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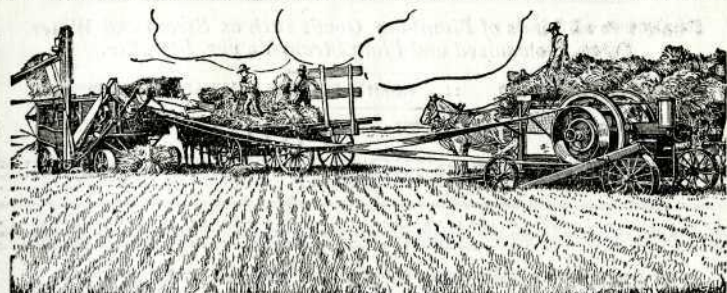
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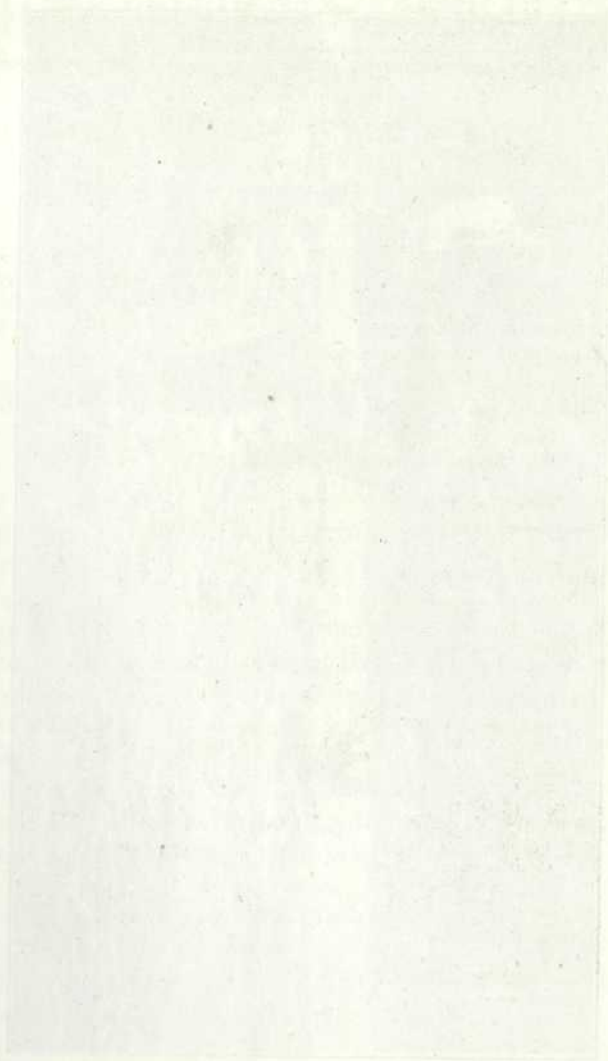
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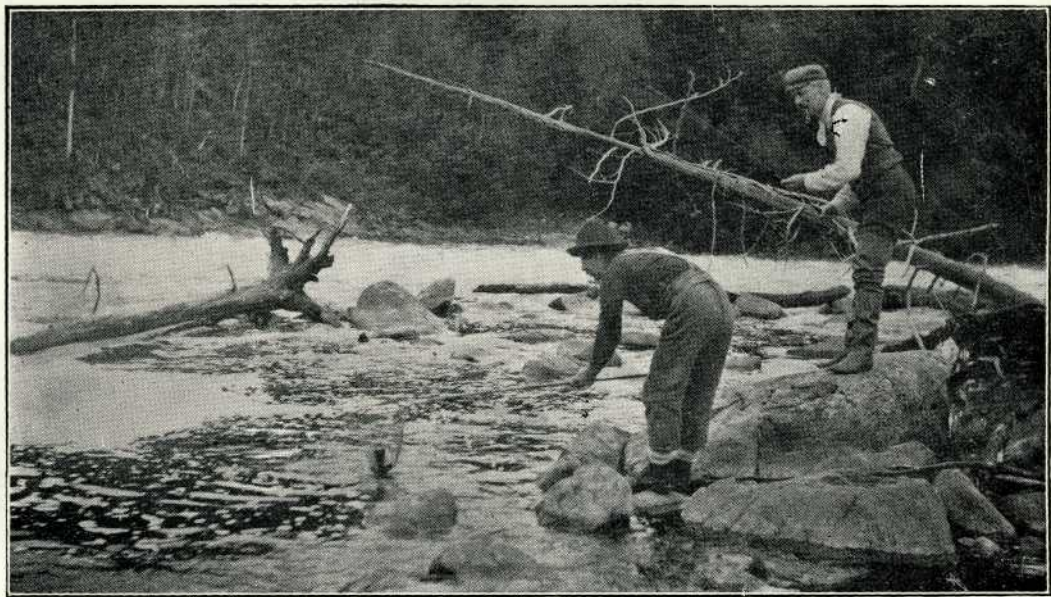
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FISHING SCENE IN NOVA SCOTIA

The
MARITIME STUDENTS' AGRICULTURIST

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Truro, N. S., February, 1913

No. 4

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EDITORIALS.

Undoubtedly one of the burning questions throughout this great Dominion of ours is that of road improvement. During the short course of this year a very valuable series of lectures was given on this subject, and undoubtedly great benefits will be reaped from it. One of the most valuable assets our Maritime Provinces could have would be that of good roads, not only for agricultural but also for general pursuits. Almost every newspaper or magazine one picks up to-day has an article on "Better Roads," and by co-operation of every farmer with those who are superintending the improvement of roads, these provinces of ours should be in the lead.

The main link between a graduate and his Alma Mater should be the college magazine, not only should he be a subscriber of the same, but he should show a lively interest in the welfare of that college by sending contributions to the magazine. All articles or open letters will be gladly received from ex-students. Many students, who perhaps get all they can from their Alma Mater, while attending college, completely loose track of all her doings after they have graduated. We have this year started an Alumni department in the M. S. A., and will be glad to receive news of any ex-students. At present

we have an extremely small per cent of graduates on our subscription list.

At times there seems to be a lack of real college spirit among our students. Of course we are under certain difficulties not having a residence, but there is no reason why the students cannot take a more lively interest in the college life. Our society meetings are, as a rule, poorly attended, the students are unwilling to pay the small fees which these societies levy and do not subscribe to the magazine. There are things which should enter into the life of every college student. We have not in the past been able to carry on very successful debates on account of our hall not being completed, but now let every student turn over a new leaf, do not necessarily take time from your studying hours and give that so often wrongfully given excuse "I have not time to spare to attend the meetings of societies, etc., on account of my studies." But rather let the student give time to that part of his college life which binds him more closely to his college as well as his fellow students, than taking his recreation in a way which is not connected with his college life at all. There has undoubtedly been a great lack of "esprit de corps" shown this year among the members of the student body.

The students wish to extend their sincere sympathy to Mr. Hicks in his recent bereavement.



AGRICULTURAL EDUCATION.

A question that comes up to the student in agriculture during his second year is "Shall I take the final two years leading to a B. S. A. degree or shall I be content with the two years only." At first thought this appears an easy question ; nobody denies that education is a good thing, therefore the more education a man has the better he will be. But this does not, necessarily, always hold good for the farmer.

First of all, what do you intend to do ? If your intent is a profession on scientific agricultural work, naturally, the thing to do is to get the best agricultural education possible. But on the other hand, if you intend to return to the farm on completion of your college course, then the matter is a little different. In this article I will only deal with the latter course.

The first question that comes up is "Will the last two years of the four year course be profitable ?" Most farmers do not feel like investing \$1000 or \$1500 in any object unless it is going to be a profitable one. Now these last two years of the course will cost a man from \$700 to \$1000 besides what money he could earn at home during those two years, and it is difficult to see where the return on this money is to come from. The subjects taken up in these two years are of a scientific character, and do not, for the most part, deal with methods of improving or increasing the crops on the farm. Therefore the four year student will not increase his income any over that of the two year student, and, as far as the crops and direct money returns go, the last two years will not be paying for themselves. We do not expect a man after attending an agricultural college for two years to stand still, we expect him to keep in touch with his college, to read the up-to-date farm books and to be the first in trying out new or improved methods of farming ; thus he will be gaining an advantage over the other man, finishing the four year course. While the latter is studying up his scientific subjects, the former is putting his learning into practice and reaping large returns.

This brings me to a second point, namely that the two year man can be set up on a paying farm long before the man who takes the degree course. At the end of the first two years one

man puts his money into land, implements, etc., and begins work; the other puts his money into his education and at the end of the fourth year the first man is drawing a good interest on his money while the second man is just about "broke" with no money coming in. Thus in the matter of getting settled the two year man has a decided advantage over the four year man.

The subjects taken up in the last two years are not of much interest to the practical farmer, although they are of great benefit to the scientific agriculturist. What interest is it to a farmer to know that the chromatophones in *spirogyra* are arranged in spiral bands, or that the hydrocarbon butane can be called ethyl methyl meethaul? These things will not increase his crops to any extent. Also the last two years in agriculture tend to make a man too much of a specialist along one line of farming and when he goes back to his farm he will follow that line only to the detriment of the other branches. It is generally admitted that except in a few districts mixed farming is more profitable than farming along one special line.

Another point often used against the four year course is, that the last two years tend to educate a man away from the farm. It is an undisputable fact that by far the greater number of men graduating with a degree do not return to the farm, while nearly all of the two year course graduates do return to it. In the last two years a man is drawn further and further away from the farm, the holidays are short and mostly taken up with the preparation of his thesis; he gets used to the city life with all its pleasures and amusements, and he perhaps thinks he sees greater opportunities away from the farm than on it. And even if he does go back to the farm he is not apt to be as contented as the two year man. He misses the theatres, parties and other amusements and is dissatisfied, and that spells ruin; for I think it is an established fact that unless a man's heart is in his work, especially in an occupation like farming, he will not reap a benefit from it.

Therefore, it would seem as if the last two years in agriculture are not of much benefit to the intending tiller of the soil. But there are many benefits that he will derive from them. The training he receives at college during those two years both in classes and in the organizations that form such a large part

of modern college life, will fit him to be a leader among his fellow men. He will be able to benefit his community by improving the social conditions. He will be able to get up in rural meetings and give interesting addresses, and in fact on account of his higher education he will be able to talk about and give advice on all sorts of questions which arise in a community much better than the two year student can. He will also have enjoyed two years to which he will always look back with pleasure. For associating with his collegiates, exchanging opinions and having "big times" are certainly some of the greatest and best days of a man's life. Whether these benefits will outweigh the points against finishing the course is a thing every man must decide for himself. If you do take the final two years, do not be led away by the apparently bright prospects along professional lines, but remember that in no other place will you live such a free and independent life, and in no other place can you do so much good in building up the welfare of the country as back on the farm.

O. SCHAFHEITLIN, '12



CHARLIE AND THE BEAR.

"I guess the old cuss can't get in there," said Tom Williams, as he fixed the bar across the door of his sheep-pen.

Then he went round to the back of the barn where a fat little porker grunted contentedly on his bed of straw, in a corner of the pig-sty. The sty itself was stoutly built of logs, at one end being a small enclosure, where the pig took his daily gymnastics.

"Oh ! I guess he won't bother you," said the farmer as he turned away. "Must see that the horse stable is alright."

The "old cuss" who seemed to bother the pioneer's mind so much, was a very lean, and very hungry bear, that had spent the winter sleeping in the mountains, and was now roaming the neighboring woods, with a very keen appetite, and a decided taste for fat mutton. Only the night before he had visited Farquhar McRae's sheep pen, and the next morning a neat roll of sheep skin, with the bones carefully placed inside, was all that was left of one of his finest ewes.

Having finished his chores Williams went into the house, put away his lantern, and removed his heavy boots.

"Didn't see anything of Bill and Charlie, Betty ?" he asked his daughter, who was preparing the evening meal.

"I heard that they were goin' over to Mr. McRae's to watch for the bear tonight."

"I don't think they could have gone by, for they nearly always call," replied his wife, glancing at the same time at her pretty daughter, who was looking in the cupboard for something that wasn't there.

"Sit down to supper and never mind your old bears," said Betty, as she turned round with a very red face.

Just then footsteps were heard outside, the door opened, and "Bill" and "Charlie" entered, each armed with a long barrelled flint lock used in those early days, and sheath knives which they carried in their belts.

"Sit ye down and hae a cup o' tea," said Williams, after they had answered his civil enquiries for their health, and the errand they were on. "Ye'll be cold and hungry enough before

morning, I bet. Hey ! what's the matter with the old dog ?" The big deer hound, who had been dozing quietly by the fire-place, had got up and was walking toward the door, growling as he went. "Better let him out," said Mrs. Williams, "there may be a wild cat out by the barn."

Charlie McKay raised the heavy wooden latch, and drew the door in. No sooner had he done so than the great dog dashed into the darkness with a fierce yelp. A hush fell over the company, as they realized that out in the darkness, not so very far away, was an enemy. But it lasted only a moment, for from the direction of the barn came a shrill squeal. Something was trying to take the little pig ! Charlie, losing his presence of mind, rushed out into the darkness. Passing through the wood yard he picked up an axe as he went and made for the pig sty. A heavy body was crushing over the fence, the noise being accompanied by the wail of the unfortunate pig, and the barks of Rover.

Instead of going back for his gun Charlie kept right on. When he reached the barn he could just see what must be a bear disappearing in the darkness and dragging the pig. The moon was hidden by clouds but had he been plunged in Stygian obscurity the cries of piggie would have guided him. But he went across the clearing 'till he came to the edge of the woods. There was poor Rover, breathing his last, his side all torn and broken by the vindictive paw of Bruin.

Meanwhile the crashing of the branches in front told him that the bear was taking no chances, but was making for the "tall timbers" with all possible speed.

The weight of the pig and the rising ground impeded his progress so much that on reaching a small opening in the woods he paused for breath. A moment later Charlie came up to him. The young hunter was no coward, but the sight of that dark form in the obscurity of the forest, quite unnerved him. Swinging the heavy axe round his head he threw it at the bear and fled. It landed on Bruin's shoulder, making quite a gash. Maddened by the pain he started in pursuit, gaining at every bound. Charlie was making good time and had neared the edge of the wood, when a branch caught his woolen jacket. In an inatant his life would not have been worth a brass farth-

ing, but just then old man Williams and Bill Dennison came up, former carrying a fire brand, the latter his rifle. At the sight of the light the bear stopped, as if undecided whether to keep on, or turn back. Before he had made up his mind, Bill raised his rifle and fired. With a roar that made every living thing in the forest tremble, the great animal leaped into the air and fell back,—dead.

—M. D. M. '13.



"THE RIGHT STUFF."

Some few years ago, when the prairie belt of Canada and the United States was first boomed for the enormous opportunities the region afforded to such as were willing to be pioneers in the opening up of a new country to civilization and ultimately to agriculture and commerce, it was described as "just the place for a man who had the right stuff in him." And, in every change of the condition or circumstances of some new country, this same expression is heard. It was said of England or rather of Britain by the ancient Phoenicians when they realized the importance of the tin mined there. It was said of America by the early Spanish and English explorers. It was said of California and the Klondike when gold was discovered in those places. It was lately said of Panama when white men were at a premium there. And as we have seen, it was said of the wheat belt. Yes—"a man with the right stuff in him." He is the one who goes where men are wanted and proves his merit. He is the one who shows his loyalty and patriotism by his efforts to develop the resources of the country. So explorers call for him to come and see their priceless gem and share the profits of its improvement. And he goes. The lure of gold, the vast opportunities for expansion, the romance of pioneering have enticed thousands of strong men and women to leave their homes and migrate to a new country there to build new homes and pursue new lines of work. All through the ages this has been going on amongst nearly all races of men and the chief results have been the spread of civilization throughout practically the whole world. And even in this late age, the strongest and ablest of our race are seeking new lands and new fields for advancement. And I suppose the process will go on in the years to come with as much ardor and zeal as is and always has been manifested. "The man with the right stuff in him" is the man who is wanted to develop the new country.

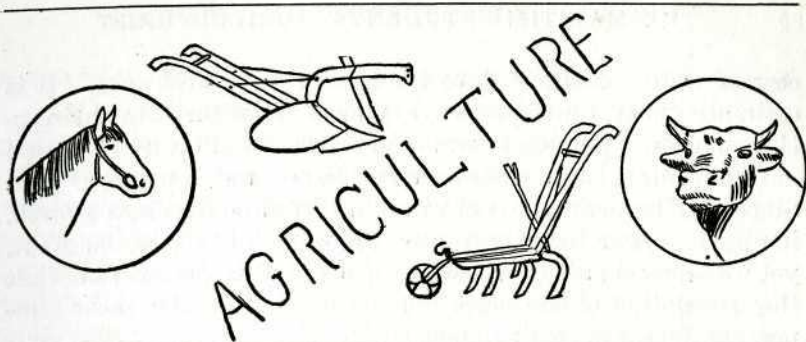
"The man with the right stuff in him" is wanted everywhere. This "new" country has no strong claim to him or to his faculties any more, or as much as has the country of his nativity, however "old" a country that may be. If the man who looks so far a-field for room to expand and develop, would

seek to find what opportunities were at first hand, they would generally find all the room for expansion that they could desire. If the farmers of Nova Scotia realized what tremendous advantages they have here at home, the lure of the west would no longer tempt them to leave all that means home to them, all that they are familiar with and that they love, to go to a new land where a stranger is at a great disadvantage and where life is a continual fight and that for enormous stakes. True, to the winner comes a pile of gold, but is that gold worth more than peace and happy contentment? I will say no more of the West, but I have somewhat yet to say of the East.

In the Province of Nova Scotia are agricultural possibilities which if reduced to figures would seem fabulous. There are thousands of acres of land unbroken by roads or large streams in Nova Scotia, which are excellent for agricultural purposes, to which the only objection is that it is too far from railroads. It is in very few cases more than fifty miles (is that too far?) from railroad or sea facilities. Moreover, the land already under cultivation is capable of producing infinitely more than it now produces. This province is admirably adapted to raising of stock. But there is comparatively little done along this line. Sheep and beef cattle could be exported by the shiploads and then more shiploads if only one condition were to be fulfilled.—“Men with the right stuff in them” must go to work and produce. Right here at home “the right stuff” can be put to use just as well as anywhere else and until it is, there is no excuse for complaint that there are no opportunities here.

Get down to business, farmers, and see if you can afford to leave behind you opportunities such as you never dreamed of, and go somewhere else “to get room to turn around.” I don't think you can. You belong to Nova Scotia if you are a Nova Scotian and we other Nova Scotians want you to stay here if you have got “the right stuff.”

R. M. L. '14.



RELATION OF SOIL MOISTURE TO SOIL FERTILITY.

What is this relation ? In order to make even an attempt to answer this question, we must first agree on our definition of "Fertility."

A fertile soil necessarily contains large amounts of the different elements of plant food, yet large amounts of plant food do not make a fertile soil. Why ? Chemical analysis of any, even our poorest, soils will show us stores of plant food equal in amount to that removed by our heaviest crops for lengths of time varying from fifty to some hundreds of years and also that our poorest soils differ relatively little from the most fertile in this respect.

What then is soil fertility ? It is the ability of the soil to produce plants. To the farmer, it is the ability of a soil to produce the crops he desires to grow. Thus the soil must not only contain plant food but must place it at the disposal of the plant in such form that the plant can make use of it. Of what value is a full granery to the hungry ox while the door remains locked and he is fast in the stall. There must be a means of entrance to the food and a transporting of that food to the place where it is needed. Water unlocks the store-house of the soil by its action in dissolving the plant food materials, for only in solution can the plant absorb its food. It serves besides, not only as a food in itself, for the plant needs it as a food as much as it needs nitrogen, but also as the transporting agent, the carrier of food, through the soil to the roots and through the roots into the plant where the food it contains is made use of while the ex-

cess of water passes off into the air through the leaves. It is estimated that, on the average, plants "transpire" in this way three hundred pounds of water in order to build up one pound of dry substance and their food can be secured in no other way. Since such large amounts of water are required for plant growth, it might appear that the water supply could not be too great, yet we know that it can, and this leads to this declaration that the regulation of the supply of soil moisture is the most important factor in crop production.

Roots of crops require air. They cannot live in saturated soil. So the depth at which we find standing water, will be the depth to which roots will penetrate, the deeper ones being smothered, thus reducing the feeding area for the plant and rendering it unable to obtain moisture when the surface soil is dry and the only moisture to be had lies at greater depth.

Again moisture affects temperature. Water is the hardest to heat of any substance found in soils. Pound for pound it requires five times as much heat as sand to raise its temperature. Even so, evaporation of one pound of water absorbs sufficient heat to raise five hundred and thirty-seven pounds one degree in temperature. Therefore the less water we have to heat and evaporate, the faster will soil become warm in spring.

Heat, air and moisture in reasonable proportions are necessary, not only for the growth of the plants themselves, but also in order that chemical and bacterial action may occur in the soil and so break down the stores of unavailable plant food into available forms as well as to appropriate certain elements from the air with which to supply the plants and the soil as in the case of "Legume Bacteria." The more these actions are hastened the more plant food will be rendered fit for use. As already stated, moisture exerts a controlling influence on heat. "Wet soils are cold soils." Moisture also controls the air content of soils, for air will fill all pore space of soil which is not filled with water.

Granting the importance of the moisture supply and of its regulation, we next notice its effect on the various types of soil and the ability of these types to control and make use of the moisture which comes to them. Coarse soils are not as fertile as finer ones because the amount of surface exposed to the mois-

ture and these other actions is less in proportion to the bulk of the soil. This may be proven by breaking a pebble in two pieces. The same weight will be present but you have all the old surface with the broken ones in addition. Thus plant food will be changed and dissolved more rapidly in finer soils. More water will be held by capillarity in finer soils for the same reason as this water is in the form of a film over the surface of the particles. The more surface, the more films. At the same time, water percolates through coarser soils more rapidly owing to larger open spaces which result in lessened friction. Thus the coarse soil gets rid of water more rapidly, holds less of it, and the water can do less good. On the other hand, very fine soil becomes saturated easily. Water is held too long. The soil becomes sticky and, in drying, cracks open and forms hard clods.

In how far can the moisture supply be controlled by handling of soil and how can its effect be augmented or checked as desired? It cannot be done absolutely but yet a great deal may be accomplished.

(1) Coarse soils should receive treatment which tends to compact them and so lessen the size of the pore spaces. Finer soils should be loosened to have the opposite effect. Both classes should be exposed as much as possible to the action of frost and other weathering agencies in order to break up the large particles of the coarse soil and to loosen the finer soil.

(2) Addition of humus, which tends to bind a coarse soil and to lighten or loosen a finer one. Humus acts as a sponge, holding a large amount of moisture before becoming saturated or allowing it to percolate away. It is this feature which makes barn-yard manure so much more valuable than commercial fertilizer. Addition of sand to clay or clay to sand is sometimes feasible and is always attended with excellent results.

(3) Good summer cultivation to keep a mulch over the ground when moisture is evaporated. This breaks the capillary connection and prevents the moisture of the soil from coming close to the surface to be evaporated.

(4) Under drainage of surplus water. Under drainage prevents surface washing which carries away the finest and best

soil and filters the water as it passes downward thus enabling the soil to hold the food contained.

It prevents fine soils from baking and cracking, breaking them down into granular particles which act like grains of sand and yet are each made up of many smaller particles which hold water by capillarity and yet allow comparatively rapid percolation.

It enables a soil to withstand drought better than before both because of deeper root system as before mentioned and by putting the soil into this granular condition. Water gets into it faster and it will hold more without becoming muddy and unfit to work, so the mulch may be formed earlier and the remainder saved.

It obviates the necessity for evaporation or heating of excess water so renders the soil warmer in spring, allowing cultivation and plant growth to proceed more rapidly. In practice, this often makes a difference of a fortnight or more in time of seeding.

It makes fields easier to work, and enables one to cultivate land which, without it, could not be worked and which, after drainage, is usually the best land on the farm as it is either humus soil or is, in whole or in part, fine soil washed in from higher ground.

No attempt has been made here to do more than to discuss principles. Practice must vary with varying conditions but principles remain the same. The handling of Agricultural land is too expensive to admit of any principle being disregarded. In order to secure best results, it is necessary to realize the full effect of each operation. Then, and only then, can our work be done so as to get maximum returns with a minimum expense.

B. H. LANDELLS, B. S. A.

THE IMPROVEMENT OF SMALL GRAINS AT MACDONALD COLLEGE, QUEBEC.

By Prof. L. S. Klinck, Macdonald College.

Three systems are employed at Macdonald College in an attempt to maintain the purity, increase the yield and improve the quality of small grains. Head-selection is practiced annually to keep standard varieties free from mixture ; the cent-gener system is used to isolate and multiply promising mother plants ; cross-breeding is employed to combine into one individual the desirable qualities existing in two or more pure line strains of proven worth.

These systems constitute progressive stages in the improvement of small grains. Careful head-selection must precede intelligent cent-gener tests. Cross-breeding cannot be most advantageously employed unless pure line strains of proven efficiency are used as foundation stock.

In this paper I shall confine myself to a discussion of our method of employing the cent-gener system and then deal briefly with some of the results obtained by this means during the past five years.

When the improvement of a given variety is undertaken, a hand selection is made of the most typical heads from the standing plot. During the winter a careful laboratory study is made of the heads and grains and the most typical are used the next spring for planting the foundation beds.

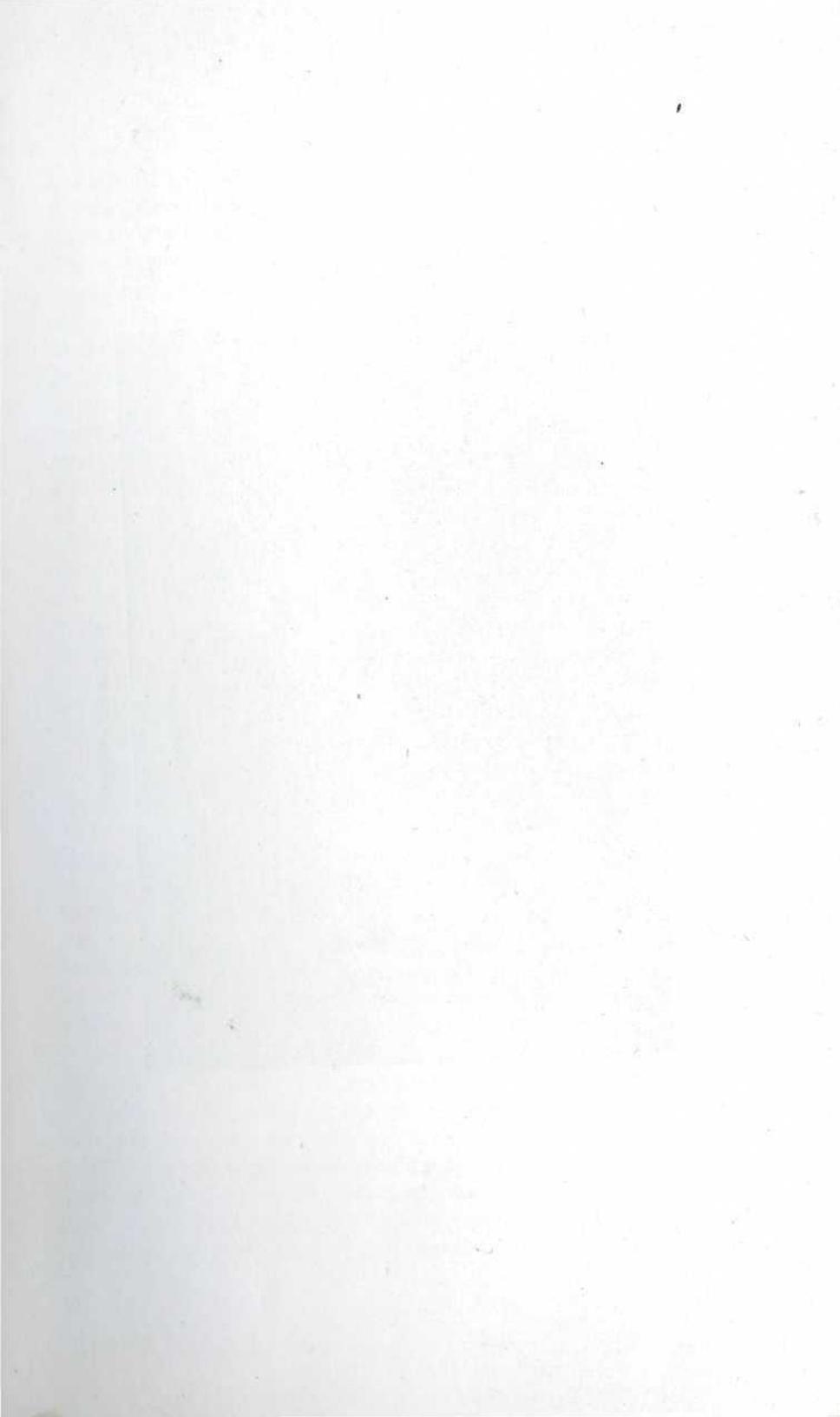
These beds, for convenience of planting and for facilitating a study of the resulting plants, are 100 links by 10 links. Only the most uniform parts of the experimental grounds are used for this purpose. The preparation of the seed bed is largely performed by hard labor. When properly fined and levelled each bed is marked off into squares four inches each way and a single seed is dibbled in at the corner of each square. This distance between plants has been decided upon because, so far as space is concerned, it approximates field conditions as closely as is consistent with enabling one to make a careful study of each individual plant.

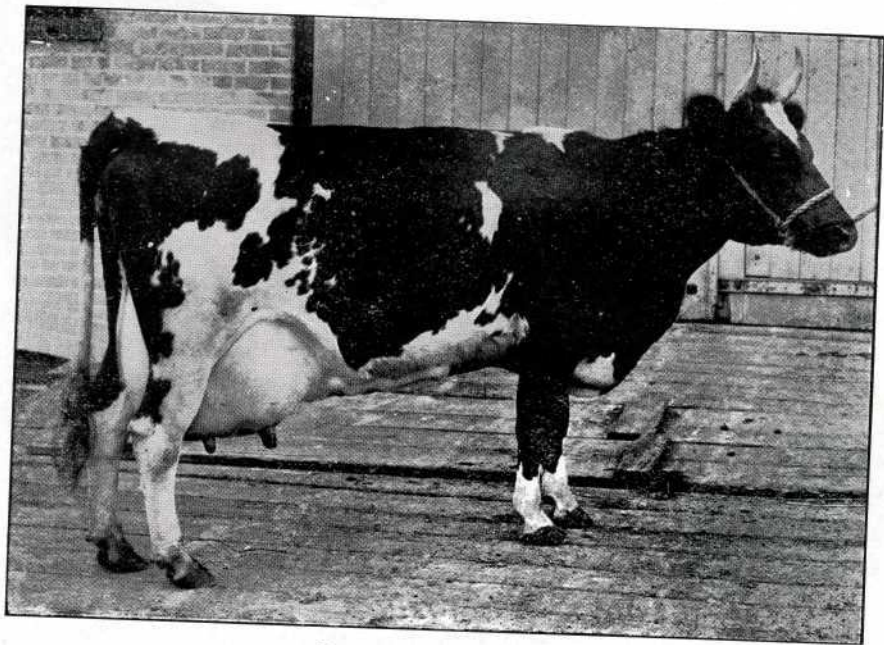
At harvest time the two outer rows in the foundation beds are discarded, as plants so situated have had a decided advantage over those in the centre of the plot. If a seed has failed to germinate, or if for any reason a plant has been destroyed, all plants immediately surrounding the blank space are discarded. Likewise all inferior and all mediocre plants are rejected and only those which, from a study of their physical characters, give evidence of making some advance over their fellows, are retained as possible progenitresses of new strains.

In harvesting foundation beds each plant is pulled up separately by the roots and carefully examined. Individuals which give promise of meeting our requirements are taken to the laboratory where a much more careful study of the plant, straw, head and grain is made. Usually a bed of 3,940 plants gives about 150 individuals of sufficient promise to warrant careful laboratory study. From this number not more than ten or twelve individuals, on the average, will measure up to standard requirements. These are threshed separately and the number and weight of the grains to be used in planting the centgener for the next year is determined. This somewhat full information is recorded not only for future reference but also to enable one to plant exactly the area required for next season's planting.

Centgener beds are planted the same as foundation beds except that two rows of a different grain are planted between centgeners. When these are removed at harvest, and the outer rows on the beds which are also planted with the same kind of grain are removed, the progeny of each mother stands out clearly and so enables one to make a careful comparative study of the different strains. These centgeners which have not bred true to the characters of the mother plant are discarded; those which have are harvested after full field notes have been taken. During the following winter each centgener is subjected to the same rigorous selection to which its parent was put the preceding year. Those which reach the high standard set for yield and quality are retained and multiplied; all others are discarded without further trial.

After the obviously inferior grains have been discarded,





"JEAN ARMOUR"

the product of the chosen centgeners is used to sow the multiplying plots. By this time the quantity of seed is sufficiently large to enable us advantageously to seed the plots broadcast. The exercise of great care, however, is still imperative and necessitates sowing, covering, rolling, etc., by hand to avoid mixing. Likewise these multiplying plots, though frequently one hundredth acre in size, are cut with a sickle, threshed by hand in sacks and cleaned by a blast of air from an electric fan to ensure maintaining the highest possible standard of purity in each strain. The product of each multiplying plot is bagged separately and stored in metal seed cabinets in which each drawer has a separate compartment. This reduces the danger of loss from mice to a minimum and renders mixing impossible. If, at the conclusion of a five years' field test, any of these strains demonstrate their superiority over the parent variety we have in this reserve an absolutely pure supply of seed with which to sow a much larger field plot and thus enable us to make a dissemination of the new strain sooner than would otherwise be possible. Few strains are discarded in the multiplying plots; practically all that are entered are carried forward next year to the larger trials in the general field.

In the field test for new strains the plots are all one hundredth acre in size. Here the new pedigree cultures are subjected to the Station's final test. The new strains are sown beside the parent varieties and a five years' test is conducted to determine whether or not improvement has been effected. If sufficient advance in the desired direction has been made to warrant the placing of a new strain in commerce, sufficient land has been set aside to multiply these strains advantageously and so enable us to make an early dissemination of the new strain.

Results of five years' work with the centgener system at Macdonald College are now available. Of the more than 500,000 single plants grown under control as previously described, only the best from the 116,000 planted in the spring of 1907 have thus far been tested side by side with the parent sorts in one hundredth acre plots for two years. From eighteen of our most productive varieties representing four classes of wheat, three of barley and two of oats, thirty-seven strains

have been isolated, which, on an average of the past two years, have yielded from one to five bushels per acre more than parent sorts grown beside them.

It is especially worthy of note that these average increases for two years were not obtained over the original, unselected parent stocks, but were obtained over original stocks which have, for the past five years, being subjected annually to the most careful hand selection of heads in the field and of grains in the laboratory.

Notwithstanding the rigorous selection described, we had under test in the field in 1912 three hundred and twenty-six pure line strains.

While these results convey some idea of the possibilities in the centgener system, it is not to be inferred that there is no place for other systems of improvement. In the opening paragraph, attention was drawn to the fact that the three systems generally employed were, in reality, progressive steps leading up to the accomplishment of a desired result. Realizing this, and believing that results can be most economically obtained only when pure line foundation stock of known performance is utilized in cross-breeding, the Department did not begin the work of crossing until last year when its first pure tested stocks were available for this purpose.



DRAFT HORSES vs. TROTTERS.

Which class does it pay the farmer best to raise? The question should not be a hard one to answer, and to most intelligent farmers the reasons for the answer should be self-evident. But present conditions would seem to indicate that many of them are either ignorant of facts, or else know "what's what" but do not practise it. It is a well-known fact that no small proportion of the farmers throughout our province have been raising and are continuing to raise trotting stock. Why they do so is hard to understand, when we consider the much greater profit in raising the draft class. It is the purpose of this article to point out to those who may not have given the

subject much consideration the principal points in favor of the draft or agricultural horse, and having done so to say a few words in regard to the type of animal desired in these classes.

Take first the case of the trotter. He may be pretty to look at and he may get over the ground at a good clip, but put him on a plow, a disc harrow, or a good-sized load and see how he "pans out." The trotter from start to finish is more expensive than the draft horse. He is harder to keep up, is more liable to disease and blemishes and unsoundness detract more from his value. It takes a good jockey to break him in, and even then he cannot be depended upon as trustworthy.

He is seldom sold before four or five years of age and up to the time he is sold he is a bill of expense to his owner, no work being obtainable from him except driving, and the less a farmer does of that the better for himself and his farm. The trotter must have size to enter the roadster class, and speed to enter the racing class. If he has neither of these qualities—and there are many such—the only demand for him is as an ordinary driver, and the price paid for horses of this class is comparatively low. So much for the trotter.

Take now the case of the draft or agricultural class. The only marked difference between these is in weight; the draft class including horses over 1500 lbs in weight, the agricultural class includes these over 1200 lbs. and under 1500 lbs. The points in favor of either class apply equally well in the case of the other. These are the horses that can pull a heavy implement day after day without signs of failing. They are easier to keep than the high-mettled trotters, unsoundness is not nearly so detrimental to their value, and anyone with ordinary common sense and kindness can break them in in a few days, with but little trouble. They can be safely worked in moderation at two years of age and the amount of work can be gradually increased, till at the time of sale, which is generally from four to five years of age, they have done as much work as the average trotter does in a lifetime. This work easily pays for their keep, leaving the sale price as clear profit. With regard to markets, there is an ever-increasing demand for this class of horses, prices often reaching \$600 for a team. Here, as in the trotting class, size is

an important factor, but undersized horses are not nearly so common, and a horse too light for the draft class can command a good price in the agricultural class.

Some man may say : "I have to have a light horse to do my driving." Well and good, but if he wants a driver, a far better horse than the trotter for general farm driving is the carriage type as represented by the Hackney. There is no more stylish horse, he is plenty speedy for the ordinary farmer and he can be worked in the horse-rake, cultivator, and express wagon, thus saving the heavy horses for team work only.

Now a few words in regard to the best type of heavy horses. The most popular and probably the best all-round breed for us is the Clydesdale. The desired type is massive and blocky, showing lots of constitution, freedom from unsoundness, good sharp action, and enough style to make the horse attractive. In buying select the individual with well-proportioned head ; muscular arched neck ; well muscled, sloping shoulders ; short back ; long underline ; deep, broad chest ; good, capacious bread basket ; strong loin ; well-muscled quarters ; rather short legs with clean flat bone, sloping pasterns, and broad, deep, waxy feet ; and abundance of quality as seen in the sleek, elastic hide, and the fine, glossy coat of hair.

In conclusion, let me say that I am not at all prejudiced against the trotting horse. He has his place as well as all others, but it certainly is not on the average Nova Scotian farm. It may be a paying proposition for the gambler, jockey, or horse fancier, but for the farmer—No !

J. G. A. '13.

CO-OPERATION FOR COUNTRY ROAD WORK.

Article by L. I. Hewes, in Southern Progress, October, 1912.

The fundamental trouble with country roads in all sections of the United States is lack of proper maintenance. The lack of proper maintenance begins with imperfect repair. Now a great defect in repair of earth roads is in connection with the drainage. There seems to be an impression among a great many road masters and supervisors that a ditch along the road, even some distance from the traveled way, is all that is needed to drain a road. This impression is, apparently, that the water is coming into the ditch from somewhere higher up on the grade and must be made to run into the ditch at all costs. It is true that during storms water does run into the ditches as it should but a ditch must always serve two purposes. It must carry away water which continuously flows into it from the crown of the road throughout its entire length. On a great many roads the ditches are so far from the travelled way that the water which falls on the travelled way itself cannot flow into the side ditches. It therefore accumulates in the roads, in pools or on hillsides, forms gullies in the wheel tracks and quickly puts the road in bad shape. In repairing country roads, therefore, the ditches must be broad and shallow and the crown of the road must slope directly into them. The ditches must not be more than 24 feet apart at the most.

When broad, shallow ditches have been dug along country roads either by hand or by the use of a scraping grader, there is a splendid opportunity for all the residents along the road to show their interest in its maintenance. For it has been repeatedly demonstrated that the best and in fact the only practical way to keep country earth roads in good shape for travel is to use the road drag. If every man who owns a pair of horses will take a rainy afternoon and construct a road drag from a split log or from a couple of planks as indicated in Figure (1) and then when opportunity follows, drag the road abutting his farm after it has become moistened by a rain, he will not only benefit himself but he will become a public benefactor as well. This dragging of the road is no longer in its experimental stage. It is known now that if a road is not full of cobble stones or pro-

truding ledges that dragging after each rain will keep it in splendid condition. In operating the drag, it is set at an angle of about 45 degrees in the direction of the road so as to move a small quantity of earth to the center. It is not a road building machine and cannot be effective unless the road is in reasonable repair. The road should be dragged frequently the first year and if it is a wide road three round trips will be necessary. If you can encourage three or four farmers in your neighborhood to undertake dragging in front of their farms, nothing more will be necessary. The improvement in the road is so obvious and the cost so little that no other argument is necessary.

Very few people realize the power of organization of individuals for a common purpose. There is no need of bad roads to persist anywhere. It is a delusion on the part of many citizens that an improvement of the roads would be too expensive for their community to undertake. If one-half dozen of such citizens would get together occasionally and lay out a map of their neighborhood, they would find that with a little study the thing that they cannot afford to do is to haul the produce through the mud or allow their crops to remain unmarketed when they should be moving to a shipping point. Every day that a road is impassable is a tax on the whole community, and every unnecessary cent per ton mile of haul is a worse tax than a good roads tax. If a group of farmers living on a ten mile stretch of road would actually figure out how much they would save if the cost of hauling on that one road were reduced five cents for each ton haul of one mile in a year, they would be astonished at the result.

The local road men in many communities are unduly handicapped. They are given a small appropriation which they must distribute over a large area and they know that their term of office depends largely upon the skill with which they can appease criticism from unfavorable voters. A little study on the part of citizens will show that this is all wrong. If the farmers would get together and form a good roads club and agree to select for their district a road man whom they are willing to support for a number of years, they would improve conditions immediately. Let a road man have the confidence of

his constituents. Insist that he be given an adequate amount of money to do the work that he undertakes. Too frequently he begins so much work that at best he can only partly finish his projects and the road money is all wasted. Let the road club insist that when he digs ditches he shall finish the digging ; that he shall be sure that the road surface is drained ; when he puts on gravel, let it be understood that the community does not desire a patch here and there but a systematic, consecutive application of new gravel of sufficient amount to bring about an improvement of the road.

One other important opportunity is always present whereby the citizens may aid in road improvement and that is in the matter of private driveways into farms and residences from the main road. Too frequently such driveways are a nuisance and a menace to good road conditions. Small tiles laid at insufficient depths constantly become broken and clogged and force the ditch water into the road. In many cases there are no tiles whatever and the ditch is filled to enable the farmer to haul material away from his land. If each resident along the road would see that his driveway ditch is free from obstructions either by installing a new underdrain of larger dimensions or by entirely removing the covered drain and paving the entrance with cobble stones, there would be a vast improvement on all country roads.



THE FEEDING OF A CHAMPION.

Corn is a good fattening food for cattle and hogs, and loud have been the praises sung of the corn fed cattle of the Middle States. Corn has been king as a feed in these states for years and the feeders have gradually become so "wrapped up" in it that they think it impossible to make good beef without it.

These feeders got a "jolt" this year at the Chicago International when the grade "doddie" from Manitoba, a steer which had never tasted corn walked away from the show wearing the purple ribbon, emblematic of the grand championship beef animal of the entire show, and was sold at the handsome price of fifty cents per pound. While teaching the corn belt farmer that there are other good feeds than corn, this should impress upon our feeders that feeds ready at hand should not be promiscuously discarded in making high-class beef. Canadian barley and oats are often just as profitable feed as American corn.

It might be of interest to our readers to know how "Glen-carnock Victor" this grand champion was fed. For the first eleven months he ran with his dam, a grade Aberdeen-Angus cow. During the first winter he was stabled and fed hay and grain. The next summer he ran in pasture getting a light grain ration, and that fall he was stall fed with oats and barley for a grain ration, after which treatment he won the championship at Brandon last March. Last summer he was stabled in the day and ran in the pasture at night getting a light grain-ration. About three months ago he was put on the ration that was to put him in the pink of condition for the International. During this period he was fed four times a day on a heavy grain-ration of oats, barley and bran with roughage consisting largely of green fodder. To keep him in condition he received a light ration of linseed meal and boiled barley. His exercise while on this heavy ration was taken in an open yard during the day.

This feed and care brought him out at the International without a soft spot or a spot that was not well covered weighing 1630 pounds.—*Farmers' Advocate.*

HORTICULTURE

THE ANNAPOLIS VALLEY AS IT IS TO-DAY.

Were an honest French farmer of Evangeline's time to revisit once more the scenes of his childhood, he would doubtless be rather bewildered.

The trains and the automobiles would fill him with superstitious awe, as would the many other wondrous inventions of his successors.

Even the whole aspect of the country would be changed. The dykes would still be there, the changeless tides and the marshlands. But in place of the unkempt old French apple trees that yielded such lucious food for the birds and squirrels, he would be astonished to see the abundance of carefully tended young orchards that are springing up,—the real wealth of the Valley.

The new methods and appliances would absolutely daze him. Pruning, cultivating, spraying, fertilizing, cover cropping, thinning, picking, packing and shipping are new words to him. Agriculture has become a profession to which the sciences are applied.

He would admire the lovely garb of nature in blossom time, little comprehending the work, energy, and brain power lavished in the production of such a scene. Even before nature awakes from her winter sleep the trees are molested by the saw and shears of the pruner, and a doubtful smelling concoction of lime and sulphur is applied to check the ravages of such pests as the bud moth and oyster shell bark louse. From March to November, the orchard scene is a busy one. As soon as the land is fit to be worked, the fertilizer is sown, and cultivation commences. The orchard, if it has not been ploughed the fall before is ploughed now. A two furrough gang plough is a most efficient instrument for the purpose.

"Cultivate and Spray"—incessantly, relentlessly, remorselessly. This is the orchardists slogan. The disc harrow follows

the gang plow, and finally the smoothing harrow is kept at work once or twice a week and after each rain. Especially during blossom time and when the fruit is setting all the possible moisture should be conserved.

Then late in June or early in July the time varying with the season, the final cultivation given and a cover crop of vetch or crimson clover is sown.

Meanwhile, the power sprayer has been kept at work. The second spray is given just before the blossom buds burst, and the third when the petals have fallen. The remaining sprays are given at short intervals of a week or so as long as the owner's patience and pocket-book will permit.

When the cover crop has stopped an excess of woolly growth, and the apples are engaged in their rapid development, the thinning process begins. Every deformed and spotted apple is removed when seen, and where the fruit is too thick, the poorest specimens are removed so as to allow ample space for each apple that is left to develop. Thinning can be kept up profitably till the fruit is fit to pick; the larger drops being used for cider, cooking or evaporating.

When the picking season arrives, an apple pickers' excursion is arranged for, and low rates are held out by the railroads as inducements for many from far and near to visit the Valley and spend a profitable two months picking apples.

Practically all the fruit in the Valley will soon be handled by the United Fruit Companies through a central association with headquarters and management at Berwick, N. S. The central association represents some twenty-five or thirty companies, the number of which is constantly growing. In past each individual has had a separate manager who received a salary of from eighty to one hundred and fifty dollars per month. However, in the future only a book-keeper will be needed in addition to the warehouse foreman, as all managing will be done by phone from the central offices.

Each company has its warehouse to which the members haul their apples as picked from the trees. The expense incurred by packing is deducted from the price received for the apples of the same number and variety have netted throughout all the companies.

No expense is spent to insure an absolutely reliable and uniform pack, a force of inspectors being maintained for this purpose. Needless to say the highest prices are secured for the fruit, which is all sold through the Central Association.

The farmers also believe in co-operative buying. All fertilizers, spraying materials, barrels, nails, pulp heads, etc., are bought in quantity. An annual saving of from six to ten thousand dollars is effected in buying fertilizers alone.

The growth of these co-operative companies, since the first one was established at Berwick a few years ago, forms an interesting history all by itself.

So fast is the whole Valley progressing and so bright its outlook, that we cannot see how any ambitious youth can leave this delightful place,—“The Garden of Nova Scotia,” where luscious fruits and lovely maidens rest the tired traveller’s eye.

TEN LITTLE CABBAGE.

Ten little cabbage, standing in a line,
Big slug swallowed one and now there are nine.
Nine little cabbages, put out very late,
One caught a nasty cold and now there are eight.
Eight little cabbages, looking up to heaven,
Larks fell in love with one and now there are seven.
Seven little cabbages, weatherproof as bricks,
One turned a moles run and now there are six.
Six little cabbages, glad they were alive,
Garden-boy hoed one up and now there are five.
Five little cabbages—only five, no more,
One flirted with a rabbit—and now there are four.
Four little cabbages, green as green could be,
Caterpillars ate one and now there are three.
Three little cabbages, meant to see it through,
One got a rotten heart and now there are two.
Two little cabbages, sitting in the sun,
One got a touch of it and now there is one.
One little cabbage plant, boiled till it was done,
Made a dainty dish for us and now there are none.

THE VEGETABLE GARDEN.

BY PROF. P. J. SHAW.

Every home, whether in the town or country, should have its vegetable garden. It is estimated that half an acre in vegetables will easily yield at least one hundred dollars worth of produce a year. Besides a saving in the grocer's bill it may make some difference in the doctor's bill and adds much to the pleasures of the table. Many people do not know the taste of good vegetables, simply because they get them more or less stale from the market rather than fresh from the garden.

If possible, the vegetable garden should be near the house, so that it will receive closer attention than if farther away, and be easy of access in gathering the vegetables. Sandy loam is the ideal garden soil because it is early, it quickly responds to fertilizers, and can be easily handled even after heavy rains. A clayey soil may be improved for garden purposes by drainage, fall plowing, and by the addition of liberal quantities of stable manure.

Fall plowing has the effect of making the land earlier in the spring than it otherwise would be. It favors the weathering action of the frost and also tends to destroy certain insects which have gone into the state of rest for the winter. Sandy soils which have been tilled the season before may perhaps be plowed early enough in the spring, but clay soils and land in sod had better be plowed the fall before, the earlier in the autumn for the sod land the better.

The quality of a vegetable garden crop depends greatly upon its making a quick and continuous growth. Vegetables which have been checked in their growth or which have made slow growth are apt to be tough, woody and bitter. Those which have grown quickly and continuously are more apt to be crisp, tender and juicy. Hence it is important for the quality of the crop as well as for the yield to have the land thoroughly prepared and well supplied with humus and quickly available plant food. It is because the gardener is aiming at quality, earliness and yield that he often indulges in what seems to the farmer an extravagant use of manures and fertilizers. The garden soil should receive a heavy application of well rotted

manure every year, or if fresh manure is used it should be applied the fall before and plowed under. Forty or fifty tons per acre is none too much for most garden crops.

In our country with its short growing season it is important to choose early and quick growing varieties in order to have them reach maturity. This is especially true of tender plants like corn, beans and tomatoes. Even with some of the hardier vegetables like carrots, beets and onions the earlier varieties are to be preferred because of their quick growth. Later sowings may be made for the winter supply.

The laying out of the garden may be a matter of individual choice but it will greatly facilitate the work of caring for it if the crops are planted in long straight rows so as to admit horse tool cultivation. In some instances these rows might be placed alongside the rows of some field crop, such as turnips or corn, and receive cultivation along with this crop. The substitution of horse tillage for hand labor lessens the work and relieves the drudgery of garden operations.

For carrots and parsnips the soil should be deep and mellow with the finest surface tilth. It should not be inclined to bake or form a crust over the seeds, since the young seedlings are delicate and come through the soil with difficulty. A sandy loam, or a soil well filled with humus is to be recommended on this account. A soil loosened to some depth favors the development of smooth symmetrical roots especially in the case of the parsnip. For table use some early and quick growing variety of carrot is desirable, such as Chautenay. Golden Ball is said sometimes to develop sufficiently for use in five weeks. Parsnips should be sown early in the spring, as the plant is hardy and requires all the full season in which to reach its maturity. Successional sowings of the early turnip rooted beets from early spring until the middle of June will give a supply of this vegetable for midsummer on through the winter. For winter storage it is better to cover all these roots crops in the cellar with clean moist sand.

Salsify is another root crop which should be grown in every garden. The root resembles the parsnip in appearance, The cultural treatment is similar to that of the parsnip. It is a hardy full season crop, hence the seed should be sown early.

The roots may be dug in the fall, or left in the ground until spring. When boiled, sliced and rolled in cracker crumbs and fried in butter, it has the flavor of oyster, hence the name of oyster plant.

Onions require a cool season and a rich soil with the best surface tilth. A rich sandy loam is a good soil for this crop. The land should be manured and plowed the fall before. It should be worked up in the spring by light harrowing so as to leave the surface soil which has been acted upon by the winter weather for the seed bed. For quickly available plant food apply a complete fertilizer broadcast in the spring, and harrow it in.

The onion crop may be grown from sets or from seed. The easiest way is to grow from sets, but the largest yields are obtained from seed. Sets are planted early in the spring in rows 12 to 14 inches apart and 2 or 3 inches apart in the row. This method of using sets gives an early crop of onions. To grow onions from seed, the seed is sown as early as the ground can be worked in the spring in rows 14 inches apart. Or it may be sown in boxes in the house, or in hotbeds, in March, and the seedlings transplanted to the garden in May. The last method gives the largest yields and is the best method of growing onions from seed in localities where the season is short. The onion crop should receive clean cultivation throughout the season.

Cabbage and cauliflower thrive on a deep rich soil. They require frequent cultivation to conserve the soil moisture and ensure continuous growth. If they are checked in their growth the quality of the crop is injured. For the early crop the seed should be sown inside, or in the hotbed in March or early in April, usually six or seven weeks before planting out. For the later crop it may be sown in a seed bed outside in May. The plants for the early crop should be well hardened off before being planted in the field or garden. Among Cabbage, Early Jersey Wakefield, Charleston Wakefield and Henderson's Early Summer are standard early kinds. Late Flat Dutch and Danish Ball Head are good winter varieties. The cauliflower is even more particular than the cabbage as to soil, season and moisture. The least check in its growth due to excessive heat,

dryness or lack of plant food may injure the quality or cause a failure of the crop. For this reason the early varieties are the best to grow either for early crop or late crop, as they take a shorter time in which to mature. Good varieties are, Extra Early Dwarf Erfurt and Thorborn's Gilt Edge. Only the best seed should be used.

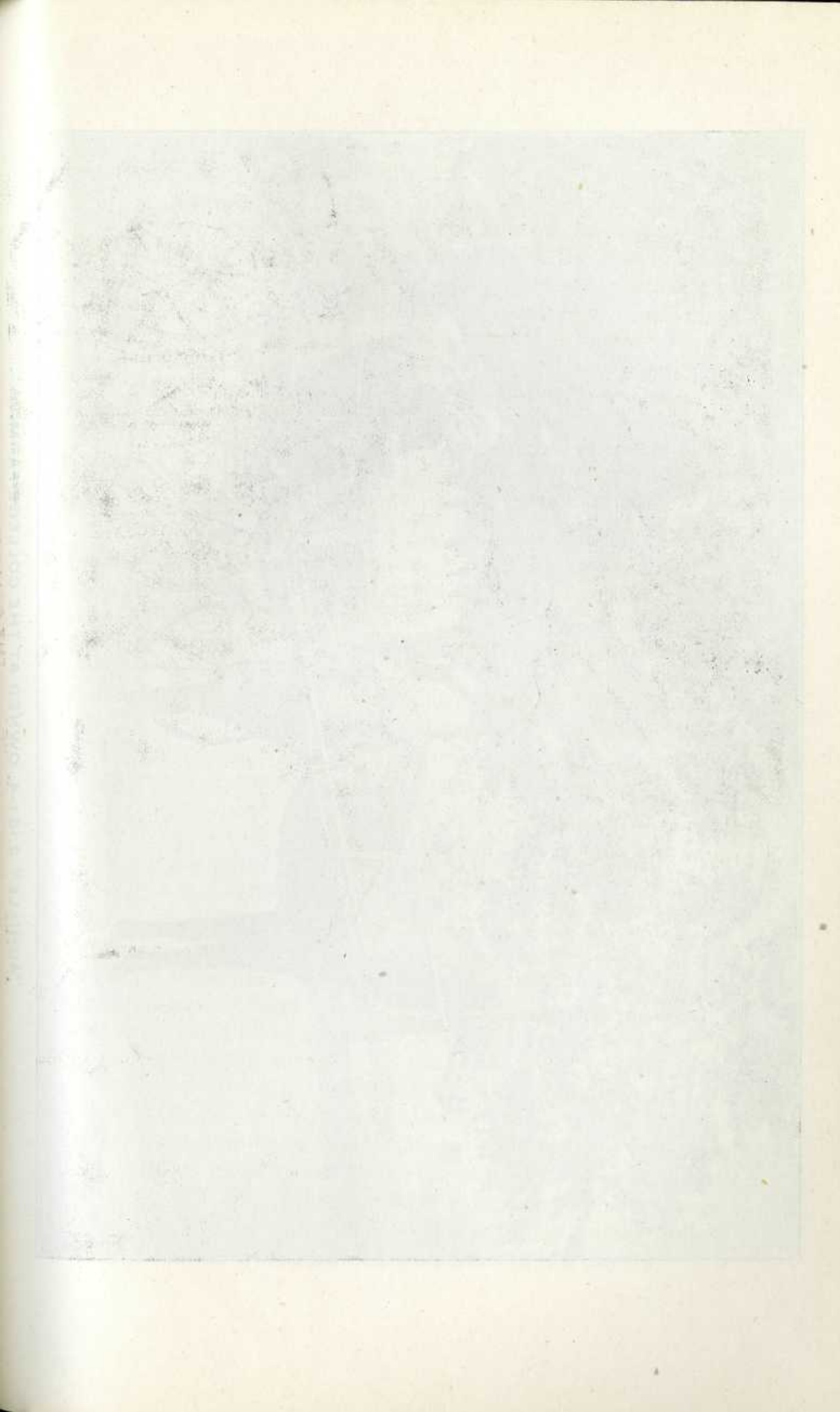
Celery requires a rich, moist soil and one containing plenty of humus and available plant food. Frequent shallow tillage is useful to conserve the soil moisture. As for cabbage, the seed should be sown in the house or in a hotbed, and for the late crop in a seed bed outside. Celery plants are improved by being given two transplantings. The first one which is given as soon as the seedlings are large enough to handle, breaks the main or tap root, and causes the plant to develop a more compact root system. Consequently when it receives its final transplanting to the garden there is less loss of roots and hence less check to the growth of the plant than if the first transplanting had not been given. Celery is planted 6 to 8 inches apart in the row and the rows 3 to 5 feet apart according to the method of blanching. Early celery may be blanched by means of boards placed edgewise on each side of the row and drawn a little closer together at the top than at the bottom. These boards are fastened by means of slats nailed across the tops of the boards or by means of wire hooks. A little earth is banked against the base of the boards to shut out any light from below and in two or three weeks the celery is blanched. When boards are used for blanching the rows may be as close as three feet apart. When using earth for blanching, the rows are placed further apart and the plants are first gone over by hand, the leaves brought together at the top and a small quantity of soil banked firmly around the lower part of the plant. This holds the leaf stock into position while the earth is thrown against them by the plow or the shovel. Blanching by means of earth is said to give the best quality of celery. White Plume and Golden Self Blanching are good varieties of early celery, Giant Paschal and Evan's Triumph of late.

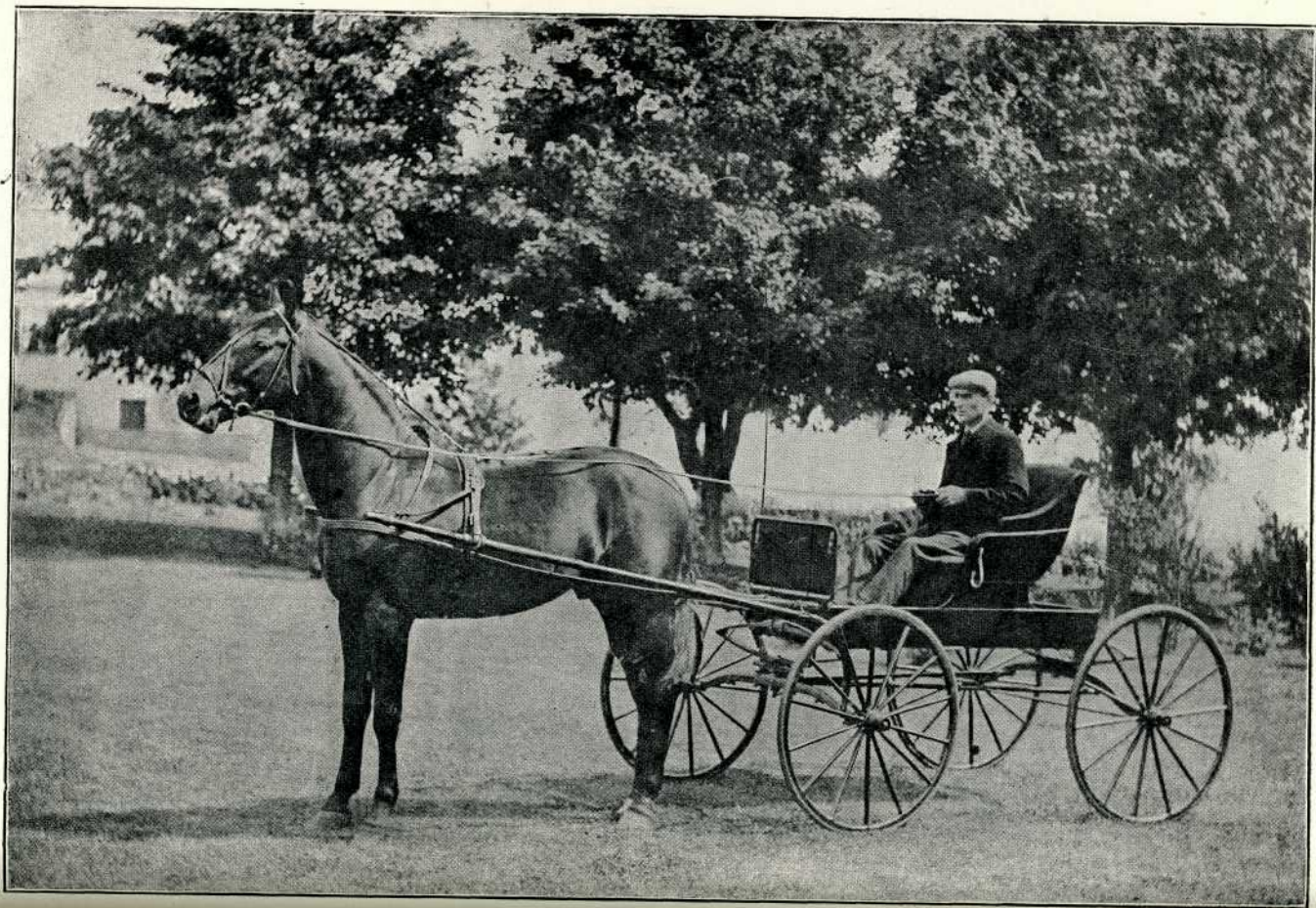
Peas and beans are legumes and therefore are capable of getting part of their nitrogenous food supply from the air. Hence they do not need as rich soil as most garden crops. Peas

are a cool season crop and do best if planted so as to make most of their growth either early in the season, or after the heat of midsummer. The smooth sorts should be planted as early in the spring as the ground can be worked. The wrinkled kinds are apt to decay if planted very early. The dwarf kinds are the earliest, and the tall growing kinds the heaviest bearers. The latter are sometimes planted in double rows 6 or 8 inches apart with brush stuck between the rows for support. These double rows are placed at a convenient distance from each other for cultivation. Early peas are First of All, Nott's Excelsior, American Wonder and Carter's Daisy. Late peas, Improved Stratagem, Telephone and Champion of England.

For early beans the ground should be in good tilth and well supplied with available plant food. Although the bean is a legume some of this plant food should consist of an available form of nitrogen, such as nitrate of soda. This tends to give the crop an early start. Good varieties of bush beans are Wardwell's Kidney Wax, Davis' Kidney Wax, Giant Stringless Green Pod and Red Valentine.

To grow a crop of ripe tomatoes in our short season it is necessary to select the earliest varieties and to give the plants the very best conditions for growth. Earliana and Early Ruby are two of the earliest. The seed should be sown inside, or in a hotbed, some time in March. About the twentieth is probably early enough for the region around Truro. In three or four weeks the seedlings should be transplanted into shallow boxes of rich earth and set about three inches apart each way. By the tenth or fifteenth of June they should be sufficiently grown and hardened off to be transplanted to the garden. Before transplanting the soil in the boxes should be thoroughly watered and allowed to drain off. The plants should then be taken up with a ball of earth adhering to the roots and planted firmly in well-prepared garden soil. A little nitrate of soda scattered about the plant at the time of transplanting aids it in making a start. Cultivation should begin at once and should be continued at frequent intervals until the plants are too large to allow further working among them.





"ACHILLE" 2.151-4. OWNED AT THE COLLEGE FARM.

THE PROTECTION OF WILD BIRDS.

It is proposed that the Department of Agriculture shall be authorized to adopt suitable regulations to give effect to the protection of our wild birds ; and with the vast amount of scientifically collected and carefully classified information which it has at its disposal in all the records of its various bureaus, the department undoubtedly is well equipped to undertake the task.

For several years increasing slaughter has diminished the feathered world almost to a minimum and measures must be taken to preserve these birds.

Thousands of wild duck from many of our provinces and from all parts of the United States, winter in a sheltered bay on the coast adjoining Virginia and North Carolina, called Currituck Sound and it is there that 200,000 birds comprising 16 species of ducks and many other types of water fowl are killed annually and are sent to northern markets, so robbing the people of both Canada and the United States for the benefit of a few. Stop the sale of game and increase the sale of poultry. Not only are ducks and such large game birds being so exterminated, but actually the robin and dove are shot as game along with many other useful insect destroying birds such as the Downy Woodpecker, the Nighthawk, the Bobolink or "Reed bird," the Killdeer Plover, which feeds largely upon caterpillars, curculios, moths, etc., and the White Breasted Nuthatch feeding largely upon borers.

It has been recorded that a pair of Grosbeaks visited their nests 450 times in 11 hours carrying two or more larvae at a time. Sparrows, Chickadees, Vireos, Martins and Warblers made from 40 to 60 trips to their nest in an hour, with all kinds of insects for their young.

One of the biological survey records the finding of 60 grasshoppers in the crop of one night-hawk ; and 500 mosquitoes in the crop of another ; 38 cut-worms in the crop of a black bird ; 50 canker worms in the crop of a cedar bird.

Prof. Tschudi estimates that a song sparrow devours 1,500 larvae per day and Prof. Forbush says that a single yellow throated warbler will consume 10,000 tree lice in a day.

By far the most efficient aids to man, in controlling the codling moth, are the birds. This insect does more harm to apples and pears than all the other insect pests combined ; the damage being estimated at \$12,000,000 per year. Thirty-six species of birds attack this insect. In some localities, these birds destroy from 66 to 85 per cent. of the hibernating larvae of this pest.

Ignorant farmers only too often shoot these useful birds for sport.

Is it not right then that these birds should be protected?

PHILIP E. DONAT, '14.



Dairying and Poultry

FEED AND CARE OF WINTER CALVES.

New Milch Cows in Fall give greatest returns when Dairy Products are Highest—Prepare Warm, Dry and Sunshiny Place for the Young Calves—Calves Should be Fed Three Times Daily when Young—Feeding Vessel Should be Kept Clean—Care Should be exercised not to Overfeed Young Calves—Provide Pens for Exercising.

Haney, of I. H. S. Service Bureau.

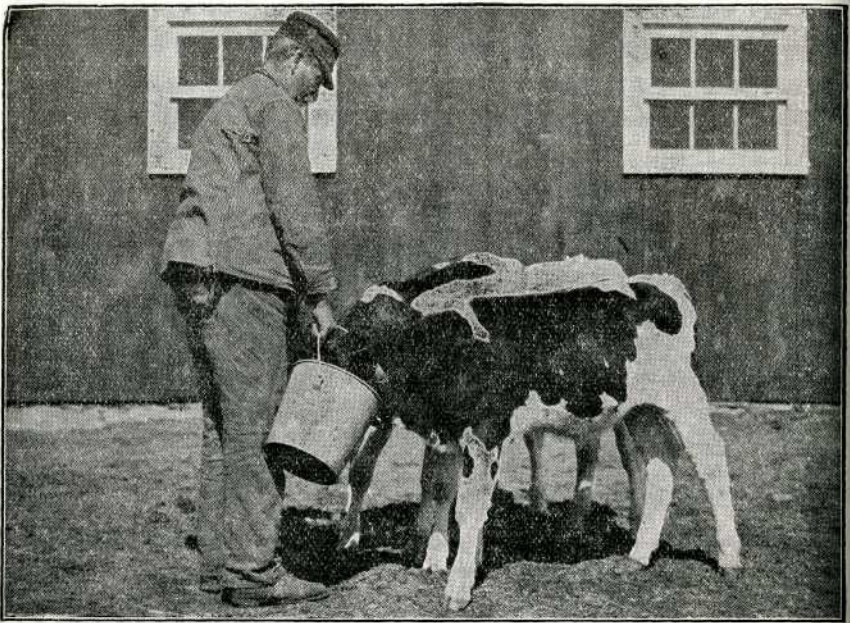
From the dairy man standpoint, it is usually desirable to have the calves dropped in the fall for the reason that cows can be made to produce a larger milk-flow at the beginning of the milking period than at the close. This admits of securing the largest quantity of milk at the time when dairy products are the highest. It also enables him to keep up the flow to the very last days of the milking period, as the feeds he is able to supply during summer and fall are more palatable than he is able to obtain during the winter.

There is a great variety of opinion as to just what time the calves had best come. For the good of the calf, it would be desirable to have it get a little start before the extreme cold weather comes on. It is also more pleasant to care for the young calves at first during the milder weather. It is certainly desirable in every way to have all of the calves dropped at as nearly the same date as possible. Calves of even size are much more easily handled and dealt with.

Knowing that there is to be a bunch of calves to care for during the winter, preparations should be made accordingly. While it is generally supposed that young calves require a great deal of attention and make a lot of work, this is not true if proper arrangements are made for handling them. If there are

more than four calves, there should be a special shed arranged with feeding stanchions.

The essentials of a calf-shed are that it be dry and as much sunshine as possible admitted into it. It should, of course, be warm but sunshine and dryness should not be sacrificed for warmth. No better place for the calf-shed can be selected than to build a lean-to on the south side of the cow-barn, which will admit of putting windows on the east, south and west. A



small lot should be provided for the calves to run out in and exercise during nice weather. For feeding the calves, if there are more than four, it will pay to build stanchions. There are various forms of calf-stanchions in use, the essential features of which are, that the calves are held in place while being fed and for an hour or so thereafter. It is desirable to know exactly what each calf receives in the way of milk and grain. Good hay should be placed where they can get at it at all times.

As to handling the calf, a great many dairymen take the

calf immediately from the cow, never allowing it to suck. Others will allow the calf to take a part of the milk for three or four days. In any event, it is essential that the calf have the first milk from a fresh cow, as the colostrum is necessary in starting the digestive system of the calf. The dairy-cow usually produces more milk than the calf is able to use, hence great care must be exercised in not allowing the calf to get too much. For this reason, it is perhaps safer to milk the cow and feed the calf from a vessel. If the calf is allowed to go without feeding for eight to twelve hours, it will usually be hungry, and by placing its muzzle in the milk and opening the mouth with the fingers, will take hold and drink without further ceremony. It is certainly desirable to teach the calf to drink as soon as possible without having to suck the finger. There has never been any calf-feeding device that has proved satisfactory. The calves should be fed every four to six hours for a few days. The period between feeds may then be lengthened to three times a day : morning, noon and night. The quantity fed must be somewhat determined by the size of the calf, but at first should perhaps be not more than two pints and gradually increased. At the end of the first week, they might receive four pints at morning ; two to three at noon, and four at night.

The three feeds a day should perhaps be continued for three weeks, after which they might be fed only morning and evening, and skim-milk gradually added to replace the whole milk. If the whole milk, which is being fed before this time, is very rich, it might be allowed to set for ten or twelve hours and a part of the cream skimmed off. However, the milk should be fed at about blood temperature and it is best to have the animal heat in it if possible, as this is most natural.

At the time of changing from whole milk to skim-milk, which should require at least a week, the calves should be taught to eat some grain. The calf stanchions, of course, should be in use before this time. These should provide for setting a vessel in front of each calf, into which its portion of milk may be poured. There are perhaps no better vessels for feeding calves than ordinary one-gallon earthen crocks. These are perfectly smooth and admit of being scalded and cleaned out carefully, as is necessary to keep them sweet and clean.

After the calf has had its milk ration, a handful of ground corn or Kafir-corn should be put in the feeding vessel. While it is a very general practice to mix grain with the milk, I do not consider it a good one, as it is essential that the calf chew the grain and secure the action of the saliva before it is swallowed. The addition of grain is for the purpose of replacing the fat which has been removed by skimming the milk. By adding the grain to the calves' rations, it is not necessary to increase the amount of milk fed as the skim-milk contains very nearly as much food value as the whole milk did, with the exception of the fats removed, and it only requires a small bit of grain to replace this. Ground corn or Kafir-corn at first should be fed. When two weeks old the calf relishes the shelled corn, but the Kafir should be ground. Oats is also good feed for calves, but it is unnecessary to buy high priced feeds to replace the fat removed by skimming the milk.

There is nine times as much trouble caused from over-feeding as from under feeding. The dairy calf especially, should be kept only in a good growing condition, and not fat. They should be encouraged to eat hay and other coarse material as it is desired to extend the digestive tract as much as possible. The feeding of the calves should be done with regularity, and great care taken to feed uniform amounts.

By using the stanchion, it is possible to soon teach the calves to come to their own place at each feeding, and the feeders should know exactly what each calf is being fed and give it no more or less, except for the gradual increase to keep up with the growth. They should be left in the stanchion for an hour or so after feeding them, for they are apparently more hungry after feeding them than before and often form the habit of sucking each others' ears. When a calf is observed to have this habit, it should be removed at once from the bunch and given a stall by itself for a few days, until it forgets the practice. The milk should always be fed at the same temperature or about 100 degrees Fahrenheit and always sweet. The vessels in which the calves are fed should be thoroughly scalded out every two or three days, depending on the weather. In cold weather, of course, there is not much danger of them becoming sour.

A great many calf-feeders consider it essential that the calf have access to some clean, loamy soil which they will eat to correct any irregularities which may occur in the system.

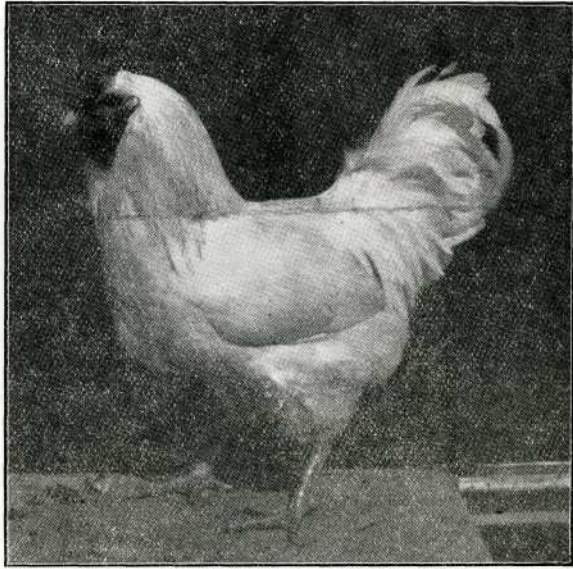
If the milk from the creamery is to be fed, it should be pasteurized before feeding. It is possible to raise calves from tea made from hay, but this requires very careful work.

The Kansas experiment station, (Bulletin 126) states the cost of feed to raise a good skim-milk calf, need not exceed \$5.27, in contrast to \$19.13 for whole milk ; and the cost of keeping a cow one year, if the cow is not milked. In a feeding trial of skim-milk, whole milk, and calves sucking dams, the skim-milk calves made the most possible gains ; whole milk calves, second ; and raised by dams, third. It is not only possible but profitable in every sense to winter calves on skim-milk.



The Production of Poultry in Nova Scotia.

The production of poultry in Nova Scotia is at present, and will be for some years to come, a side issue on nearly every farm. There are only very few exclusive poultry farms. The exclusive poultry farm has never been the success in the Maritime Provinces that it has been in the New England States. This is accounted for by the fact that nearly every farm has some poultry, and at certain seasons of the year more eggs and poultry are produced than are consumed in local markets.

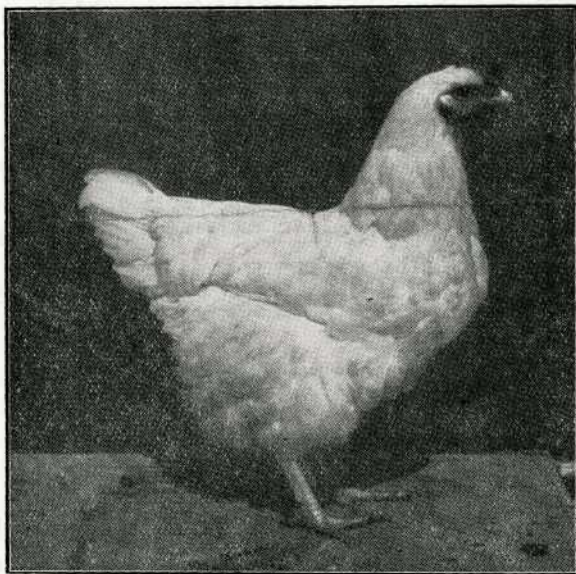


WHITE WYANDOTTE COCK.

The production is steadily increasing, and several firms are buying up all the eggs and poultry during the time of the year when the market is over-stocked, to hold for an increase price, which usually takes place after the bulk of each year's crop of the poultry and eggs have been marketed.

During the past ten years, the farmers have improved their flocks of fowl by attending to breeding and selection, and one may obtain poultry and eggs of as good quality in the stores of our principal towns, as is to be found anywhere. There is how-

ever, too large a portion of the poultry and eggs from our farms which is not placed on the market in good condition. The country store is the medium by which a great bulk of the poultry and eggs from our rural districts reaches the larger markets of our towns and cities. Our farmers would do much better from their flocks of fowls, if they would co-operate or form circles to market their poultry and eggs in a fresher and better condition. The consumer wants the poultry and eggs strictly fresh, but on many farms it is not always convenient to forward



WHITE WYANDOTTE HEN.

these products in a regular manner. As a result, they are taken to the country store, where they remain sometimes for a week before reaching the consumer. This system does not tend to insure the quality of the eggs, whether for immediate consumption or to remain in storage for later use.

In some sections a co-operative system is in use for marketing, which very well repays the attention it requires, but these sections are far too few. If our farmers will only give this subject the attention it should receive, there would be

very few complaints of poor quality of poultry products, and they would find the poultry the most profitable animals on the farm.

The writer, after an experience of ten years with poultry, would recommend the use of incubators for hatching chickens, and on the average farm it is much better to give the young chicks to hens to rear, the incubators are now made very simple and give good results in the hands of inexperienced persons, as well as experts.

In conclusion, I would advise the farmers of the Maritime Provinces to give more attention to the production of poultry, which in the face of a much larger increase in production during recent years, has also made a very great increase in price, due to improvement in the quality and the greater consumption of these products in our towns and cities. We need not, for some time, fear over-production, as the markets of other countries are open for these products, and have already sent these buyers this way during the past few years.

J. P. LANDRY.

SOMETHING ABOUT GEESE.

Of all the farmyard occupants none need less attention than the goose, yet they cannot be profitably kept unless they have a free range over pasture land, and even then we should not keep too many.

The two varieties best known in this country are the Emden and the Toulouse. For marketing purposes a cross between the two is preferable, as the two vary a good deal in characteristics, and the economic value of the cross obtained will be readily recognized. The Emden is not so large and does not lay so well as the Toulouse, but matures earlier and is a better sitter, and mother, and so by crossing a combination of the good qualities is obtained.

Geese being bulky birds require a good deal of room and

should not be confined in this respect, as far as their sleeping quarters is concerned ; on no account should geese or ducks be housed with other poultry. They will thrive best when they have an unlimited supply of fresh air.

In the morning a small feed of grain is all they require before they go off on their foraging expedition, but they can be depended upon to return to their house at dusk, which in my experience cannot be said of either ducks or turkeys. Grass and all kinds of herbage are their principal food for they are essentially grazers, so it will be understood how impossible it is to try to raise them unless plenty of grass, etc., is obtainable. If there is a small pond or running stream near their grazing ground so much the better, it will have its beneficial effect but it is not absolutely essential. The goose is a hardy bird and is seldom troubled with the usual poultry yard complaints.

Immature birds should never be utilized for breeding purposes. If you want healthy, quick-growing goslings, the eggs should be collected as they are laid, otherwise the goose will hatch and not lay so many eggs. If a hen is used for hatching purposes four eggs is all she will be able to manage comfortably but a goose itself can easily handle a dozen. She is a close siter and should not be disturbed. On leaving the nest she is always careful to cover the eggs with down with which she lines her nest. Strange to say I have found that the gander takes a lively interest in the incubation and faithfully guards the setting goose.

With regard to the number of geese to be entrusted to one male I have found that three or at most four gives the best results. Geese live a long time, but for utility purposes it is best not to keep them after they are six years old.

After hatching the goslings need no food for the first twenty-four hours, and then a little cut grass may be given to them with a feed of some ground meal mixed with milk. After a week's confinement they may be allowed out to forage with the others of the flocks. In about three months time they should be and usually are ready for the table, weighing from eight to ten pounds. In my estimation the goose is one of the most profitable of farm-yard fowls, as well as being the most easily reared.--CANADIAN FARMER.

RAISING CHICKS.

The successful caring for chicks from the shell to maturity, depends largely on the judgment of the caretaker, more so than on the feed used, however important the latter may be.

I do not consider the way a chick is hatched, whether by hen or incubator of any importance if the hen hatching and brooding the chicks is absolutely free from lice and the chicks kept so ; otherwise the incubator chicks would have the advantage.

To start the chicks right, they should not be fed for at least twenty-four hours after hatching, and for my part I always have practised waiting until thirty-six hours after hatching. The last stage in the development of a chick in the shell is to absorb the yolk thereby furnishing the chick sufficient food for at least forty-eight hours. Therefore, if food is crowded on the digestive tract soon after hatching a derangement is apt to take place and it is known that more chicks die from the excess of food at this early stage than during any later period of its life. Another early reminder is, that young chicks should not be fed wet or sloppy food. I have obtained best results by using a good specially prepared chick food, and as there are a number of these on the market and easily obtained by all, I would advise feeding one of them until the chicks are at least three months old, increasing the size of the grain as the chicks advance in age. Also keep dry bran in a hopper before them at all times.

When the chicks are old enough, good wheat, cracked corn and hulled oats may be given. Grit, charcoal, bone and good meat scraps should also be before them at all times after a few days.

As a mixture I have used with good results a ration of two parts oats, two parts wheat, and one of corn, ground together and mixed in this proportion ; feed it in a slightly wet condition, that is, it should crumble when placed in the feeding trough. On account of this ration being well balanced it will give the birds a steady growth.

The breed and purpose for which your chicks are raised

should govern your methods of feeding, but under all conditions keep your birds free from lice and in a healthy condition, making the best use of your judgment and success will surely pay you for your efforts.

C. F. PETERSON, '13.



ATHLETICS

Hockey is now in full swing and the college sports a team which can at least hold its own with the best of them. H. G. Crawford was elected business manager and after the initial practices had his team picked and submitted to the Association. R. Donaldson, a former Acadia man, was elected captain. Only one game has been played as yet, but the brand of hockey handed out was far in advance of last year's exhibitions. The defence is far stronger and the forwards show greater speed and team work. Below is an account of the game :

East Enders-1

N. S. A. C.-0.

From the drop of the puck the game was fast and even. The play was rushed to the college nets at the start of the game, and although several shots were tried on the goal, the Eastenders failed to score, owing to the splendid work of the defence man. The puck was then carried back to centre ice and the play was carried on in that part of the rink until the Eastenders by a pretty piece of combination work rushed the puck to the college end and scored. From the face off till the end of the period the town team was forced to play on the defensive, but although many shots were tried "Ick" was "right there with the goods" as is always the case.

The second half saw the play for the most part in centre ice and although both teams worked hard for a score the gong rang with the score standing 1-0.

The teams lined up as follows :

N. S. A. C.		Eastenders.
Morash	Goal	Guinan
Starr	Point	Cox
Keenan	C. Point	Hill
Donaldson	Rover	Grant
Dustan ...	Centre	C. McLean
Boulden	R. Wing	Westbury
Hubbard	L. Wing	Hannaway



College Life



The Reception.

The chief social event of the college year was held on the evening of Friday, Feb. 7th, and quite came up to the expectations of the guests. Many considering it the best one ever held, which is no mild praise, as the "Farmers' Reception" has an enviable reputation.

Mrs. Harlow and Mrs. Matheson very kindly acted as chaperons.

The first part of the evening was taken up with promenades and a programme :

1. Quartette College.
2. Reading..... James Landels.
3. Solo Miss Langille.
4. Reading..... Mr. Peel.
5. Solo R. Schafheitlin.
6. Monologue C. C. Kenyon.
7. Farce College.

Followed by refreshments which closed the first part of the evening.

We wish, particularly, to thank Miss Langille, Mr. Peel, Mr. Fraser and Prof. Stewart for their assistance in the programme.

After the refreshments the floor was cleared and dancing was the all-absorbing subject. This lasted until about half-past one when the affair broke up, all having had a very enjoyable evening.

We wish to compliment the committee in charge of the reception on the very satisfactory result of their labors.

∴ ALUMNI ∴

E. S. Archibald, B. S. A., our popular professor of agriculture last year, has been in Truro recently.

Carl Church, '07, a leading farmer of Falmouth, and Earl Illsley '07, both took in the short course this year.

D. Chipman and Roland Rutherford '08, are managing creameries in N. S. Mr. Rutherford attended the Dairy Conference at the short course.

Blanchard '08, manages a large farm at Ellershouse.

Frank Ellis '08 is the enterprising editor of "Farm and Dairy."

Robinson '10 is assistant Horticulturist on the Experimental Farm, Kentville. Davis '10 runs a big fruit and dairy farm at Kentville.

Longley '09 is in Minnesota, doing agricultural high school work.

Porter "Hardle John" Saggarl, and McKay '09 are all District Representatives in Ontario.

Rutherford '09 is on his farm at River Hibbert, Cumberland Co.



Normalite at Prin's party—"Do you know who that queer looking fellow opposite us, is?"

Junior—"That is my brother."

N. in confusion—"Excuse me, but I did notice the resemblance."

"Mr. M-n-r-o?" "What is it Tommy?" "When you were a little boy and fellers called on your sister, did they ever give you a nickle to go out and play?"

"I have been abroad in the best of society," boasted the city youth. "Why even my trunk bears the labels of Switzerland."

"Why that ain't nothing sonny," drawled Uncle Rube, "so does a box of cheese."

"Look hyar, Aberham, I done heerd you got married ; is yer?" "Well, said Abe, "I ain't sayin' that I ain't." "I ain't askin yer is you ain't," said the other. "I askin' ain't you is?"

Boob to Rube. "I suppose you have lived here all your life."

Rube, "Not yet."

"Tim," inquired Mr. Riley, glancing over the door of the post office, "what is the meaning of thim letters, MDCCCXV III."

"They mean eighteen hundred and ninety eight".

"Tim, don't it sthrike you that they're carryin' this spel-lin' reform entirely too far?"

"See here you old rascal, why didn't you tell me this horse was lame before I bought him?"

"Well, the feller that sold it to me didn't say anything a-bout it, so I thought it was a secret."

W-l-on having spilt some H_2SO_4 on the floor was given HEL_2 by the Prof to neutralize the effect.

Prof. A. in English—"Where was the Duke of Morocco?"
Bou-d-n. "At Belmont," sir, "pressing his suit."

D-s-an (with feeling) "Small colts are great?"

Cynic (looking puzzled) "How could they be?"

L-w-s—Debating—"A woman's sphere is in the home, for example—take a Normal home——"

(We heartily agree with Mr. Lewis as we have tried it.)

IMPROVEMENT PARAGRAPHS.

Everybody is in favor of good roads, but many viciously oppose all plans of taxation to get the money to build the good roads.

Every merchant should study the good roads problem until he grasps it fully and until he sees that it is his problem.

Happiness and prosperity are more likely to be found upon the farm, but you must have a good road to find the farm.

Much opposition to road bonds and levies comes from excessively fast driving of automobiles and the attending dangers.

If it is sensible to propose the issuance of government bonds to improve water transportation, then it is equally sensible to do so for the improvement of wagon roads.

—◆—

Before a rooster goes to bed,
He winds up his alarm.
For he must wake at three and crow,
To start life on the farm.

J. S. HAY & CO.,

MEN'S AND LADIES' TAILORS

Inglis St., - - - - - Truro, N. S.

A Large Stock of the most up-to-the-minute Imported Cloths to select from.

In Scotch Suitings, West of England Trouserings.

In Materials for Evening Dress, Day Frock Suits, Beavers, Meltons, Cheviots and particularly CHINCHILLAS

which cloth is the last word in overcoatings.

Made by the best workman obtainable, at reasonable prices.

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Samples and Self-Measurement Blanks sent on Application, to Mail Order Customers.

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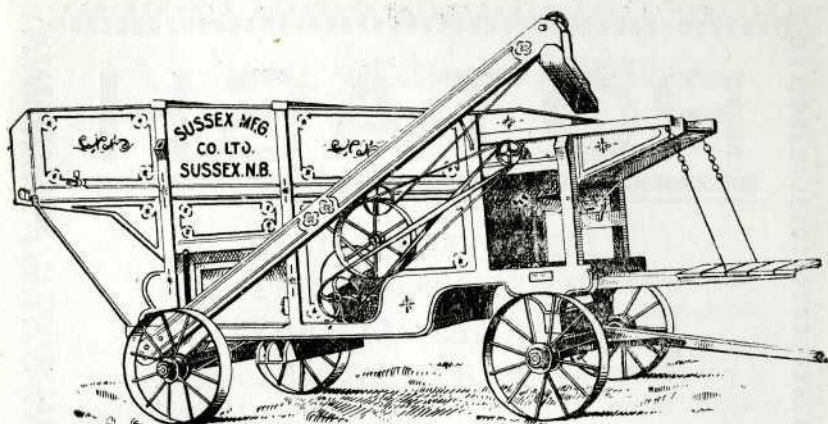
DO not allow yourself to be deluded into buying foreign Slag of Low Quality when you can get the Sydney make, sold on a clear guarantee of available Phosphoric Acid.

If offered foreign Slag ask to know the registered number and refer to Government Bulletin to find out what guarantee, if any, is given of available Phosphoric Acid.

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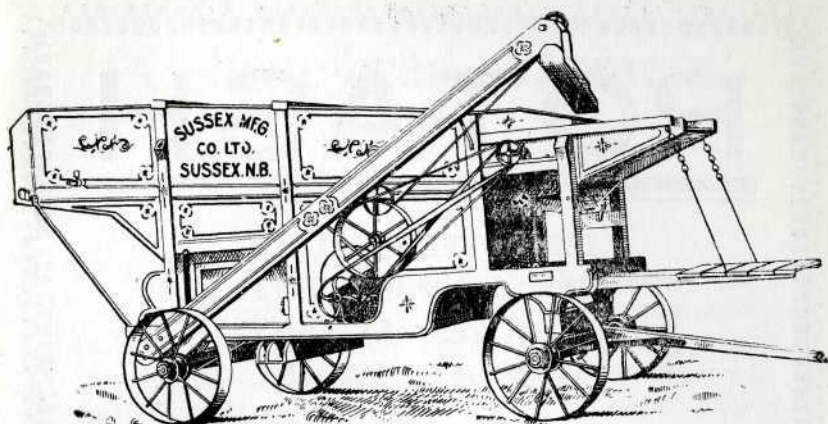
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Our information department will supply any desired information on the use of concrete, free.

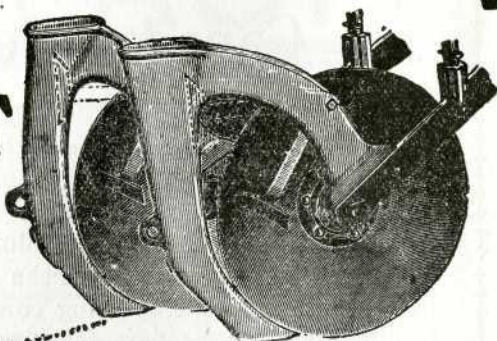
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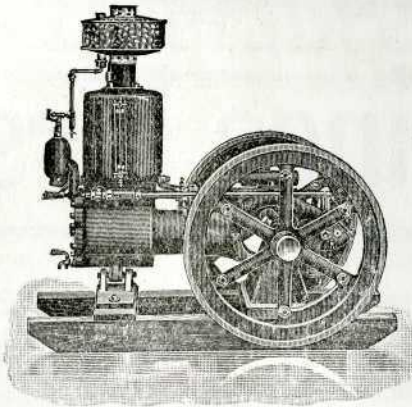
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