dormitories.
5. The sale of supplies on commission or otherwise, arrangement for which may be made only with dormitory officials. This is an opportunity that is open to only a few students each year.
6. Office work such as typewriting for the faculty, which may be done during office hours or which may be taken to one's room; typewriting for students or others; and occasional work such as addressing envelopes.

In general, the type of outside work most satisfactory to both the student and her employer is that for which there are definite hours of service. On her part the student must possess aptitude for the work and, in the case of work requiring previous training she should possess skill. Typewriting, preferably with stenography, offers a special opportunity in that the remuneration is higher than for other types of work. If a prospective student plans to do this work, she must, however, be more proficient than is the average high school graduate, and though she may have this proficiency it is not advisable for her to enter college without sufficient money to cover the greater part of her first year's expenses.

It is the opinion of many university students, as well as of many members of the faculty, that at least a year of training in some branch of work is advisable between high school and college. The necessity for such a course is readily understood in the case of a student who must earn part of her college expenses.

The Students' Association

Most of the readers of the *Country-man* know what are the purposes and accomplishments of the Students' Association but for the benefit of those who do not know the following definition is given. The Students' Association is an organization through which any former student of the College of Agriculture may show his loyalty and gratitude by active work for the College. Anyone doubting this statement should write to the Secretary for something definite to do. The annual dues are one dollar.

Does a need exist for graduate interest in the College? A strong alumni organization is especially great in the case of the College of Agriculture because it attempts to touch every community in the State. Former students may serve as connecting links between the College and their community. As individuals or as a body our graduates may by community work demonstrate what the College means and thus give the College a greater leverage on any particular community and they may co-operate directly with the College in its extension experimental and teaching work.

This year the Association is attempting to secure the co-operation of a large number of former students through what is known as the Project Plan of County Organization. The advantages of county organizations are: (1) that such an organization can meet at least once a year and can do community work; (2) a county organization can effectively further the extension work of the College and the farm bureaus (3) a complete, up-to-date directory of former students in each county may be kept which will be of great value to the College. In order that county associations may be more than a name, it is planned that each association at its annual meeting shall decide on a project for the ensuing year. When this plan is carried out each county organization in the State will be accomplishing some definite piece of work each year.

A list of possible projects is given which may suggest the kind of work your county organization should take up.

1. Co-operating with the extension schools in your county.
2. Taking definite steps to encourage attendance at Farmers' Week.
3. Following out a definite plan to connect up the granges of your county with the Extension Department of the College.
4. Offering scholarships to aid boys and girls of the county to take a course in agriculture at Cornell University.
5. Conducting a Students' Association membership campaign.
6. Co-operating in a definite way with the farm bureau.
7. Promoting plans for a farm bureau where there is none.
8. Promoting high school courses in agriculture.
9. Assisting in making agricultural fairs (county, town and state) of greatest educational and commercial value.
10. Holding field demonstration meetings each year on the farms of members. Such organizations can accomplish things for a county that can be accomplished in no other way. Every former student can do something if he will.

Next Farmers' Week the Association plans to have one evening set aside for the Alumni Banquet. The plans for this banquet are not complete but it will be the largest and best of its kind ever held. The Committee plans to make this banquet a feature of next Farmers' Week and hopes it may become an annual affair.

No student should leave Ithaca without becoming a member of this association. If you keep in touch with the College both parties benefit.

By F. W. LATHROP,
Secretary-Treasurer,
Canandaigua, N. Y.
Birds and Their Relation to Agriculture

By ARTHUR A. ALLEN
Assistant Professor of Ornithology, New York State College of Agriculture
at Cornell University

During the past few years there has grown up in this country a widespread interest in birds. Bird clubs and societies for the study and protection of birds have been formed in hundreds of cities and towns, and thousands of people are making early morning trips to learn the birds and their ways. New laws for the protection of birds have been agitated in nearly every state of the Union and have been passed by the Federal government; new bird books have been written, new bird magazines have been launched, and periodicals and newspapers all over the country have taken up the cry until one begins to wonder if the bird has not suddenly developed into a popular fad that will eventually follow the Teddy Bear and the Kewpie into obscurity. One begins to wonder if the natural interest in wild life which is normal to all human beings, has not in this case, been played upon by sentimentalism until the birds are receiving undue attention.

It was not many years ago that everyone believed the saying, “a bird in the hand is worth two in the bush,” and the only value ascribed to any bird was to its flesh on the table or its feathers on the hat. But today we read “A bird in the bush is worth ten on the hat” and other epigrams expressive of the principle of conserving our living birds. If this principle is based upon sentiment alone, if the bird lover is a faddist and the bird student a deluded scientist, it is time the phantom were exposed. If on the other hand, there lies beneath this interest in birds the solid foundations of science and truth, if the popular acclaim is but an expression of the value of birds and the interest which they bring into our lives, if the sentimentalism is but the method of a few individuals in expressing themselves, it is better that we should listen before condemning, lest more of our birds meet the fate of the passenger pigeon, the Carolina parroquet, the heath hen, the great auk, the Labrador duck and numbers of our shore birds.

Fortunately the history of ornithology and of bird study has been well recorded and we can see just what excavations have been made, what foundations laid, and what superstructure added to make the edifice what it is today. We can follow the struggles of Wilson and Audubon in laying the foundations of American ornithology and the painstaking work of later scientists making possible the economic studies that have characterized the past thirty years; studies by which we have come to a true realization of the part birds play in successful agriculture. Much of this work has been done by the United States Biological Survey in their thorough studies of the food of birds, and we can now see how popular interest has increased coordinately with the announcement of their discoveries and the simplification of the study of birds by the publishing of less technical and better illustrated texts. The present widespread interest in birds is therefore the fruit of a large number of scientists and educators interested in the conservation of one of our great natural resources.

It has been repeatedly shown that the birds are nature’s guards, appointed to keep the wonderfully prolific insects from over-running the earth; that although it is possible with sufficient output of time, labor and expense to keep the farm in profitable condition by means of poison sprays, still the whole world is not a garden and human ingenuity will never devise means of spraying the fields or trapping the forest insects.

Five hundred species of insects prey
BIRDS AND AGRICULTURE

A cherry tree in midsummer showing the work of tent caterpillars in devastating the foliage. This pest is controlled to a great extent by the few cuckoos and orioles in summer and chickadees in winter.

upon the oak trees alone, any one of which, if left uncontrolled, would destroy the trees. Indeed it was discovered when experiments were being carried on in Massachusetts with the raising of the American silkworm, that few oak trees would be large enough to bring to maturity the brood from even a single moth. Fortunately for our trees, however, it was discovered at the same time, that in a state of nature, at least 90 per cent of the caterpillars are destroyed by birds.

In Dakota when the first attempts were made to grow trees in the prairie districts, it was found almost impossible because of the ravages of caterpillars. At that time there were no arboreal birds inhabiting those parts. Today, tree-frequenting birds have increased their range to include this territory and there is no further difficulty.

But even where birds are established it sometimes happens that an insect escapes the control of its natural enemies and there occurs the well known destruction by gypsy and brown-tail moths, canker worms, tussock moths and elm-leaf beetles. But during these devastations it has been repeatedly noticed that the outbreaks have always started in cities or areas remarkably barren in bird life and that spots to which birds have been attracted have suffered the least.

Nor is it among our trees alone that the value of birds is evidenced. There are countless cases on record where birds have saved grain fields and gardens. Three years ago a monument was erected in Salt Lake City "to the gulls that saved the early Mormon settlers
A yellow-billed cuckoo bringing a tent caterpillar to its young.

from starvation.” The first year the settlers planted, their entire crops were destroyed by black crickets and the second year, when they had planted the remnant of their seed, crickets appeared again. But this time great flocks of gulls came from the lake and fell upon them and devoured them in such numbers that the crops were saved.

Usually the work of the birds goes on unseen and unappreciated and it is not until some such crisis as this arises that the good which they are continually doing shines forth and attracts attention. This past summer at the New York State Game Farm at Sherburne, several hundred pheasants were turned loose on the neighboring farms to glean their living. The farmers had had previous experience with them and raised no objections nor had any fears of the pheasants destroying their crops. One farmer came to the game-keeper raising the inquiry if it would hurt the pheasants that were feeding in his potato field if he sprayed the vines with Paris Green. The man was advised to examine the vines before spraying as usual to see if they needed it, and when he did so, there was not a beetle to be found as the birds had devoured them all. When other distant farms were overrun with grasshoppers, numbers of pheasants were released and aided materially in their destruction. In a similar way, army worms, cut worms, white grubs, and the numerous other pests of the farm and garden are kept down by the birds that frequent such places, and it is these birds that can be most materially and easily increased by the proper protection and encouragement.

Recent censuses made under the auspices of the United States Biological (Continued on page 776)
Practical Problems of School Consolidation
As Exemplified by Gouverneur Township, St. Lawrence County
By A. F. CORBIN, Gouverneur, N. Y.

Some three years ago Dr. John H. Finley, State Commissioner of Education, after a tramp through rural sections and visits to rural schools, announced that a new type of school was needed which should be not of the established order but flexible in its curriculum and adaptable to diverse communities, a real "community school." Possibly Dr. Findley had in mind the type of school since described by Herbert Quick in his story *The Brown Mouse*, where adults as well as children found pleasure in its library, its varied entertainments and lectures, its singing schools and plays; a school whose teachers are themselves patriotic citizens and welcome visitors in the homes of the neighborhood.

Plans have been outlined for opening three such schools in the neighborhood of Gouverneur, a township lying midway between the foothills of the Adirondacks and the waters of the St. Lawrence River, where Gouverneur Morris established his residence some years after the colonies declared their independence. Cornell men residing in the section have compiled farm management data showing the section to be especially prosperous, the average capital invested in 141 farms being $13,000 and the average labor income over and above interest on capital, $700. Until the State and County roads were completed the surrounding sections were, during a portion of the year, completely isolated. The proposed plan includes the remodeling of three country schools within seven miles of Gouverneur village, at Richville, Hailesboro, and Somerville, (see frontispiece map), where special vocational courses will be considered for schools already flourishing. Gouverneur already has 1348 registered pupils, has established courses in commerce and in agriculture in its new Dean Memorial High School, and hopes soon to establish a course in home-making. In the 18 other districts considered there are some 500 pupils with 23 teachers. The problem of regrading and consolidation here relates to the topography rather than township lines; to state roads over limestone ridges, through clay valleys, and along the winding Oswegatchie with its sand banks carried down from the Adirondack foothills above Hailesboro; to whether the boys can ride in to the central schools on bicycles or on the milk wagons or must board in town from Monday until Friday.

At Richville we find a school of 10 grades, at Hailesboro one of 9 grades, at Somerville one of 8 grades, all lo-
located on state or county highways. Each school could, by adding courses in agriculture and home-making and by uniting the available funds of two or three adjoining districts, carry many children through two years of academic subjects and become in truth a community center for agricultural information as to pure bred Holsteins and Ayrshires, as to clean milk, and as to the best butter and cheese making practices.

If additional primary teachers in two or three other sections were employed and the older children were sent to the central schools having workshops, kitchens, and laboratories there would be practically no new schools to construct. Five one-room schools in inaccessible districts would be continued in eight grades as at present. Thus all the pupils outside the village of Gouverneur would be cared for, leaving five unused buildings to be sold.

Even the most successful farmers are sometimes overcautious when the matter of school taxes is considered. A district through which the New York Central or the Northern New York Telephone has the right of way invariably has a low tax rate. It is to be hoped that the proposed legislation will equalize this defect. In line with the progressive legislation for rural betterment recently approved by the State Education Department might be mentioned laws relating to the organization of Schools of Agriculture, Mechanic Arts, and Home-Making of a secondary or high school grade, as enacted in 1908, the election of District School Superintendents, two or more in each county, who hold office for five years where formerly there was but one County Commissioner, and finally the Central (or Elementary) Rural School legislation of 1914. Two hundred and seven District Superintendents will this year be chosen to fill the places of those elected in 1911.

The procedure suggested for Gouverneur follows the line laid out by Senator Elon R. Brown of Watertown who introduced the last mentioned bill. On the approval of the Superintendent two or more district may vote to pool State and local funds, elect their own Board of Education, employ teachers of agriculture and home-making, and if necessary or desirable, pay for the transportation of the children. All State funds heretofore granted would still be received. It would therefore mean the remodeling of three buildings, the closing up of four or five one room schools, and the employment of six special teachers. Approximately $5400 required for salaries of these teachers would be refunded to the extent of $3,000 and the Central districts would receive also from the State $20 for each non-resident pupil taught.

As an example of a successful school of the Central or Community type Maryland in Oswego County may be cited. The writer arrived in the village on a holiday when the pupils were attending the County Fair. Finding the doors locked and the teachers out of town he was at a loss until a seventh grade boy was found who had not gone to the Fair. He knew how to get into the building and enthusiastically told of the good times he was having in the class in agriculture.

On the first Tuesday in May there was held the annual election of school trustees throughout the State. It would seem especially desirable that Cornell men in the rural communities of New York should at this time seek out these newly elected trustees and back them in their attempts toward school betterment.

On the third Tuesday in June the County School Directors chosen at the General Election in 1915 will select the new District Superintendents, whose co-operation is most essential in any progressive program. These officers, whether men or women, must pass an examination in agriculture and be qualified to teach. At this critical time all men who are alive to the need of training the rising generation toward the farm rather than the city should make a special study of school matters in their own communities.
Winter Vetch as an Important Forage Crop

By F. E. ROBERTSON, '09, Farm Bureau Manager of Jefferson County

HARVESTING WINTER VETCH AND CLOVER

Very often it remains for the practical farmer to discover a new crop, or a new method for handling an old crop, and to work out its adaptability and use for his conditions. Theoretically, our most advanced ideas concerning agricultural practices should emanate from our Experiment Stations and Colleges of Agriculture. It is not uncommon however to find the practical farmer several years in advance of our institutions of research and teaching. This condition need not be unfortunate.

An example of an instance where the practical farmers "got the jump" on our higher institutions is illustrated in the growing practice of utilizing winter vetch as a forage crop, a practice that has extended very widely during the past five years. For many years the leading horticulturists recognized the value of winter vetch as a cover crop in orchard work and as a soil improver in almost any capacity. Apparently but little attempt was ever made beyond this to utilize the vetch for any other purpose. Then a time came when a farmer in Jefferson County, W. H. Williams, Pierrepont Manor, N. Y., began to grow winter vetch for hay. The value of the crop was at once recognized. This crop first came to the notice of the writer during the summer of 1912. Since that time, largely through the agencies of the various Farm Bureaus, the knowledge of its use has spread very generally through the northern states.

In growing winter vetch as a forage crop we still recognize that there is something to be learned regarding the best rate of seeding and most suitable companion forage crops for different sections. These factors of farm practice will be worked out by different men in different ways. A blanket recommendation for growing any particular crop is never fully satisfactory.

Winter vetch as a forage crop seems to be at its best as a companion crop with oats. The vetch is seeded in the spring mixed with the oats as in the case of oats and peas. We find that the rate of seeding to be recommended, varies considerably with the locality; for example, in the northern part of the State six to eight pounds of winter vetch per acre is plenty, while in the
The winter vetch, when seeded with oats in the spring, grows with the oats and reaches the flowering stage when the oats are ripe. Usually no vetch seed will be found in the grain crop. After the oats are harvested the vetch being hardy continues to grow, frequently making a large after-growth covering the seeding of clover and grasses if the field happens to be seeded. If the field has not been seeded to clover and grass the growth may be plowed under as a soiling crop in the fall. If the field has been seeded the winter vetch lives over winter and makes its maximum growth with the clover the following June thus very materially supplementing the clover crop. In this practice we have vetch in the oat straw, and vetch and clover the following season.

We are not certain that the best practice for handling the winter vetch as a forage crop has yet been worked out. It would seem, however, that when a farmer can grow a leguminous crop analyzing seventeen per cent protein he should not be long working out a method for handling so valuable a crop. We feel that the time will soon come when the farmers in the East will appreciate the desirability, even the necessity, for growing from their own soils more of the food substances required by their livestock. This condition may even be forced upon them because of the increasing practice of diversified farming in the formerly extensive grain growing sections of the West, the result of which is an ever increasing price of concentrated feeding stuffs—particularly those rich in protein. In the East we can grow plenty of the carbohydrate materials. What we need is to grow more of our required protein. It is worth noting that vetch hay contains two and seven-tenths per cent more protein than alfalfa hay and four and six-tenths per cent more than clover hay.

As regards the adaptability of winter vetch to soil conditions we find that it is very hardy and will grow luxuriantly on a great variety of soils. That the soil should be alkaline or neutral does not appear to be a requirement for the successful growing of vetch. Some of our best crops of vetch hay have been secured from soils that showed a decided acid reaction. It will therefore grow where alfalfa will not. It will grow remarkably well on cold, moist soils unsuited for alfalfa. We should not look upon winter vetch as a crop to take the place of, or even compete with alfalfa where alfalfa can be grown success-
When a tale is told to adorn a moral both are likely to suffer, and especially is this the case with *The Brown Mouse*, Herbert Quick’s attempt to novelize the redirection of rural education in America. A good story must swing on to a brisk conclusion, whereas an educational reform must move slowly. By crowding the action of his story and the consequent consumation of his reform into a single school year the author tells a readable tale, though one of slight interest in itself, but his plan loses plausibility by the very speed with which the plot carries it out. Rural communities are not made over in a year, even by genuises. The title of the book is applied to Jim Irwin, the hero, as descriptive of a “Mendelian segregation of adapted factors” making for great native genius. He is a man of only elementary education, but of great vision and sound sense. When, by political mistake, he is elected teacher of the local rural school, he enters upon his task with a full realization of needs at hand and a purpose unhamp ered by city standards. By making straight for the essential things of rural life in a human manner, he soon succeeds in bringing the hostile countryside to his banners and his lady to his arms. In the development of this theory the author goes beyond the bounds of conservative pedagogy, but the theory itself is one generally held and in many cases repudiated.

R. L.

(Continued on page 793)

The application of the fundamental principles of market distribution to the marketing of farm products is the subject treated by Dr. Weld. The author is Professor of Business Administration in the Sheffield Scientific School of Yale University and was formerly Chief of the Division of Agricultural Economics at the University of Minnesota. He points out the status of marketing in the field of economics and explains the general organizations and methods employed in the process. His consideration of the factors affecting the cost of distribution is comprehensive and enlightening. The book represents a thorough, scholarly, and practical analysis of the marketing situation.

This text, to quote the preface, “seeks to present a brief and untechnical account of fresh-water life, its forms, its conditions, its fitnesses, its associations and its economic possibilities.” This it does, presenting to the student in the first courses of this subject a readable text book. It considers the nature and types of aquatic environment, aquatic organisms and their adjustment to the conditions of aquatic life, then aquatic societies and concludes with a study of inland water culture. This volume serves to remind us that Professor Needham may be numbered among “those scientists who can write,” an impression created by his earlier works.

(Continued on page 783)
The Cornell Countryman is glad to announce the election of Miss Elizabeth Alward '18, of Buffalo, as assistant woman's editor, and Adrian F. Shannon '18, of New York City, as one of our assistant business managers.

The Countryman is in the untried hands of a new board. It is customary upon such occasions to devote editorial space to a declaration of plans and policies for the forthcoming volume. The new board is a respecter of reasonable traditions.

In the work of the year we shall strive to bear in mind the original intent of the publication and to direct our efforts along those lines of editorial and business conduct which thirteen years of experience seem to have justified. In common with many of our predecessors, we are anxious to bring the paper into closer human touch with our readers. The sudden great size and necessity for specialization in agriculture seems to be forcing us apart. Every year will make it easier for the editorial staff to retire in dignity behind editorial formalities and for the subscriber to read the Former Student Notes and maintain a magnificent silence. Here is a tendency to be fought, and we are going to fight it, but we need your help. Will you not during the year come around to the office or write us a letter saying what you like or do not like about our work? Applause will, of course, be always welcomed, but even an occasional hiss is to be valued above utter silence.
We hear no loud cheers on the "ag" campus in response to such features of the new marking system in the College of Agriculture as have gotten abroad. The students do not as yet fully understand the innovation, and when they do their present lack of enthusiasm will probably be transferred to well-defined distaste. To tell the truth, there is very little "in it" for the present college generation.

At the head of our department of Campus Notes will be found a summary of the new ruling, derived from official sources. Briefly, it provides a system of graduated credits, proportioned to the grade of the student. If he gets an A in a five hour course, he receives six hours credit; if he gets the equivalent of an E, he only receives four hours credit. Secondly, the system provides that there shall be no exemptions or conditions. And here's the rub: the present student body falls under this second provision without being subject to the compensating privileges of the first. They have taken from our students their chance to exempt a course and gaily travel homeward while inferior minds toil "on the hill"; from the rest of us they have taken the blessed hazard of a re-examination in conditioned subjects, and they have not made it possible for us to increase or decrease our hours by the first provision. That part starts only with the class of 1920.

Viewed unselfishly, the advantages of the new scheme are obvious. The world does not pay equally for work well and slovenly done; neither should a college which trains men and women for work in the world. Given a fair start, the system will stimulate scholarship and reward it. It should do away with that "just-so-I-get-my-hours" spirit now prevalent, a spirit certainly not conducive to the development of the best that is in us.

Then, too, it will standardize marks and make them more fair. Pedagogical proof of the inaccuracy of the percentage-right system need not be presented to the students of this University; room-mates have too often submitted identical material with disportionate results. The new plan provides for a faculty committee which shall prepare for faculty circulation an annual statement of the distribution of grades given by each instructor reporting seventy-five or more grades, and, while it is urged that the theoretical distribution of grades is not to be regarded as "wooden," it may be predicted that "cinches" and "soakers" will ultimately gravitate to a more common and satisfactory ground.

Nevertheless, the manner in which the plan is being put into effect does not seem altogether fair to the interests of the present student body; The Countryman does not believe that it is wholly fair, but we do think that it is as fair as the faculty could make it. It has been necessary to make a drastic change for future betterment; clerical reasons have prevented our utter exclusion or inclusion, and so we are set to suffer a mild sort of martyrdom for the good of the majority who
are to come. It is up to us, as good Cornellians, to be sensible and good-natured in the face of so slight a sacrifice to so excellent a reform.

The Countryman comes to the close of another year. We wish to express our indebtedness to our authors and to those who have submitted articles. We also wish to thank the many alumni who by sending us information have made possible our department of Former Student Notes. And lastly, we thank all our competitors for the splendid work in their various competitions.

This College is not a money-making institution but an educational institution. It stands out as perhaps the greatest agricultural college in the world, the fruit of the efforts of three great deans—Isaac P. Roberts, Liberty Hyde Bailey, and Beverly T. Galloway and it belongs to the agricultural enthusiasts of the State. Farmer Boys, your fathers are helping support this institution. Why not come and share its benefits?

On May 12 and 13 the Association of Agricultural College Magazines met in the rooms of the Advertising Convention Club of Chicago. This fourth convention showed that already we have an association growing in size, unity and quality such as we had only dreamed of. Eighteen men were present representing the States of Missouri, Iowa, Wisconsin, Illinois, Indiana, Ohio and New York. The meeting proved conclusively to each of us that we have an association which has come with the right plans and purposes and an association which has come to stay.

The National City Bank of New York has announced a plan "for bringing the universities of the United States into closer touch with the needs and the demands of the commercial institutions of the country." The Farmer of New York often refuses to thus meet the College of Agriculture in bringing the students in close touch with the soil. He accepts the student labor offered by the Department of Farm Practice and pays small wages, but often refuses to accept as his share in this bargain the imparting of practical training to the student.

A case in point is that of a student who went out last summer to accept a position secured through the Department of Farm Practice. This student spent two months on a farm and the only work he was permitted to do, in addition to weeding and picking stones, was to
drive a team occasionally. The farmer secured him for low wages, but made him do work which the average "hand" would not do continuously for any wage.

A student by hiring out, indicates an interest in the work and a desire to learn. This boy was enthusiastic and hopeful in the beginning. In September he was disgusted and disappointed. Upon the farmer's report to the Department of Farm Practice, he received three of the forty required credits for his summer's work.

While one could not expect the farmer to permit this student to run expensive machinery and handle valuable animals indiscriminately, it is but just to think that he should give him more practical training. The student goes to the farmer for the experience, wages being a secondary consideration; the farmer securing help under such a provision should pay in that coin.

Our Department of Farm Practice is doing much toward systematizing this important phase of the work of the College, but it cannot proceed far without the active co-operation of the farmers of the State. The National City Bank is pointing the way to commercial houses; we need some such volunteer service on the part of our farmers. This should come particularly from those who have gone out from this institution and are now in a position to foster better agriculture, by training students in the practical art of farming.

The Former Students' Association should take the initiative in this work. The Department of Farm Practice should send no more students to such farmers as the one above mentioned.

We know of a certain river bank where old hemlocks

**Come On In!**

reach above green waters; we know of a rutted path that follows the slope of a meadow into deep woods and then leads down the river bank to this very spot. And just as soon as school lets out and we get home, we are going to call for the crowd and chase down that old path. The air will be filled with clothes; "first in, last out!"

It will be great to plunge head-first into cool depths, to glide through the yielding waters with long, lazy over-strokes, to literally wallow in clean coolness. Then we will splash and duck and tussle even as our fathers' fathers splashed and ducked and tussled in the old swimming hole of their day and generation. And everybody who can't dive will try to. Just three weeks from tomorrow!

There must be such a swimming hole somewhere around your place. You are thinking of it now, and of the old path leading to it. It may have been many a year since your bare feet hurried down that path, but never mind; it all comes back like a flash when you hit the water. So some day when the sun is hot and work is toil, yell to the kids to fol-
low you, and lead the way. It will make you young again and glad that you are alive, and living in the country.

Shakespeare wrote for us all, and it is not fitting that in this tercentenary year the cities should do all the celebrating. Such celebrations as they are holding are a thing beyond our rural scope or desire, but it is possible that in our own quiet way we may also contribute to the memory of this great man and writer.

For one thing, our rural high schools and literary societies might for a while forsake the usual run of mail-order farce and try something new. They need not fear a lack of response; rural people can be trusted to distinguish real things. We know of a rural high school which in 1912 presented "The Merchant of Venice" and which has since been held to this standard by local demand. We also know of adaptations of correlated scenes following the main plots of "The Merchant", "The Taming of the Shrew" and "King Lear", two of which have already been successfully presented before their audiences. Costumes and scenery are extremely simple. We would be glad indeed to communicated with anyone who might use them.

Inclement weather postponed the taking of the Senior picture past our date of issue. It has therefore been impossible for us to include it in this number, as we had planned. We are sorry.

Toil

The day is long, and harsh the torrid sun;
    Down the long hours, dulled to hope or pain,
We trail the binder at a sullen run
    Around the field; around, around again.

Unmoved we see the sun sink out of sight;
    And hear the farm bells calling in the men.
The day is done; now comes enfolding night:
    These things seem but the commonplace refrain
Of our dull lives: food, heavy sleep, and then
    Around the field: around, around again,

A. P. N. '18
Campus Notes

New Grading System

Important changes have been made in the grading system of the College of Agriculture, to take effect at the beginning of the fall term. These changes inaugurate a system of graduated credits whereby a student with high grades will obtain additional credit and the student with low grades decreased credit. The following is a specific statement of the new rule.

"Students receiving the grade of C shall receive normal credit toward graduation; grade B, ten per cent additional credit; grade of A, twenty per cent additional credit; grade of D, credit reduced ten per cent; grade of P, credit reduced twenty per cent. This regulation will go into effect with the class of 1920 and will not apply to any student now enrolled in the College.

It has also been decided to abolish exemptions and conditions and to have five passing grades instead of four, to be assigned in all courses taken for credit as follows:

A. The highest grade, one which is in the long run to be assigned in about five per cent of the cases.

B. A grade which is in the long run to be assigned in about twenty per cent of the cases.

C. A grade which is in the long run to be assigned in about twenty per cent of the cases.

D. A grade which is in the long run to be assigned in about five per cent of the cases.

P. The lowest passing grade, to be assigned in about five per cent of the cases.

F. Failure. It is assumed that the frequency suggested for the passing grades A to P admit of enough variation so that a specific percentage of frequency need not be indicated for the grade of F."

This second regulation will go into effect with all classes entering or enrolled in the College in the fall of 1916, and afterwards.

 Provision is made for those students who accrue considerable extra credit by exceptional work so that they may graduate in seven terms without petitioning the faculty. Another innovation is thus stated, "At every registration, after the freshman year, each student is to be furnished with a record card on which his work to date is to be posted." It is expected that this will be useful to the student who has requirements to meet and to his advisor, who must help him arrange his schedule with reference to these requirements.

When interviewed by a member of the Countryman staff, Secretary Betten, of the College of Agriculture, said that the system had been evolved to give credit for quality and to standardize the system of marking in all courses of the College and that it was not concocted to make passage through
the College either an easier or more difficult task than now it is.

Former Secretary Wilson Visits College

Honorable James Wilson, former United States Secretary of Agriculture, who enjoys the distinction of having served in the cabinet longer than any other man in the country's history, visited Cornell during the last week in April. He has recently been elected president of the National Agricultural Society, a new organization, with headquarters at present in New York City, whose purpose is to act as a clearing house for agricultural interests and information. The society, which will later become permanently established in Washington, publishes the Field and the Agricultural Digest. During his stay, Mr. Wilson was the guest of Dean Galloway and was entertained by faculty members at a luncheon in the Home Economics Cafeteria.

Poultry Association Banquet

The Poultry Association held their first banquet in the Home Economics Cafeteria on Wednesday evening, April 26, Professor G. A. Everett '99 acting as toastmaster. Sixty students who are specializing in Poultry Husbandry were present. They were entertained by E. E. Green '18, with a vocal selection and C. S. Brewster, Grad., with a mandolin solo. A retrospective talk was given by F. D. Brooks '16, while C. H. Rector '17 spoke on the future prospects of the association. Mr. Irving Rice, a poultryman, discussed "The Poultry Student on the Farm"; Professor Earl W. Benjamin '11, then spoke on "The Poultry Student's Obligation to the Consumer." Professor James E. Rice, head of the Department of Poultry Husbandry addressed the students on "Motives and Results."

Summer Forestry Camp

The coming third term with its ten weeks in camp at Saratoga Lake for students specializing in the forestry department, is being eagerly awaited by twenty-five seniors and graduate students of the New York State College of Agriculture. Students and faculty alike say that they realize the advantages of instruction where one need only step out of one's tent to find examples.

The camp is to be located near the centre of a tract on Lake Saratoga, owned by Mr. T. C. Luther, who not only desires to practice forestry on his tract under a working plan to be prepared this year by the Cornell graduate students, but will also co-operate in carrying out many experiments to be planned by the Department of Forestry. The location of the camp in a region of pine and hardwoods where nearly every kind of forest product is being utilized is of great advantage in teaching applied forestry.

This tract offers many problems in thinning, improving and reproducing forest stands as well as opportunities to study recently established plantations and to prepare a plan for reforestation of a large area in need of forest planting.

Forestry students spend two summers in camp, the first when they are seniors and the second as graduate students. The Luther Tract offers decidedly different conditions from the Cutting tract in the Adirondacks, where the camp was located in 1915.

The camp site is in an open flat in pine woods about a mile from the lake. Its water supply is from an unusually fine spring and the site is well drained and sanitary in every respect. The owner is constructing a two story house for mess and lecture hall. Students and faculty will camp nearby in roomy tents, facing a miniature street.

Seniors will be engaged in class room and field work in silviculture, forest mensuration and utilization. Graduate students, aside from field work in their major and minor subjects, will be preparing a plan for the management of this forest tract. The equipment and library of the department will be trans-
ferred to camp and the time of the students will be occupied as fully as in Ithaca.

Spring Day The students of the College of Agriculture played a prominent part in the annual Spring Day festivities, which were held on Alumni Field on May 27. A pleasure park modeled after Luna Park was arranged by the "Ag" men. A piano and a "rube" orchestra, consisting of a saxophone, clarinet, cornet, drum and two violins furnished dance music. Among the features in the park were an imported Egyptian fortune teller, a doll rack, and a china rack. Hot dog, sweet cider and buttermilk stands did a good business. Side shows were run by the Forestry and Poultry Clubs.

The annual inspection of the Cadet Corps took place on the campus on Friday and Saturday, May 5 and 6, when the regiment was reviewed by Captain J. S. Bayard Schindel, U. S. A. The inspecting officer expressed himself as being well satisfied with the work.

THE CORNELL CADET CAMP ON INSPECTION DAY

For the first time since the establishment of drill at Cornell, three companies were fully equipped for field service; these companies included as part of the exhibition work the pitching of camp on the quadrangle. The accompanying illustration will convey some idea as to the resulting spectacle and will also serve to show how the present undergraduates look in khaki, which is now the official uniform of the Cadet Corps.

On the following Monday, the annual competition for the best drilled company was decided in favor of Company K, Captain Warsaw, '16, commanding. Randall J. LeBoeuf, '19 was awarded the President Schurman Medal offered for individual competition.

Many Students to Attend Plattsburg Camp Lieutenant Thompson, Commandant of the Cadet Corps recently remarked, while conversing with a representative of the Military Training Camps Association, that if the Plattsburg camps were to immediately follow the close of the term or precede the fall term the registration of
students would greatly increase. Major-General Wood, on being informed of Lieutenant Thompson's opinion, granted permission to the Cadet Corps to join the third camp on August 17, ten days after it has started.

This permission is dependent on two conditions. The first is that at least 600 men go to the camp and the second that at the end of the Plattsburg camp the men be organized as a regiment and march toward Ithaca for ten days. They will thus make up for the training omitted at the opening of the camp and will arrive in Ithaca on the day preceding registration. Two hundred and fifty men immediately signed their intention of attending. It is expected that the necessary 600 will be secured within a few days.

Second Convocation Hour

Charles M. Schwab was the speaker at the second Convocation Hour, addressing the faculty and students assembled on the subject of "Conditions that Lead to Success." Mr. Schwab is President of the Bethlehem Steel Corporation and a newly elected member of the University Board of Trustees. He described the growth of the steel industry and the rise of the men connected with it. In speaking of the fortunes amassed in this process of growth, he emphasized the point that while "money is not to be despised," real success is only to be secured by doing beneficial things for mankind, and that it is possible to render such service in the industrial as well as in the academic world.

Home Economics Convention

The annual meeting of the American Home Economics Association, of which Miss Van Rensselaer of the Department of Home Economics is President, will be held at Cornell June 28-July 3. About four hundred visitors, comprising teachers, institution managers and extension workers are expected to attend. These will include representatives from the Department of Agriculture and Bureau of Education, Washington, the National Industrial and Vocational Society, and the Society of Practical Arts and Vocational Education. The agricultural colleges of the country and other institutions giving Home Economics, such as Teachers' College, Simmons College, Pratt Institute, Drexel and the public schools will also be represented. The meetings to be held in the Assembly Room of the Home Economics Building will be open to the public.

The time was appointed to immediately precede the meeting of the National Educational Association in New York City, with the expectation that teachers attending that convention would stop at Ithaca for the meeting of the American Home Economics Association.

University Trustees Meet in Ithaca

At a trustees' meeting held in Ithaca on Saturday, April 29, George C. Boldt, Chairman of the Committee on Dormitories announced two anonymous gifts to the fund for the erection of a dining hall. These gifts, of $25,000 and $10,000 bring the total collected for that purpose to $55,000. The proposed dining hall is to cost $350,000.

Meteorology Inspection Trip

George W. Mindling of the Department of Meteorology recently made an inspection trip of the co-operating stations of the department, situated throughout the state. He first visited the eastern plateau region and the Catskill Mountain area, proceeding from there to New York City by way of the Hudson Valley. On his return, Mr. Mindling stopped at the stations in Delaware and Sullivan Counties. These stations send records of local weather conditions to the department, where they are classified and published in monthly and annual summaries. According to Mr. Mindling, the development of vegetation has been from two to three weeks later than the average this spring.
At the same meeting the Committee on Buildings and Grounds reported that they had apportioned sufficient funds to build a roof over the first floor and basement of Morse Hall. It is believed that this work will be completed in time to use this renovated structure for laboratory classes in the fall.

Forestry 5.—Conservation of Natural Resources
Home Economics 5a.—Institutional Management (Lunch Room Management)
Home Economics 5b.—Large Quantity Cooking
Home Economics 5c.—Institutional Buying.

Plans for the new chemistry building will not be made public until the insurance claims on Morse Hall are adjusted. It has been stated, however, that the new structure will be erected on the site now occupied by President Schurman's residence.

The following changes will be made in the list of courses given in the College of Agriculture for the year 1916-17:

**New Courses Added**
- Botany 4.—Microscopic Wood Technology
- Botany 8.—Special Taxonomy of the Ornamental Herbaceous Plants
- Botany 11.—Methods in Histology and Cytology

**Old Courses Discontinued**
- Agricultural Chemistry 91
- Animal Husbandry 3
- Entomology 8
- Floriculture 10
Courses Consolidated or Modified

Botany 12.—Divided into three courses:
  Botany 12.—Comparative Morphology of Algae and Fungi
  Botany 13.—Comparative Morphology of Bryophytes and Pteridophytes
  Botany 14.—Comparative Morphology of Spermatophytes

Farm Crops 2 and 3.—Combined into new course 3.—Farm Crops, Advanced Course

Pomology 1 and 1a.—Combined

In a note published in this department last month it was stated that F. L. Griffen, Professor of Rural Education, was formerly on the staff of the University of Oregon, whereas he was a member of the faculty of the Oregon Agricultural College at Corvallis, Oregon, before coming to Cornell.

The annual "Ag Soph" Boat Ride and Dance was given by the 1918 Class on Wednesday evening, May 10. The "Horton" took sixty couples up the lake to Taughanock, stopping on the return at Glenwood, where the dance was held.

Dr. L. H. Bailey and several faculty members will deliver lectures at the seventh session of the Graduate School of Agriculture at the Massachusetts College of Agriculture at Amherst. The session will extend from the third to the twenty-eighth of July. Dr. L. H. Bailey will speak on "Rural Organization and Land Problems;" Professor G. A. Works, on "Agricultural Education;" Professor J. E. Rice, on "Poultry Production;" and Professor E. W. Benjamin, on "Problems of Distribution."

H. B. Knapp has resigned his position as Assistant Extension Professor in the Department of Pomology, to take charge of the State Agricultural School of Schenectady County. He is there at present making plans for the opening of the new school next fall. Professor Knapp graduated from the College of Agriculture in 1912 and will be remembered for his record in oratory and debate. He entered the Pomology Department as Extension Instructor in the fall of 1912.

W. W. Warsaw, Extension Instructor in the Soils Department has been engaged all spring in carrying on drainage demonstrations in co-operation with various farm bureau agents throughout the state. A large number of individual surveys have been made and several field meetings held in connection with the drainage work.

Cornell was represented at the Mid-West Convention of the Intercollegiate Women's Student Government Conference held at Lincoln, Neb., on May 4, 5 and 6, by Dorothy Winner '16 and Amy Luce '17.

A chapter of the National Special Aid Society has been formed at Cornell with the purpose of training the women of the University in first aid work. Laura Miller '16 is Chairman of the organization committee.

The Department of Forestry is still engaged on the reforestation work at Varna. Eighteen thousand trees made up of varieties of white pine, red pine, Scotch pine, and Norway spruce are being planted over an area of eighteen acres. This completes the forest planting of one hundred and twenty-five acres of the property around Varna which belongs to Cornell University.

(Continued on page 786)
06, B. S. A.—Charles F. Shaw is entering upon his fourth year of work as Professor of Soil Technology at the University of California. He has charge of the institution in Soil Physics at the University and at the University Farm, near Davis, and is directing a state-wide soil survey, probably the most extensive ever undertaken in this country.

In response to a letter of inquiry Professor Shaw has written us the following summary of the nature and scope of the work he is doing:

"The soil survey work is being done in co-operation with the United States Bureau of Soils and Drainage Investigations, acting with the Office of Public Roads and Rural Engineering. We are carrying on reconnaissance and detailed surveys, maintaining a force of six or more men in the field throughout the year. The favorable climate enables us to continue active field work for twelve months of the year.

"We are planning to get out a preliminary report on the soils in the State for publication in 1918, but the whole survey cannot be completed short of fifteen or twenty years. In our drainage investigations, we are studying general drainage problems of the State and are doing investigation and extension work along these lines. We are also carrying on some rather extensive experiments looking toward the reclamation of alkali land and have secured rather pleasing results to date. The teaching work of the division consists of lectures and laboratory work at Berkeley and Davis. A summer travelling course, lasting for six weeks immediately after Commencement, is given to soil students. In this course the men are taught the principles of soil surveying and by means of a trip over the agricultural portions of the State, are instructed as to the methods of soil correlation."

Previously to taking up his work in the West, Professor Shaw was employed by the national Bureau of Soils and by the Pennsylvania State College. In 1909 he was married to Miss Helen S. Hosterman, of Centre Hall, Pa.

Ex. '73—George H. Crosby entered the service of the Chicago, Rock Island and Pacific Railway Company in 1871, and is now Vice-President, Secretary and Treasurer of the road.

'79, B. S.—George M. Weeles is in general farming near Elmira. His specialty is breeding pure bred Holsteins. The farm supports a herd of fifty, headed by a son of King Segis Pontiac Alcartra.

'81, B. Agr.—Fred L. Kilborne is now practicing veterinary medicine at Kelloggsville. He returned to Cornell in '85 to take his B. V. S. and went from here to do ten years work as Director of the Veterinary Experiment Station of the Department of Agriculture at Washington. Beside his practice at Kelloggsville
he has for the past fifteen years run a
hardware and implement business.

'91, W. C.—Alfred Leith has been at
Pleasant Valley ever since 1891, "work-
ing a small farm for the purpose of sup-
plying a boarding house, which is my
money crop. I have met with a little
success and am satisfied."

'93, Sp.—In answer to the question,"What have you been doing since leaving
Cornell," Frank C. Doxsee, Clay, New
York, sends this reply:
"This is quite a question in my case:
travelling, deep sea fishing, boating,
book keeping, florist line, general farm-
ing, carpentering and now own a three-
acre place and am raising chickens and
eggs and selling direct to private par-
ties in Syracuse and New York."

'94, W. C.—Irving C. H. Cook writes,
"I am farming on the old farm, where
my father was born eighty-seven years
ago." The farm is under a general crop-
ing system and is stocked with sheep
and steers. It is near South Byron.

'96, W. C.—James H. Stone writes as
follows:
"Since leaving Cornell, I have been
on the farm where I was born. My
father and myself are engaged in the
manipulation of a registered Holstein-
Friesian herd and have made a practice
of testing them officially during the
winter months and of exhibiting them at
the state fair. The Shelter Valley herd
has won more than a dozen firsts, and
numerous other prizes of various classes.
We have recently bought from the
Adirondacks Farms at Glens Falls
'Dewey,' the registered Percheron stal-
lion who won first prize in the yearling
class at the New York State Fair in
1914."

'00, Ph. D.—Wilhelm Miller who, with
Professor S. W. Fletcher, was the first
to receive the degree of Doctor of Philos-
ophy for work in agriculture, is now
head of the Division of Landscape Exten-
sion in the University of Illinois. From
1897 to 1901 he was Associate Editor of
Bailey's Cyclopaedia of American Horti-
culture. From 1901 to 1912 he was on
the editorial staff of Country Life in
America and The Garden Magazine. Next
September he plans to move to Phila-
delphia where he will engage in the
practice of landscape architecture. Pro-
fessor Miller is the author of "What
England Can Teach Us About Garden-
ing," "The Illinois Way of Beautifying
the Farm," and "The Prairie Spirit in
Landscape Gardening."

'00, B. S. A.—E. W. Mitchell is farm-
ing near Stuyvesant Falls, in the Hud-
son Valley.

'00, W. C.—Henry T. Moon is treasurer
of the Wm. H. Moon Company, an old or-
charding concern operating the Glen-
wood Nurseries, near Morrisville, Pa.
The firm has a tract of 650 acres in
Buck County, Pennsylvania, about 450
acres of which is planted to ornamental
trees. In addition to his business duti-es
Mr. Moon has found time to serve on the
Pennsylvania Nursery Commission and
on the State Agricultural Commission,
appointed by Governor Brumbaugh.

'02, Sp.—Dorr W. McLaury is engaged
in extensive farming at Portlandville.
He ships from three to four thousand
quarts of milk to New York every day.
He is the secretary of the local farm
bureau and for eight years has had
charge of the cattle show at the state
fair.

'02, Sp.—Lester A. Parke is in the
farming and produce business near
South Dayton. He is doing some ad-
vanced registry work and carrying on
experiments in co-operation with the
local farm bureau.

'03—Gilbert A. Flint is on a farm of
163 acres owned by his father. His ad-
dress is Amenia. He is selling butter
and fattening calves for the New York
market.

'04, B. S., '06, M. S. A.—W. F. Fletch-
er may be reached at 5131 Sherrier
Place, W., Washington, D. C. Since
1904 he has been engaged in work with
the Fruit Investigations of the national
Department of Agriculture. In this
capacity he has studied the climatic and
location factor effecting the blooming and

(Continued on page 777)
Of the Wold’s Creameries
Separate their cream with a

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TEN YEARS AGO THERE WERE A DOZEN DIFFERENT MAKES of creamery or factory separators in use. Today over 98 per cent of the world’s creameries use DeLaval Separators exclusively.

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50,000 Branches and Local Agencies the World Over
Winter Vetch
(Continued from page 760)

vetch should make a valuable addition to the leguminous crops now being grown.

The growing of the seed is another matter that is receiving more and more attention and eventually, without doubt, we will be growing all the vetch seed we require instead of having it imported as at present.

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Eggs and Poultry
For food purposes

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Birds and Agriculture
(Continued from page 756)

Survey have shown an average of less than one pair of birds per acre in the farming districts of northeastern United States, yet at least one person has been able to increase that number to fifty-nine pairs nesting in the same area. The number of native birds nesting on the Cornell Campus in 1915 was somewhat above the average for the State being one and seven-tenths pairs per acre. This number, however, is far below what is possible and far below what we ought to have. A little constructive work such as feeding the birds in winter, building nest-boxes, planting food-bearing trees, shrubs and vines, and controlling such bird enemies as stray cats and English sparrows would result in doubling or tripling the number in a very few years.

It is possible to do this on every farm in the State and practically every farm in the United States. There are extremely few places where the number of birds is what it ought to be or what it could be with very little effort and expense. Any efforts put forth will be more than repaid in actual money values because of the numbers of destructive insects consumed by these efficient guardians of the forests and gardens.

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Former Student Notes
(Continued from page 774)

The varietal adaptability of fruits and is now working on special methods of propagation and pruning.

'05, M. S. A.—Samuel Fraser is engaged in the growing of nursery stock at Geneseo.

'05, B. S. A.—James G. Halpin is now a professor in the College of Agriculture of the University of Wisconsin, doing work in the poultry department. He taught at the Cornell summer school last summer. Upon graduation Halpin was placed in charge of the poultry department at the Rhode Island College. From there he went to Michigan and then to his present position at Wisconsin.

'06, Sp.—On February 26, Lowell B. Gable was married to Miss Lilian Stradley of Icedale, Pennsylvania.

'07, Sp.—Robert P. Trask is beginning his second year as Poultry Advisor of the Hampden County Improvement League of Springfield, Massachusetts. He is also doing boys' and girls' club work with the local farm bureau, the largest in the United States, employing six advisors and four office girls. Mr. Trask is living on a poultry farm at North Wilbraham, Massachusetts. He plans to keep two thousand birds and do pedigree work to improve breeding stock.

'07, W. C.—B. R. Vuplanck is Manager of the Stonykill Farms at Fishkill-on-Hudson. The tract includes two dairy farms, a fruit farm and a "black dirt" onion farm. In 1913 Mr. Vuplanck took up aviation. The thirty-fifth hydro-license to be issued in the United States is in his name. He is a Captain of Company B, 4th Squadron Provisional Aviation Corps, and the recipient of a Medal of Merit from the Aero Club of America.

'08, W. C.—H. N. Wells is employed as County Agent in Sullivan County, New Hampshire, having his headquarters at Newport. Sullivan County is the first county in New England to have established...
WHAT WOULD MACHINE MILKING SAVE YOU?

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Former Student Notes

Established a Home Economics department in cooperation with the farm bureau.

'08, Sp.—Bruner C. Brown is farming near Fairport. The farm supports a flock of forty Shropshires and a herd of grade Guernseys, headed by a pure bred bull.

'08, Sp.—Orrin F. Ross has been transferred from the managership of the Franklin County Farm Bureau to that of Oneida County. He may be reached at New Hartford. Mr. Ross still retains his interest in the business of H. D. Ross & Sons of Lowville.

'08, Sp.—William E. Wright has rented his farm and is working with the International Harvester Company. His address is 50 N. Stockton Street, Trenton, N. J.

'08, W. C.—Harry W. Brooks is in the retail milk business at Orleans. He is living on his father's farm and conducting a permanent pasture test from which he expects good results.

'08, W. C.—Charles L. Selter writes, "I am living on a farm, kicking about existing conditions, political and otherwise, and wondering if the time will ever come when I can do anything worth while to make things better." His address is Three Mile Bay.

'10, Sp.—J. H. Phillips is Farm Bureau agent in Essex county.

'11, B. S. A.—L. Brodlee is now Director of the Extension Department at the University of Vermont and State Agricultural College. His headquarters are at Burlington.

'11, Sp.—Since leaving Cornell, Samuel R. Heffron has done investigation work for the federal Department of Agriculture and milk testing work in New York State. He is now enrolled in the regular course in agriculture at Ohio State University and expects to graduate

(Continued on page 780)
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Former Student Notes

(Continued from page 778)

this June. On September 11, 1915, he was married to Miss Lina Baird, of Hartford, New York. Mrs. Heffron is a graduate of Nebraska State University.

'12, B. S.—A. M. Goodman is engaged in county agent work at Morristown, New Jersey.

'12, W. C.—George Hall, who is managing the Cedar Hill Farm, near Somers, writes as follows in regard to some orchard experiments he has under way:

“Peach and apple trees were planted in dynamited holes in alternate rows and alternate trees used for test. The soil was a clay loam with a medium clay subsoil. The experiment has run for four years and at no stage during this time have the trees set in blasted holes shown any superiority over those that were not.

“I have also tried several fertilizer mixtures in the effort to force peach trees to early maturity. The following method and treatment has given by far the best results: \( \frac{1}{2} \) Nitrate Soda, \( \frac{1}{4} \) Muriate Potash, \( \frac{1}{2} \) Acid Phosphate. The first year a third of a handful was applied in an eighteen inch circle and the treatment repeated about the first of June. During the second year a large handful was applied twice in a three foot circle and during the third year three handfuls were applied twice to a six foot circle.

“In 1912 I obtained through Professor Wilson cions of Yellow Newtown and Esopus from Hood River, Oregon. I grafted adjoining trees to these varieties with wood taken from a local orchard. The Oregon wood has proved far superior in vitality; hardly any of the cions died. Seventy-five per cent of the eastern cions died, while those surviving in no case made a growth of over two feet. The western cions made an excellent growth, as much as six to eight feet in some cases. All grafts were set in a row of mature Ben Davis trees of apparently equal vigor.”

'13, B. S.—H. M. Sherwin is a lieutenant-Marshland Farms, Apalachin.

'13, B. S.—H. M. Sherwin is a Lieutenant in the Philippine Constabulary. He writes:

(Continued on page 782)
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Former Student Notes

(Continued from Page 780)

"I have found the work very interesting and at times rather exciting, since my entire service has been on the Island of Mindanao among the wild tribes of Manobos and Moros. Cornell men will be given the key to the gates of this post, Nato Barracks, any time they show up. I hope to return to the states in the spring of 1917 and take up farming."

'13, B. S.—Clyde W. Bame is in charge of the agricultural department of the Gouverneur High School and is Scoutmaster for the local troop of Boy Scouts.

'13, B. S.—Albert B. Genung is now in charge of the agricultural department of Stamford Seminary, near Stamford. In 1914 he was married to Miss Mildred Derrick, Cornell, '12.

'13, B. S.—T. M. Avery is now manager of the Nassau County Farm Bureau, Long Island. Previous to accepting this position he taught agriculture in the Belmont High School, and was farm bureau manager of Delaware County.

'14, Sp.—Arthur S. Drake has a position in the Mystic Oral School, Mystic, Connecticut.

'14, B. S.—Edith MacArthur's address is 17 W. 21st Street, Erie, Pa. She is teaching domestic science in one of the public schools there.

'14, B. S.—Robert C. Shoemaker is doing extensive Y. M. C. A. work in Burlington County. He recently visited the College.

'14, W. C.—Harman B. Gray is farming in partnership with his father near Lima. The farm is known as the Cherry Avenue Stock Farm and consists of 230 acres devoted to the breeding of registered Percherons. Exhibiting a stable of ten at the state fair last fall, he won prizes of $335 in cash, a silver cup, a championship ribbon and two reserve championship ribbons.

(Continued on page 784)
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Former Student Notes
(Continued from page 782)

'14, W. C.—Wayne Patterson is working for his father on a hay and grain farm of 230 acres. His address is East Bloomfield.

Ex. '14—C. Monroe Conklin, Jr., is farming, dairying, teaching school and doing carpenter work near Cuba. He plans to "buy, improve and sell run-down farms for pleasure and profit." In regard to experimentation he writes: "I am improving pastures and learning how to get Nature to do my work while I watch the game."

'15, B. S.—Bruce Kocher is working on his home farm, near North East, Pennsylvania. He is specializing in the production of Concord grapes.

'15, B. S.—G. R. McDermott is with the Department of Health of New York City.

'15, Ph. D.—J. P. H. Schroeder who is with the federal department of agriculture, recently sailed for South America.

'15, B. S.—C. E. Young is managing his father's farm at Theresa, raising hay, oats, buckwheat and potatoes. He is doing experimental work with corn, oats and timothy.

'15, B. S.—The address of P. K. Whelpston and Willard D. Hill, who are engaged in the States' Relation Service of the federal department of agriculture, is 1008 New Hampshire Avenue, Washington.

'16, Sp.—F. Black is head farmer in the Woodland School for Boys at Phoenicia.

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Where you saw it will help you, them and us
Campus Notes

(Continued from Page 772)

Professor Taft, of Yale University, recently made his fourth visit to Cornell, delivering a series of lectures in Bailey Hall on May 3, 4, 5 and 6, on various phases of the presidency. He discussed in detail the powers, limitations, and responsibilities of the President of the United States.

W. G. Krum, Extension Instructor in Poultry, has just finished a survey of forty poultry farms surrounding Otego and Richfield Springs. This survey was made in co-operation with the Otsego County Farm Bureau. The results when correlated will be released for publication.

Frigga Fylgae held their annual fair in the Home Economics Auditorium on May 12 and 13. On Friday evening, supper was served by the girls, following which they gave an entertainment. The hall was decorated as a Japanese tea garden, where a tea dance was held on Saturday afternoon. The proceeds of the fair have been turned into the club house fund.

The senior girls are living in the Home Economics apartments this term, in relays of fours, for periods of eight days. During this time, they do all the necessary work, entertaining guests at least three times.

Professor J. H. Barron of the Department of Farm Crops is giving field demonstrations throughout the State at points where extension schools have been held, demonstrating methods of culture, handling of crops and pasture improvement.

Professor E. W. Benjamin, of the poultry husbandry department, plans a trip through the Southwest during August and September to study centers for production of eggs and poultry.

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IF NOT WE MAKE IT RIGHT

Campus Notes

(Continued from page 786)

Arrangements have been made with the College of Agriculture for the use of their Buckeye Traction Ditching Machine on the farms of Tompkins County. The object is to demonstrate to the farmers the extent to which such a machine may be practically employed. The machine is to be operated and supervised by employees of the college; and the farmers will be charged only for the actual cost of the work. Adjustment will be made through the Tompkins County Farm Bureau Office. It is hoped to show that it will be practicable to maintain such a machine in the county and operate it co-operatively.

E. G. Misner, Instructor in the Department of Farm Management was operated on for appendicitis in the City Hospital on Easter Sunday, April 23. He is progressing favorably and hopes to be back at work soon.

On April 15 Professor L. A. Maynard, of the Department of Animal Husbandry, went to New Haven as a delegate at the installation of the Nu Chapter of Gamma Alpha, the national scientific society. During his stay he visited the laboratories of the Connecticut Experiment Station.

A. E. Wilkinson, Extension Instructor of Vegetable Gardening is cooperating with the George Junior Republic in garden work.

The following members of the 1918 class have been elected to Raven and Serpent, the women’s Junior honorary society: Ernestine Becker, Florence Becker, Florence Boocheever, Johanna Donlon, Esther Grimes, Marcia Grimes, Vi Graham, Harriet Hosmer, Katherine McMurray, Alice Quinlan and Dagmar Schmidt.

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A New Insecticide

BY G. W. HERRICK

Professor of Economic Entomology, New York State College of Agriculture
at Cornell University

It was during the sixties that the Colorado potato beetle made its march through the central West and in the early seventies that it crossed New York and reached the Atlantic. This insect left devastation in its wake and brought consternation to the hearts of the farmers throughout all of this territory. What can be done to check its ravages was the question on everyone's lips. The answer came unexpectedly and sooner than anyone thought. Paris green which appeared between 1860 and 1870 was the answer, but who suggested it or first used it will probably never be known. Although Paris green has been so successful in controlling the potato beetle and has been so widely used for other insects it is not an ideal insecticide. Its great commendable feature is its high content of arsenious oxide, being 58.65 per cent when pure. No other poison insecticide, which is safe to use, approaches Paris green in this respect. Unfortunately it contains more or less soluble arsenic and is therefore likely to burn tender foliage. It is unsafe to use for summer spraying when combined with lime-sulphur and finally it is expensive.

During the early nineties Massachusetts began her strenuous fight against the gipsy moth. It was very soon found that in order to kill the half-grown caterpillars Paris green would have to be used so strong that the foliage of the trees would be seriously injured. A search was immediately begun for a poison that might be applied in large quantities and yet produce no injury to the foliage. Thus that well-known and widely used insecticide, arsenate of lead, appeared on the scene. It is almost an ideal insecticide so far as its safety on foliage is concerned, but unfortunately it is low in poison content, having, on the average, only fifteen per cent of arsenic oxid. It is also moderately expensive.

The situation, then, regarding poison insecticides for the past twenty-five years has stood with Paris green on the one hand, high in poison-content but apt to burn and also expensive, and with arsenate of lead on the other hand, low in poison-content but safe to use on foliage and medium in cost. The great desideratum therefore is to find a material that is high in poison-content like Paris green and safe to use on foliage like arsenate of lead, and at the same time low in cost. This is what entomologists, in conjunction with chemists, are searching for, and what the fruit grower is patiently waiting for.

Calcium or lime is probably the cheapest material or base with which arsenic can be combined to produce a safe and cheap insecticide. Arsenite of lime has long been known and used but owing to its injurious effect on foliage it has not come into general use. On the other hand, arsenate of lime seems to be a "more stable and less soluble compound" than the arsenite and should prove to be less injurious to foliage. It should also be considerably cheaper than either arsenate of lead or Paris green and can be made with somewhat higher poison-content than the former although not so high as the latter. The commercial brand, however, in the form of powder, is said to contain 44 per cent of arsenic oxide which is nearly three times as high as the paste arsenate of lead and one and one-third times higher than the powdered arsenate of lead. Therefore, if arsenate of lime should prove as safe on foliage as arsenate of lead, it would appear to be a most valuable find.

In 1915 W. M. Scott reported the results of experiments with arsenate of

(Continued on page 799)
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calcium which he made during 1913 and 1914 in spraying apple trees and shade trees for the codling moth and other biting insects. The material was combined with lime-sulphur in the case of the apple trees and used in comparison with arsenate of lead. Scott concluded from these experiments "that for spraying apple and shade trees arsenate of lime may be used with the same degree of efficiency and safety as arsenate of lead. The chief advantage it has is in the matter of cost, being cheaper than arsenate of lead. It mixes with lime-sulphur solution without causing any chemical reaction which fact might be considered as another advantage, neither material being decomposed by the combination."

Entomologists of the United States Department of Agriculture have also been experimenting with arsenate of calcium during the past three seasons of 1912, 1913, and 1914. Their work shows that this material gives promising results in the control of biting insects like the larva of the codling moth, tent caterpillar, and others that attack the apple. Their work also shows that this insecticide does not injure the foliage. The poison was used at the rate of two pounds to 50 gallons of water and compared favorably with arsenate of lead used at the same rate. In some cases its action was slower than that of the arsenate of lead, but apparently as effective in the end. When the arsenate of calcium was combined with lime-sulphur it seemed to be more effective as a killing agent than when used alone, and did not lessen the fungicidal value of the latter. In 1914 a commercial brand of paste arsenate of calcium containing 18.82 per cent of arsenic oxid was used in combination with lime-sulphur. The sprayed plots gave 98.79 per cent sound apples while the plots sprayed with arsenate of lead gave 99.44 per cent of sound apples, a difference that may be considered negligible if arsenate of calcium is considerably cheaper. The check plots of unsprayed trees gave only 58.71 per cent sound apples.

Arsenate of calcium may be made at home as follows:

| Stone lime (90 per cent CaO) | 55 pounds |
| Sodium arsenate, fused (dry powdered) | 100 pounds |
| Water | 26 gallons |

"Place the stone lime in a wooden container and add a small amount of water, just enough to start slaking. When the slaking is well under way pour in the sodium arsenate, which should first have been dissolved in hot water. Keep stirring until the lime has thoroughly slaked. Sufficient water should be added from time to time to prevent burning. The resulting arsenate of calcium should contain about 18 per cent of arsenic oxid."

Evidently, arsenate of calcium cannot be used on peach foliage with safety, and the writer would like to emphasize the fact that it has not yet been tested thoroughly enough and widely enough to unreservedly recommend it for general use or to say that it should supplant arsenate of lead even when spraying apple and other trees of equally resistant foliage.
Book Reviews

(Continued from page 761)

"This book has grown out of the author's experience in the lecture room and laboratory, while giving instructions to students in the short course in agriculture in the University of Wisconsin. It is intended especially for students who have had little or no previous instruction in botany, and it is hoped that it may also be found interesting and profitable to the general reader who would learn more of the principles that underlie the culture of plants."

The subject is covered as thoroughly as it is possible to cover so broad a field in an elementary text; the manner of presentation adapts it for the purpose for which the author designed it. The revisors have fulfilled their task most creditably in that they have made the necessary changes to bring the matter up to date without obliterating the evidences of the guiding personality of Professor Goff.

The Breeds of Live-Stock (By Carl W. Gay; published by Macmillan in the Rural Text-Book Series, edited by former dean, L. H. Bailey.)

The original material of which this book is composed was prepared for the Cyclopaedia of American Agriculture by men who have been prominently identified with the respective breeds of which they write. This subject-matter has been revised, rearranged, amplified and brought up to date as a possible handbook for the breeder and text-book for the student. This revision has been made by Dr. Carl W. Gay, Professor of Animal Industry in the University of Pennsylvania, a teacher and investigator of wide experience and an author of high standing.

The breeds of horses, cattle, sheep and goats and lastly, swine are treated thoroughly and authoritatively. Sixteen plates illustrate the important types of all the breeds considered. The descriptive matter together with these sixteen
We are showing some new designs in Cornell jewelry. We want you to see these original things that will please you.

Book Reviews

Subtropical Vegetable Gardening (By P. H. Rolfs; published by Macmillan in the Rural Science Series, edited by former dean, L. H. Bailey.)

The Director of the Florida Experiment Station presents the principles upon which the successful growing of subtropical vegetables depends. He discusses all the important vegetables—those with edible leaves, stems, bulbs, fruits, tubers, roots and seeds. In addition, he considers soils, fertilizers, watering, seeds, seed sowing, planting, pests, diseases, and the peculiar problems presented in the marketing of subtropical products. Professor Rolfs' work will commend itself to those interested in the growing of subtropical vegetables and might also be read with profit by growers throughout the United States.

E. B. S.

Concrete Fence Prepared by the Office of Public Roads.)

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E. A.

Recent Publications From the Cornell University Agricultural Experiment Station and From the New York State College of Agriculture

Since the Countryman gave brief reviews of recent and forthcoming Cornell publications, in its November issue, a number of new bulletins and circulars have been published by the College and by the experiment station. They are listed here, and will be sent free on application as long as the supply lasts. Cornellians everywhere are entitled to such as will be of interest, but should state, in writing for such publications, that the writer is a Cornellian; otherwise the request may not be granted if the writer is not a resident of New York State. The publications are primarily intended for residents of New York. Requests for publications may be addressed to the Information Service.

Bulletins

373. Metallic Flavor in Dairy Products—By S. S. Guthrie—a compilation of opinions about this defect in dairy
The Publications of our Service Bureau and other departments should be on the desks of all agricultural students. These publications are helpful and they are free. Study the plant food problem from every angle. Address

The American Agricultural Chemical Co.
Publicity Department, Boston, Mass.
products, of interest to manufacturers and to testers of such products.

374. Reforesting Methods and Results of Forest Planting in New York State—By B. H. Paul—A survey of certain forest plantations in New York, with deductions as to factors which make for success in forest planting; of interest to owners of timber lands and woodlots.

375. Possibilities of Private Forest Management in New York State—By C. H. Guise—Carries forward the thought of bulletin 374 to the point where the forest is ripe for methods of management.

376. Army Worm in New York State—By H. H. Knight—A history of the recent devastation wrought by this pest in this State with methods of control to prevent or to cope with a recurrence of the insect in large numbers.

377. The Lesser Migratory Locust—By G. W. Herrick—An entomological description of the insect, not suited to the lay reader; probably will be followed by a popular treatise on this grasshopper with methods for its control.

Circulars

32. Dusting Nursery Stock for the Control of Leaf Diseases—By V. E. Stewart—As its name implies, a description of materials and methods of dusting nursery stock to control various blights, mildews, and other diseases, of use to nursery men and others.

This is the last of the experiment station popular series; it is announced that such publications will be superseded by a series of extension bulletins issued by the College.

The following publications, for popular distribution, have titles which are sufficiently descriptive to furnish an idea of their contents.

Reading Course Lessons for the Farm

100. Farmers’ Week at Cornell.
105. Spring in the Home Flower Garden—By David Lumsden.
108. Culture of Sweet Clover and Vetch—By E. G. Montgomery.
112. Potato Growing in New York State—By E. V. Hardenburg.
113. Judging Draft Horses—By E. S. Ham.

Reading Course Lessons for the Farm Home

95. The Fireless Cooker and its Uses—By Helen Canon and Lucile Brewer.
97. Keeping Christmas—By Miscellaneous authors.
99. Programs for Study Clubs in Home Economics—By Helen Canon.
103. Suggestions for the Health of Children—By Helen Knowlton.
105. Dandelions as Food—By Lucile Brewer and Helen Canon.

Extension Bulletins

1. Protecting Home Apple Orchards by Dusting—By Donald Reddick and C. R. Crosby.
2. Legume Inoculation—By Lewis Knudsen.

Rural School Leaflet for January.
Rural School Leaflet for March.

Farm Bureau Circulars

7. Chemung County: An Account of its Agriculture and its Farm Bureau.
9. Oneida County: An Account of its Agriculture and its Farm Bureau.

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