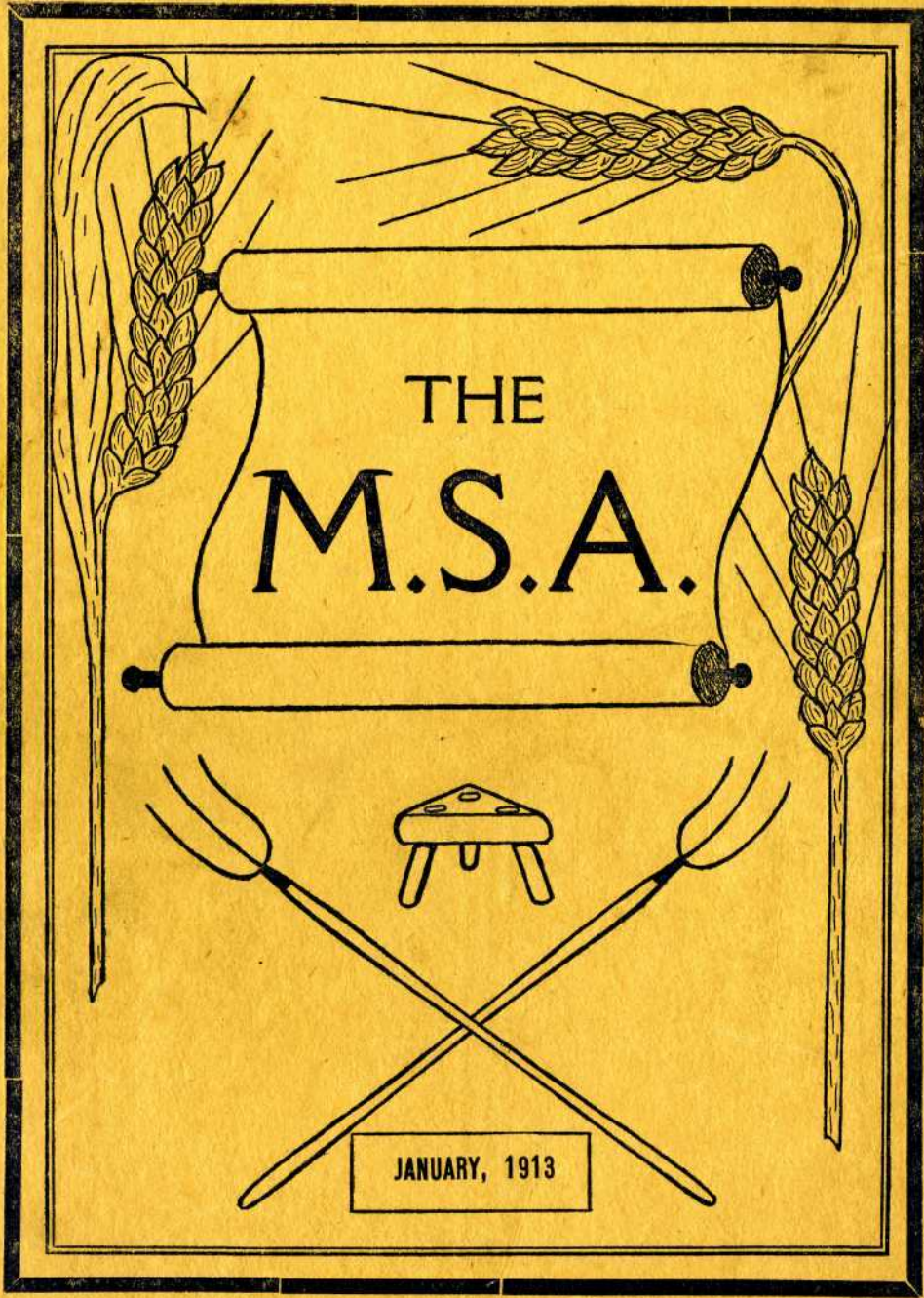


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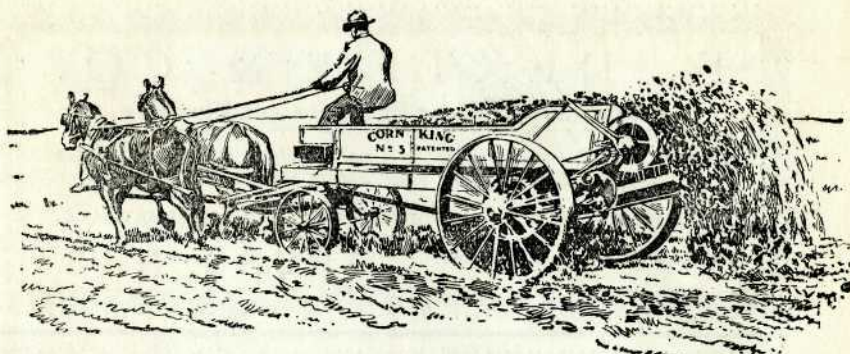
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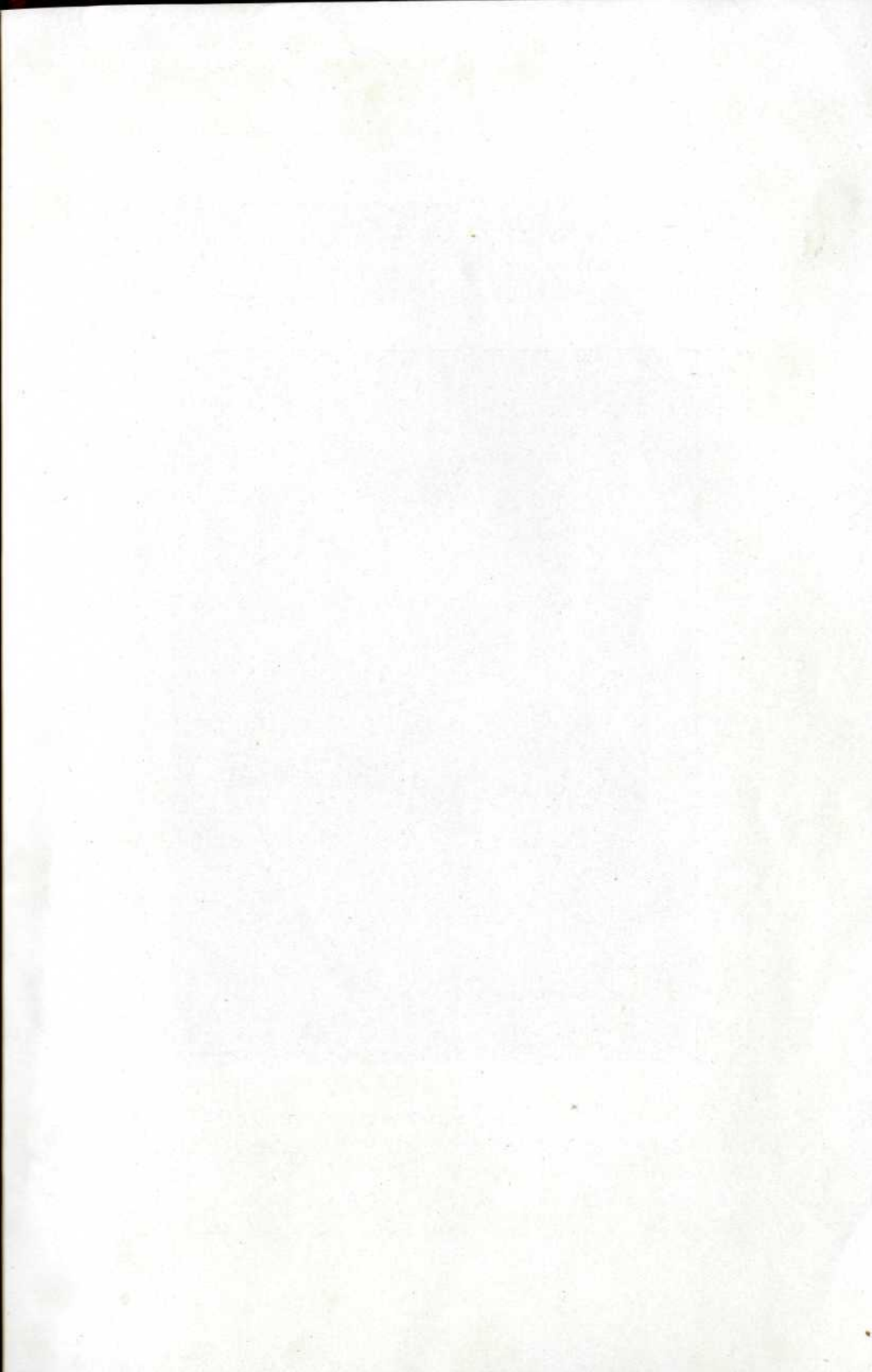
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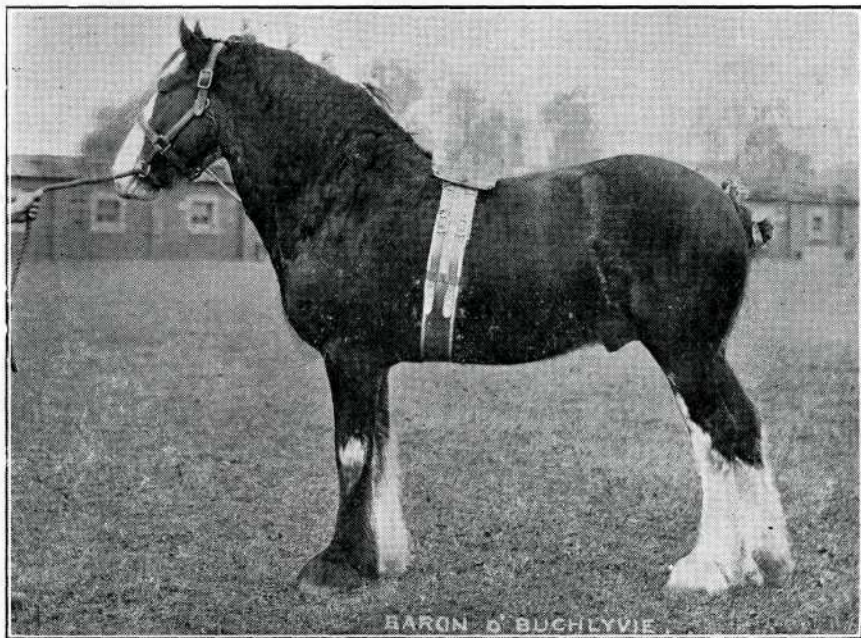
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MARITIME STUDENTS' AGRICULTURIST

Vol. V.

Truro, N. S., January, 1913

No. 3

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EDITORIALS.

The M. S. A. wishes to all its friends and subscribers a very Happy New Year.

The year of 1912 has undoubtedly been one of great success for the N. S. A. C. She has seen not only a marked difference in regard to her buildings and equipment, but she has also increased her staff, and has had over one hundred regular students enrolled.

The 1913 short course was, as usual, a great success. Although not quite so large as last year's, was well attended and an excellent programme was arranged for the students, a full account of it will be found in this issue.

The students wish, through the medium of the M. S. A., to heartily thank Mr. R. J. Messenger for his very welcome gift of apples; also Messrs. F. M. Chute, Roy Clark and Herbert Oyler for the apples supplied during the short course, both were much appreciated.

Mr. F. W. L. Sladen, our short course lecturer on Bees, is anxious to get more closely acquainted with the conditions for apiculture in the Maritime Provinces, and would like to hear from any of the students that take up bee-keeping about the honey plants, etc. He would also be pleased to straighten

out any difficulties that may be encountered. He is making a special study of the wild bees (solitary bees and bumble bees) and wasps of Canada, and would be pleased to receive specimens of these from Nova Scotia, New Brunswick and Prince Edward Island for the Dominion collection at Ottawa, with a view to the preparation of a list of species to be found in each of the Maritime Provinces. All interested in collecting insects are invited to send specimens. It is probable that many species, new to science, will be found. The specimens should be killed in a cyanide killing bottle, containing tissue paper to prevent them rolling about and spoiling one another's coats. It is important that each specimen should be labelled with the date and locality of capture. They should be packed in tissue paper if entomological pins are not obtainable, and placed in strong wooden or tin boxes and mailed to Mr. F. W. L. SLADEN, Central Experimental Farm, Ottawa. No postage is necessary. The best time for collecting bees and wasps is from April to September.



THE BROKEN IDYLL.

New Years Eve :—The white mantle lay lightly upon the cold frozen earth, covering tenderly the dried and withered grass and leaves, relict of a joyous summer. Every bare twig and branch was laden with its white robe, the great spruces which occasionally grew by the roadside were bending beneath the weight of their burdens of snow. Overhead the moon shone brilliantly, casting fantastic shadows from every bush and tree, the stars twinkled merrily, the air was crisp and keen, not a sound was to be heard save the merry jingle of the sleigh bells on the swiftly trotting mare. Ahead lay the road like a great white ribbon leading to her home.

In a few moments he was handing her into the sleigh. How carefully he tucked her in with the great bear skin robe so that not a breath of cold could possibly touch her,—and they were off. Never before had the spirited mare gone so fast ; never before had the moon shone so brightly, never had bells jingled so merrily or so musically, never in all his life had he been so supremely happy. But suppose she should feel the cold. That robe must be held in place and one hand was enough to control the mare. For him time had vanished, space had vanished. They were alone together and what else mattered. That pluck he had received in his midyear exams. What of it ? That high mark of which he had boasted so much---What of it ?

The miles were still slipping merrily by, the mare steaming ever so slightly was still holding her pace, occasionally a sleigh went whirling past, the sound of their bells gradually diminishing into silence. All around was the great stillness of nature's sleep. The farm houses with a tiny ray of light from under the closed blinds seemed to fit into the whole general scheme—and he was supremely, superbly happy.

How tender, how fragile she seemed as she nestled in the circle of his protecting arm, and yet how adorable. He could hardly credit his good fortune that such a creature could possibly be with him. No doubt when he went back to college other fellows with their sleighs would want to take her out and at the thought his arm contracted almost fiercely. But

tonight she was his, and no disquieting thoughts must disturb his content.

The mare, although in no whit diminishing her pace, was now getting warm. The steam rising in clouds from her flanks mingled with the breath from her nostrils, so he turned into a side road leading by a circuitous route back to the village. Here for a space the road was not so well broken and the mare walked along, the runners of the sleigh cutting the crust which rattled off down the slope to the ditch. Overhead the spruces and pines met forming a canopy through which the moon shone but faintly, the streaks of light contrasting vividly with the dense shadows. In another week he must go back to his work. Could he leave without some word, some token to cheer his long, lonely hours of labor. The girl from the N—— was forgotten, everything was forgotten save that he must leave her in one short week and—

Suddenly he was interrupted by a voice saying : “Mr. B— will you discuss the tissues to be found in the roots of the *Monocotyledonae*. B— started to his feet, looked wildly around and subsided saying weakly : “Not prepared sir.”

H. E. W. 13.



SHORT COURSE.

Nova Scotia's annual short course for men and maidens of the farm has this year been most successfully carried on and concluded.

On Tuesday, January 7th, the students assembled in the magnificent new auditorium of the Agricultural College. From then till a week from the following Saturday Truro witnessed an enthusiastically active dissemination of the Gospel of Agriculture.

The main new feature this year was a course in practical road-making, which was opened on Thursday of the first week by a lecture on road building and maintenance by Prof. Souland, of Halifax Technical College. Its practical application and general excellence was much appreciated.

This was followed in the evening by an illustrated lecture on "Better Roads at Small Cost," by W. B. McKenzie, C. E., Chief Engineer of the Intercolonial Railway. Mr. McKenzie is thoroughly conversant with conditions and materials in the Maritime Provinces, and he has long made a hobby of his subject. On Friday, a lecture was given by Hiram Donkin, C. E., Deputy Commissioner of Mines for Nova Scotia, who dwelt on the relation of water to roads, the building of culverts and bridges, and the location of roads with reference to easier grades and shortest distance between points. On Monday, Mr. McColl, Provincial Engineer, gave an interesting and instructive address on "Highway Bridges and Culverts."

The college was most fortunate in securing the services of Dr. Hewes, of Washington, D. C., who is considered the leading authority on the country road question in the United States.

The practical aspect of his lectures with reference to Nova Scotia conditions demonstrated that the same underlying principles apply to road building and maintenance everywhere.

He enumerated the advantages of a narrow road and showed how drainage is best secured.

He spoke of the value of the split log drag when properly used and the abuse of road machinery. He pointed out the

folly and impracticability of statute labor, and the absurdity of a system of control which insures a frequent change of road surveyors, by dismissing men when they are just beginning to learn the business of road making.

He told how clay roads were improved by the addition of sand, and sand roads by the addition of clay.

In short with his lectures and his lantern slides he instilled into his hearers the "good road" spirit, and with the valuable instruction given by the other men the students should be able to carry back to their home districts knowledge which will make for the everlasting improvement of rural highway conditions in Nova Scotia.

In the seed judging classes Professor Klinck, of McDonald, taught the students how to select seed grain, what varieties to plant and how to plant them. The Professor's qualifications and abilities are acknowledged without a peer in America, and he was at Truro this year simply because a better man for his position was impossible to find.

To those who hailed from the stock raising districts, Prof. Stevenson's classes in live stock were of prime interest. It is of the greatest importance that the dairyman be able to recognize the most approved and economical dairy type. And the same applies to the beef breeder with reference to the beef type, for each must have fixed in his mind the ideal, it is that he is striving for else he cannot achieve a full measure of success. The whole import of Prof. Stevenson's lectures was to impress in the minds of his students those points which indicate production in a dairy cow or quality in the beef animal. His lectures were aptly illustrated by examples from the college barns, the strong points of good individuals and the weaknesses of poor ones being thus brought out in a most lucid and satisfactory manner.

It was fortunate for the short course students that the college owns such high class representatives of the Holstein, Jersey, and Ayrshire breeds in the dairy class, and the Shorthorns in the beef sections.

Many thanks are due Hugh Dickson, of Onslow, who was there with his prize winning Guernseys, and Mr. Blanchard, who loaned members of his celebrated Ayrshire herd.

The Yorkshire or bacon hog and the Berkshire were carefully scored. The classes in sheep and swine caused the students to view these animals from a new and vastly different standpoint.

Horticulture received particular attention during the first part of the course and the practical work taken up by Professor Shaw, was of inestimable value. Orcharding and gardening are all too much neglected in most parts of the province and the instruction given this year was exceptionally appropriate. On Tuesday the selection of varieties and trees for planting was discussed, followed the next day by a lecture on spraying by Prof. Blair, of the Kentville Experiment Station. Wednesday afternoon was devoted to box and barrel packing. In the evening Prof. Blair lectured on small fruits and vegetable growing. On Thursday the students were shown the various grafting methods.

On account of the scarcity and high prices of nursery stock, grafting is a subject of vital importance and the expert practical instruction given by Prof. Shaw should prove of incalculable benefit to the students.

In the Ladies' Course, Prof. Shaw took up both Floriculture and vegetable gardening in a most instructive manner. The address on Carnations, Chrysanthemums and Sweet Peas was particularly good, while the talk on Shrubs, Vines and Ornamental Trees was of vital interest to those interested in beautifying and improving their homes. Much of this instruction could have been profitably assimilated by the men who, as a rule, pay far too little attention to the cultivation of their aesthetic tastes.

Veterinary science was treated through the course in a most satisfactory manner by Dr. Standish and was undoubtedly one of the most popular courses.

Dr. Standish also held classes in horse judging in the stock pavillion where the magnificent action of the Hackney stallion won the plaudits of the class, and the great Clydesdale horse, "Royal Baron" was viewed with admiration.

A most important and successful part of the course was the Domestic Science instruction given the ladies by Mrs. Dunbrack, in the new agricultural building.

On the afternoons of the second week any person who was fortunate and foresighted enough to be on the good side of the ladies, might sample some of the delicious cooking done by the class.

On Friday, January 10, representatives from the various creameries and cheese factories met in the Dairy Building, and constituted the first Annual Dairymen's Convention.

The object of this meeting, which was instigated by W. A. McKay, Dairy Superintendent, was to enable the creamery men to become organized, that they might more successfully give attention to those questions in which they and the dairy farmers were vitally interested.

As a result of this convention, efforts will be made to secure better prices for products, a Dairy Herd Competition in the Province, improvements in the refrigerator car service and more effective co-operation in the future. Much good cannot fail to come from the movement.

The Nova Scotia Provincial Seed Fair was held at the college, on Tuesday, Jan. 14. The exhibits upon which judgment was passed by Professor Klinck, were of rather exceptional quality.

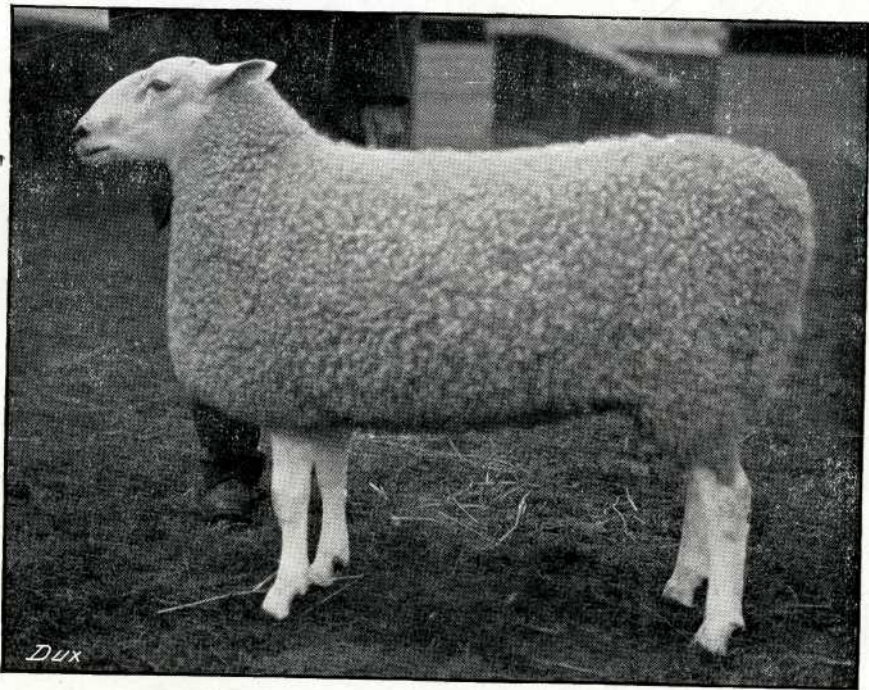
On the same day was held the convention of Nova Scotia veterinarians, and on Wednesday the annual meeting of the Maritime Stock Breeders Association. These meetings were characterized by enthusiastic interest and were most successful.

The farmers were taught how to intelligently feed their stock, and the care and use of manures and fertilizers. They were initiated into the mysteries of insect life and fungus diseases.

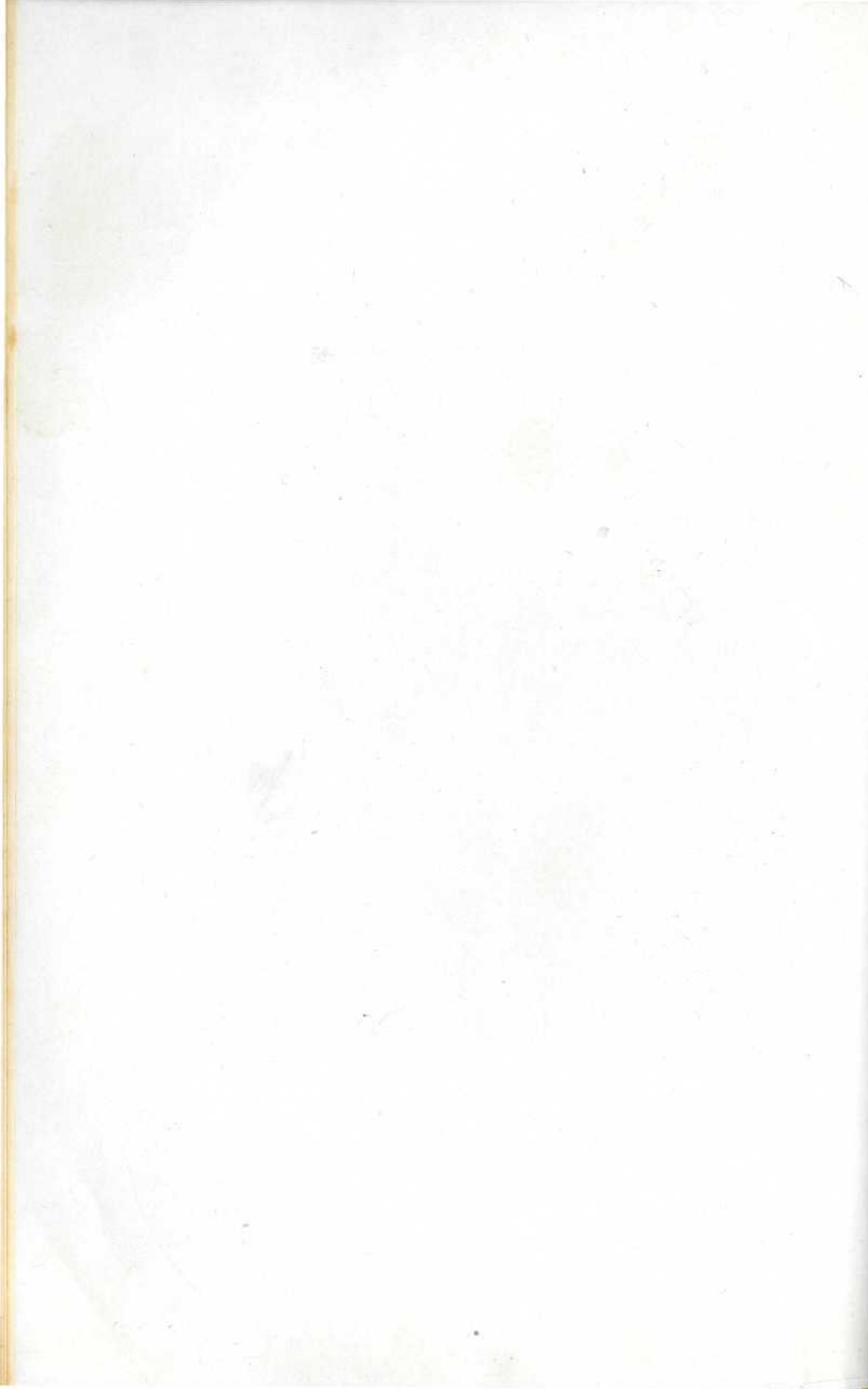
A course of lectures on Dairying was conducted in the dairy building. Drainage and other farm problems were thoroughly discussed.

During the latter part of the course, Mr. Sladen, of Ottawa, lectured on Bees. His advice to the students was: First keep bees ; second, keep more bees ; third, keep better bees, fourth, keep bees better.

The illustrated lecture on Poultry, by Prof. Landry, was largely attended and proved most interestingly successful.



TYPICAL BORDER LEICESTER RAM



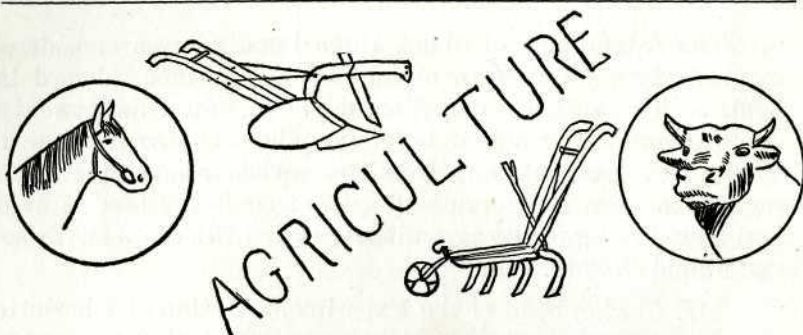
The attendance of about three hundred was considered particularly good, in view of the fact that Prince Edward Island, which last year contributed one hundred and twenty-five students, is this year holding a short course of its own. There were present many New Brunswickers and nine representatives from Newfoundland. That seafaring land is evidently awakening to the agricultural possibilities of its fertile soil and humid climate.

Mr. Clarke, head of the Experiment Station at Charlottetown, was at the course and gave an interesting account of his experiences with alfalfa. Mr. Robertson, of Nappan, expressed his opinion that the good done by the short course was incalculable. Kings County students will be gratified to know that their county had the banner attendance at the course.

On Wednesday evening the town of Truro entertained the short course students most charmingly, and treated them to chocolates and cigars. At the same time apples from the Valley donated by Ray Clarke, Herbert Oyler and Fos. Chute, were passed around and much appreciated.

On Jan. 17, the last lectures of the course were held and the students took their departure, carrying back to their homes that spirit of progress, which should imbue every farmer, and the largest amount of practical knowledge it was possible to assimilate during their brief stay in Truro.

PHILIP ILSLEY. '13



SHEEP RAISING IN NOVA SCOTIA.

In looking over the bulletins published by the Dominion Government the following statistics were obtained, relating to the Sheep Industry of Nova Scotia.

Number of sheep in Nova Scotia in 1910 was 385,000 head.

Value of sheep and lambs sold in 1910 was \$119,756.00.

Average wool clip the last few years was 1,189,500 lbs.

Falling off in the number of sheep for the twenty years previous to 1904 was about 10,000 head.

During the last few years Canada has shipped to the United States from one million to two and a quarter million pounds of wool per year. For the year ending March 1, 1908, she imported six million pounds, for the year ending March 1, 1909, five and one-half million pounds, and for the year ending March 1st, 1910 seven and one-half million pounds of wool to supply her mills. When we compare these figures with those of the United States and Great Britain we are forced to confess that we are outclassed as far as the raising of sheep is concerned. Let us look for a moment at the conditions that actually exist in our Province by the Sea.

In Nova Scotia there are approximately one million acres of untilled land. Much of this is gravelly and rocky rolling upland that must remain as permanent pasture. It is covered in the main with short, nutritious natural grasses intermingled with white clover, yielding an herbage on which sheep thrive very well. The soil and climate are also suited to the growing

of clover, roots, rape, mixed hay, and oats for winter feeding. We can never compete with Ontario and the West in the production of cereals or of beef, so sheep raising combined with dairying should be one of our most profitable industries. In the Sydney market they pay as high as 15 cents per pound for early lamb, while the price of wool is seldom below 25 cents per pound. We have our woolen mills and our market for mutton; then why not build up an industry that will be a credit to Nova Scotia as an agricultural province ?

In Western Nova Scotia the farms are given over to dairying, and fruit growing. It is in the Eastern and Southern sections of the Peninsula and the Island of Cape Breton that most of our mutton is produced. Then we find a tendency of late toward the improvement of flocks by the importation of pure bred stock from Ontario. We hope that the example set by the few who have taken this step, will stimulate others to do the same. In the Bulletin of 1912, published by the Government, the number of pure bred sheep in Nova Scotia was as follows Shropshires, 600 ; Southdowns 80 ; Leicesters 80 ; Oxford Downs 100 ; Dorsets 30 ; Cotswolds 100. This year the Government imported several hundred pure bred sheep from Ontario, and auctioned them off to farmers at several points in the province. Such a policy persistently maintained cannot fail to make a lasting impression on the sheep industry of Nova Scotia.

We find, however, the great bulk of producers of mutton and wool outside of those few farmers who keep pure bred rams and who take good care of these flocks. These may be divided into two classes.

The first class is the farmer who takes some interest in his flock. He usually goes in for dairying or the raising of fat stock, recognizing, however, the fact that no part of his live stock yields better returns than his flock of sheep, when properly cared for. He uses a grade or cheap pure bred at the head of his flock, and occasionally raises clover hay and turnips for winter feeding. Proper care is given to castration and the general care of the ewes, so that in many cases his lambs give him good returns for his trouble.

The second class is the one which is so common in Nova

Scotia. To it belongs the farmer who takes no pride in his calling and whose sons, disgusted with the farm, leave it to go to the city or to the West. No attempt is made to improve the flock by the use of pure bred stock. All the sheep get during the winter is hay or straw thrown out on the snow, and sometimes a limited amount of that. No attempt is made to keep them clean and dry so that when shearing time comes a very poor quality of wool is produced. The writer has seen flocks where large patches of wool were torn off the backs of the sheep by rubbing against fences and trees. Had the farmer dipped his sheep the summer before, he would have been well repaid not only by the wool saved, but also by the improved condition of his stock.

This class of farmers very seldom take the care to castrate all the male lambs, or even of keeping the sexes separate. The result is very evident to any one who has handled lambs for the market. Not only are the males in poor condition but the ewe lambs are constantly bothered so that they cannot feed properly.

In Ontario the decline in the number of sheep raised has been attributed to the dog. The same is true in Nova Scotia. How often does the farmer find that his valuable flock has been scattered and some of his best ewes killed or maimed by dogs. Determined action on the part of sheep raisers should help to do away with this evil, for it is manifestly unfair that such a useful industry should be destroyed, not by the useful dog that his master cares for, but by the worthless cur that has no owner.

In suggesting improvements for the present condition of sheep raising, one of the first considerations is the type of sheep best suited to our climatic conditions. A compact medium sized sheep with a close dense fleece is better adapted to our damp, foggy climate than a sheep with a more open one. Both Shropshires and Southdowns are eminently suitable, not only on account of their fleece, but because of the high grade of mutton they produce.

Before closing, a word must be said about the effect of sheep on our weed pests. Without an exception our authorities regard them as one of the best agents for the destruction of Ragwort, Thistle and Wild Mustard.

In most parts of our province there are too many deserted farms upon which a good living could be made with sheep husbandry the chief factor in their working. With the present price of wool and mutton it would be a good investment for any young farmer to buy up those cheap farms, and take up sheep farming extensively.

How then are we to bring about better conditions in the province? We must turn to the product of our Agricultural College for help. A few men with a good education, a little capital, and a faith in their work, in each district should soon establish this industry on a good solid footing and help to repopulate our sparsely settled country districts.—*M. D. M.* '13.

◆

ONLY A HORSE.

Only a horse, and an old horse too, working from day to day,
Only a worn out nag, 'tis true, plodding his weary way.

A horse that works and works in vain for his master's word of
praise,
A slave that bows to the tightened rein; a beast that the master
flays.

Only a horse; but a horse with a heart—A thin worn out old
bay;
But with spirit strong, he plods along with an uncomplaining
neigh.

A beast of burden by man abused, tortured with lash and with
goad;
But a lesson in faithfulness, courage and truth is this worn out
nag of the road.

Only a horse—not a brute—but a horse, a patient tired old bay,
The brute is the one who applies the lash, not the one who re-
ceives the flay.

He labors hard for his master's greed, he endures the toil and
the pain;
But the look of despair from his eyes is a prayer—an appeal to
be humane.

—*Maritime Farmer.*

A WORLD'S CHAMPION DEAD.

Clydesdale breeders throughout all the country learned with regret of the death of "Baron's Pride" last December. This great horse for years held the distinction of being the greatest living sire of the breed, and when at last he was obliged to hand over his laurels, the sting was removed by the fact that his conqueror was his own son.

Baron's Pride (9122) was bred by R. and J. Findlay, Springhill, Baillieston, Scotland. He was sired by Sir Everard (5353) by Topgallant (1850) by Darnley (222). His dam was Forest Queen (7233) by Springhill Darnley (2429) by Darnley (222). When coming four years of age he was purchased by A. & W. Montgomery, Netherhall & Banks, Kirkcudbright, at a very modest figure, who immediately fitted him for exhibition and at the Highland and Agricultural Society show at Aberdeen he took championship honors. But it was as a sire rather than as a show horse that Baron's Pride defeated all comers. His most famous son is Baron of Buchlyvie (of which a cut appears in this issue) and which recently took the honors away from his sire. Baron of Buchlyvie was sold at public auction in December, 1911 for the enormous sum of \$47,500. Among the other great sons of Baron's Pride we would mention especially "Everlasting", "Pride of Blacon"; and "Up to Time". His mares also have found great favor among breeders several going well up into the four figures.

Baron's Pride stock is well represented at the college farm by Royal Baron (4722) (11161) which heads the stud and by Prima Donna and Baron Lil all sired by this great horse. The college also owns a fine imported yearling mare, a grand daughter of Baron's Pride beside Royal Baron's stock. Such stock as this distributed throughout the province should certainly tend to elevate the standard of draft horses on the farm.

H. E. W. '13

THE VALUE OF UNDERDRAINAGE.

Farm underdrainage has been practised in the Maritime Provinces to a limited extent since the days of the Acadians when the only materials used were wooden boxes or poles. As these rotted away they were replaced by rock and as they filled up they gave place to the more modern system of tile. It was not until within the last four or five years however that clay tile has been used to any appreciable extent. Those who have practised underdrainage on their farms are very loud in its praise and claim that in some cases the system has paid for itself in one year and in nearly every case in two years. Despite this fact, however, the practise of underdrainage spreads comparatively slowly. This is due probably to a number of causes. First, the successful results of underdrainage are not generally known. Secondly, farmers are not generally acquainted with the critical operations of underdrainage. Not knowing how to compute the grade of a proposed drain they prefer to leave well enough alone. Thirdly, there is an impression abroad that a man of limited circumstance cannot afford to drain as the cost is so great. Lastly, some men who are fully impressed with the value of underdrainage cannot, on account of the scarcity and high price of labor. To be convinced of the need of underdrainage one has only to travel over the Maritime Provinces in the latter part of May and the first of June and see the large areas that are too wet to be cultivated and which only produce a minimum crop of inferior grasses and in some cases produce nothing at all.

Below are a few of the many instances where underdrainage has paid as an investment. Cunningham Bros., Bay Head, N. S. have had underdrains in part of their farm for the last thirty or forty years. The yield was so much better than on the undrained land that recently they drained 50 acres more and they claim that the drained land yields double the crop that undrained land yields.

Hugh A. Dickson, of Central Onslow, N. S., has had the same experience as Cunningham Bros., regarding the increase in yield, and he states that in the Spring when the land is drying out, he can clearly see where each drain lies because of the

dry ground immediately over it. Mr. W. B. Ross, of Middleton, put in about eight miles of drains in 1910. In one field which he drained the land was so wet, previous to underdraining, that he could not put the horses on it up to the first of June, but since is the earliest piece of land on the farm. This field is

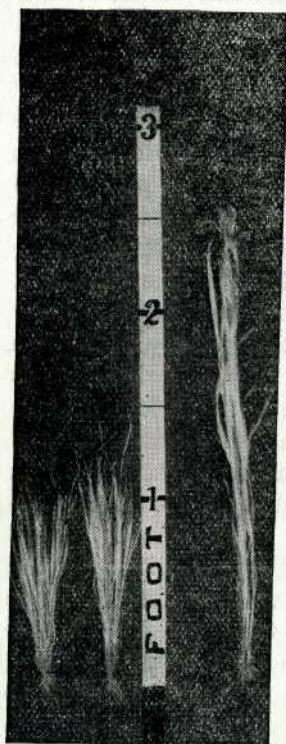
also yielding twice the crop which it did before underdraining. In every case the date of seeding has been advanced from two to four weeks.

Such experiences as the above should convince the farmers that it pays to underdrain wet land, giving not only good interest on the capital invested but the capital itself is returned in a very few years so that in a short time the farmer will receive many times his original investment.

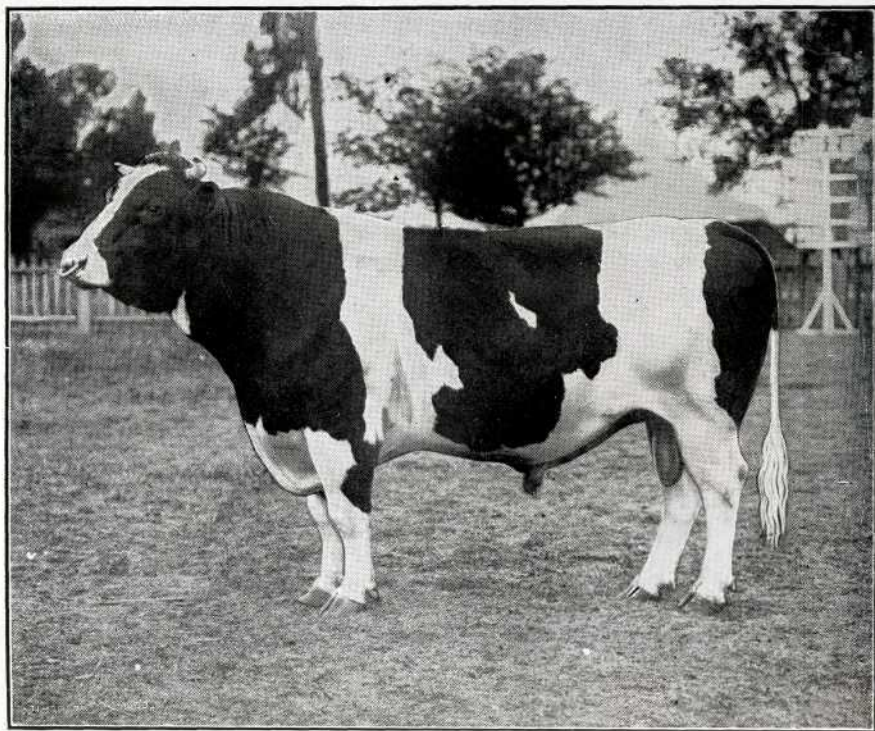
Aside entirely from the increase in crops there are other considerations which enter into the value of underdrainage. We all know that dry land is more easily worked than wet land.

The reason for this is that underdrained land is inclined to puddle if worked when too wet, and the temptation is always to work the land, even when a little wet, in order to get the crops in at least in fairly good season.

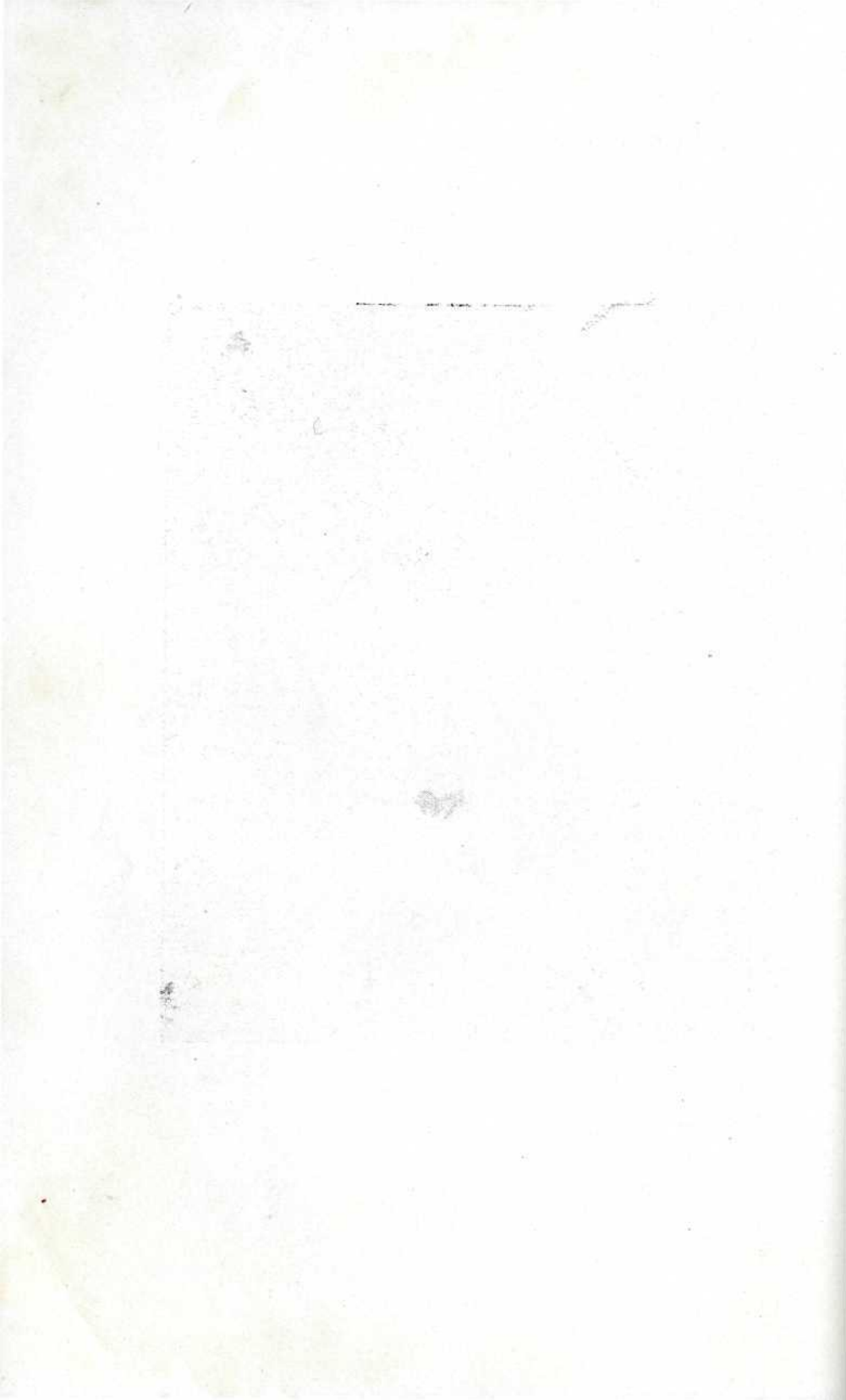
Such lands when disturbed puddle ; that is the particles settle together through the action of the water, adhere very closely to one another, and then when they dry they bake and the result is that we have a hard, lumpy field of which the physical texture cannot wholly be restored for two or three years. This land would, if left till later in the season, work all right, but leaving it till then would mean a very late planting. Accordingly the farmer on wet land must face this problem every spring, and choose between hurting the texture of his soil or planting late in the season, both of which means a low yield. The man on the drained land, however, is in an altogether different position. His land



Oats on Drained and Undrained Land.



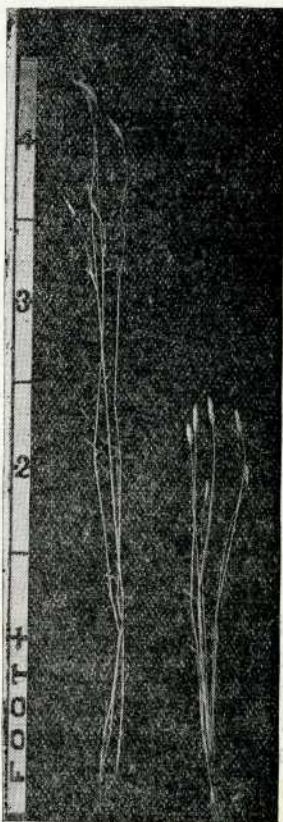
HOLSTEIN BULL "ARTIS MERCEDES POSCH"



will dry out earlier, so that he can work it early in the season and at the same time improve rather than hurt its texture and get good satisfactory yields.

Under-drainage does away with the old time surface ditch or water furrow and noting the better conditions of the land as pointed out in the preceding paragraph one can easily see how farm machinery going over drained land gets less jolts and hard knocks than on undrained land, thereby prolonging the usefulness of the machinery. We can, therefore, see how machinery lasts longer on drained land the same as a horse lasts longer on a farm than on a hard city street.

“How Underdrainage Produces such Great Results.” Let us now consider the principles that underlie the great gains made by draining. The physical character of the soil is the first and chief consideration contributing toward these ends. For example, every one knows that a drained soil is lighter than an undrained soil. To verify this take equal amounts of drained and undrained soil say one cubic foot, dry them thoroughly and then weigh them, and the drained soil will be found to be the lighter. This shows that there must be more air spaces or pores in drained soil this accelerating the downward passage of the water and its place is more readily taken by fresh, pure air. Thus we have more air in drained soil and plants cannot do their best where the supply of air is limited or where its place is taken by water.



Fall Wheat on Drained and Undrained Land.

Seeing by the preceding paragraph that drained soils contain more air between its particles it is therefore easy to see that drained soils are better ventilated.

Incredulous as it may seem, drained soil contains more water than undrained soil and besides the water in drained soil is beneficial while that in undrained soil is not. In an experiment conducted by Prof. W. H. Day, Dept. of Physics, O. A. C., he found that with two samples of average loam one packed tight like undrained soil and the other left loose like drained soil, being saturated and allowed to drain that the loose loam retained 28 per cent. more water than the tightly compressed loam. But after all wouldn't this seem natural, seeing that there are more pores in the drained soil to hold the water? Two things prevent the rapid escape of water from undrained soil. First, there are less air spaces for it to work down through and secondly, while the water goes into some of the pores at the top, air has to escape through the others, thus not all the pores can work at once in conveying the water downward. In drained soil this air can escape through the under drains thus allowing the more rapid absorption and carrying away of excess water. It therefore follows quite naturally that drained soil will absorb water much faster and as described in the first of this paragraph will retain more in case of a local summer shower.

There is also another way in which drained soils supply more water for plants. Down about four to seven feet below the surface of the ground there are stored large quantities of water which travels toward the surface by a process known as capillary action, much the same as oil travels upward through the wick of a lamp. When the droughts of July and August set in and the soil water is about exhausted, this capillary action sets in and supplies the plants with moisture. It is easy to see how capillary action would be greater in drained than undrained soil, because there are so many pores as pointed out in a previous paragraph and therefore the action is greater. Anyone can readily recall that the wettest part of the farm in the Spring is the driest in the summer drought, simply because the pores are so few that the small amount of capillary action counts but very little.

It has now become a well-established fact that the top of a plant or the part above ground is about equal in length to the part below ground. Therefore, if the roots cannot get down

into the ground, how can the part above ground ever grow and be any size? When the roots cannot penetrate deep into the ground they have to expand laterally thus making room for less plants and causing the plant to exist entirely on what nourishment that can be gathered up from the surface layers. And again, when the water table recedes as dry weather comes on, the roots are left high and dry, thus causing such failures from drought. Capillary action is the greatest at the water-table and becomes less as we near the surface of the ground, hence when young roots strike down deep and strong they can get the best supply of water through capillarity.

In experiments conducted by Prof. King, Wisconsin, he found that drained soil was from 5 to 12 degrees warmer than undrained soil. And why wouldn't this be so? Water is the hardest known substance to heat. Therefore when a soil is saturated with water wouldn't it be harder to heat than when the same pores are filled with air? And, again, a wet soil is constantly giving up water by evaporation. Now evaporation consumes heat. Hence when water is evaporating from a soil heat that would otherwise be utilized in heating the ground is consumed by the process of evaporation or in other words has become latent.

Since drained land is warmer than undrained land, it is therefore quite easy to see that seeds germinate quicker in the former thus giving a better stand. A most important consideration.

Bacteria thrives better in drained land. All soils contain minute organisms known as bacteria. Through their agency manures, and organic compound are changed into soluble salts which enter the plant with the water. It is, therefore, seen that these bacteria are very essential to the welfare of the plant. Now everybody knows that bacteria thrive better in the presence of plenty of fresh air, and a warm temperature. Then if drained soils contain these qualities, which they certainly do, to any greater extent than undrained soils why wouldn't the bacteria thrive better? In undrained soil, when the supply of air becomes limited or impure, or the temperature drops too low, the bacteria either becomes inactive or die, and there is a kind which when this condition prevails consumes the food

which the plant would otherwise take up. Since bacteria are more abundant and work more actively and the roots strike deeper in drained soil it is, therefore, quite plain to be seen that the plant has more readily available plant food at its disposal.

In this article the writer has dwelt principally upon the gains made by the farm underdrainage, with an explanation of the causes producing these gains. It is the plan to furnish an article on the "critical operations of farm underdraining" in an early issue.

H. P. MUNRO, '13.



WHERE NITRATE OF SODA COMES FROM.

At the college one often hears Nitrate of Soda mentioned, and many farmers at one time or another use this fertilizer, so perhaps the few details given below, written by one who has recently spent four years in the nitrate district, may be of some interest.

The only place where nitrate of soda is found in large quantities is in the north of Chile, in the Province of Tarapaca and Antofagasta, which were taken from the Peruvians and Bolivians respectively in the war of 1879.

The Nitrate Works, or "oficinas" to give them their Chilean name, are all situated inland on the "Pampas" at an altitude of from three thousand to six thousand feet above sea level, being scattered five to ten miles apart over a great desert.

Nitrate is found practically on the surface and is extracted from the ground, by blasting with dynamite, in the form of "Caliche" and "Castra," the former being very similar in appearance to large pieces of solid rock salt, and the latter not being unlike dry earth and gravel frozen together.

This raw material, after passing through a crusher, goes through a process of boiling in large tanks for several hours, during which time the nitrate mixes with the water. This water is then run off into settling tanks, where the nitrate slowly precipitates. From these tanks the nitrate is dumped on the

drying ground, where it remains for several days in the sun before being packed and sent to port for shipment.

The majority of these nitrate works are in the hands of English companies, although the Germans own many places, as do the Chilians themselves.

Taking an English "Oficina" as an example, you find as a rule five British employees: Manager, book-keeper, time-keeper, paymaster and store-keeper, who all live together in the Administration House, and some five hundred to a thousand native workers, who do all the out door work and manual labor. These men live in small wooden shacks around the camp, and among them you find all kinds of Chilians, Peruvians, and Bolivians, many of the last named being more than half Indian.

The average man earns about 80 cents to a dollar per day, but as they live chiefly on beans grown in the South of Chili, living expenses are not very high.

Taken as a whole, it would be hard to find a more uneducated, uncivilized crowd, a great number not being able to even read or write, drinking being their sole recreation, and the knifesharpening most disputes.

The climate is a very agreeable one in many ways, rain being absolutely uncommon in the district, and the days being warm and sunny all the year round. As can only be expected in such a warm climate there is no vegetation at all, and nothing is to be seen in this vast desert but sand, stones or dust.

In the majority of the "Oficinas" the water required for working purposes and domestic use is obtained from deep wells, others getting their water from an English Company, who bring it about sixty miles in a pipe line from a place where the water from the Andes collects.

One hears many complaints about the high price which has to be paid for nitrate of soda, and for this the Chilian Government are partly responsible, there being a very heavy export duty, amounting to about eleven and a half dollars per ton.

W. P. A. T.

HORTICULTURE

SPRAYING AND SPRAY MIXTURE.

There are four great factors to be considered in orchard culture, namely : Tillage, fertilizing, pruning and spraying. It is difficult to point to any one of these as the fundamental process in the growing of fruit since they each hold an equal place in their importance in fruit culture. Yet even to-day, in spite of the overwhelming evidence we have of their importance, we find men who declare that they do not believe in one or another of these processes. They may even point to individual cases where orchards are growing and producing fruit where these processes are neglected, yet the fact remains that for continued constant production of high class fruit these are absolutely necessary.

It is our intention in this article to consider only the last named of these, namely spraying. The first question we naturally ask is—Why do we spray ? Then as a natural sequence, when shall we spray ? What material shall we use ? How shall we apply them ? We shall consider each of these in turn and endeavor to answer them as fully as our space will permit.

Let us consider first the reason for spraying. The answer to this question is very simple. We spray, 1st to kill the injurious insects, and 2nd to destroy the fungus diseases. We may classify the injurious insects into two classes. 1st the biting insects ; 2nd the sucking insects. The former of these are insects of which the larva subsist by eating the leaves and fruit of the plant ; they include the bud moth, caterpillar, canker worm, codling moth, tussock moth, etc., and the remedy for them is merely to poison their food by means of poisoned spray. The suckling insects are smaller and harder to combat. These insects do not eat the leaves or fruit but get their living by piercing the tended skin on the leaves and young twigs and sucking the sap directly from the tree. Accordingly we cannot kill these by poisoned spray, but must use some

caustic solution which will kill them by mere contact and which must be applied directly to the insect. Examples of the insects are the wooly aplies, the oyster shell bark louse and the San Jose Scale, which has lately invaded our Valley.

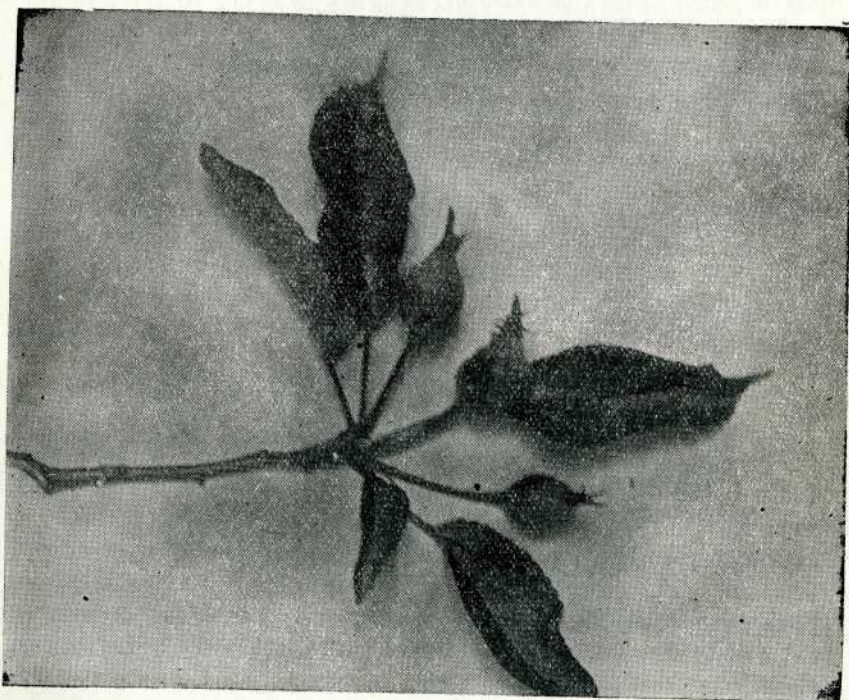
Then again we must spray to combat the fungus diseases which affect the leaves and fruit of the trees. In order to do this we must apply a fungicide not to the fungus but to the fruit or leaf before the fungus appears in order to prevent its obtaining a foothold. This fungicide, apparently, will not kill the fungus, but if it is applied to the healthy leaf the spores cannot germinate there and so the fungus is prevented. Spraying in this instance is not the cure for the disease but rather the insurance against the disease.

Having considered the reasons for spraying, let us now turn our attentions to the time for spraying. This, of course, must vary with the reason for the spray but the safe rule is spray often and spray well. Of late years it has become the practice of up-to-date orchardists to apply the first spray when the trees are in the dormant stage, using for this purpose a good caustic spray. The value of this spray is still more or less disputed by orchardists, some apparently putting too much faith in it while others regard it as nearly useless. One of the main objects for this spray is in combating the oyster shell bark louse. For good results the old loose bark should first be scraped from the trees and then a good application of spray applied. The spray ordinarily used for this operation is Lime Sulphur testing 32 degrees Beaume, mixed with water in the ratio of 1:10. It has been claimed, however, that for the oyster shell louse ordinary white wash is just as good, the principle being that the spray adheres to the scale, and on drying peels off, taking the scale with it, when the next rain will wash the eggs which were deposited under the scale to the ground to be eventually lost.

The second spraying is for the bud moth. This insect attacks the bud just as it begins to unfold, entering the tips of the bud and eating out the interior. Accordingly, to combat this successfully a poison spray must be used just when the bud begins to unfold. A little delay here is fatal, for once the moth enters the bud it is quite safe from injury so that the only way

to successfully control it, is to make sure that the first mouthful contains poison. Many orchardists combine these first two sprays as the leaves are so little unfolded as to be uninjured by the strong solution, and so by merely adding poison to the dormant spray the two operations are done in one.

The next spraying should be done just as the caterpillar and canker worms are emerging from the egg. It is import-



Apple Blossom Ready for Spraying

ant here, also, that the first meal they receive be one of poison as the older and larger they get the more difficult they are to kill. They may, however, be very easily controlled if the opportunity is seized in time. This should complete the spraying before the blossoming period. After this period just as the apples are setting they all point upwards with the calyx forms ing a little eye at the top. At this time the spraying should be done once again, as at this stage the codling moth gets in its work. The larva of this moth enters the fruit at the calyx,

and once inside is past the control of man. If, however, the little cup at the calyx is full of poison the worm cannot enter the fruit and the danger is past. This spraying should also kill any other worms which have escaped the previous spray or which have hatched out since and at the same time cover the leaves and fruit so as to effectively prevent the attack of fungous diseases. The spraying after this will depend largely upon the condition of the weather, etc., but it is safe to say, that the trees should be sprayed once or even twice more. As the season advances the leaves and fruit grow making new unsprayed portions which are susceptible to the attacks of the various fungi so that it is necessary, particularly in a warm damp season, to spray often. These later sprays will also kill the tussock moth larva if any, and take their part in the destroying of the insect pests.

The third question for us to consider is "What shall we spray with"? There are two standard solutions which are used by orchardists, viz., Bordeaux mixture is the old safe standby, but apparently it has been surpassed the last few years by the lime sulphur, which undoubtedly can lay claim to certain advantages. We will very briefly discuss both of these mixtures here as to their composition and respective merits. The formula for Bordeaux mixture is as follows :

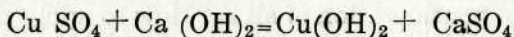
4 lbs. copper sulphate (blue vitrol).

4 lbs. quicklime.

40 gals. water.

The copper sulphate is dissolved by suspending in water, the lime is slacked, and each solution has twenty gallons of water added to it, they are then transferred to the spray barrel, taking a pail from one and then a pail from the other until they are all transferred.

The solution in the barrel undergoes a certain chemical change as follows :



This copper hydrate is insoluble and deposited on the leaf or fruit forms a coating which will not wash off, but remains as a preventative against the various fungi which attack the fruit. If this solution is desired to be poisonous one-half a pound of

paris green should be added to it which will effectively kill the insect life.

Of late years, however, the Bordeaux mixture has been practically superceded by the lime-sulphur spray. This material may be made at home from the lime and sulphur but the most satisfactory method is to buy the concentrated solution testing 32 degrees Beaume. This solution will keep indefinitely unless it freezes, whereas the home made mixture must be used as made, which takes a man's time just in the busiest season. The concentrated solution can be bought, however, and applied in the same way as Bordeaux, mixing it with water in the ratio of 1:40. The only safe poison to use with this is lead arsenate as the free arsenic in the paris green and arsenate of lime will burn the foliage. The principle advantages which the lime sulphur has over the Bordeaux is that it is easier to apply, since it will not clog the nozzles and it does not discolor the fruit as the Bordeaux occasionally does. This spray which was unknown until but a few years ago has grown in favor so rapidly as to have practically superceded the Bordeaux mixture.

We have yet to consider the spray for the sucking insects. These insects since they do not bite the leaf cannot be killed by ordinary poison spray but require a caustic solution which must touch the insect. The solution is in most general favor for this purpose is kerosene emulsion. This emulsion is prepared as follows:

Hard soap, one-half pound.

Boiling Water (soft,) 1 gallon.

Kerosene oil, 2 gallons.

Dissolve the soap in the water, add the kerosene and churn with a pump for five to ten minutes, dilute 4 to 25 times before applying. For scale insects apply in winter diluted 4 to 9 times. This will kill the insects by contact and the weaker solution will not injure the foliage.

The last consideration of all is "How to apply the spray?" This is one of the most important considerations of all; a little squirt on a tree as we go by is not spraying. If the grower is going to use such methods he had better not waste his time spraying at all. Every part of the foliage and fruit must be

covered with the spray. One of the first requisites is having plenty of pressure. A power spray apparatus is preferable, but if the grower has not one use a pressure gauge and see that a good strong pressure is used. The next requisite is a good nozzle. Those nozzles which form a sort of mist around the foliage are the best for ordinary work as all parts of the trees must be dampened under such conditions. Be sure to spray the under side of the leaves as here is the foothold of the fungous diseases and all the inside of the tree which may not get as much sunlight as the outside.

The reader must not make the fatal mistake of supposing that spraying is the whole battle for good fruit. Far from it. Spraying is only one of the requisites equal but not greater in importance to good tillage, pruning and fertilizing. The successful grower must give heed to all these points and he will be rewarded by a bountiful harvest of luscious high-class fruit.

H. E. W. '13.

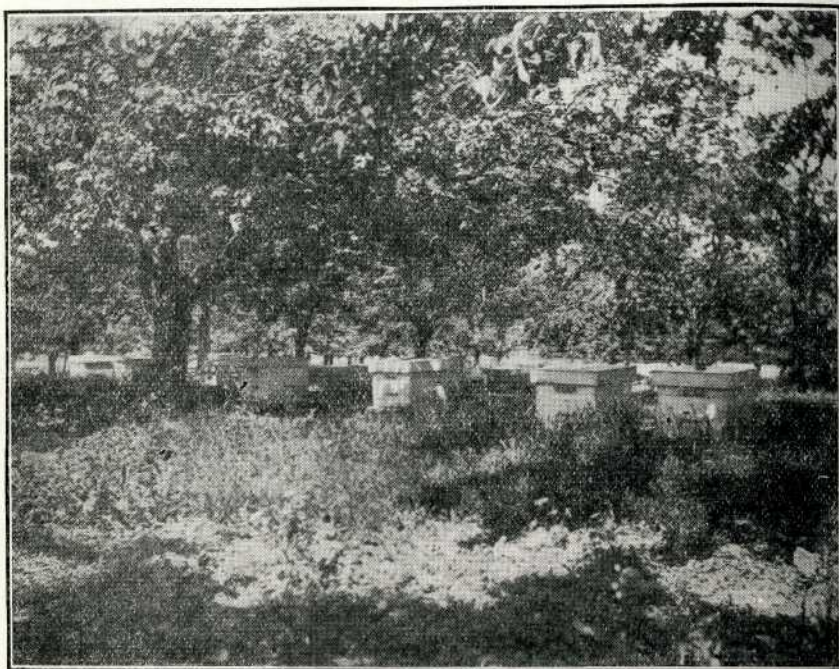
SOMETHING ABOUT BEES.

It is a recognized fact among all prominent bee keepers, that the beginner, no matter how great his interest and enthusiasm, should start small and gradually build up his apiary and at the same time gain experience. Many a bee enthusiast has made this mistake and on account of his lack of knowledge, has sustained heavy losses and in some cases has been forced even to go out of the business altogether. A half a dozen colonies or even less gives a man, who is new to the business, about all the care and excitement he wants for the first year and after that he can increase as he sees fit.

The Langstroth hive has been chosen as the standard and the size containing ten frames is the one in most common use. The bee keeper should have at least one super for each hive, fitted with sections for the production of comb honey, or frames, which are used when the honey is to be extracted. A smoker is another necessity and should always be on hand when the hives are opened as it is most useful to quiet the bees

when they are inclined to be savage. A beginner should always use a veil and gloves, because he is apt to be nervous when first handling the bees and the protection of these articles will give him greater confidence and will lessen his desire to move rapidly which should always be avoided when working about the hives.

It is best to buy your hives in the spring as this gives you a longer time to become familiar with the habits and wants of



Apiary in Orchard owned by F. H. Johnson, Bridgetown.

the bees before the wintering process comes on, which is one of the greatest difficulties to be met with in bee-keeping. See that you buy good strong colonies which are in a healthy condition and be very careful to examine the frames well for any trace of foul brood.

As soon as the spring comes in and the buds start to open, the bees will emerge and begin work at once. Their first care

is to fill up the frames with honey and to feed and care for the younggrowing brood. There are three classes of individuals produced.

The Queen, which is the only perfect female in the hive. She it is who lays the eggs—from two to three thousand daily—and is at the head of the whole hive. She is more delicate in structure, than the other classes, and has a long tapering body which can be easily distinguished when inspecting a hive.

The Drones are the male bees and do no work whatever through their whole life. They usually hatch in May and are expelled from the hive in the autumn by the workers. They are not so large as the queen, nor so small as the workers, but are thick heavy chaps which can often be seen at noon around the entrance of the hive.

The Workers are imperfect females and constitute the great bulk of the bees in the hive. They are the smallest class and gather all the honey and pollen for the development of the brood and for winter storage.

When the keeper sees that the brood chamber is about filled with honey he places a super on the top of the hive, in which he puts either sections or frames—if desiring comb honey sections ; if honey for extraction, frames. Here he must be guided by the public demand, if comb honey is preferred and he finds that it pays him better to raise it in this form, he should by all means do so. If he exports it in the comb, there are various ways in which it can be put on the market, in boxes containing twelve sections, in cardboard packages containing but one section or unwrapped just as it comes from the hive, while if he extracts it he will use either glass bottles or cans of some sort, both of which, however, must be airtight to prevent granulating.

Swarming is the next thing to be watched for and will often take place as early as May and again the bees may not swarm till July. The early swarms are by far the most valuable as they have a longer time to gather honey before the winter comes on. The old queen always leads the swarm and she is accompanied by a large proportion of the workers. The swarm usually settles on a tree near the hive. From here they can be taken in a basket or some vessel and put in the new hive placed,

if possible, on the stand occupied by the old one. This is done, because the swarming bees are for the most part old and have been used to this stand, while the bees left in the old hive are young and would take just as readily to a new stand as to the old. Frames and foundation should be placed in the new hive so that the swarm will be able to start work at once.

Some seasons the bees are not able to gather enough honey to last them through the winter and when this is the case the keeper is forced to feed them some substitute. A sugar syrup, made of a saturated solution of sugar and water, is very good and can be fed from a can punctured at the bottom and placed on the top of the frames. Feeding is sometimes necessary in the spring if the bees are in a weakened condition, from lack of food through the winter.

When gathering the honey in the fall great care should be taken to remove it to the honey house as quickly as possible as the bees from the other hives are apt to smell the honey and start robbing each other. This is very dangerous, because the weaker colonies will be overpowered, all their stores will be taken and many of them will be killed. A little care however, at the time of gathering the honey will remove all fear of such a calamity.

In this country the bees are wintered for the most part out of doors. For this purpose many people use double walled hives and simply fill the intervening space with leaves, sawdust or some such packing. Where the hives are single walled, it is often a good plan to place them in a packing case and fill the space in the same way as stated above. In some cases the hives are simply wrapped with bags or tar paper and the bees emerge in the spring in a healthy and strong condition. In all cases however, the entrance must not be entirely closed, but only contracted, as the bees need ventilation in the winter and on warm days often get out for exercise.

Many of our farmers are going in for bee raising and the large majority find it to be one of their most paying side lines. The local markets offer a good price for both comb and extracted honey, and as the expense of keeping and rearing is but slight, the returns pay the keeper well for the time and trouble he has expended. Beside the direct returns received from

the honey, however, there is another great factor which must be considered, viz : the cross pollination of the fruit blossoms. This, to my mind, is the outstanding reason why all fruit raising farmers should keep at least a few colonies of bees. In some years, when the blossoming season is short, the presence of bees on the farm may save the keepers whole crop and enable him to have a successful year, which otherwise would have been a total failure.

A. G. D. '13.

MARKET GARDENING FOR PROFIT.

As success is the sole ambition in all enterprises, so it is in Market Gardening.

In order to attain success you must locate as near to a good market as possible, have the soil rich and in the very best tilth and grow as cheaply as possible, the very best kinds of vegetables. It is well also to have the vegetables ready when the market makes the greatest demands for them.

Let us now consider briefly some of the common garden products that pay well. First let us consider the potato. Say we grow three acres of potatoes planting equal amounts of early and late varieties. We were able to dispose of our early potatoes at two dollars per bushel and our late ones at two dollars per barrel, giving us a profit of \$500 for the three acres.

Our cabbage is another money maker. We raise twenty-five to thirty tons of cabbage per acre. It is not customary, however, in the Maritime Provinces to sell them by weight but by the head. Heads usually sell at four to five dollars per hundred. On an average we grow on an acre of land about twelve to fifteen thousand heads depending upon the variety. Thus we can see the handsome profits in growing this meritable member of the Cole family.

Next let us consider carrots, beets and parsnips. These are sold in bunches of four or five. These bunches are sold at from thirty to fifty cents per dozen which is equal to seven or eight dollars per barrel. I might say here that the total cost of raising them did not exceed forty cents per barrel last season.

Turnips are also another big money maker which should not be overlooked. Turnips may be grown at from five to six cents per bushel and last year were in great demand at one dollar per barrel of two and a half bushels.

In concluding I may say that a fair amount of these vegetables may be carried along as a side line to general farming, and especially with dairy cattle which delight in chewing up all the offals which are very condimental. This has been my own particular experience with this kind of farming, and find it not only a pleasant occupation but a very paying one as I have explained above.

WM. ARTHURS '13.



Dairying and Poultry

POULTRY ON THE FARM.

By J. G. HANEY, of I. H. C. Service Bureau.

USUALLY A SIDE LINE, BUT VERY IMPORTANT—POULTRY PRODUCTS EXCEED IN VALUE THE YEARLY PRODUCTION OF WHEAT—KIND OF BREED IS NOT SO IMPORTANT, BUT SHOULD BE KEPT AS PURE AS POSSIBLE—THE FLOCK SHOULD BE PROPERLY HOUSED — KIND AND AMOUNT OF FEED EXCEEDINGLY IMPORTANT IN POULTRY MANAGEMENT.

Generally the farmer when asked as to how his chickens are getting along will answer, "I don't pay much attention to those as they are looked after by the women and the kids." However, this important branch of farm work in 1900 had a total value of over \$100,000,000, and the year 1911 totalled over \$750,000,000. These figures doubtless represent the amounts that were sold and not what was used on the farms. As indicated above, the use of poultry products is greatly on the increase and is worthy of careful consideration.

The question of breeds is one that need not bother the farmer a great deal. Of course, if he is going into the poultry business exclusively, he may find that certain breeds are better suited to a particular locality or condition than others ; however, it is probably true that the largest amount of products are from flocks of no special breeding, but the profits could be very greatly increased by paying attention to this subject. A certain breed should be selected and kept as pure as possible. It is not advisable for very many to go into the breeding business, but should depend on buying their breeding stock from reputable breeders, who have a knowledge of the performance of every stock.

It costs perhaps just as much to feed a hen that only lays 50 eggs a year as it would one that laid 150, and it is not im-

possible to get entire flocks that would average this latter figure. While it is not possible for every farmer to use a trap nest and determine exactly what each individual hen is doing, he can buy breeding stock of known productivity.

The results from a flock of poultry are usually directly with the amount of care and attention given them, and there is perhaps no other department of the farm that will respond more readily to a given amount of effort than the flock of poultry.

It is not necessary to have expensive hen houses and give them one's entire attention, but there are certain things in the way of buildings and attention which are essential. The modern poultry house should be a compromise between two extremes in poultry house construction, between the open shedshelter on one hand, which is too open, and the large, double boarded, tight house, which is too close. In the former the fowl suffer from cold, in the latter they suffer from the lack of fresh air. The modern house is the composite of the successes of centuries and the result of the elimination of many mistakes. The house must be first of all cheerful, healthful, comfortable, convenient, inexpensive and durable. In order to meet the conditions of climate. That is, it would not do to build the same in the southern states as in the northern, for the reason of the difference in climate. The size of the flock would determine the size of the poultry house. The modern tendency seems toward larger flocks, and therefore larger houses. This is because the labor required to attend to large flocks is relatively less than with a small flock, and also the larger house is proportionately cheaper to construct. The amount of space required per hen is a disputed question, and depends upon a number of things, such as the location; as to whether it is protected or exposed to strong winds; as to whether the fowls are allowed to run out on range a large part of the time, and also as to the size of the breed. It is, however, now generally considered that each fowl should have four to five feet of floor space. The location of the poultry house is very important and the following factors must be considered. It should face the south if possible to get the largest benefit from the sun; be protected from prevailing winds by hills, trees, or other buildings; should be located on well-drained soil so as to insure dryness; should be

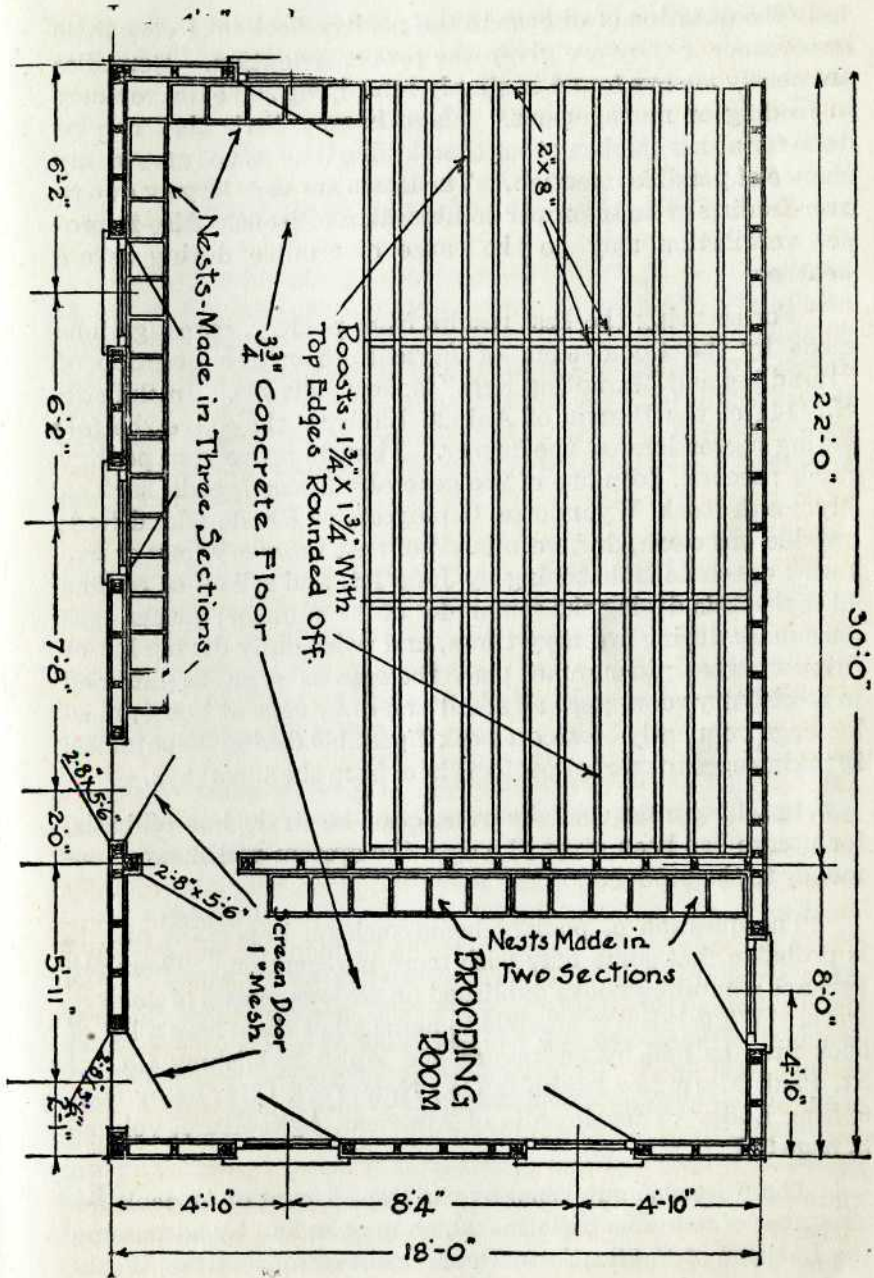
so placed as would be possible to have trees for shade and good pasturage during the summer months. It should not be placed in a low place where the cold air settles. Such locations are often colder than high and more exposed places. As to the shape and construction of the house, there is almost an endless variety to select from. This is only important in so far as it enables the including of the essential principles of construction.

The feeding of the stock is perhaps the most neglected operation in poultry management. Where they are allowed to run at large about the farm, they usually secure more feed than is necessary ; where they are kept in pens and fed, they are often not given what is required for best results. However, there is doubtless more trouble with over-feeding than under-feeding. The ration for the poultry flock must be varied according to their needs. It must first contain a sufficient amount of the digestible nutriments for their requirements ; it must be of such food as is relished by the fowl. Fowl have a decided preference for certain foods which cannot be accounted for by their composition. The following grains are preferred by fowl in the order named : Wheat, corn, oats, peas, barley, buckwheat and rye.

Habit may play an important part in determining their preference for certain foods ; hence it is not advisable to make radical changes in the food given. The ration should provide a great variety, as they become tired of eating one kind of feed continuously. The feed should have sufficient bulk to enable digestible secretions to act on it quickly. When a large amount of a single, concentrated, ground grain is fed, the ration may be so concentrated that it will become compact in the crop. Thus a certain amount of bulk in the ration is necessary. This may be provided by feeding wheat bran, chopped alfalfa or clover. However, the ration must not be made too bulky. The kind and quantity of the different grains fed would be perhaps determined quite largely by what is grown on the farm, as it should be the practice to grow what is needed for feeding. It is indispensable that a good supply of grit in the shape of sand or crushed bone or shells be kept on hand. The quality of their meat, and also of the egg can be largely influenced by feeding ; hence it would not be desirable to feed in excess any of the highly flavored crops. The ration must be varied to suit the re-

quirements of the flock being fed. If they are to be fattened for market, the foods can contain a larger percentage of the starchy foods, while if it is desirable to stimulate the egg production the food must contain more of the elements which go to make up the egg.

Prof. H. M. Cottrell, now agricultural commissioner of the Rock Island Railroad, in speaking of egg production, used the argument that in feeding, the season of the year at which hens produced the larger number of eggs should be imitated as nearly as possible. To enforce this idea he told of an instance where a young man in New York state had observed that eggs during May and June were quoted at perhaps one-fourth what they were during December and January. He asked himself why this was, and naturally answered it by saying that May and June were the months when the climate and feed stimulated the egg production to the greatest extent. He further asked himself why it would not be possible to imitate these conditions at the time when eggs were so high in price. A study of conditions during the greatest egg production showed that if the climate is mild the hens are able to get plenty of exercise, a large variety of feed which makes it possible for them to reach the maximum in egg production. He reasoned that it would be possible for him to build warm, airy coops, heat them, if necessary, artificially. He could combine grains in such a way as to secure a variety of feeds, and to take the place of the insects which the hens collect during the summer, and doubtless add greatly to their ability to produce eggs, he would buy meat scraps, etc. He studied out every condition which he thought must be met, but he was unable to get his hens to exercise themselves properly in the houses. He had bought during the fall a large amount of low-grade cabbage that he intended to feed them to take the place of green feeds. He conceived the idea of hanging these cabbages from the roof so it was necessary for the hens to jump up a foot or so to get at the cabbage. This he thought would certainly give them the proper amount of exercise. This all done he said : "I have now given the hens the exact conditions which existed during May and June, and they must either lay eggs or bust." The story ends that he was very successful, and enabled to carry out all his plans which included a college romance.



The question of disease in the poultry flock is of very little importance if they are given the proper attention. Remedies are nearly always found in simply remedying some discrepancy in feeding or management. There is very little that can be done for a sick chicken other than killing it so as to remove any chance of possible infection. The losses are very largely due to over-feeding or an improper combination of feeds. Also improper ventilation may be the cause of trouble during severe weather.

For securing the best results from poultry, investigations made by the Department of Agriculture on the question of "Handling and Marketing Eggs" is very valuable. In Bulletin No. 141 of the Bureau of Animal Industry they give the following suggestions to the farmer. First, improve your poultry stock ; second, keep one of the general purpose breeds, such as Plymouth Rock, Wyandotte, Orpington, or Rhode Island Red ; provide one clean, dry, vermin-proof nest for every four or five hens ; conclude all hatching by June 1st, and sell off or confine all male birds during the remainder of the summer ; gather eggs once daily during ordinary times, and twice daily during hot or rainy weather ; in summer place the eggs as soon as gathered in a cold, dry room ; use all small and dirty eggs at home ; market eggs frequently—twice a week if possible during the summer ; in taking eggs to market protect them from the sun's rays.

In selling insist that the transaction be on the loss-off basis, for if care has been given the eggs the system will mean more money to the producer.

The question of poultry being such an important one, it is probable that some may wish more information. There are perhaps a hundred books published on various phases of poultry work. While it is not possible to name all of them here a list of such may be had by addressing the Webb Publishing Co., of St. Paul, Minn., or Munn & Co., New York City, or by consulting Bailey's encyclopedia of American Agriculture, volume 3, page 527.

There are also published by the Department of Agriculture a number of valuable bulletins which may be had by addressing the Division of Publications, Department of Agriculture, Wash-

ington, D. C., and making inquiry from such bulletins, which may be had free of cost.

POULTRY RAISING IN ENGLAND.

Poultry raising is extensively carried on in nearly every county in England, and in many cases is a pleasant and profitable undertaking. In some places there are farms where only poultry is kept, but it is generally kept as a side line. I consider this is the best way, as poultry and orcharding or some other line of farming go well together. Success depends very much upon the ability of the owner, nothing pays for trouble more than poultry.

There are many varieties kept. Some of them are, Orpingtons, Leghorn, Plymouth Rock, Houdan, Dorking, Minorca, Game and Wyandotte, these are all very good kinds, but have different qualities. In some districts the Houdan-Buff Orpington cross is thought much of, and can hardly be excelled for laying qualities. I have had some experience with this variety and found it to be very good.

The feeding is much the same as in this country ; soft food in the morning with meat of some kind chopped up in it, as well as a little pepper or curry powder dusted in, especially in the winter when hens want warming up. At noon a little loose grain is generally scattered in some place where the birds have to scratch for it. And in the afternoon a feed of hard grain is given. Fresh eggs are the only produce of the farmer that has been for years steadily improving in price, the demand is always greater than the supply, while all the foods he needs to feed the fowls have been getting cheaper. Eggs now sell at from 50 to 75 per cent. better prices and foods have depreciated in price more than that. In nothing supplied to England by foreign countries would it be easier to create a more flourishing home trade than in the production of eggs, and fat fowls. However rapidly foreign produces of this nature can be taken over, owing to the excellent methods of collecting and transit

facilities afforded, it is not improved, to say the least, by the close, stuffy, packing, the shipping and the necessary delay of a long journey. Hatching is carried on at all times of the year, but all chicks required for laying during the following winter are hatched in March and April. A great many incubators are used, as these are always willing "to sit" and chicks can be hatched at all times of the year. The chicks when hatched are placed in brooders, which for the first few days should have a temperature of about 90 degrees, gradually lowering to 75 degrees when the birds are six weeks old. The chick should never be allowed to chill, as it never entirely recovers from the effects, although too much heat is almost as great a mistake as too little. Plenty of light and air are necessary, it is also well to be on the look out for vermin, as this delays the birds' progress. A good many chickens are hatched about the end of October, these are sold to poultry dealers in April and always fetch a very good price.

Birds that are being fattened are penned up in the usual way, with food supplied three times a day, but in many cases, the cramming machine is used during the last week of confinement. After the birds are killed and plucked, they are placed between boards and pressed until they are cold. Dislocation of the neck and sticking are the ways generally adopted for killing poultry. The head and neck are always left on, as the bird is thought to keep better. Packing and dressing should be neatly done, as the market value depends upon appearance to a considerable extent.

DUCKS

Duck raising is a branch of the poultry industry that can scarcely be said to be overdone, there is always a great demand for ducklings during the summer months. I consider that duck rearing pays much better than keeping chickens. If a pond or stream is near by, the stock birds require very little attention. They should be housed every night, so as to be able to collect the eggs. Ducks always lay early in the morning, so that one is able to let them out after they have had their morning feed.

The breeds most frequently kept are the Aylesbury, Pe-kin, Rouen and Indian Runner; the Aylesbury-Indian Runner

is a very good cross, but the pure Aylesbury is the best for all round purposes, it is large and obtains maturity very quickly.

Sittings of eggs usually fetch a good price and are hatched under hens and in incubators. I think that hatching with the first named is preferable, the eggs need to be occasionally moistened during the period of incubation. The ducklings are generally quite hardy after the first few days and if fed well and liberally, should be fit to kill in ten weeks. Ducks that are being kept for killing purposes should not be allowed access to the water, only enough being allowed for them to drink. September is the best month for mating stock birds, only the finest should be kept, and as soon as the mornings begin to get cold, the morning feed should be given warm. The man who devotes a little extra time to his birds, will get eggs earlier and will be better paid in the long run.—A. G. W.

DAIRYING.

Under the important subject of dairying we are only going to consider one or two phases which come under this heading. Whether dairying, generally speaking, is to be the principal feature in farm operations, or whether it is to be as a side line to some other branch of farming, the all important question to ask is "How can I best carry on the work, so that I may facilitate cost, and at the same time to turn in the larger profit, under ordinary conditions."

Perhaps it is difficult to arrive at any definite conclusions, but the first and proper way to begin dairying—after suitable and convenient accommodations are procured, is to select such a breed of dairy cows as are preferable to our liking and adaptable to our surroundings.

On the selection, whether for foundation stock, or for additions to the herd it is very important that two fundamental essentials be kept in view.

First.—That we select stock of sound pedigree, and

Second—Consider individual excellence.

These two essentials, coupled with good management, good sanitary conditions, and proper feeding and care, will govern the achievements of the dairy herd. Much may be said in favor of the different breeds ; and no doubt each breed has some preferences or another, when it comes to be discussed among individual stockmen. At present the Holstein, Ayrshire and Guernsey breeds are in the lead as regards milk production, but for general dairying, I believe the Ayrshire cow is not to be passed over lightly, either in regard to quantity or quality of milk produced. For a *dual* purpose cow, I would myself prefer the Ayrshire.

But here again it is a question of individual preference. There is a danger of getting the breed too fine, and not have then up to the standard weight, in which case they are outside as compared with the original Ayrshire Breed. If we follow our own judgment in the matter of the selection of breeds, and use care in breeding there can be no doubt whatever, that dairying will pay.

In Newfoundland, as in Canada, there is a great demand for dairy products ; and especially in regard to the former country, I may say that where milk retails at an average price of 40 cents per gallon, there is, practically speaking, an unlimited field for the farmer who can raise good dairy cows.

But dairying is not up to the proper standard that it should be. Dairy cows have not been made to give the amount of milk that they should yield ; provided they were properly housed, properly fed and well looked after. If dairying was scientifically as well as practically carried on, it would give its best returns under such conditions.

The following approximate costs of feeding an Holstein and an Ayrshire cow, under Maritime Province conditions, may prove interesting :

For Holstein cow giving from 60 to 70 lbs. of milk per day.	
1 1-2 bushels of turnips at 6 cents per bush equal9 cts.
15 lbs. hay at \$10 per ton	7 1-2 "
15 lbs. grain at \$30 per ton equal	33 1-2 "
Total	40 cents

2nd—For Ayrshire cow giving from 50 to 60 lbs. milk per day :

1 bush turnips at 6 cents per bush equal	6 cts.
14 lbs. hay at \$10 per ton equal	7 “
12 lbs. grain at \$30 per ton equal	18 ”
	—
	31 cts.

These relative costs are for dairy cows giving a full flow of milk. As the cow decreases in milk production feed about one lb. grain to every four pounds of milk.

We can therefore see that an average dairy cow will cost for feed from 20 to 40 cents per day. Supposing such an average cow, will yield 20 lbs. milk (2 gallons) per day (average) for 10 months. This would be worth about 80 cents per day at retail price in Newfoundland. Therefore it can be seen that a good dairy cow will give an average of 40 cents profit per day for ten months.

Is not this return a good investment.

H. A. BUTLER, '14.

DAIRYING IN CANADA.

Dairying is a great asset to Canada. Her great exports of Dairy products are known all over the world. The Canadians captured the highest prices at the World's fair at Chicago and Buffalo, for the largest cheese that was ever exhibited at any fair or exhibition.

Ayrshires are the favorite breed of Eastern Canada. In Upper Canada the Holsteins and Jerseys are more abundant.

The Ayrshire seems to be more adapted to the rough pastures, and rather more open country of the Maritime Provinces. They will do well on only fair pastures, and coarse roughage with a little grain and roots. In the Maritime Provinces, the dairymen, as a rule, do not have silos. They depend on roots and mill feeds to a great extent.

Another factor is, that by going heavily into dairying, the

farmers of the Lower Province, are increasing the yields of their crops to a large extent. The number of cows a farmer keeps determines the amount of crops he can raise so that if it were possible by buying mill feed and good hay a farmer could, say, increase the number of his cows one-half in the course of ten years, he would increase the yield of his crops immensely.

In Ontario and certain parts of Quebec and the Maritime Provinces the farmers have silos, which saves the food green for winter use ; the green food making conditions as near as possible ideal for the production of large quantities of excellent milk.

They find also by having their cows freshen in the fall months they get much higher price for their markets. The markets for dairy products are unlimited. At present we do not produce very much more than enough to supply the home demand. The markets of the world are open to us, and orders are sometimes filled for people in remote corners of the earth.

Although Canada produces such wonderful amounts of butter, cheese, condensed milk, cream, etc., we have still much to learn in the way of improvement of our herds. For instance, in Denmark the average yearly production for each cow is seven thousand pounds. In Canada our cows have the average annual production of *only* three thousand lbs. It would need only a glance to see that if the production of our herds could be increased to equal the herds of Denmark, that perhaps without feeding any more then we do at present, we would more than double the amount of our returns.

The Dominion and Provincial Governments with this end in view, give large sums each year to the encouragement of cow testing associations, the testing and weighing of milk, and the keeping of individual records.

The old-fashioned practise of making the butter up in the summer, and shipping it for sale in the fall has been done away with on account of co-operative companies formed by the farmer, buying the cream and making it into butter for a small commission. The choicest part of the cream he sells to the confectionery companies, who pay a certain premium for his choice cream.

C. B. S., '13.



College Life



THE DANCE.

On the eve of January 9th, the curling rink was the scene of a very pretty dance given by the college boys. There were about twenty-five couples present, and the ladies as is always the case, looked delightfully charming in their "chic" gowns. During the evening the Highland Fling was very gracefully executed by one of the fair guests.

The music was of a very high order, and we feel that we are fortunate in being able to secure such able "fiddlers." The dance breaking up at about two o'clock, the students wandered home to spend the rest of the night in packing their trunks in preparation for their departure next day.

For the first time in the history of this institution a college orchestra has been formed. A couple of rehearsals have already been held, and notwithstanding the fact that most of the players are novices at orchestra work, bright prospects are entertained for the future. The personell of the orchestra is follows :—

Piano—G. F. H. Buckley.

Violins—Messrs. Layton, Crawford, Flannigan.

Cornets—Messrs. Fishlock, Hunt and Munro.

Cello—R. Schafheitlin.

Trombone—A. J. Fraser.

It was through the efforts of H. P. Munro, '13, who is also a member of the Truro band, that this talent was "dug up." Mr. Layton '14, who is quite an accomplished musician, has been chosen leader, and under his leadership we feel that it will not be long before the boys will be furnishing music for the social functions of the college. It is hoped that this number will be enlarged and any additional talent which might be hidden be invited to join the circle.

V. S. C.

One meeting of the V. S. C. was held since Xmas, and a semi-report by the committee to meet the Mayor was given. As they had not been able to make an appointment with the Mayor before Xmas, they were advised to do so as quickly as possible by the meeting.

A committee to deal with the college reception was then appointed, consisting of Messrs. Woodman, Hunt, Filmore, Keenan, Kenyon, Buckley, Wright, Bremner, Schafheitlin. This committee was also empowered to deal with the banquet which is to be held at a future date.



ATHLETICS

Owing to the error of the printers, the report for athletics was omitted last issue, but the games played by our basket ball team are given below. Arrangements have been made with the manager of the rink, and the boys have two hours a week for hockey practise. Although no league has been organized in town this year, we hope to have some good hockey, as there are two or three teams being formed and the college will have a stronger team this year than they did last. Quite a few of last year's players are back and some of the new talent looks good. The following are the basket-ball games to date :

BASKET-BALL

N. S. A. C.—12

Bankers—25

On Tuesday, November 26th, the N. S. A. C. basketball team lost its first game by the score of 25-12.

The game was called at 8 o'clock and the teams faced each other—both confident of victory. The bankers started the scoring soon after the game was called and did not seem to have any trouble in keeping the ball out of their territory for the greater part of the first period.

The bankers were constantly penalized for fouls and gave a fine exhibition of how dirty the game of basket-ball could be.

The second period went more in favor of the farmers and at one time they had the game sewed up in a bag. However, by some good combination playing the bankers were enabled to again get the lead, which they kept till time was called.

The line up for both teams was :

N. S. A. C.

Peterson

Millar

Maclean

Sanford

Star

N. S. A. C.—15

Forwards

Center

Defense

Bankers.

Heffernan,

Leck

Walker

Carter

Carrol

Y. M. C. A.—22.

On Friday, November 29th, the A. C. team lost its second game to the tune of 22-15.

The game for the first period was close and the Y. M. C. A. team had hard work to keep in the lead. However, in the second period they managed to slip in a few baskets and retired from the floor victors.

Referees : Cameron and Walker ; Timer, Armstrong.

N. S. A. C.

Y. M. C. A.

Peterson

Forwards

MacDonald

Shaf

Pence.

MacLean

Center

Duncan.

Miller

Defence

Wall

Hunt

Ryan.

N. S. A. C.-15

Y. M. C. A.-22.

On Monday, December 9, a large number saw the A. C. team again go down to defeat in the hardest fought game that has been played for some time in Truro.

The game belonged to anybody throughout both periods, first one and then the other team had the advantage.

When the whistle blew for the end of the game the score was A. C. -21, Y. M. C. A-21 but the referee decided, that just as the whistle blew, the farmers had fouled and gave the Y. M. C. A. a free try. Pentz who tried, scored, and the game went to the Y. M. C. A. team.

Referees Cameron and Dexter ; Timer, Armstrong.

N. S. A. C. 17

Academy 17.

The best games of the season was played last Monday evening, when the college and the Academy met for the first game since the Xmas holidays. The playing was hard and even from start to finish. Both sides showing great form and speed. It was anybody's game throughout, and yet it was no body's, as the game ended a tie. The college boys are getting stronger each match and certainly deserve great credit for the game they put up against the best team in the league. Line up:—

Academy

N. S. A. C.

H. Dawson

Peterson

Cox

Forwards

Schafheitlin.

Dawon

Centre

Keenan.

Dexter

Defence

Hunt.

Armstrong

Starr.

Alumni and Exchange

ALUMNI.

W. F. Faulkner '11 in company with his brother is proprietor of book stores in Stellarton and Trenton and both brothers have prospects of a large business. Mr. Faulkner also spends part of his summer on his large farm.

J. H. Ross '11 is a class mate of Durling and Schafheitlin at McDonald.

Austin Scales '11 is raising foxes just outside Charlottetown, P. E. I.

E. S. Leonard, '10 is tilling the soil at his home in Paradise.

G. Magee '10 formerly of the M. S. A. staff is farming at Maple Lodge, Ont.

B. Gornall '10, a former editor of this magazine is the successful manager of the horticulture department on W. B. Ross' farm at Middleton. He attended our recent short course.

L. Baker '10 is in Middleton, N. S.

Several students who used to attend the college took in the short course this year.

EXCHANGE.

This month we have on our exchange list the following :
O. A. C. Review, Argosy, Gazette, McDonald College Magazine.

The McDonald College Magazine this month is a splendid number, but we would like to see more student talent displayed in the articles.

The *Dalhousie Gazette*, commenting on the November number of *O. A. C. Review* said it was the best magazine out, and in our estimation the last number is even better.



Border English : "Oh ?
 "Ay oo."
 "A oo ?"
 "Ay, a oo"
 "A ae oo ?"
 "Ay a ae oo."

What they meant was "Wool ?"
 "Yes wool."
 "All wool ?"
 "Yes all wool."
 "All one wool ?"
 "Yes all one wool."

It is now quite plain how they pull the wool over each other's eyes in England.

1st Junior—"The very first thing I sent to the magazine was accepted."

2nd Junior—"What was it on, poultry or horticulture ?"

1st Junior—"Neither, it was 65 cents."

(No such contribution will be thrown out. Let all try their luck.)

"Is Miss A—— in?"

Maid—"No, Mr. B——" (Junior)

"But I just saw her at the window."

Maid—"Yes, and she saw you."

Johnnie—"Mamma, a Normalite can see in the dark."

Mamma—"How do you know that?"

Johnnie—"Last night in the hall I heard one tell an N. S. A. C. student he had not shaved."

Humorist having his shoes shined.

"And is your father a bootblack too," he asked the boy.

"No, sir, my father is a farmer."

"Ah! he evidently believes in making hay while the sun shines."

If some of the taffy served out by four of the speakers of the short course to each other had been collected we might easily have started a candy kitchen.

Short course man pointing at Mac-e-n-z-e—"What is that?"

Senior—"Oh! that is the standard apple picker. Very superior type, ask for score card of the Pres. of the Junior class."

IN SUNDAY SCHOOL.

Teacher—"Ralph who made the earth?"

Ralph—"Kenyon."

First Short Course Man—"Why man your coat is all warped."

Second Short Course Man—"Yours would be also if you had to sleep hung up by a coat hanger."

Junior—"Say do you want to buy these skates?"

Senior—"What is the matter with them?"

Junior—"Nothing."

Senior—"Then what are you selling them for?"

Junior—"Nothing."

Senior—"Thanks, I'll take the pair."

Jolly Junior at Debate :—

“Electricity, gentlemen, is wonderful, I tell you it makes one think.”

Voice from audience—“Why don't you get a battery ?”

1st Senior—“I tell you Billy A-thu-s' land lady taught him a lesson ; he started to praise her cooking.”

2nd Senior—“Didn't she like it ?”

1st Senior—“Like it ! she raised his board.”

Heard in the halls :

“I think we met at the short course last winter. Your overcoat is very familiar to me.”

“But I did not own it then.”

“No ! but I did.”

Co-Ed—“Well, I suppose all your sweethearts gave you something for Christmas ? What was it ?”

Ill--y-- (sourly) mittens.

(It was noticed, coming up on the train, however, that he did not have them on.)

B- -gg—“Why did you break with your Normalite ?”

S-i-t-h—If I failed to show up every evening, she expected me to bring a written excuse from my landlady.”

Sunny Jim—“Sir, would you be very careful how you mark my papers as my folks suffer dreadfully from rerves.”

(A chip of the old block.)

Co-Ed.—In Physics keeping from freezing by following a strip of sunlight and making a great clatter dragging chair about.

Prof.—If you mind the sun we can have the blind drawn.”

Co-Ed.—Wretch ! would you have my life ?”

Prof. S. putting his head into the physics class room and withdrawing hastily ?

Prof B., falling, in a faint whispers—“When did he escape?”

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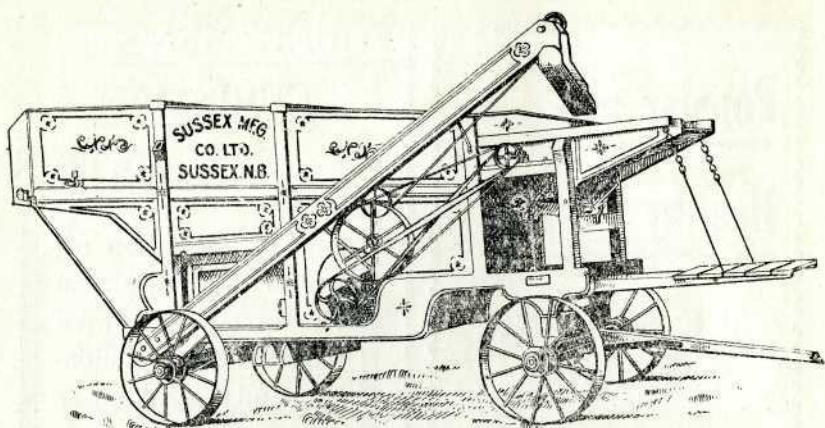
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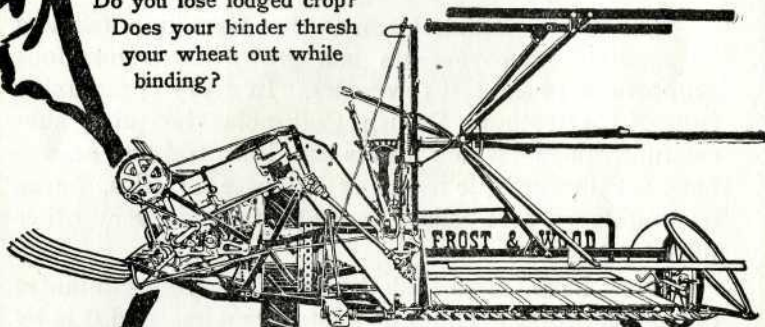
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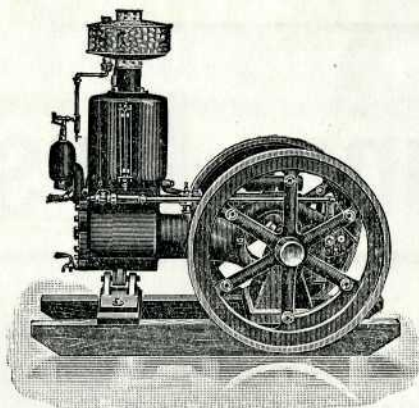
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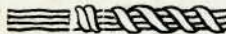



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