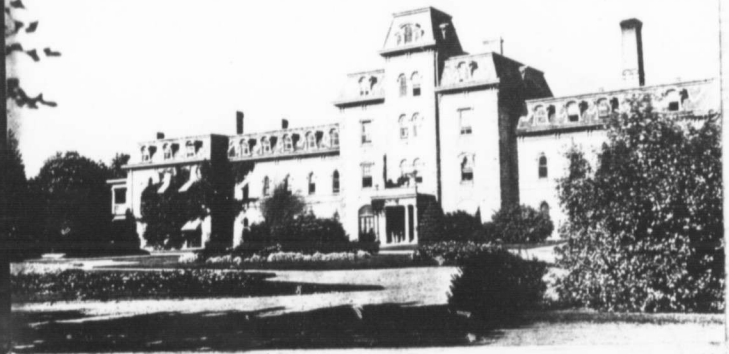
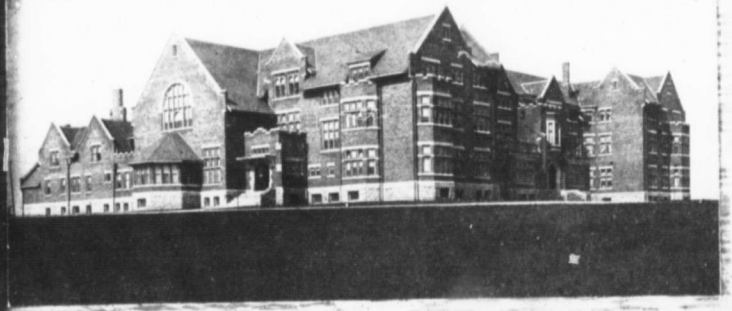


THE O.A.C. REVIEW

MAY, 1911



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The above sketch is one of 32 which appear in "Canada and the Telephone," a book intended to illustrate the value of a telephone in the rural home and a copy of which we will send you on application.

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Canadian Independent Telephone Co. Ltd.

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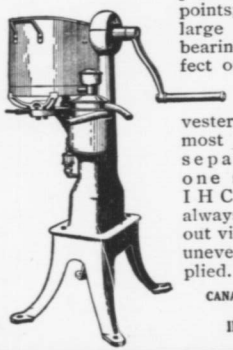

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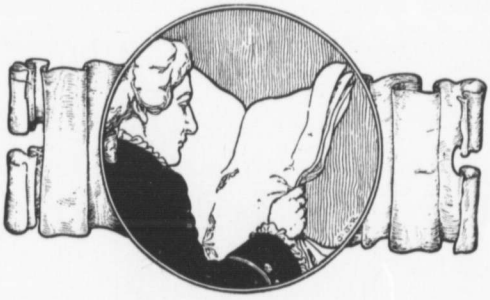

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THE O. A. C. REVIEW

THE DIGNITY OF A CALLING IS ITS UTILITY

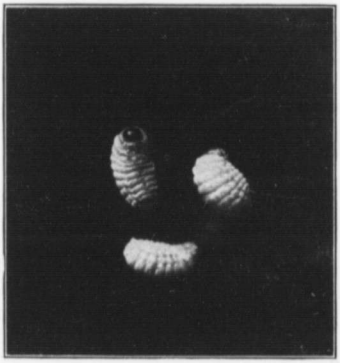
VOL. XXIII. MAY, 1911. NO. 8.

Some Seed-infesting Insects

ARTHUR GIBSON, CHIEF ASSISTANT ENTOMOLOGIST, CENTRAL EXPERIMENTAL FARM, OTTAWA.

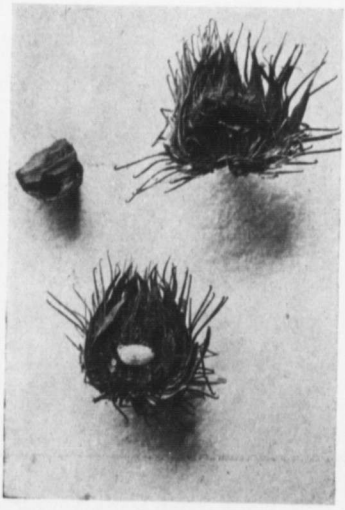
INSECTS which infest or destroy the seeds of plants of various kinds may, for the purpose of this article, be divided into two classes, viz., those which are beneficial and those which are decidedly destructive. In this latter class there are many species which destroy thousands of dollars worth of economic seeds every year. Some of the better known of these are the Granary Weevil, the Rice Weevil, the Angoumois Moth, the Pea Weevil, the Bean Weevil and the Pea Moth. The first three mentioned are particularly destructive to stored grain. Fortunately in Canada, where we have such cold winters, injury by them is not very serious, but in the Southern States, they do an enormous amount of damage every year, and it has been estimated of Texas alone that there is an annual loss of over a million dollars. Grain infested by these insects loses in weight, is useless for seed, and is unfit for consumption by human beings or live stock. The Pea Weevil and the Pea Moth, the larvae of both of which attack the growing seeds, are some years in Ontario, the cause of enormous losses. It is not of this class, however, that I wish to draw attention to here, but to certain members of the beneficial class, which are more or less abundant every year, and to which little attention has as yet been directed. Some of these are extremely useful from their habit of feeding upon the seeds of some of our well known weeds, and it is of a few of these only, belonging to the order Lepidoptera, that space at this time will permit a mention of.

The most useful seed-destroying insect occurring in Eastern Canada, at the present time, is the Burdock Seed Gelechiid, "*Metzneria lappella*," which is found commonly in the seed heads of burdock. This species, which is a



Caterpillars of Burdock Seed Gelechiid—Much Enlarged.

native of Europe and Asia, was first discovered in Canada by the Rev. T. W. Fyles, who found it at Levis, Quebec, in September, 1898. Since that date it has spread considerably throughout the Provinces of Quebec and Ontario. In the Ottawa district the insect occurs in large numbers and there is no difficulty whatever in finding, during the winter months, the curious little larvae snugly concealed within the burs. Two or three of the caterpillars often occur in a single head. As an instance of the abundance of these larvae at Ottawa, I might mention that we have reared from a small handful of heads nearly 100 of the moths. The caterpillar, specimens of which, enlarged, are shown in the accompanying figure, is short and thick, whitish in color, with a brown head; when mature it is about three-sixteenths of an inch in length. On the arrival of spring the caterpillar transforms to the pupal state and the moths emerge towards the end of May and during June. The second figure shows a seed-head which has been cut open to illustrate the full grown larva as it hibernates. The separate cluster of seeds indicates clearly, the value of this insect as a seed destroyer. The moth is a rather delicate little species, expanding when the wings are spread about half an inch, the females being larger than the males. The front wings are pale brownish in color, with darker markings of brown; the hind wings are of a slate-color and bear long fringes.



Burdock Seed Gelechiid—larval work and hibernaculum, or winter shelter; slightly enlarged

The pretty little Tortricid, *Olethreutes hebesana*, is another species the caterpillar of which reaches maturity in the autumn and hiberates in the heads of the common mullein, *Verbascum thapsus*. Some years, at Ottawa, the larva is quite abundant and can easily be found within the seed-capsules, where it has been feeding upon the seeds. It is not quite half an inch in length and varies in color from greenish to dull copper. The body bears inconspicuous tubercles, the hairs from which are pale. Some specimens have a faint dark dorsal stripe. When ready to change to the chrysalis state in the spring the caterpillar spins a thin cocoon of white silk, in which it then pupates, and the moths appear from the middle to the end of May. Although this insect in Eastern Ontario is beneficial owing to its habit of feeding upon the seeds of the above weed, there are instances on record in the United States, where the caterpillars have been decidedly destructive to verbenas; in fact, under the name of *Penthina fullerea*, it is known as the Verbena Bud-moth. The larva has

also been found infesting the seed capsules of snapdragon, *Antirrhinum*. Seeds of other plants are also attacked. The figure herewith, redrawn from The American Entomologist and Bot-

anist, shows the empty pupal shell of the moth protruding from a seed-capsule of Tigridia, in which the caterpillar had been feeding.

The Wild Parsnip, *Pastinaca sativa*, which in some sections of Ontario and Quebec is conspicuously abundant in meadows and along railroad tracks, fences, etc., is very often attacked by a caterpillar known as the Parsnip Webworm, *Depressaria heracliana*, an importation from Europe. As the popular name implies, this caterpillar has the habit of webbing the flower heads together and feeding upon the flowers and unripe seed. It is light yellowish or greenish in color and when full grown is about half an inch in length. The body bears conspicuous black piliferous tubercles, and the head and the shield behind the head are black. When mature the caterpillar has the habit of boring into the hollow stems of the plants and there changes to the chrysalis state, the moths emerging towards the end of July and August. These latter, when the wings are expanded, measure about three-quarters of an inch, and in color are grayish-buff with dark spots and blotches on the front wings. Mr. E. B. Southwick, of New York City, relates an instance where the stalks of wild parsnips, in a certain field, "were so completely stripped of every umbel and leaf that they presented nothing more or less than a mass of dry sticks standing among the grass, and in this case materially lessening the seed crop, and therefore the plants, for the coming year." In the district "the wild parsnips were considered a curse among the farmers."

Another caterpillar which in some years is rather plentiful in Ontario, and which feeds in the buds and seed capsules of the common Evening Primrose, is that of the noctuid moth, *Rhodophora florida*. This moth is a particularly handsome one, the front wings being mostly of a brilliant rosy-red. It flies in July and may often be seen in early evening frequenting the flowers of Œnothera. The caterpillar when full grown is about an inch and a quarter in length, and in color is green; it is cylindrical in shape, smooth and plump, of a cutworm-like appearance. At Ottawa, we have found the caterpillars, in August, feeding upon the unripe seeds, their heads and about half of their bodies being within the seed capsule, the entrance into which is made by the larva boring a hole large enough to admit the body.

The Ontario Pioneer in Agriculture

G. J. JENKINS, '13.

THE history of the pioneer farmer is largely unwritten; except in the pastures clothed with flocks, the green meadows, and the waving, swaying grain fields, as they bow their countless golden heads beneath the summer sun.

The roads, bridges, schools, churches, yea and even our cities are but the outgrowth of the unflinching, unwavering perseverence and courage of the pioneer.

The eye wanders over a June landscape in our beautiful Province of Ontario, dotted with homes—sweet peaceful homes, surrounded with comforts and conveniences, from the sweet blossoms of early spring until the gorgeous fruits of the autumn, when the farmer receives fresh from his Creator his supplies, while his wife rejoicing with him, prepares and spreads them upon the family board. Then with bowed heads and grateful hearts, they adore and praise the Hand that feeds them.

A century ago, scarcely an opening had been made in the forest; the great interior still slumbered in the gloom of its ancient solitude, a wilderness of pine, and maple—primeval haunt of the deer, the red Indian, the wolf, and the bear.

The virgin forest, that has never heard the ring of the woodsman's axe now reverberates its echo. The pioneer has come. A new ruler has taken possession, and rules with an iron hand. The busy world is forgotten. The world, with its noise and toils and care and sorrow, is buried out of sight, and the loving trees close round the trail, and welcome the white man as a confederate in the great kingdom of wild nature. The manhood of the giant trees draws the human heart into a glorious companionship. And when the night closes round the scene and the moon and stars look down, the heart of the pioneer thrills with delight in the presence of a mysterious beauty which he cannot explain. There is a hope and a yearning, a striving in the heart for pathless wilds, for bold adventure, for the daring life of a young country that aspires to a seat beside the throned peoples of the world.

When we think of the crude methods and meagre appliances prevailing in the pioneer's time, and remember that a lack of means prevented many from even taking advantage of the best known methods crude as they were, we get some faint conception of the herculean task that confronted them. It was a bold undertaking for a pair of weak, human arms; but the sturdy settlers believed that the labor of the day was sufficient for that day, and so they improved the golden hours, firmly believing that other days would come, each with its quota of work well performed, and that, ultimately all would be crowned with success. They did not have the neat easy-working tools that enable two men in our day, to put up eight cords of stove-wood in one day. Many a forest tree stood erect for half a day after the settler had dealt his first blow, before it came crashing to earth. But blow after blow, and chip after chip laid the towering giants low, and in a short time the sun was permitted to kiss a spot of virgin soil sufficiently large for a garden patch.

In these reminiscences of pioneer days, let us not forget the true, unselfish and devoted wives and mothers, whose role in the building of our country was essentially as important as that of the pioneer himself. The stories of our great-grandmothers do not refer to their girlhood days; they refer to a time when they were burdened with the cares and responsibilities of caring for a large family; a time when the old crane in the big fire-place swung to and fro with its burden of big iron kettles; a time when the winter's snow found its way through the chinks between the logs; a time when the forest trees were being chopped down, and the fires in the "foller" lit the heavens with a lurid glare; a time when every yard of clothing and bedding material needed for herself, her husband and her children, had to be spun, woven and made up by herself; a time when she was wont to climb into an ox-cart with her children on a Sunday morning, and ride five miles over corduroy roads, and through mudholes, linch-pin deep, for the pleasure of sitting on a hard bench for an hour and listening to a good old-fashioned Gospel sermon, delivered in a sledge-hammer style. These were the happy days of our grandmothers; days of honest toil and social equality; days of mutual help, sympathy and encouragement; days of heart-felt gratefulness and simple faith-in short, pioneer days.

The life the pioneer led was plain and uneventful. There was no ostentatious display, or assumption of superiority by the "first families." Indeed there was no room for the lines of demarcation which exist in these days. All had to struggle for a home and home comforts, and if some had been more successful in the rough battle of pioneer life than others, they saw no reason why they should be elated or puffed up about it. Neighbors were too scarce to be coldly or haughtily treated. They had hewn their way side by side into the fastness of the Canadian bush, and therefore stood on one common level. Nothing binds people more closely together than common hardships and common efforts to surmount them. But few superfluities could be found either in their houses or on their persons. Their dress was of home-made fabric, plain, often coarse, but substantial and comfortable. Their manners were cordial and hearty, even to brusqueness, but they were true friends and honest counsellors, rejoicing with their neighbors in prosperity, and sympathizing when days of darkness visited their homes. Modern refinement had not crept into their domestic circle to disturb it with shams and pretensions. Fashion had no court wherein to adjudicate on matters of dress. Time worn styles of dress and living were considered best, and hence there was no rivalry or foolish display in either.

The sons and daughters of the pioneers possessed few advantages for acquiring even the crudest kind of fundamental education. In the beginning, children received little or no education beyond what their parents were able to give them, and even where the parents had received a fair education in the older lands whence they came, they had little time while struggling for a bare existence in the primeval forest, to instruct their children in the commonest branches of learning. As settlement advanced, and a sufficient number of families had settled where it was possible for the children of each to gather at a common centre a school was established. By united effort a rude log structure was erected, and the

neighborhood canvassed for monthly subscriptions, for the payment of a teacher's salary. These pioneer schools were established on purely voluntary principles.

In the old days the sanitary conditions of the school-room were not looked to as they are now. The heating was obtained by means of a rude box stove placed in the centre of the room about which the long wooden benches were arranged. Next the walls were the desks, raised a little from the floor. When the settlement could afford to keep the school going through the summer months, the pupils who attended were all of tender years, the elder ones being kept at home to help with the work. Some of the little pupils had to sit on the hard wooden benches, with their little feet dangling for seven or eight hours a day. In such a plight they were expected to be very good children, to make no noise, and to learn their lessons. The terror of the rod was the only thing that could keep them still, and that often failed Sometimes, tired and weary they would fall asleep and tumble off the bench. The last day in the school term was usually one to be remembered. The parents were invited and an entertainment provided. The program consisted of reading, writing and a spelling match.

Let us now return to the pioneer and his wife. Let us picture them as they entered and played their part in the first act, of the great drama of a new life. Many a pioneer mother spent the first night in the forest upon a rude bed of pine boughs, her children cuddled together beside her, and her husband keeping loving watch over them. We may well wonder what were the thoughts of the brave young pioneer as he guarded that rudely constructed couch all through the stilly watches of that first night. In our imagination we can see the leaping flames and radiating shadows. Stretching away in every direction lay the vast, unbroken forest. The pioneer, as he stood with his back to the crackling flames peered into the mysterious darkness. Ever and anon as he listened, the discordant howls of the blood-thirsty wolves smote upon his ear. The mother and children having had a long hard journey through the forest, slept soundly, oblivious of their surroundings. The vigilant sentry heaped on more wood and sent the sparkling flames higher and still higher, for well he knew that the fire warded off the attacks of wild animals.

The site for the little home selected, the cabin built, and the family safely ensconced therein, the pioneer proceeded with the clearing of his farm. Although the forest differed in various localities as to the nature and size of its timber, the general principles adopted in the clearing it were practically the same all over Ontario. The preliminary work was that of underbrushing, or clearing away the growth of very small saplings and trees which usually grow thickly among the larger timber. This work was mostly performed in the Autumn of the year before the snow fell so as to insure their being cut off as close to the surface of the ground as possible. This was done so that when the land was cleared and crops sown the stumps would be out of the way of the plow and harrow. As soon as cut the under-brush was carefully piled up in the open spaces in such a way as to insure their being consumed when the general burning took place later on.

When the forests that covered the hillsides and clothed the valleys in

mystery had put off their summer robes and stood naked in the frosty winds of late autumn, and the days shortened, and the breath of the north winds got more bitter, the pioneer knew that winter was not far distant. We of this generation might think that the winter days of the early settlers were dull and dreary—days of cold and lethargy—that the great forest was held in their grip until spring wakened it with the promise of summer. Not so the brown season passed. The sun burned down earlier each day over the horizon like a giant candle in its socket. And then came a day when the snow fell, soft and thick and rich. There was no sound anywhere, yet all was movement. Autumn was over; and winter reigned supreme.

And at sunset, when the wind had gone down and the snow had ceased to fall, from under the heavy cloud the setting sun looked for a moment before it went down, to see the change in Nature's face. It was a moment of glory—that vision of the transfigured earth. Wild forest wastes, where no man had come to rule since the making of the world. Then the winter's soul in the pioneer awakened. Refreshed and strong and keen, like a young child filled with the joyous possession of a new toy he went forth to take possession of the winter forest.

The real labor of chopping down the forest was done during the winter months, when hardly any other work could be done to advantage. The American chopping axe was the only tool used. It differed considerably in weight and shape from the modern axe. The time it took to chop an acre of bush, necessarily varied according to the character of the timber, and the skill of the chopper, but, taking the average of choppers and timber lands it usually took about two weeks. Ten acres fairly heavy timber cut and prepared for logging was considered a good winter's work for one man.

While chopping appears to be an accomplishment easily learned, it is nevertheless one in which skill and brains count, just as in everything else. This was particularly the case in regard to the order and the places in which the pioneer axeman made the trees to fall. They were not chopped down at random and allowed to fall just where they lusted, but rather according to a predetermined plan. Before a single tree was felled, the ground was thoroughly gone over in order to find out the general lean of the timber, for very few if any trees grow really perpendicular. This learned, the ground was laid out in sections in such a manner as to throw the timber when felled into "windrows" or "jam piles." Windrows were made by chopping a lane twenty-five or thirty feet wide, down through the timber, the trees all being felled so as to be parallel with each other the lengthway of the windrow. Afterwards all the trees on either side as far as they would reach were chopped so as to fall as nearly parallel as possible and with their heads upon the foundation first made, thus bringing an immense body of timber and brush together and ensuring its almost total destruction when fired in the spring.

The highest skill displayed by the choppers, outside of the purely mechanical part of the work was in controlling the direction in which each tree would fall. So expert did many of them become that they could fashion their cut so as to throw a tree in any, given direction, and some of them could even gauge their aim accurately

enough to strike a handspike almost every time.

The winter's work over, the "chopping" or "fallow" as the ground covered by the felled trees was called, was allowed to remain untouched until along towards the middle of May or early in June (according to the season) when the sun had dried the brush and leaves sufficiently to make them burn readily. The burning of the brush was a critical, as well as an important operation, and the settler had to wait patiently for a time when the wind was in a quarter which would not only carry the sparks and burning cinders away from his own buildings and crops, but would not endanger those of his neighbors, if he had any, before he dared to apply his torch to the dry leaves and brush along the windward side of his chopping. Once alight, the fire fanned by the breeze, quickly spread until the whole chopping was one seething mass of flames, which licked up leaves, brush, chips, limbs, broken timber and everything that it could possibly devour, leaving usually (if the burn proved successful) little beyond the blackened tree-trunks outside the windrow.

Logging was the next operation, and was usually performed by a "gang" of five men where the timber was at all heavy. One of these drove the oxen which hauled the logs to some convenient spot, while the other four (two at each end) rolled them by means of handspikes, up short skids into tapering heaps four or five logs deep, each log being held in place by settling into the hollow formed by the two logs in the layer below. As but very few settlers had men or boys enough in their family to make up a logging gang of their own, they were forced to band together and exchange work with each other for this purpose. Thus, five men, each having logging to do, would form a gang and work probable a week on each place until they had gone the round. As a rule the man on whose place they worked provided the oxen, in which case it evened up all right, but where the settler had no oxen and they had to be provided by a neighbor, the owner was entitled to an extra day's work of a man for the use of his team. Under average conditions from three-quarters to one acre was considered a good day's logging.

Sometimes the exigencies of the situation demanded that the pioneer's chopping should be logged up in a hurry, and in order to effect this, he resorted to what was known as a "logging bee." This meant that his neighbors for miles around were all invited to come and work together on his chopping on a given day, and as many yoke of oxen were secured as there were gangs of men. On the day chosen the men were all assembled betimes; the fallow was apportioned and staked out into equal divisions; leaders were appointed, each of whom selected the men to form his own particular gang, and at a given signal the work commenced. Under the inspiration of the leader this soon developed into a fierce struggle as to which gang could accomplish their alloted task in the shortest time. Although the victors were not crowned with laurel, they had the proud satisfaction of being acknowledged the champion loggers, and of being, for the time at least, the most envied men in the settlement.

After the logs had been made up into piles, they were usually fired as soon as possible after the job was completed, and by a judicious use of the handspikes, when they were burned down

pretty well, the brands, as the charred pieces of logs were called, were kept burning together until but little was left of them. When everything about the log heap was burned that would burn, the remnants or brands were hauled by the oxen and again made into heaps and fired. This second logging or "branding" as it was called, generally, put the finishing touches to the destruction of the timber, and the ground was then considered ready for cultivation.

Could we have seen a newly cleared field with its blackened surface, its great beds of ashes showing where the log piles had been burned, and the charred, unsightly stumps, with their roots sticking out in every direction, we would have wondered how it could ever be cultivated. As a matter of fact, it did not receive much cultivation for a few years, and what it did get was of the most primitive kind. The first crop was generally potatoes, the work of planting usually being done by hand with strong iron hoes. Sometimes wheat was put in as the first crop in which case the ground was sometimes harrowed once before the seed was sown, and a couple of times afterwards. The harrow used was a very primitive affair, being made of thick round poles and shaped exactly like the letter A, the iron teeth placed along the two poles and slanted backwards at an angle sufficient to help the harrow over roots and other obstacles that it was continually compelled to surmount. In the early days these crops were harvested by hand with an old fashioned sickle, and later on with the cradle, which in its day was considered to be a wonderful labor-saving machine. If the pioneer could manage it, he rarely took more than one or two crops off his newly cleared land before seeding it down in grass,, the reason for this being that in many sections ploughing was almost impossible, on account of the stumps and roots with which the ground was filled, and which made it not only almost impossible to plough, but slow and often dangerous.

Once seeded down in grass, the land was allowed to remain as hay and pasture for five or six years, by which time, if the timber had been hardwood, the smaller roots and stumps were so much decayed that they could be readily pulled out by a yoke of oxen. Those capable of being dealt with in that way were then piled around the large ones remaining, and the heaps fired on the first dry and convenient day. The result of this treatment was to practically clear the field of stumps, leaving it ready for its first real ploughing.

It must not be supposed that while the pioneers had trials and tribulations in plenty there was no sunshine in their lives. As every cloud is said to have its silver lining, so they also had their times of refreshment and merry-making, when they cast dull care to the winds and made the most of their opportunities. True, their dances were held on the threshing floor of the largest barn, the walls of which were lighted up by home-made tallow candles, while the best they could boast of in the way of an orchestra was perhaps a violin, played by some itinerant fiddler or some not over skilful backwoodsman. It may be admitted, also, that the manners of those who took part in the often impromptu functions of that time, had not that repose which marks the caste of the debutante of the present day, nor were they dressed in anything more fashionable than homespun and home-made garments, but in spite of all these drawbacks, they enjoyed themselves jus. as thoroughly,

and perhaps more, than do many of our society people at a fancy dress ball of the present period.

Young and old alike enjoyed the fun of gathering the pumpkins and corn into the barn. The corn was husked generally at night and sometimes husking bees were held. A few neighbors were invited and the husking took place in the barn. The bright golden ears found their way into the old crib, from whence they were brought later on, to fatten the turkeys for Christmas.

"Strung o'er the heaped up harvest, from pitchforks in the mow,
Shone dimly down the lanterns on the pleasant scenes below;
The growing pile of husks behind, the golden ears before,
And laughing eyes, and busy hand, and brown cheeks glimmering o'er.

Half hidden in a quiet nook, serene of look and heart,
Talking their old times o'er, the old men sat apart;
While up and down the unhusked pile, or nestling in its shade,
At hide-and-seek, with laugh and shout, the happy children played."

With jokes and laughter the husks and ears flew, until the work was done, when all hands repaired to the house. Having partaken of a hearty meal, they left for home in high spirits.

Time has wrought many changes since the days of which I write. The yelping of the Indian dog, and the war-whoop of his master have died away in the distance, and in their stead is heard the hum of the threshing-machine, the rattle of the railway engine, the rattle of the steam engine, and the ringing of the school bells. The tall forest trees have given place to the orchard trees. The log hut or slab shanty has been succeeded by the more elegant frame or brick dwelling. The cow path has grown into a highway. The clanking of the logging chain has been exchanged for the tinkling of sleigh bells, and the old ox-cart has its successor in the modern carriage.

Society has changed too, as much as the country has improved. The pioneers had very different ideas respecting many things from what we have. And their surroundings in early life differed from those of the youth of the present day; but they made the best use of the few advantages they had. To say that they were weaker than their descendants, either mentally or physically, would be to say the very reverse of what is true. To admit, however, for want of proper training and culture, they were less able to show what was in them, than we of this generation, is only granting what cannot be disputed. But if some of those sturdy men who cleared the land in our front townships could visit the scenes of their old time toils and see some of their descendants trying to handle an axe or a hand-spike, they would be as much amused as we would be to see a boy start off to mill with a bag of wheat thrown over a horse's back, having a bushel of wheat in one end of it and a big stone at the other end to make it balance. If some of the old dames who helped to make the homes of our country, and who were so handy with the wheel and distaff, the rolling pin and the knitting needles, could revisit the room of all work, where her housewifely skill won its former triumphs, and catch some of her great-granddaughters trying to darn little Bessie's hose, or to patch Willie's coat, she would be likely to

take the work into her own hands, and say, "Law sakes, child, what do you know about mending children's fixings? Let me do this, and you go and pound some kind of a tune like "Auld Lang Syne' out of the pianner." Let it be clearly understood that I am presenting the extremes. Some of our grandmothers were as much at home in the parlor as they were in the kitchen. And some of the granddaughters are as much at home in the kitchen as they are in the parlor. These old people did their work, and did it well according to their opportunities and the means at their disposal.

Well will it be for us who have inherited the fruits of their honest toil, if we are as true and faithful in our day and generation as they were in theirs. It was in such a school and under such masters that the foundation of Canadian prosperity was laid.

THE CAMPER.

Night 'neath the northern skies, lone, black, and grim:
Nought but the starlight lies 'twixt heaven and him.

Of man no need has he, of God, no prayer;
He and his Diety are brothers there.

Above his bivouac the firs fling down
Through branches guant and black, their needles brown.

Afar some mountain streams, rockbound and fleet,
Sing themselves through his dreams in cadence sweet.

The pine trees whispering, the heron's cry,
The plover's passing wing, his lullaby.

And blinking overhead the white stars keep
Watch o'er his hemlock bed—his sinless sleep.

—E. Pauline Johnstone.

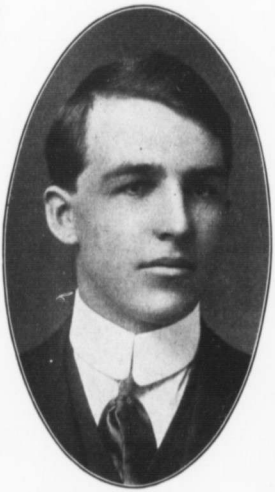
The Romance of Canadian History

R. L. VINING, '13.

THE history of the world reveals no more romantic story than the story of our country. It is a tale that sums up a conflict of civilization with savagery. It tells of pioneers, who crossed the Atlantic to face the terrors of the wilderness and the wild man. It sets forth the struggle of two great European powers for the mastery of the world. It includes the breaking up and the reconstruction of the British Empire.

Four hundred years have passed since America was discovered by those brave souls, who rose above the superstitutions of their day, and aspired to know the mystery that lay beyond the Western ocean.

That was the dawn of history for this continent. There is no record of the ages that had gone before. They are wrapt in eternal mystery.



R. L. VINING, '13.
Winner of Oratorical Contest.

Those pioneer explorers found this land peopled with wandering savages—red men—Indians they called them, for they thought they had reached the shores of India.

It is three hundred and seventy-seven years since that hardy Breton sea-captain put out from St. Malo to dare the perils of the North Atlantic. That first voyage of Jacques Cartier awakened the spirit of discovery in old France. Her people saw a vision of a New France beyond the Atlantic. There was another motive equally potent. The heresies of Luther and Calvin were rampant in Europe. Devout Catholics were filled with an holy zeal to requite the church for her losses in the old world by gathering into her fold, the infidels of the new. Such was the two-fold ambition of France.

To the realization of that ambition, she lent her best blood, her bravest men, her noblest women. The French period of Canadian history glows with deeds of daring and dauntless endurance. It is bright with records of devoted zeal and martyr courage.

The foremost name on that role of heroes is that of Samuel de Champlain. We stand in awe and wonder before the story of his exploits, his triumphs, and his failures.

We follow him with his dusky companions up the winding forest streams where no white man had been before. Lake Champlain is the memorial of one of his earliest achievements.

We see him befriending the Hurons and Algonquins—laying down the lines of a policy for New France, that, for a century and a half, turned vast

stretches of North America into a shamble.

We are with him at the founding of Quebec three hundred years ago. We see him cross and recross the Atlantic many times that the colony may be kept alive.

For thirty years the life-story of Champlain is the story of Canada. While the historian can record his chequered career, his name will never be forgotten. The waters of the lake that bears his name still chant the most fitting requiem to his memory as they murmur ceaselessly against their shores.

What Champlain began so early in the seventeenth century was continued with more or less spirit throughout its course. Frontenac, as a ruler, was a greater Champlain, and fifty years after Champlain had been laid in his grave, his successors were still engaged t destroy the Iroquois confederacy. The conflict was long and bitter!

It meant martyrdom for many of the missionaries. It involved the destruction of the Huron tribe. It scattered the Algonquins to the ends of the wilderness. It enacted the highest qualities of courage and heroism among the settlers.

Of the Jesuit martyrs, the most striking case is that of Jean de Brebeof and Gabriel Lalemant. These missionaries were taken by the Iroquois at the destruction of the Huron town St. Louis. They suffered all the tortures that devilish Indian genuis could devise ere death set them free. Their names are writ in letters of gold on the martyr roll of church.

Their devotion was sublime, but it was hardly greater than that of Adam Daulac and his sixteen companions.

The story of Madeline of Verecheres reveals the same indomitable spirit.

These things are but incidentals to a great scheme that had the control of a continent for its object. France was ambitious, but she was not prepared to make the sacrifices necessary to accomplish her imperial ambitions. She was jealous of English expansion, but she bound hand and foot, those whom she sent to check it. New France was the off-spring of Church and State. Nutured with artificial stimulants and guided by rule and discipline, it grew unnaturally and languished for want of vital energy in Parkman's way of saying it, "Feebly rooted in the soil she spread forth branches that overshadowed half a continent, a magnificent object to the eye, but one which the first whirlwind would prostrate in the dust." And the whilwind came!

In sharpest contrast we see the lusty outcast. New England growing strong in the spirit of non-conformity, in the love of liberty, in the hatred of power. The English colonist called no man master. And when France put into practice that policy that was to hem him in between the Alleghanies and the ocean the fight began.

The English flag was first hoisted over historic Quebec on July 22nd, 1629. France and England were at war. The Kirkes summoned Champlain to surrender. Defence was out of the question, and the colony passed into English hands. For three years they held it, and then gave it back to France for a trifle. The Englishman of that day saw little of the value or the possibiliities of Canada.

Quebec once again in French hands became a thorn in the side of New England. The great Frontenac gave the English colonists no respite, and in 1690 Sir William Phipps appeared before Quebec and once again in the name of England demanded uncondi-

tional surrender. Sixty years had added to the numbers and increased the strength of the French stronghold. Phipps required an answer in an hour "upon the peril that will ensue." The haughty Frontenac did not keep him waiting. To the English messenger he replied: "I will answer your general only with the mouths of my cannons, that he may learn that a man like me, may not be summoned after this fashion." Phipps did not take Quebec.

The seven years war was ushered in by sharp frontier conflicts in America. It began badly for the English colonies, as it began badly for the Mother Country. Then Pitt came. With masterful strategy he directed fleets and armies east and west to victory. Only a Pitt would have dared to entrust the most important of his American ventures to the care of so young a general as Wolfe. Wolfe was to capture Quebec. The fortress had never been so strong as it was in 1759 and it never had been held by so able a soldier as Montcalm.

The story of the long seige: Wolfe's first disastrous attack; the occupation of the Heights of Levis, from which Quebec was pounded with cannon; the moving of the fleet up the river above Quebec; the decision to attempt a landing at the little cove, now Wolfe's Cove; the silent progress of the boats at dead of night; while the young general recited Grey's Elegy and lingered over those peculiarly prophetic words:

"The boast of heraldy, the pomp of power,
And all that Beauty, all that Wealth e'er gave,
Await alike, the inevitable hour,
The paths of glory lead but to the grave,"

The dramatic accident that placed the password of the French in their possession; the silent ascent of the cliffs till four thousand seasoned veterans stood in battle array on the Plains of Abraham, the wild alarm in old Quebec on that September morn; the swift decisive conflict; the death of Wolfe in the hour of victory and of his noble adversary a few hours later, has often been told.

A joint monument to the memory of these noble rivals stands on Dufferin Terrace, Quebec—a monument at once unique and wonderfully significant.

Quebec had fallen. Canada was won. One swift fierce fight failed to retake the fortress, and the French have never had another opportunity. In the hour of her triumph Britain was wisely great. She had driven France from America and was resolved that she should never return, but she undertook to leave the Canadians in full possession of their language, their laws and their religion.

When the American colonies declared their independence, they sought to undermine the loyalty of Canada. They sent flattering messages to the Canadians. They talked of brotherhood and freedom. They believed that they had only to show their soldiers in Canada to unite the whole continent against the Mother Country. But their advances met with little favor and their army was severely beaten when they attempted to capture Quebec. Canada's sympathies were with Britain.

In 1812 again, when England was at grips with Napoleon, the Americans declared war and tried to capture Canada—and again they failed sadly. This time they learned their lesson well. For a hundred years the two nations have been at peace and prosperity has blessed them both.

There were many agencies at work to cause unrest in the early years. There was the country to the South rejoicing in its liberty. There was the progress of reform in England. There was an exacting and autocratic Family Compact in whose hands the government of the colony reposed. A policy similar to that which caused the American revolt, brought Canada to the verge of armed rebellion in 1837.

But the calamity was averted. The Earl of Durham was sent to Canada and in his brief sojourn here saved the colony to England. He turned the Canadians from sullen anger to enthusiastic friendship. The fruit of his labor was the Act of Union in 1840, that united the two people, French and English, the two Provinces, Ontario and Quebec, and gave them responsible government.

A quarter of a century of progress made possible the creation of a federal Dominion—the Dominion of Canada.

Since 1867 Canada has grown wonderfully. She has grown strong in the spirit of liberty and prospered under a system of government that has no superior in all the world.

Canada has become a nation.—a nation within an Empire. And the Empire rejoices in the fair daughter who proudly says,

"Daughter, am I in my mother's house,
But mistress in my own."

We have looked to-night, back over the trail that Canada has travelled. We have seen but the rugged outline of that trail, over which the mists of Time are thickly settling. We have seen it lurid with the smoke of battles. We have seen heroes and martyrs laying down their lives.

We may well look into the future at this time, at the way that lies before our country. It is a way that is rough and steep—a way that is fraught with difficulty and peril and danger. There are mighty problems to be faced and solved. Let us remember that the history of Canada is not yet written. Let us remember that we have a part in the making of that history.

Breathes there a man with soul so dead
Who never to himself hath said,

"This is my own, my native land,—
my Canada."

The Observations of a Fire Ranger

DURING the College vacation of 1910, it was my fortune to be employed by the Ontario Department of Lands, Forests and Mines, in the humble capacity of Fire Ranger.

I left for the Northland on the 23rd of April, and reported for duty to the Chief Ranger at Cochrane. After receiving instructions, camp outfit and a partner, we left for Mattagami River, and established camp. Our summer residence was a rather plain affair, a tent 7x7½ feet, erected on a log foundation, high up on the bank of that beautiful river. We built a log shack 10x10 feet at the water's edge. This was our cook house, laundry, dining room, etc., in fact everything but our sleeping quarters. Our tent high up on the river bank, where we could sit in the evenings, and watch the rush of waters through the rapids, or the ever changing colors of a most beautiful aurora borealis, was our sleeping quarters.

Our camp established, we proceeded to carry out all instructions given us by our Chief. The greater part of the day for the entire five months was taken up with a regular routine of beat walking, preventing fires and protecting game.

In the Northland the period of light is much longer than here in Southern Ontario. This made it possible for me to observe the animal and bird life of the north, in the early morning, in the evening, and in the night. Mr. and Mrs. Moose, Mr. Bear, Mr. Snowshoe Rabbit, Mr. and Mrs. Ruffled Grouse, Mr. and Mrs. Red Squirrel, Mr. Pekam, Mr. and Mrs. Martin, Mrs. Chipmunk, and the children of all the families were our neighbors. I visited them all. I was always welcome with the kids but most unwelcome if the old lady happened to be at home.

The endless, silent forest north of Height of Land, broken naturally only by the rivers, the muskegs, the marshes and the lakes, is the home of many moose. One evening late in May when investigating "smoke" that appeared north on the river, I chanced to make the discovery of a moose family consisting of a cow and two calves. Mrs. Moose was wading about a shallow lake (half a mile west of river) poking her head beneath the water and pulling up the tubers of the waterlily, a food that the moose are particularly fond of. The baby moose were poking around among the Labrador Tea bushes near the water edge, and I was working

VIEW OF MATTAGAMI RIVER, LOOKING NORTH—PROF. BAKER AND PARTY LEAVING FIRE RANGERS' LANDING. —Photo by Steve.

through the spruce crawling over a thick carpet of moss trying to get up close, moving only when Mrs. Moose put her head beneath the water. In this way I got within twenty yards of the little fellows. I tried to call them to me, but only succeeded in attracting their attention. They turned and faced me, wondering perhaps what kind of an animal I was. After they had satisfied their curiosity and I had concluded that I was more skillful calling Holstein calves than moose calves, the little fellows turned and moved quickly towards their mother. She was now leaving the water, thrusting her head up with nostrils dilated and anxious eye. Had she caught the man smell or had the actions of the little ones aroused her suspicions? She led her calves into the dark woods. The little moose were about eight or nine hands high at the shoulder, and were dark brown in color. The mother moose would measure about fifteen hands, and appeared at a distance of sixty yards to be almost black. I saw four other moose during the season. One young bull we met on the river bank, he was quietly feeding on the leaves of the Arrowhead. We paddled our canoe within thirty yards of him, moving silently when he was not looking. He evidently thought we were coming too close so turned quickly and bounded into the bush.

On the evening of the 19th of September, we were north on the river getting our supply of spring water. It was just getting dark, I heard what sounded to me like mo-waugh-yu, this was the call of a cow moose. We unloaded the water, headed our old canoe down stream, hugged the shore, ran the rapids, and approached the next bend of the river with all the caution possible. We heard the call again, it seemed farther down the river, we followed on noiselessly, it was almost dark and a few stars were appearing. Mo-waugh-yu rang out again just ahead and from high up. We stopped paddling and eased the canoe up to the shore. We heard a rustle of branches and a mooh-mooh, not very loud, and in an instant the love sick mo-waugh yu rang out again. I did not have any trouble locating the singer this time. High up above the river on a steep cliff of granite, a dark form was silhouetted against the sky, this was the cow moose. The wind was from the north and favorable to us. We were undetected. We decided to wait and see what the calling would bring forth. The cow was very restless, disappearing in the scrub spruce and appearing again three times within half an hour, taking up her position at the edge of the rock, and giving the call, each time with greater effort than before. From the other side of the river there now came sounds of life, a sharp cracking of dead branches and a bellow that sounded to me like oob-ahh-oob-ahh. The breaking of more branches, another call from the cow, and then a splashing of water, indicated to us that the bull had entered the river, and was swimming across to meet the love sick cow. Knowing the river, its swift currents, low and high banks, we concluded that the bull must land at a point about two hundred yards lower down. We were very anxious to see him. We headed our canoe into mid stream, approached his lordship, and followed as far as deep water would permit. He swam very low, the nostril, the eye and the great crescent-shaped antlers was all that we could see until he reached the beach. His narrow back rose above the water as he scrambled up the bank. He was in a

great hurry and bounded into the bush seemingly regardless of everything ahead of him. The cow called no more. She, too, was aware of our presence, and had left the granite rock. Our presence on the river doubtless spoiled their lovemaking for that night. It me and I was able to watch him for about ten minutes at a distance of forty yards. In this space he had nearly completed his task, when the angry squalls of a raven disturbed him. He then went into the stream with all the speed of a falling stone. This was

LIFT GANG ON CONSTRUCTION. —Photo by Steve.

was becoming quite dark, so we left the scene and headed for camp two miles up stream.

The numerous fresh moose tracks each morning on the river bank on the trails and on the grade indicated the presence of many moose and that they moved about considerably during the night. Sometimes singly, sometimes in twos or threes. The first impression of a calf footprint I noticed on the 26th of May.

Early one morning while noiselessly picking my way through the black alder bushes that line the bank of a small stream that joins the Mattagami, two miles south of our camp, I had the good fortune to see a beaver at work on a small poplar. The little fellow was sitting on his haunches with his flat tail stuck out behind as if for a prop. Judging from the movements of his head he cut the lower end of the clip with his lower teeth and the upper end with his upper teeth. He always removed the chips by pulling from above downward. The gurgle of the noisy stream, and the wind favored the only beaver that I saw during five months in the woods. I followed many streams, located many old meadows and dams, but the beaver had gone, yes, years ago. Some of the beaver families had completed their homes, others had been disturbed as indicated by the partly build dams and partly cut trees. The new tamarack growth in the meadows showed plainly that this "beaver crisis" had happened twenty years ago. There was a Hudson Bay post farther up the river. The post wanted the fur and the Indian wanted the whiteman's goods.

On the morning of the 10th of May we crawled out of our bunk feeling rather more than half frozen. Little wonder, when we opened the front of our tent we saw three inches of snow on the ground. I might say right here that the first night we spent in the woods, we undressed and went to bed like civilized people, but that first night was enough, in future we put on all the clothes we had. We were short of blankets, only had six. However, the presence of snow on this particular

May morning reduced the possibilities of fires, so I decided to spend the day in the deep woods away to the northwest of our camp, hoping to further my acquaintance with Mr. Bear, or Mr. Fisher. I tramped all day, following streams, circling muskegs, through spruce, open tamarack and balm of gilead. I had crossed the tracks of moose, caribou, and white-tailed deer, but had seen no living creatures except moose, birds, and noisy ravens. It was nearly six o'clock and I felt that I was within two miles of camp. This country is all flat, no hills to climb to get one's bearing. A man is dependent upon his own judgment and his compass. As I was leaving the timber and crossing a narrow beaver meadow a strong odor was borne down by the wind, it was the "bear smell," bruin must be near and to windward. I stepped back into the shelter of the spruce and crouching low waited, hoping his lordship might appear. But he did not appear so I moved cautiously up the wind towards an old beaver dam, and there I saw Mr. Bear standing at the edge of the water, his head down and one foot slightly raised as if to strike. He was hunting frogs for his supper. Several noisy chickadees betrayed my presence and bruin turned quickly, evidently alarmed at their chatter. He saw me, turned and bounded into the spruce, breaking down considerable underbrush in his hurry to get away..

During the last week in June, I had the pleasure of making a rough examination of an old male bear's stomach, and was able to form some idea of his food at that time of the year. Making an incision through the walls of this interesting organ, I sorted out of the capacious cavity, the mangled remains of a large quantity of black ants, three frogs, some bees and fragments of comb, a few May flies, the remains of several mice, a quantity of wild strawberries, easily recognizable by calyx and stem, and some other stuff that was beyond my ability to classify.

Late in the evening on June the 10th, while strolling from the end of a small platform that we had erected over the river, I was much surprised to see the carcase of a sheep go floating by. It was heading for James Bay all right enough, but where it came from I never knew. It was just what I wanted, so I got into the canoe, started after it secured it and towed it ashore near the mouth of a small creek that joined the river a short distance below the camp. Along the banks of this creek I had often noticed the tracks of Fisher but had never been able to get a look at them. Now, that I had this piece of carrion I stood some chance of observing Mr. Fisher. I dragged the dead sheep up the bank to a favorable location, from my point of view, and left it At three o'clock next morning I went to see if there was anything doing at this nice luncheon I had prepared for the Fisher family. I took up my stand high up on the opposite bank of the creek in a sentry box that I had fixed up some time before. It was simply the shell of an old cedar that happened to be facing the right direction. I had cut a small peep hole about five feet from the ground through which I could observe what was doing without being seen. At three, it was still so dark that I could not see across the ravine, but at three-thirty I could make out the form of the sheep, and at three-forty-five I could see the back of a black, fox-like animal. I realized now that I had made a foolish mistake in placing the sheep with its back turned

toward my place of concealment. I should have known better from past experience with Fisher, that if one came it would attack the belly side first and this it did. I was unable to see much of him in this position so decided to change to another tree farther along the bank. I just took one step, did not make enough noise to hear it myself, the Fisher heard the footfall, he whirled around jumped over a log and darted into a thicket with all the speed of a frightened cat. I went back again next morning, but Mr. Fisher was evidently hunting something fresh as he did not appear again.

While lying concealed behind a spruce top watching a cock grouse drumming early on the evening of May the 4th, I was surprised to see a small brown head appear at the end of the log. This was a marten. His large ears and bright eyes made him look like a minature fox. He was hunting. Yes, the very grouse that was standing on the log quite unconscious of his presence. After an interval of about three minutes the grouse straightened up, with breast advanced and eyes tightly closed, started his love song again. This was the marten's chance, he moved up to within four feet of the grouse and crouched beneath the log. The grouse was still unconscious of the marten's presence, he started to drum again, the marten twitched nervously and moved to spring upon the bird. But I had made up my mind that he should not get him and a well-directed hand-full of soil spoiled it all for Mr. Marten. He scampered up a near-by spruce and hustled away through the treetops with all the agility of a red squirrel.

Many tell-tale patches of feathers indicated to me that many wood and spruce grouse fall victim to the marten, the fox, the fisher and the lynx. They are caught during the season of mating. The cocks drumming with their eyes tightly closed and making enough noise to protect and attract the sneaking marauders that have learned the call.

In a giant spruce snag that stood about eight feet from our cabin door Mr. and Mrs. Chickaree had set up house-keeping some time before our arrival. Mr. Chickaree was very good natured and became very tame. Mrs. Chickaree was cross and very changeable, sometimes she would sit on my knee and eat a raisin, but more often she was in a scolding humor. These squirrels had been eating spruce seeds, buds of various kinds and a few berries in summer. They had never tasted grain, nuts or fruit; doubtless our com-

VIEW OF MATTAGAMI RIVER, LOOKING EAST—FIRE RANGERS' CAMP MARKED IN WOODS. —Photo by Steve

ing would mark an epoch in their lives, as they were soon eating everything that we ate, from bacon to fresh fish and orange peel. During the second week in May four little chickarees were born blind and naked, their bodies were about 2½ inches long. I only disturbed them once. Mrs. Chickaree kicked up such a fuss that I left them alone in future hoping that they would soon be able to come out of the nest and show themselves. Mr. Chickaree was expelled from the home, his wife chasing and scolding every time he came near. One day at dinner time while sitting in the door of our shack, I noticed the little squirrels peeping from behind the snag. This was in July, they were more than half grown and within a week were climbing about the top of the snag in plain view, but did not come to the ground. Early one morning I saw Mrs. Chickaree at the top of the snag with a little one in her mouth, grasped by the stomach. She carried him carefully to the ground. The little one seemed bewildered but as quickly as his mother ascended the snag he followed. I saw this performance repeated three times. The mother squirrel was evidently giving her children a climbing lesson. In the course of three weeks by the middle of August, they were following her through the trees at a great rate, learning all the jumps and catches. These squirrels were a source of amusement to us, they never failed to be on hand at meal times, in fact, they had complete possession of our cabin when we left. I often think of them and hope that Mr. and Mrs. Chickaree and the little ones escape the crushing jaws of the marten, the red squirrel's greatest enemy.

The northern or Canadian flying squirrels were quite common about our camp. I often watched them at dusk during July and August. They invariably nested in a woodpecker's hole, high up on a dead spruce or cotton wood. Only once during the season did I see any in broad daylight and then under exceptional conditions. While fighting a small fire that had gained a footing in my district, I noticed four squirrels coasting away from their burning homes, one mother squirrel carried a little one in her mouth. The next day when putting out the last sparks of the fire, I looked over the burned trees in hope of seeing what might prove to be the home of the squirrels. After climbing several bark charred trees and examining all the holes, I found a hole that showed evidence of life. With the aid of a bright compass top I reflected the sunlight into the nest and saw a restless mass of light fawn fur, four little squirrels waiting for their mother's return. She had been gone for more than a day, some thing had surely happened her, she had been unable to return for her other children. Had she remained in the tree she would have escaped with her family as the tree was only slightly scorched. What was to be done to save those little squirrels? I resolved to take them to camp and see what I could do to save them. In my boy hood days I had a young flying squirrel for a pet so the experience was not new to me. Condensed cream, warmed and diluted was their first food from human hands. They lived and grew, learned to eat oatmeal, evaporated fruits, spruce and maple seeds. I gave them their liberty on August 15th, that they might become used to the conditions under which they must live after I had left the Mattagami country.

Of all the animals that I observed in the northland I think the snowshoe

rabbit the most stupid, with the porcupine a close second. One afternoon during the first week of July I was helping my mate fight a small fire that had gained considerable headway in a strip of thick spruce, east of the river. Rabbits were jumping about every where; they would bound out of the blazing area, turn and go right back in again. They did not seem to know enough to get away. While chopping a fire lane ahead of the fire I had noticed a porcupine moving uneasily in the top of a spruce. He had plenty of time to get away, but stuck to the tree evidently thinking himself safe. When the flames reached this tree they ascended with the usual swish, crackle and roar. Mr. Porcupine came tumbling down with his hair and quills singed to the skin. He presented a sorry sight as he scrambled into a hole and disappeared beneath the roots of another tree, safe for the time being from the scorching flames.

I think I have written enough about animals for the present, and will conclude this part of my observations by saying that in addition to those animals I have already mentioned, I noticed the presence of the otter, the muskrat, the mink, the red-backed vole, the cooper shrew, the marmot, the lynx, the skunk and the chipmunk. There were no wolves; white-tail deer and caribou were not very plentiful.

What about bird life? Wild fowl were not as plentiful as I expected to find them. Most of the ducks and geese were farther north in the vicinity of James Bay. A few fish ducks alone remaining on the rivers and small lakes to breed. I found the nest of an American Merganser in a hollow cedar stub that overhung the river, it was composed of moss, lichens and down, and contained six buff colored eggs. Six days after finding the nest I noticed the old birds and six little balls of down paddling about a quiet eddy beneath the nest tree. They hung around for about two weeks, the little ones grew rapidly feeding on tadpoles, of which there was an abundance in shallow water. One evening while doing my week's washing I had occasion to throw a pail of scapy water into the river. I had no idea the duck family was near and judging from the commotion that was kicked up by the mother duck I think they got the benefit of it. The mother duck had evidently hidden with her little ones beneath the steep bank, knowing that I was near and within ten feet of her for fifteen minutes. They went on down the river, out of sight, and I never saw them again.

VIEW OF RIVER AND BRIDGE— THE CROSSING OF THE TRANSCONTINENTAL RAILWAY. —Photo by Steve.

One morning in June, when walking westward over my beat, I noticed a blackheart plover in great distress. She was flitting about from stone to stone, one leg hanging as though broken. Three ravens were also in the scene, two perched on the tops of near-by spruce and one on the ground busily engaged eating plover eggs. I chased the thieving ravens, found two eggs still unbroken, which I replaced in the nest a leaf-lined depression close to the shore of the pond. I did not see anything of the male plover at this time, but next morning found him dead, one hundred yards from the nest. The plover had evidently received a severe and sudden assault while guarding their nest from the ravens.

The Bronzed Grackle, the Evening Grosbeak, the American Crossbill and the Whiskey Jack were the most common everyday friends, that we had clothed in feathers. We had a lot of fun with the Whiskey Jacks, they would come to the door of our shack looking for scraps of food. They would eat anything from pork rind to macaroni and cheese. They had many disputes with the red squirrel family over the possession of choice bits of food. We encouraged this quarreling and it led to many interesting scenes and object lessons in animal character.

The birds common about the home stead in Southern Ontario have not yet penetrated the northern wilds, but will no doubt do so as soon as conditions are favorable. I saw a few robins about Cochrane on April 25th, and I noticed one swallow at the Mattagami River in June. I noticed the presence of the marsh hawk, also one specimen of what I believed to be a Swainson hawk and several sharp-shinned hawks. The sharp-shinned hawks were especially fond of woodpeckers. I saw one of these birds pounce on an Artic three-toed woodpecker that was working industriously on the side of a spruce tree. The woodpecker struggled valiantly after being borne to the ground by the hawk and finally escaped, after losing a lot of feathers.

The short-eared owl, the snowy owl and a small owl that I was unable to identify were the only members of that interesting family Bubonidae that I noticed. The front of our tent was never closed during July and August. It was quite a common sight to witness, even when lying in the bunk, the pursuit of a flying squirrel by a small owl. The squirrels would coast away before the owl could strike and usually escape by darting into one of several large brush piles that were between our tent and the river. The owl was successful on several occasions, and the tail was all he left to explain the tragedy of the night. The flora of the north is both varied and beautiful. The Pitcher plants abound in the muskegs. I noticed quite a number of plants belonging to the Orchidaceae. The most common of which were: Harbinaria psycodis; Cypripedium parviflorum; Epipactis ophioidis; Epipactis pubescius; Arthusa bulbosa. Many plants and weeds common to Southern Ontario were present, the seeds having been brought in by contractors along with the hay and oats. No less than four varieties of mustard graced the grade, even before the ballast was put on. Wild roses, orange lilies and ferns decorated many sheltered banks along the river. Many trees in the deep woods were covered with Lichens and Fungi.

What about the timber? Spruce, spruce, everywhere, small spruce 4, 6 and 8 inches in diameter, standing as

thick as they can stand. On the drier ground Balm of Gilead, 8, 10, 12 and 15 inches in diameter, is mixed with the spruce. Along the rivers, the canoe birch and cedars are often seen. The underbrush is largely small maple, mooswood and black alder. A few very fine spruce are to be seen along the river banks. The piling and ties that are being used in the construction of the N. T. C. Ry. are being secured at convenient points along the survey. By counting the annual rings on many ties and pile timbers I was able to form some idea of the period of time taken to grow the trees from which they were cut. They varied from 125 years for small ties to 175 to 200 years for large ties and piling. Spruce five and six inches in diameter required 45 years to grow.

The most energetic creatures that I came in contact with were the mosquitos and black flies—one continual z-z-z-z all night and all day. Veil and gloves were the only satisfactory protection, and they were most useful during June and July. Stoneflies were sometimes troublesome, crawling into one's clothes.

I noticed the presence of many bark beetles of the genus Deudroctonus. They were busy on the spruce. Many dead and dying trees indicate the effectiveness of their destructive work. I was also pleased to note the presence of a European bark beetle destroyers. These little fellows made it interesting for the bark beetle. They have quite as much energy as our old friend the tiger beetle, and it is to be hoped that they increase in time to save the spruce forests.

Horn-tails were also very numerous. They confined their operations to the Balsam, with the result that many Balsams in sunny locations are dead. I watched them drilling holes when ovi positing. The operation of drilling a hole one half inch deep and depositing an egg and withdrawing the ovipositor occupied, on an average, six minutes. The Ichneumon flies were quite numerous. Their larve are parasitic on the Horn-tail larve. I often observed them both at work on the same tree.

I noticed a number of Ensign flies of the species Fornus. They were quite common about flowers and were of rather interesting construction. Coleoptera, with the exception of the Bark beetles and Long-horned borers, were not nearly as numerous as here in Southern Ontario. Diptera and Lepidoptera were, I think, the best represented of all the orders. I captured 140 different kinds of insects and saw many other kinds that were too fast for me.

Fish were very plentiful, but difficult to catch, owing to the abundance of food. There were a few brook trout in the small streams. Pike, pickerel and sturgeon were plentiful in the river. My largest fish, a wall-eyed pike, measured 31 inches. I had the pleasure of seeing two Indians land a five foot sturgeon, but no such big game ever came my way. I caught one perch eight inches long. This one was enough to show their presence in these northern waters. In August the shallow water of the river was teeming with little fish, varying from one half to one inch long.

No account of the northland would be complete without a word or two about the Indians. There was an Indian summer camp on the west bank of the river about one half mile up stream. The correct census of this camp was five squaws, twenty-one cub Indians, all about the same size, and forty-two dogs. The buck Indians were engaged in freighting on the river for prospec-

tors, and were only at home when out of a job.

I have every respect for those northern children of the woods, and hope the day will soon come when the fur trade will be reserved exclusively for them. One can forgive them what ever they may do. They are more humane than the white trapper. An Indian will always lift his traps in the spring. This is something that the white trapper does not always do. I have seen steel traps that had been set, judging from surroundings, during the winter of 1910. These were still set in August. I have seen in June a steel trap that had been set by a white man still holding the bleaching bones of a victim that had never been collected. I have seen in May a steel trap that had been set by a white man, holding the rotting carcase of a mother marten. Just think of it, the slow agonizing death, and the waiting in the old home tree of four or five little martens, for a mother that never returned. When I found any steel traps I pulled them from their fastenings and threw them into the deepest part of the river. The Indians of Northern Ontario have learned to foster the game and fur. They use the old and merciful deadfall wherever possible in their trapping operations, and when using steel traps they always collect them on the last round.

Is the country north of the Height of Land suitable for agriculture? My observations were limited to the territory lying along the N. T. C. Ry. between the Abitibi and Ground-hog Rivers. East of Cochrane there is a great deal of shallow Muskeg. The country is comparatively level and covered with small spruce and Balm of Gilead. Soil, clay, covered with a black vegetable mold, varying from two inches to four feet in thickness. West of Cochrane there are hundreds of thousands of acres of as fine agricultural land as we have anywhere in Southern Ontario. Of course this land is still covered with the timber that it has produced, both standing and decayed. The rivers and creeks all flow north or northeast. The country is level with a gradual north slope. Soils clay loam, clay, black muck, muskeg and a few small areas of glacial sand. The growing season of 1910 was much the same as our Soutehrn Ontario seasons, only a month shorter at each end. I saw as fine oats, wheat and barley, volunteer growth along the grade, as ever I have seen in the south. They all ripened before frost. Timothy, clover, wild pease and vetches grow most luxuriantly. My own little garden, spaded up beside the tent, produced as fine vegetables as one could desire. The muskegs are very shallow and easily drained. They should make great timothy land. This tract of country commonly spoken of as the clay belt is four hundred miles long and two hundred miles wide. It may be known some day as "The Meadow of the Empire."

In conclusion, I will say this: The longer I stayed in the northland the better I liked it. A fire ranger's life is not all fun. We suffered many hard ships that I have not enumerated here. The silent northland has a fascination for those that appreciate nature. It was with feelings of regret that I turned away from the grand old Mattagami, after viewing for the last time her beautifully wooded banks. The blending of the frost-tinted leaves of maple and birch with the deep green of the spruce and the dark waters of the river, made a picture that I shall never forget.

"Steve," '12.

Fagging

J. B. GRANGE, '13.

A BOY'S experiences in a Canadian school are so very different to those of a boy in one of England's large boarding schools, that a short account of some of the old customs, still practised in the latter may prove interesting.

Fagging is one of these customs and plays an important part in a boys' school career. Its objects are much the same as hazing, but the effects are more lasting; it teaches boys that they must be modest and unobtrusive, and generally this end has been gained when their life as a "fag." ceases.

The following quotation from "Tom Brown's School Days," shows that the custom is by no means modern—it tells of the duties of a night fag (that is from supper till nine o'clock):—

"This consisted generally of going to the buttery for beer, bread and cheese (for the great men did not sup with the rest, but had each his own allowance in his study or fifth or form room), cleaning candle-sticks, and putting in new candles, toasting cheese, bottling beer and carrying messages about the house." The custom of supplying the boys with beer has now almost ceased, otherwise this description is very true to the present day.

It is a disputed point whether or no fagging carried on as described below, is good for boys. Those who do not believe it to be advantageous are mostly people who have had very little to do with it; while others who have been through it, are firm advocates of the custom. As one of the latter I may say that I think it a truly excellent method of instilling the first principles of discipline.

As a general rule every boy must fag until he has been at the school a year; if by this time he has got to the class half way up the school he is let off. If he has not succeeded in doing this he must fag until he does. If he has not reached this class in three years he is given what is called a "charity shunt" and released from fagging for the rest of his career. A "charity shunt" is given to boys who have remained in one form too long and seem unable or unwilling to get out of it.

Fagging is practised rather differently in the various schools, the following being a brief outline of the duties of a fag at one of them. In the first place, however, it is necessary to explain the manner in which we were roomed. Belonging to the school there were eight living houses, there being about forty boys in each house. The rooms we used during the day were termed "studies" in distinction to the "bedders"; some had seven occupants and others five and four. The head of a study was usually a boy from the top classes or one who for some time had distinguished himself at athletics; he was allowed to fag only the junior boys in his study. That is he could legitimately order them to do anything at any time, except during study hour; and had authority to make them "cock up" if they refused or did anything wrong. To "cock up" meant kneeling on a chair and bending over the back, during the application of a cane, toasting fork or other handy implement. A "house prefect" had authority over any fag in the house. Three fags were allotted by the housemaster to large studies and two to the smaller.

The duties of these fags started after breakfast when they had to dust and

sweep their respective studies. Every ornament on the mantlepiece had to be dusted each morning, also the bookshelves and tops of all the pictures. The penalty for leaving dust in any of these places was to "lick it off."

If the head of the study was not particularly brilliant at construing Latin and Greek the fags were often made to do it for him, or perhaps read to him out of the crib. If he was unfortunate enough to be set lines (impositions) his fags were often made to write them for him while he played football.

After dinner the study fire had to be lighted and attended to for the rest of the day. Only a limited amount of coal was supplied, so that if this ran short the fags had to creep down to the cellar and steal some more.

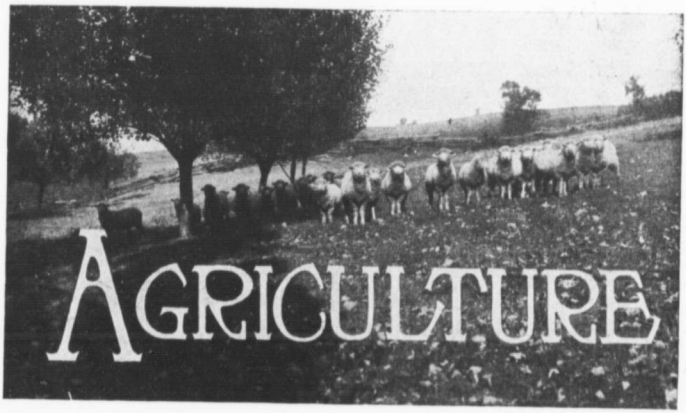
After a game of football they had to run home and prepare a bath for their lord and master; while he bathed the fags prepared a brew of cocoa on the study fire. In return for these many services the fags were taught long-distance running, by being herded together and made to run five or six miles, followed by the older boys who helped the laggers on by the aid of a stick.

In the evening, about nine o'clock, there would often be supper to prepare; this might only consist in opening canned beef or something of that sort, but more often porridge would have to be made, or a brew of cocoa. All the cooking was done over the study fire and woe betide the fag who let anything burn; the toasting fork with wire twisted handle would then be brought into very active service. After this meal the dishes and cups would have to be well washed and the porridge pot carefully scraped and sandpapered.

On Saturday and Sunday no tea was provided in the dining hall, but all the boys had tea in the studies. Bread, butter and milk were supplied in limited quantities and this had to be fought for and brought to the studies by the fags. Anything extra, including tea, had to be supplied by the study. The tea things were laid out and large supplies of toast made. Also extra supplies of bread, butter, milk and cake had to be fetched from the store. One very particular point which had to be observed was that the tea had to be made with boiling water; also the tea-pot warmed before putting in the tea. This was most important and the result of neglectfulness on this matter was that the fag would receive "correction." After the meal there was all the washing up to be done (the cups being usually dried with the cloth for dusting the study), the crumbs brushed of the tables on to the floor, and the floor swept clean. Sometimes a brew of coffee would have to be made when this was finished.

Besides these regular duties there were often extras. If the head of the study was in the cricket team his fags would have to whiten his boots and oil his bats. He might also be made to bowl and field to him during practices. However, this was the exception rather than the rule.

Now many people will say that this is abject slavery. It certainly does look like it when put on paper, but in reality is far from it. Indeed the life is very enjoyable. Others say that it is bad for boys to be allowed and encouraged to have others under their authority in this manner, but this is an argument which I do not feel able to discuss.



Hand-Made Cement Tile

E. S. HOPKINS, '11.

WHATEVER may be the criticisms of this article, it cannot be said that the subject has been approached in a biased or prejudiced manner. Tile manufacturers are engaged in controversy over the relative merits of clay and cement tile, and the articles written by them are merely arguments for the respective sides to which they adhere. Such literature paints one side to the exclusion of the other.

In order to publish reliable information on this subject and to investigate the feasibility of the manufacture of cement tile on the farm experiments were conducted with a "Farmers' Cement Tile Machine." These experiments comprized an investigation into the cost, solubility and crushing stress of cement tile.

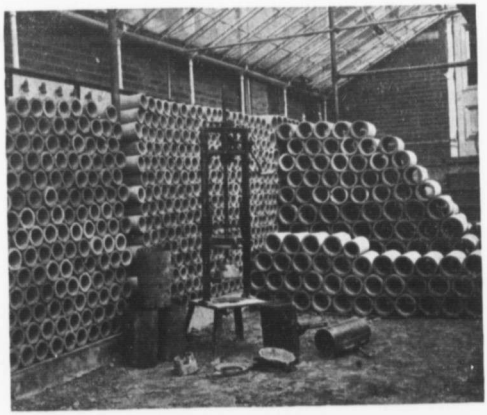
The cost of cement tile depends upon the price of sand, cement, and labor. These factors vary in different parts of Ontario, but, knowing the cost of materials in his locality and the number of tile that can be made in a day, a man can calculate for himself the cost of his tile. The hauling of the material may be off-set by the hauling of the clay tile so that in arriving at a comparison between the two this factor may be omitted. With sand at 20 cents per yard, cement at $1.90 per bbl., and labor at 15 cents per hour, three inch cement tile will cost $11.87 per thousand, when one form is used and $10.68 when two forms are used. Four inch tile cost $15.89, five inch $18.95, and six inch $20.01, using only one form.

With two forms two men can make 600 three inch tile in one day of ten hours. With one form two men can make 485 three inch tile, 370 four inch, 355 five inch and 350 six inch tile in one day.

It is often stated that cement pipe is soluble in water, that it is ruined by

the action of alkali, and, that it cannot withstand the action of acids. Experiments were conducted to test the solubility of cement tile in water. Tile were placed in running water for upwards of one year and nine months. This resulted in an increase in the weight of the tile.

It was found that samples immersed in sodium salts had increased in weight. This was no doubt due to a great extent to a deposition of the salt on the exterior portion and possibly also on the interior parts of the tile.



HAND CEMENT TILE MACHINE AND TILE USED IN THE EXPERIMENTS.

The action of the acids upon cement tile was very marked when placed in a 10% or a 5% acid solution. A reaction took place and continued as long as new solutions were added until the sample was completely disintegrated.

The action of 1% and of 5% solutions was much slower but it was well marked, and such solutions would destroy the tile in time as completely as the stronger solutions.

In an experiment with reference to the relative frost resisting power of clay and cement tile the latter were found to be the stronger. This is explained by the fact that the clay tile contains a greater percentage of pores, which absorb more water, thus increasing the expanding force of the freezing water contained in these pores.

In estimating the relative crushing stress of clay and cement pipe, a method was used which although not giving the absolute strength of the tile, established a relation between the two. The results show that not only are the best hand made cement tile much weaker than the ordinary clay tile, but that there is a material reduction between the tile made with different proportions of sand and cement.

Two tests of the quality of cement tile are the "ring" and the "absorption." Concerning the "ring" test it may be stated that hand made cement tile do not give the desired metallic ring when struck with the hammer. On

this point, however, opinion might easily differ, but on the absorption test only one conclusion can be drawn. The "Universal Portland Cement Company," in a pamphlet issued in 1910, stated that the absorption of water should not exceed eight per cent. Taking this standard set by the cement manufacturers themselves, results of experiments are on hand to show a failure of the cement tile to measure up to the requirements.

In summarizing the value of cement tile on the farm for general drainage purposes the following conclusions have been arrived at:

I.—Cost.

Cement tile can be made on the farm with material and labor at average prices with the following profits over average market prices of cement and clay tile:

3-inch tile profit $1.32 per thousand.
4-inch tile profit $1.11 per thousand.
5-inch tile profit $4.05 per thousand.
6-inch tile profit $14.99 per thousand.

II.—Durability and Efficiency.

Hand machine made cement tile absorb a greater per centage of water than the maximum standard giving indications of too great porosity of wall.

These tile are readily soluble in an acid solution.

Hand machine made tile are rough on the surface and would present a greater resistance to the flow of water than would clay tile or tile made by power-driver cement tile machinery but are their equal in uniformity and shape.

Considering the results as a whole, cement tile manufactured with a hand machine are inferior in value for drainage purposes compared with clay tile, and power machine made cement tile, and their manufacture is not recommended where clay tile or power machine made tile are available.

New World's Record

"Made in Canada"

BRAMPTON, Lady George, on February 7th, 1911, established a record not to be forgotten.

On February 8th, 1910, when two years and sixty-six days old, she dropped her first calf, and for 365 days her milk was weighed in accordance with the rules of the Canadian Record of Performance the test being authenticated by the record officers, her monthly production being as follows:

February 8-28	517.75
March	1022.04
April	998.04
May	1053.05
June	1001.06
July	1019.01
August	938.
September	883.02
October	830.05
November	794.
December	915.03
January	837.06
February 1-7	193.04

making a total for yearly period of 11,004.75 lbs. of milk which yielded 536.045 lbs. of butter.

Brampton Lady George's sire and dam were both bred and raised at Brampton, by B. H. Bull & Son, the former being by Blue Blood, the latter by Brampton Monarch, imported.

Brampton Lady George dropped her second calf March 3rd, 1911, less than

thirty days after completion of the test. She was exhibited at Toronto, also contended in Winter fair dairy tests at Guelph and Ottawa, at each she averaged 28.9 lbs. milk per day, for the three days of the test, the former being in December, the latter in January, when within sixty days of calving.

This record gives her the World's milk record for Jersey heifer under two years and six months at commencement of yearly authenticated test, she is about 250 lbs. ahead of her nearest rival, a heifer owned in Pennsylvania, her milk record is above that made by any other Jersey any age, tested for record of performance. Her butter record is highest of Jerseys on Canadian record of performance.

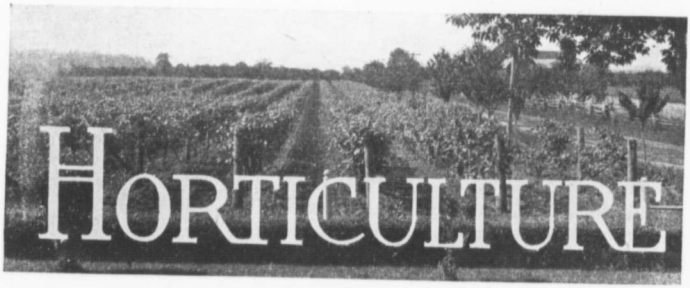
Quoting from the latest report of Canadian Record of Performance, Brampton Lady George has the Canadian butter record for heifer under three years at commencement of yearly authenticated test.

When one considers that Brampton Lady George was not fitted for a trot, in fact she had calved a couple of weeks before she was entered for test, then she was travelled to Toronto fair and home and the two hard winter trips, it is a very creditable record, and for eight out of twelve months of the test she carried a calf.

Blood will tell. Her dam Brampton Electra is now being entered for yearly test and promises very good. They are a very persistent family, and the female descendants of Brampton Monarch are with few exceptions great yearly butter cows.

There are many animals in the Brampton herd bred close akin to Brampton Lady George.

Canadian Jerseys have made several good records, Adelaide of St. Lambert, a daughter of Princess Minette and sister of Minette of Brampton, both owned by B. H. Bull & Son, holds the world's Jersey monthly milk record. Minette of Brampton is dam of Brampton Lady George's sire, while all will recall the world famous test of Mary Ann of St. Lambert.



Notes on the Demands of Our Apple Market in Great Britain

GRANT S. PEART, '11.

DURING the past year an effort has been made to gain a broader knowledge of our apple markets in Britain and what those markets demand, etc. Investigation has revealed no new startling facts. It has resulted only in collecting together many of the ideas, which have been gained by apple shippers as a result of experience.

The following is a brief summary of conclusions arrived at in the study of this question:

In the British Isles at the present time there is a distinct demand for three classes of apples; the dessert type for a limited fancy trade, No. 1 cooking and dessert apples for the general trade, and inferior stock, No. 2's, for culinary purposes alone. Of the latter enormous quantities are in demand. Another class may be included, varieties of poor quality, Ben Davis and Gano as examples. Such apples are consumed chiefly by those of very limited means, who cannot afford to pay the higher prices for apples of better quality.

With regard to varieties of a strictly dessert type, say McIntosh and Fameuse, only the fancy and No. 1 stock should be exported. The inferior surplus can be marketed at home to better advantage. The same remarks may be said to apply to No. 3 stock of all other varieties. Low grade apples of any type placed on any market tend to depreciate the value of the better grades. Further, a creditable reputation for the production and high grade fruit cannot be established for Ontario if her shippers insist upon such a practise.

Experience has taught us that a few varieties which we may call standard "staples" are wanted always by the British consumer and that the demand for them is practically unlimited, and that many other varieties are accepted, sometimes at good prices, but only when required for a special trade, or at a time when there is a shortage in standards.

Six apple shippers, representing different parts of Ontario, when asked to name the best paying varieties of ap-

ples, taking one year with another, from the exporters' point of view, gave the following list. The varieties given also are placed approximately in the order of their selling value:

Four exporters named the King.
Three exporters named the Snow.
One exporter named the McIntosh.
Five exporters named the Spy.
Two exporters named the Ribston.
All exporters named the Baldwin.
Four exporters named the G. Russet.
All exporters named the R. I. Greening.
Three exporters named the Stark.
One exporter named the Ben Davis.

The call for particular varieties in individual markets differs considerably. It is extremely difficult to determine where the various sorts of apples should be shipped to get the best returns. The markets change from day to day according to supply and demand, so that a variety which goes begging in Glasgow might be somewhat eagerly sought after in London, while a week later the positions may be reversed.

FANCY DESSERT.

In a general way, however, the markets of the Midlands, typified by Birmingham, are very strong purchasers of Russet apples of all sorts, including the Ribston Pippin, Roxbury and Golden Russet. The North of England as represented by Manchester and Scotland, also seems to want red apples, which means that the Spy, Baldwin, King and even at the proper time, Ben Davis are in good demand if well colored. The South of England and Ireland are the apple-growing districts of the British Isles, and keep the markets of Ireland and London comparatively well supplied. However, these apples are largely of cooking sorts, so that Ontario shippers can expect to receive fair prices for dessert varieties in these markets.

For large quantities of box apples Glasgow appears to be one of the best markets, while Liverpool is equally as good for large shipments of barrels. Both these places are heavy distributing centres, buyers from other towns and cities purchasing their supplies in them.

With regard to the size of fruit most in demand, the dessert trade requires a medium apple. It must be remembered that this fruit is retailed by the number, so much a dozen, or by weight, so many to the pound. The retail merchant will not pay as much for the very large apple, because his profits would be decreased.

Commission merchants in England and Scotland seem to be unanimous on the point that only apples of fancy No. 1 grades should be packed in boxes. They argue convincingly that relative net prices received by the shipper, for No. 2's per box and barrel are about the same. If this be the case it will pay to use the box for inferior grades of fruit, owing to the extra cost of labor and transportation attached to the box method.

Demonstration Work

I. F. METCALFE, COLLINGWOOD, ONTARIO.

IT is a generally acknowledged fact that there is great room for improvement in present methods of farming, and it would be strange if this were not so since we never get absolute perfection in this world. As a matter of fact there are single animals of different classes which approach near to perfection but many are far below these, and the consequence is that the average is much lower than the best specimens. The same thing holds true in methods of farm work. Although the science of agriculture has gone ahead with leaps and bounds within the memory of most of us, and although we have many progressive farmers who are well to the front, yet there is room for a great deal of improvement in the methods of managing the work on the average farm—also in methods of marketing farm produce.

In the past a great deal has been done towards improving these conditions by sending speakers out to farmers' meetings. It has been found, however, that it is very largely the exceptional farmer who has been reached by this method. The Ontario Department of Agriculture is now trying with marked success to reach the average farmer by sending District Representatives to work with him and show him what may be accomplished by improved methods of management in his own district. The District Representative is not expected to spend much of his time in planning new methods of work since that is already being done at the Agricultural College. What is expected of the Representative is that he will demonstrate these improved methods to the farmers of his district. The average farmer is very suspicious of "book-learning"—and in many cases with good reason—

AT COLLINGWOOD.

but is willing to take up new plans of work if it can be proved to him that these plans will be successful.

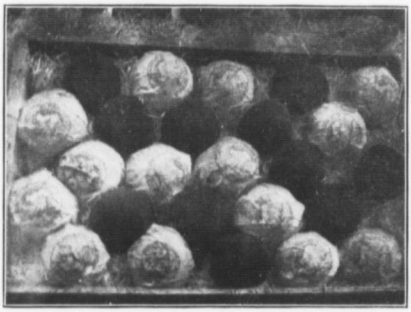
Since Simcoe County comes in the Georgian Bay District, it is not necessary to say that there are a great many orchards there. However, in the past these orchards have been sadly neglected, and as a natural consequence they have not produced nearly so well either in quantity or in quality as they should have. Last season six orchards were taken over as Demonstration Orchards in as many representative parts of the township of Nottawasaga. These orchards were given the best of treatment and a careful account of expenses was kept. The results were certainly good. Even the worst orchard paid for the work that was done on it, and about half of the expense was for pruning, for which the expense would be small in the future. The best orchard consisted of 50 trees and had never returned more than $50 for a season's crop. This year, $48.30 was spent in improving the orchard and the net returns were $232.97. These results should convince the orchardists of that township that it would pay them well to give their orchards good attention and already there are indications of an awakening along that line.

The spray outfit when mounted on a cart was used to spray mustard fields—which are all too common in parts of Simcoe County as well as in other counties. Both copper sulphate and iron sulphate were used, but the iron sulphate proved the most effective. Where the mustard plants were taken young enough they were completely killed and thus a valuable object lesson was given the farmers of what might be accomplished in weed eradication by other methods than the costly one of cultivation. The same outfit will be used for potato spraying, etc., and its many uses will show what a good investment it would be for the average farmer to own and use a cheap outfit such as was used.

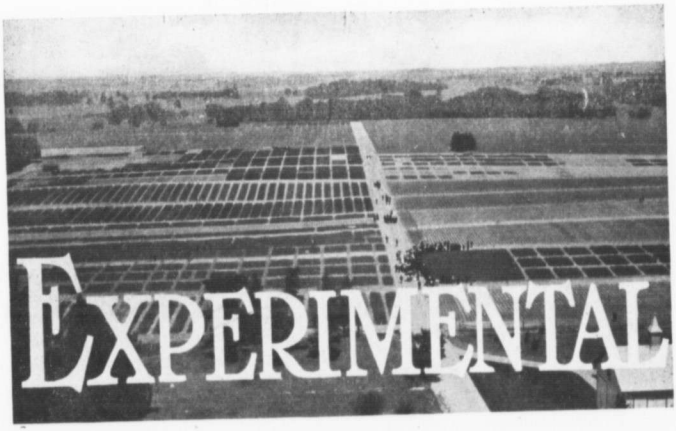
DEMONSTRATION IN SPRAYING

Here another thought suggests itself, namely, Expense. An expensive power outfit might have been used and

would no doubt have done excellent work but for demonstration work one of the first essentials is simplicity. Show the farmer what can be done with the same kind of an outfit as he can easily own himself and you will stand some chance of convincing him but get your results with an expensive outfit which he is not likely to buy—on the start at least—and you will make little or no impression. The farmer is willing to listen to reason and can be convinced if you go about it the right way and that way is just the way that you would expect him to do the work himself.



ELBERTAS FOR BRITAIN.



The Testing of Varieties as Foundation Work in the Improvement of Farm Crops

A. M. TENEYCK, SUPERINTENDENT WESTERN KANSAS BRANCH EXPERIMENTAL STATION.

IN beginning the improvement of farm crops in any locality, the most important factor to consider in securing foundation stock for breeding is the adaptation of the crops or variety for growing in that particular soil and climate. Three principal characters largely determine the value of a variety of any cultivated crop; namely, yield, quality and adaptation, and the last named is really the deciding factor which determines whether the variety may be successfully grown in any locality. In no state, perhaps in no two sections of the state, are plants subjected to exactly the same conditions of soil and climate. One section may have a more fertile soil or moister climate than another, and the plants of that section adapt themselves to those conditions and when planted in other environment may not succeed as well, but such plants may be adapted for growing in any region having similar conditions of soil and climate. We find a demonstration of this principle in the fact that wheat and other grains brought from the steppes of Russia are adapted for growing in the Western Plains region of the United States, which has a climate similar to that of the country named.

Throughout the Great Plains Region, the Turkey Red wheat has largely replaced all other varieties of hard red winter wheat, and yet some of the varieties which it has succeeded have been grown in the West for many years and seemed to be fairly well adapted to the western soil and climatic conditions. This superior hardiness and adaptation which the Russian varieties of wheat seem to have in our western country may be largely cred-

ited to the centuries of training which these varieties have had in an environment similar to that of the Western Plains, while the varieties which the Russian grains succeeded were as a rule those which had been gradually moved from the Eastern and Middle States further west, and although these varieties seemed to be fairly well adapted for growing in our western climate, yet in the comparatively short period, during which they have been grown under western conditions, apparently they have not become as hardy and as well adapted to those conditions as the Russian varieties.

In studying the reports of the variety trials of the several crops at the Experiment Stations in different states the first surprise is the large number of varieties which have been tested and the few of the same name which are grown throughout any large area, and an even greater surprise to one who is unacquainted with the work of variety testing, is the great variation in the productiveness, quality and hardiness which is observed between different varieties. Only a few of all of the varieties tested at the different experiment stations have proved to be superior in all of the qualities which make a certain variety more valuable than others. For instance, after five years' (1897-1901) testing of wheat at the Nebraska Station, (See Bulletin No. 72), of the one hundred and eighteen varieties grown only two, Turkish Red, and Big Frame, were found to have sufficient hardiness and productiveness to be recommended for general growing in the state.

At the Kansas Station, as reported in Bulletin No. 71, out of some fifty leading varieties of winter wheat which had been grown at the station for several years, only three, the Turkey, Tasmanian Red, and the Crimean withstood the winter of 1896-97 sufficiently well to yield at the rate of 10 bushels or more per acre. In the two tests noted it will be observed that the want of hardiness and adaptation was the principal factor in determining which were the "best" varieties.

During the last seven years the Agronomy Department of the Kansas Station has tested a large number of varieties of the different standard crops The result of these tests with almost every crop is quite decisive. In our trials with oats three varieties out of thirty or forty tested, easily ranked first in hardiness and productivness; these are the Red Texas, Kherson and Sixty Day varieties. More than one hundred different samples or varieties of corn have been grown in our test plots during the last seven years. Of all this number ten or twelve may be selected which are decidely above the average in yield and quality of product. Of the hundreds of varieties of wheat which have been grown and tested in comparative trials in Kansas during the last ten years at several different points in the state; Manhattan, McPherson and Ft. Hays, a dozen varieties of the hard red winter type, which produce wheat of good milling quality, rank highest in productiveness and hardiness. The same is true also of other crops, barley, flax, sorghums, cow peas and soy beans.

After seven years' testing of different varieties of cow-peas at the State Experiment Station the writer has no hesitancy in naming four or five varieties out of fifty or more grown, which are best adapted for growing under Kansas conditions. These are the Groit, New Era, Gray Goose, Whippoorwill, and perhaps the Black Eye. Also, from the variety tests of Soy

beans at the station the writer has concluded that ordinary varieties which mature in our latitude and which we have been recommending for growing in Kansas, such as Early Yellow, Ito San, Early Brown and Green Smarrow, are not profitable crops for growing in that state, while later maturing varieties such as the Austin, Meyer, Ebony and U. S. No. 19186, though more productive, usually fail to mature seed in the latitude of Central Kansas.

Almost every Experiment Station has some data along this line, proving the difference in hardiness and productiveness of certain varieties for growing in a particular soil and climate. This proves the importance and even the necessity of carefully testing varieties in order to select the best foundation stock for breeding. It is a waste of time and money to breed or improve varieties not well adapted to the soil or climate.

Again, it is necessary to breed crops in the soil and climate where they are intended to grow. There is little to be gained from breeding in Eastern Kansas drought resisting crops for growing in Western Kansas, and a crop intended for growing in a light sandy soil should not be bred and selected for that purpose in a heavy clay loam. It is advisable, in my judgment, however, to give breeding plants the best possible natural conditions for growth in the soil and environment in which they must continue to grow.

A well-bred plant is an artificial product; it has not been produced by natural conditions. Nature never made an ear of corn such as we have to-day. The present corn has been produced by giving it better conditions to grow in than the wild plants have. We have in corn an artificial product that has been made under conditions which are co-relative with nature, but which are not entirely natural, and any crop will deteriorate if left dependent upon nature without the aid of man. Then if we will improve our crops or keep them at a high grade of perfection, we must have fertile soil and practice the best methods of culture along with breeding and careful selection of seed.

Hardiness requires fixed characters in the plant, and this is exhibited by wild plants, which, being perfectly adapted to certain environments, change very slightly, if at all, even during the lapse of centuries. These wild plants when grown under cultivation are surrounded by new conditions, which cause them to vary in their characters, and it is true of our cultivated varieties that under the various conditions in which they are grown there is much greater tendency to variation in the characters of the plants than is found in the wild plants of the same species.

From the experiments of breeders and from general farming experience it would appear that changes in quality, productiveness and other minor characters of plants occur much more readily than changes which tend to produce hardiness or better adaptation to new or unsuitable environments. The changes by which plants become more hardy and more resistant to unfavorable conditions doubtless take place very slowly, yet with annual crops, especially those which are produced from seed, changes by which the plant becomes better adapted to the conditions in which it grows evidently take place much more rapidly than with wild plants. Not only do we have the general experience of western agriculturists to prove this proposition, but the experiments which have been carried on in different states in changing seed and

testing varieties prove that when certain crops are well adapted for growing in a locality, the crop from new seed introduced from other sources usually becomes gradually more productive and more vigorous and hardy after growing a few years in its environment.

The question arises as to how widely these "best" varieties as shown by the tests at the experiment stations, may be adapted for growing. Will the corn which produces well at the Kansas Station produce well all over the state and in other states wherever corn is successfully grown?. From a study of variety testing at several experiment stations it is evident that some few varieties of wheat and corn have proven to be among the better producers through a wide area of country. The Fultz wheat, for instance, which is one of the best producing varieties of soft wheat at the Kansas Station, is also among the best producers at the Kentucky and Tennessee Experiment Stations, and has a wide adaptation. Likewise the Boone County White Corn which originated in Indiana, is now being grown successfully throughout the corn belt, from Iowa to Texas, and from Kansas to Indiana.

Although, as stated, some varieties are grown successfully throughout a large area of country, in different acids and even under different climatic conditions, yet even the best varieties are not fully adapted to the new conditions, but gradually become better adapted as shown by experiments in changing seed. In Kansas some co-operative experiments are being conducted to test different varieties of crops for growing in different localities in the state. The reports which have been received show that in several cases the new seed sent out from the Experiment Station each year does not yield so well as the seed of the same variety which the co-operator has selected from his own crop of the previous season. A most remarkable difference in yield of corn is reported from Wallace County by J. R. Berry. Sexton, Kansas, Wallace County is in the extreme western portion of the state. The variety tested is known as McAuley's White Dent, a medium late maturing corn. According to McAuley's report the seed which we sent to him in the spring of 1900, produced at the rate of 12 bushels per acre, while the crop from seed which he selected the previous year from the McAuley field of his own growing produced 41 bushels per acre. In his report Mr. Berry attributes the great difference in yield entirely to adaptation by one year's growing and selection in Wallace County and the careful selection of seed ears.

It would be interesting to know just how these best varieties have originated and why they are superior to others in their class. Some, like the Turkey wheat and other Russian varieties of grain, are evidently "best" largely because of their greater hardiness or power to resist the adverse climatic or soil conditions, which character they have acquired by centuries of adaptation in a similar climate and soil. Some varieties (and this may be more general than can be proven) are "best" because they are better bred.

Some record of the origin of a few of the "best" varieties has been kept. With wheat, for instance, several of the leading varieties, such as the Fultz, White Clawson, and Blue Stem, according to Professor Andrew M. Soule, of the Virginia Experiment Station, have been originated by "picking out what are apparently sporting heads of wheat

from large fields and "rouging" them until a distinct character of heads and grain has been secured."

The Power's Fife wheat, for many years one of the best producing varieties of Scotch Fife wheat grown in North Dakota, originated from a single plant which was found growing in the edge of an oat field. Of the six improved varieties which were originated by Professor Hays, at the Minnesota Experiment Station, four, including the three best producers came from selected individual parent plants, and were produced by continued plant selection lasting for several years. The others were in-bred crosses, namely two selected plants of the same variety were crossed, and from the plants produced from these crosses the best individual plants were selected for a number of years, finally establishing the improved variety. Thus these varieties have been established by what is really a type of intensive inbreeding, which has largely destroyed the tendency to variation in the plants and fixed very strongly their type and character, so that it is uniformly produced even under changed environment. A good variety of any crop from this standpoint is largely due to the prepotency of plants which have the hereditary power to reproduce their characters, and such varieties will produce well wherever the climatic conditions will allow the plants to grow and mature. Although these well-bred varieties may also succeed throughout a wide area differing in soil and perhaps in climate, yet improved strains may be developed locally which are superior to the best introduced varieties.

The writer believes in the local testing and breeding of crops. The Kansas Experiment Station is improving a few of the best producing varieties of each of the several of the standard crops by breeding by the head-row and ear-row method. Forty-eight breeding selections of winter wheat, winter barley and winter rye, the product from the great producing heads in the head-test of 1907 were planted in one-tenth acre plots in the fall of 1909 for propagation and testing, and ten or twelve pure samples from the head test of 1906 were planted at the same time in larger area to produce seed for field planting and for distribution. Next spring the station will plant as large a number of pure head row selection of barley, oats and other grains in order to test these new productions and to secure seed for further propagation.

The breeding work with corn has been carried on for a longer period. Practically all of our "College bred" seed of the best producing varieties, Kansas Sunflower, Hildreth, Boone County White, and Reid's Yellow Dent, is the product of the highest producing ear-rows. A similar work has been accomplished with several varieties of Kaffir corn, Cane and Milo maize. Several thousand bushels of this improved high bred seed corn, Kaffir corn and cane has been distributed among the farmers of Kansas during the past two or three years, and hundreds of thousands of acres of these improved crops will be grown in Kansas next season.

While the station has not produced for distribution any pure seed from the "head-row" selections of wheat and other small grains, yet many thousand bushels of improved seed of the "best" producing varieties have been distributed among the farmers of the West. A million acres of Kharkof wheat have been planted in the State this fall, and a hundred thou-

sand acres of our best producing varieties of spring grains will be planted next spring, and the ultimate result of the distribution of these improved seeds must be to increase the yield of the standard crops in Kansas. In my judgment, this will be easily observed in the crop of 1910, and to a greater degree in the crops of succeeding years.

While the discussion of this subject relates to the testing of varieties to secure good foundation stock for breeding, yet it will be observed that the breeding work itself necessitates the further testing of the selections produced in order to compare and prove them. Necessarily some of these selections must prove superior to others and the larger number will eventually be discarded and propagation made only of those which prove to be the hardiest and best producing strains. Variety testing is therefore a necessary and important part of the crop improvement work.

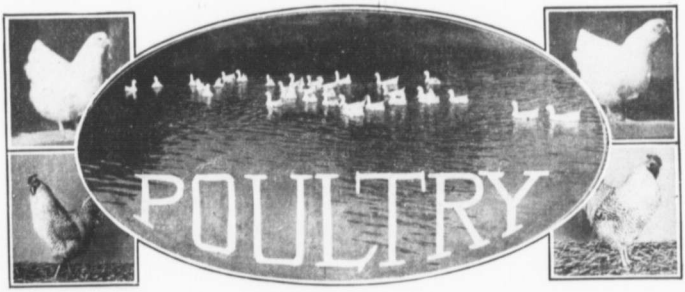
A large amount of variety testing has been done in several states, but usually with little result. The writer found on studying up this question that while a number of experiment stations have tested a large number of varieties of crops through a long period of years and finally made reports showing that certain varieties were the best producers, that at present some varieties which had been recommended were not grown in the State and the Experiment Station was again testing an almost entirely new lot of varieties. The variety tests had been made and the seed simply thrown away.

Such work has very little value. To know that a certain variety is better than another does not help the farmer unless he can secure the seed of that variety and plant it and grow it. The farmers want some of the seed of the best producing type of corn, wheat or oats, and I have found them willing to pay a good price for it.

It has been the plan at the Kansas Experiment Station not only to test varieties, but as soon as certain varieties are shown to be better than others the seed has been planted in increase plots, multiplied in quantity and the product distributed to the farmers of Kansas at a moderate price. And meanwhile the Station is securing improved strains of these varieties by breeding by the "head-row" method as described heretofore.

There is no question but that as these better producing varieties are separated and made purer in type, that we have something better than the average; something far better than the farmers of the State are growing. This is not only shown by our tests at the Experiment Station farm, but the reports of growers of our Kharof wheat, Kherson oats, Sunflower corn, pure bred White Kaffir and other crops indicated that these purer and better bred varieties are far superior in productiveness, as well as in quality and purity of grain produced to the "scrub" crops which many farmers are still growing.

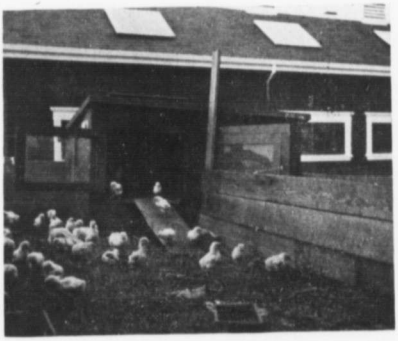
In closing, I wish again to emphasize this thought: The ultimate purpose of the variety testing and crop improvement work by our experiment stations should be to produce and distribute among the farmers better seed of standard farm crops.



Spring Poultry Work

PROFESSOR W. A. BROWN, UNIVERSITY OF MAINE, ORONO, MAINE.

THE late winter and the early spring months are the busiest months in the poultryman's calendar. They are not only the busiest, but they are the most important, for it is at this time of year that the breeding stock is one of the poultryman's greatest assets, and that selection should not only be practiced throughout the entire year, but that the most critical time is in the selection of the right birds for the breeding pen.



"RAISING CHICKENS ARTIFICALLY"

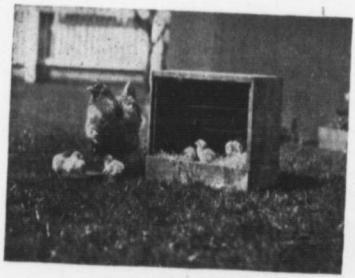
ing pens are mated up, the eggs are incubated and the chickens started on a career which will mean success or non-success to the poultryman.

Some one has said that strong, vigorous, healthy, early-maturing breeding stock is one of the poultryman's greatest assets, and that selection should not only be practiced throughout the entire year, but that the most critical time is in the selection of the right birds for the breeding pen.

Every poultryman should have some ideal which he is striving to perfect. It may be color of plumage, breed shape, meat, type, egg productiveness, early maturity, etc., or it may be a combination of them all. Whatever it

may be, it is very true that he will run but small chance of attaining that end unless his birds have the strength and stamina sufficient to make them prepotent in it.

For a number of years poultrymen have placed the blame for the great mortality that exists among young chickens on the methods of feeding and brooding. A radical change took place, many excellent poultry foods and new and approved appliances were placed on the market, but the mortality continued. Next came the attack on the incubator and many schemes were evolved and experiments



"NATURE'S WAY."

conducted, but still the mortality continued. One more factor remained, and to-day this great loss is attributed to weak, low vitality breeding stock. When such a condition exists, the loss is not all centered in the young chickens. It is apparent both before and after, for is not the lack of fertility in the eggs, the large number of fully formed dead chicks in the shell and the stunted, slow-growing, late-maturing chickens and the resultant poor winter egg production more or less directly caused by the same?

It pays to take pains in the selection of the breeding stock. The selection should be made early; in late January or early February for, in some instances, it may be advisable to change it. Last year an instance came to the writer's attention where a beautiful pen of eight females and a male of a certain breed had been mated up. Much attention had been paid to breed shape and color characteristics, but little had been paid to the eggs until it was time to fill orders for them, then it was found that but four of the eight females were laying an egg that was not suitable to ship for hatching purposes and the owner was obliged to turn away many excellent orders. It is advisable, if possible, to make more than one mating. The successful fancier will make up eight, ten and sometimes a dozen different breeding pens, and occasionally results come from the most unexpected sources.

In the early months the breeding stock should be placed in well-lighted, airy pens and later moved out on free range where they can secure all the exercise and food ingredients that nature intended they should, in order to produce a strong, highly-vitalized egg. Their ration should be composed largely of hard grain and they should be induced to work in a deep litter. For a mash, crushed oats are excellent, and if one has not a sufficient quantity of skim milk to go around, a little beef scrap or green cut bone should be placed in a separate compartment in a hopper. If possible the birds should be given access to a liberal supply of clover leaves and chaff or cut clover.

The eggs for hatching may be saved after the pen had been mated up for a week or ten days. It is not advisable to sell any for two weeks or better, not until the breeder has had opportunity to test out for himself whether or not the eggs from any given pen are reasonably fertile. The fresher the eggs

are when set, the better; if forced to hold them for some time, they should be kept in a room of about 50 to 55 degrees in temperature.

Care should be taken in the selection of a setting hen and a large roomy nest should be provided in a rather dark, cool room, where the hen will have opportunity to get off and eat, drink and dust herself without being disturbed. Of course she should be dusted several times and if this is properly done there will be little trouble with lice on chickens afterwards.

If one is going to use artificial means of hatching, the incubator and all appliances concerned should be thoroughly disinfected, new burlap should be attached to the diaphragms, new wicks placed in the lamp, the machine should be set level and some provision made for the application of moisture. The brooders should also be prepared in a sanitary way.

What shall those chickens be fed? A great many different rations are recommended and a great many people claim that the one they use is the best. From the writer's experience it would seem that it does not matter much what they are fed, provided they have hatched well and come from strong, vigorous stock. However, chickens seem to do best on a variety of feed and this with a good admixture of common sense methods on the part of the feeder, ought to give results. A plentiful supply of green food should be provided and those chickens should be given an opportunity to get out on the ground at the earliest possible opportunity, even if it is only to let them out and drive them in again.

It is hoped that with these few suggestions, at least one person will be enabled to raise more and better chickens this year than he or she has done heretofore.

How the Dominion Government Might Help the Poultry Industry

ERNEST RHODES, STE. ANNE-DE-BELLEVUE, QUEBEC.

THE Dominon Government has not done all it might to help and encourage the Poultry Industry. In 1898 two Poultry Stations were established by Prof. Robertson, one in Ontario and one in Quebec. These were afterwards increased to over thirty stations at various points throughout the Eastern Provinces. The object of these stations was to assist the poultrymen of the Provinces in which they were situated to introduce the English method of feeding and killing their cockerels. On some of these plants the most useful of our general purpose breeds were kept. In addition to these stations there was and is still a Poultry Department in connection with the Central Experimental Farm at Ottawa.

The Government Poultry Stations are now done away with and the work has in part been taken up by the Provincial Governments in some Provinces and by the Macdonald College in Quebec.

The work done on the Government Poultry Plant at Ottawa is far from satisfactory to those seeking information on any of the many different

branches of the poultry industry. A short time ago I visited the plant and to my astonishment found an antiquated poultry plant totally inadequate to meet the needs of the important work which should be carried on there. The condition of the birds was just as one would expect to find under the housing conditions to which they were subjected. Some of the birds were in colony houses, the majority, however, I found in a continuous house which appears to have been built rather from an artistic standpoint than one of usefulness. There is a total disregard for the necessity for as much sunlight as possible, the parts of the house devoted to the laying stock facing west. The windows are all securely fitted with storm windows, and large heaters are placed at intervals through the house, which, of course, in such a house may be a necessity. While this continual summer temperature may be conducive to the production of more eggs, which I very much doubt, it is not a good lesson to attempt to teach those visiting the plant. It is not practicable for the average poultry-keeper to keep his birds under such conditions and it is hard to erase from his mind what he sees there, even though you do show him that a few birds are kept in the cold colony houses.

It is not my desire to cast any reflection upon those in charge of this plant, but rather to point out the utter uselessness of their efforts—no matter how honest they may be—under existing circumstances. There is no evidence that sufficient money is allowed those in charge of the department to improve their flock of birds by the introduction of new blood or to allow for a proper selection. Doubtless if a free hand were allowed and a modern plant erected the country would get some benefit from the money spent and the faithful efforts of Prof. Gilbert and his assistants, who are now endeavoring "to make brick without straw."

In the foregoing paragraphs I have attempted to, show how much work has been and is being done by the Dominion Government for the Poultry industry. There may have been other work which I know not of, I hope there is. I have no desire to critize, but I want to point out how, in my humble opinion, the poultry producers of Canada, and through them, Canadians, might be assisted.

There are two lines of work upon which practically nothing has been done, which are of national importance and absolutely essential for the future success and prosperity of the industry, viz.: First, Scientific Research Work Upon Poultry Diseases—More especially those affecting the chick and the turkey, and Second, Co-operation in Marketing. This work can only be managed as it ought to be managed, by the Dominion Government.

The greatest hindrance to poultry development is the inability to renew the flock successfully, due to diseases of which poultrymen know very little, and which are for the most part troubling chickens. The question may be asked, What does it matter whether a chick lives or dies? But is it the case of a chick here and there? I wonder how many people have troubled to estimate the loss to the country through mortality in chicks? Of every hundred chicks hatched not more than sixty are reared—this is an average of figures received from poultry men who hatch out annually about fifteen thousand chicks. Let us take it that fifty million chicks grow to market age, and it means that had it not been for the mortality of 40 per cent., we should

have had two-thirds more, or in all eighty-three million chickens growing to market age. Taking the value of the fifty millions as $20,000,000 this mortality means a loss to the country in one year of $13,200,000. This is a tremendous loss and more than any country can afford to have. It cannot all be avoided, but if scientific investigation will save the half of it, $6,000,000, the expense entailed would be more than justified. Why does this loss occur? Simply because no organized investigation has been carried on with regard to the early ailments of our friend the hen. We often hear the old saying, "live and let live," but the most of us "live" and only "let live" if it costs us neither time nor trouble.

Two bulletins have been published during the last ten years dealing with poultry diseases and remedies, the one practically a rehash of the other and neither based on very thorough investigation. One of the assistants to the Dominion Pathologist told me quite recently that nothing definite was known regarding such disease as White Diarrhoea in chicks and Black Head in turkeys. Different theories as to the origin of these diseases and their cures are propounded almost every day and in the meantime our birds are dying by hundreds and thousands with the breeder perfectly helpless. We are taught that "prevention is better than cure," but how can prevention be accomplished with the cause unknown.

The establishment of a Bacteriological Laboratory in charge of scientifically trained men would in the course of two or three years be publishing valuable results which would be a boon to the poultrymen of the Dominion. In this laboratory diseases of all kinds affecting poultry could be studied and causes and remedies ascertained. In connection with this department of research it would be necessary to have a poultry plant sufficiently large to encounter with all commercial difficulties which arise.

This is a great work and should be taken up by the Government, as the result will benefit the whole of the poultry producers in the Dominion, and the work is too extensive to be undertaken and duplicated provincially or by private individuals.

Let us consider the second point, viz.:—Co-operation.

Canada has ceased to be an exporter of poultry products. Surely this is a deplorable statement to have to make. The reason for this is invariably given as "supply has not kept pace with the demand," but is it true in its entirety? What has been the result of the increased demand on the producer and the buyer? The producer has sold to the buyer all and everything which had the slightest resemblance to either an egg or a hen, irrespective of age or any other consideration. The estimated loss from marketing bad eggs alone in Canada last year has been placed by a prominent Canadian produce merchant at $1,650,000. If eggs had been marketed in the proper manner during the past few years these losses from bad eggs would never have occurred and Canada might still have been exporting eggs.

Is there any reason why this loss should occur from year to year? There certainly is under the present system of marketing, but it can be remedied easily if gone at in the right way.

Lack of system in marketing is the centre of all the trouble, which is very much aggravated by too much competition. For this there is but one remedy — Co-operation. Co-operation, among producers in mar-

keting and between buyer and seller.

It is the custom for a producer to market his produce independent of his neighbor. He imagines his neighbor is his enemy and the consumer is always trying to run down prices. This is not to be wondered at when he receives 15 cents a dozen for eggs for which the consumer is paying 25 cents. Between the producer and consumer, however, we find the eggs have probably changed hands from three to five times. Each time the handler or middleman has taken his profit for handling and so the dissatisfaction of both producer and consumer is directly due to the method of marketing—the dealers paying a flat price, which covers good and bad and helping the dishonest to the detriment of the honest.

The bad egg question must be considered. Under the present system of marketing both producer and buyer use no discrimination and the doubtful quality of the eggs when they leave the producer does not improve by the time the middleman is reached, with whom the consumer deals. Seventeen per cent. of the eggs sold by the producer have to be discarded sometime during their wanderings. The producer should always bear in mind that the consumer never objects to the price he has to pay provided he is getting good quality.

Let me give the reports of two Quebec and Ontario produce merchants to prove that the loss estimated from bad eggs is not exaggerated. The Quebec merchant states that during the period from May 15th, to October 1st, he handles from 35,000 to 40,000 cases of eggs (30 dozen per case) and that two-thirds of these cases contain no new laid eggs. The Ontario merchant handles about 20,000 cases of eggs in the same period and says that with strict candling there would be none classed as new laid, forty percent. of the whole would be stale or shrunken and ten per cent. bad. These merchants further state that if the bad eggs were eliminated they could pay from two to eight cents a dozen more for eggs.

How will co-operation help to remedy these evils? By the producers in a district marketing through one center thereby cutting out the middlemen; and by these centers receiving only that produce which is good and fresh beyond dispute.

Poultry producers are for the most part in the business on a small scale, too small for them to become responsible for the organization work and dealers object to paying the cost of organization and then having to come in on an even footing with other dealers who have paid nothing.

All these difficulties will be overcome if the Government will undertake the educational work. The producer must be educated for his own good and for the good of the industry and the country—to see the advantages of co-operative marketing. With this must also follow the standardization of poultry products, which will do away with the many different grades at present recognized. The standardization of poultry products and co-operation in marketing is an absolute necessity, and is a work of such national importance and character that there should be no question as to where the help is to come from to carry out the work.

The Fruit and Dairy industries have both been assisted by the Government. The result of this assistance is apparent. Both of these industries have been raised to a higher plane and mean much to the national assets.

When the Fruit Mart's Act was passed considerable opposition was experienced from buyers. A similar Act with regard to poultry might well be passed, and as such an Act is being advocated by both producer and buyer, its better enforcement is practically assured.

Everybody is ready to admit the Government has done a great deal for different branches of Agriculture, the dairy branch in particular, and all are proud of the standing Canada has especially in the cheese market of the world. The dairy industry is looked upon as one of Canada's greatest industries. We are told that in 1909 the value of the dairy produce amounted to $100,000,000 but during the same period under the conditions before mentioned and with practically no help from the Government the poultry produce of Canadian farms amounted to nearly one-half that amount or at least $40,000,000.

Very few industries respond to good treatment as readily as does the poultry industry, and there never was a time so opportune for that good treatment to be applied as at present, and more particularly as both consumer and producer are demanding attention and consideration.

The poultry industry is of such importance that it must be looked after and no Government can afford to ignore it.

A FLOCK OF CHICKS FOUR WEEKS OLD.

THE O. A. C. REVIEW

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W. DAWSON, Editor-in-Chief.

J. MILLER, Associate Editor.

W. TOOLE, Agriculture.
I. B. HENDERSON, Experimental.
C. M. CLEMENT, Horticulture.
M. C. HERNER, Poultry.
G. R. GREEN, College Life.
G. P. McROSTIE, Alumni.
F. C. McRAE, Athletics.
MISS R. MacADAMS Macdonald.
MISS MacTAVISH, Asst. Macdonald.
S. H. HOPKINS, Locals.

W. H. WRIGHT, Artist

A. HUTCHINSON, Business Manager.
E. A. WEIR, Assistant Business Manager.

Editorial

The Student Council

The past college year saw the organization of the first Student Council. We all remember the very interesting and enthusiastic meeting early in the fall term, from which this organization sprung. Many of us felt that a mistake had been made and "vice versa," while many decided that it was at least worth trying, and if unsuccessful, the question of "student government" would be settled for all time. Now that the year is closed we can look back and ask ourselves whether the experiment has proven successful and whether it is worth repeating in 1911-12 or not. We cannot here recount all the doings of the Council, but simply mention one or two of its recommendations. During the past two years there has been much discussion on the advisability of having the officers of the various student organizations elected on one day and of having these elections conducted in a similar manner to municipal elections. The responsibility of electing new officers for all our societies rests entirely with the students and upon the judgment of the students depends the success of each society; therefore it is necessary that every student be present at these elections. But election meetings come so often that we soon tire and only a few are ever present, with the result that a large majority of the students have no voice in the selecting of the various officers.

We firmly believe that if the Student Council recommendation is acted upon and that we have a regular nomination and election day, a wider and greater interest will be evinced in this matter. Such a scheme is in vogue both at 'Varsity and Queen's, and is giving satisfaction. We see no reason why it should not meet with the same degree of success here, and consequently a greater interest in elections and greater satisfaction.

The placing of the Philharmonic Society on the basis of a regular stud-

ent organization we believe to be a step in the right direction. No one can deny the fact that in the matter of support from the sidelines during games and in true college spirit, we are sadly lacking. In placing this society on its new basis we look for new life, for a combined effort in all our games and in cheering our teams to victory.

Therefore, come back next year fully prepared to become a member of the "Rooter's Club," to help in a revival of college spirit, to lend your aid in the compiling and publishing a new college song book and victory will undoubtedly be seen perching on our banners. We also heartily endorse the recommendation that hereafter examinations be written under a "nom-de-plume" and on a better quality of paper.

Articles by Students

To mention the subject of articles by students in this Review may seem somewhat out of place and unnecessary, as this issue contains four articles written by students. The four of these essays should prove of extreme interest to all our readers, as they are upon subjects which should at once arouse and hold the interest of every student and reader. "The Ontario Pioneer in Agriculture," by G. J. Jenkins, treats exhaustively of the toil, patience, sacrifice and privations of the Ontario pioneer to whose integrity and labor we are indebted for the heritage we enjoy. The fact that this essay is winner of the valedictory prize is sufficient to recommend its publication and careful perusal.

"The Romance of Canadian History," by R. L. Vining, who, with this as his subject, won the oratorical contest in March, will be read with a great deal of interest by all Canadians, and brother students from other lands. The subject is at once interesting and fascinating, and one of which many of us know little, and this article should prove highly instructive. However, it is not our intention or purpose to offer any criticisms or commendations on these two articles, but in a casual way to ask that during the summer holidays each and every student will ever be on the alert to do what he can towards helping and improving the Review from month to month. If you are a lover of the camera, and have secured some good photographs, bring them in, if you can compose a line or two of poetry, be it of love or fame, bring them in. Let us know how you spent and enjoyed your summer vacation. The Review is your property, therefore use it as a means to aid in fostering and developing literary ability.

During the past college year Mr. F. Davy, Editor of the Central Canada Citizen, Ottawa, conducted a very interesting and profitable course in Journalism. He outlined the underlying principles in detail, but laid stress upon the fact that to become a successful newspaper man or writer, you must practice, that being the great essential to success.

Therefore, next year we hope that in every issue of The Review will be seen articles on general subjects, not necessarily agricultural, poems, and photographs contributed by members of the student body.

The Future of the Cosmopolitan Club

BEFORE dealing with the aims of the Cosmopolitan Club for the future and more especially during the ensuing year, a brief review will not be out of place. As the majority of the readers of this article are aware that the movement started among a few students at Jordan Harbor last summer. Mr. Heurtley and Mr. Bosman interested themeslves in it, and talked to a few students here of the possibility of forming such a club, with the result that a general meeting was called and the Students' Cosmopolitan Club of the O. A. C.—the first organization of its kind in Canada—sprang into being.

The faculty and the students gave their most whole-hearted support to the movement, and we are proud to say that our Cosmopolitan Club holds the record for the largest initial membership on the continent. Mr. Heurtley and the Board of Management at once set to work to look for suitable quarters and the little house at Forbes Avenue was secured. at the time, but from the start we have felt that the right place for the Cosmopolitan Club is on the College Heights. Therefore at the general meeting of the club in March last, it was decided to look out for a new site. The board were most fortunate in being able to secure the very thing needed—a modern, up-to-date house of eleven rooms within three minutes' walk of the residence. There are three big rooms downstairs which have been reserved for club purposes, and the upstairs portion is to be used for a members' residence. In addition there is a good kitchen, and it is our aim to establish in the club a first-class dining-room, which will be of the greatest value to student members of the club, boarding in the city, and we trust, also to the faculty.

One of the avowed objects in starting the club was to promote better understanding, between the representatives of different nations attending the O. A. College, of the social, political and economic problems in each country. This we propose to carry out to the fullest of our ability in the ensuing year by learning the whereabouts of prominent men travelling in Canada, and, when possible, inviting them down to address the members of the club. In addition we feel it our duty to encourage social intercourse in our College Life and this can best be done through the welcome med-

ium of dances, skating and concerts.

In conclusion the board wishes to thank members of the past year for the sincere support they gave us. And in the future we ask for the help and co-operation of the students, which alone can make the Cosmopolitan Club a successful and beneficial organization—in fact an organization which the College is proud to own. H.L.P.

Philharmonic Organizes.

Year by year the growing necessity of putting the Philharmonic Society on an equal basis with the other College societies has been more and more keenly felt. The reasons for taking such a proceeding is obvious. In the first place no society can be successful without some substantial financial support and for this reason the society has depended largely on the proceeds of the annual Philharmonic concert. During the past few years our old College song book has become worn thread-bare and all that remains "is the one grasshopper sitting on an other grasshopper's back" and "Auld Lang Syne." It is largely because of the lack of support in College yells and songs that we have suffered repeated defeats in football and other games. Therefore the Philharmonic Society has resolved to come to the aid of the football men in furnishing music suitable for them by the formation of a "Rooters' Club." The society intends that a song practice shall hereafter be held once a week so that when occasion requires there will be nothing lacking in the line of reinforcement and encouragement from the side lines.

O. A. C. COSMOPOLITAN CLUB, 1911.

It is the purpose of the society that the "Rooters' Club" shall be headed by the College band which heretofore has not received the support of the student body. However, those who spent their

time and energy as chartered members of the band and those who have been interested in its welfare know that all that is lacking is support from the students which it will have in the years to follow.

Before any immediate action was taken the whole matter had to be brought before the student body for approval, after first receiving due consideration from the "student council." At the last roll call an opportunity was afforded and discussion followed in which both sides of this important question were brought out. However, it was unanimously decided that the Philharmonic be placed on an eqhal footing with the other societies and a fee of $1.00 charged. A new College song book will be published this summer, and the College orchestra, the College band and the "Rooters' Club" will be under the guidance and directions of the Philharmonic officers who have been elected as follows:

President, F. A. W. Boyd.

Vice-President, P. S. D. Harding.

Treasurer, J. M. Creelman.

Fourth Year Representative, H. S. Ryrie.

Third Year Representative, (to be elected).

Second Year Representative, A. McLaurin.

First Year Representative, (to be elected).

At the same meeting the question of having a general voting day for all the various officers in College societies was discussed, and met with general approval from the students. Therefore next year a day will be set apart for "Alma Mater elections," and needless to say there will be more interest taken in the appointment of these officers and keener competition among the students

A recommendation was also brought forward from the members of the First Year to the effect that in future all examinations shall be written under a "nom de plume," and that respectable paper shall be provided, also in the case of any student failing on a subject he shall have his paper returned to him if he so desire. This matter will come up before the Student Council at their next meeting in September.

Valedictory.

The winner of the Valedictory for best original Second Year Thesis was won by Mr. J. G. Jenkins. The subject assigned was "The Ontario Pioneer in Agriculture."

Public Speaking.

Mr. H. S. Ryrie was first in this department in class '12, and Mr. H. M. King, led the public speaking class of class '13. We extend to them our heartiest congratulations on their success.

New Review Staff.

The Review Staff for the year 1911-12 has been elected, and is as follows:

Editor in Chief, W. Dawson.

Associate Editor, J. Miller.

Business Manager, E. A. Weir,

Assistant Business Manager, G. J. Jenkins.

Agricultural Editor, L. Stevenson.

Experimental, E. Bradt.

Horticulture, W. Aikenhead.

Poultry, J. H. Fay.

College Life, C. W. Stanley.

Alumni, L. B. Henry.

Locals, J. H. Winslow.

Cartoonist, F. Waterhouse.

Auditors, Messrs. Darling and Jerow.

Union Literary Society.

The Union Literary Society Committee for 1911-12 is as follows:

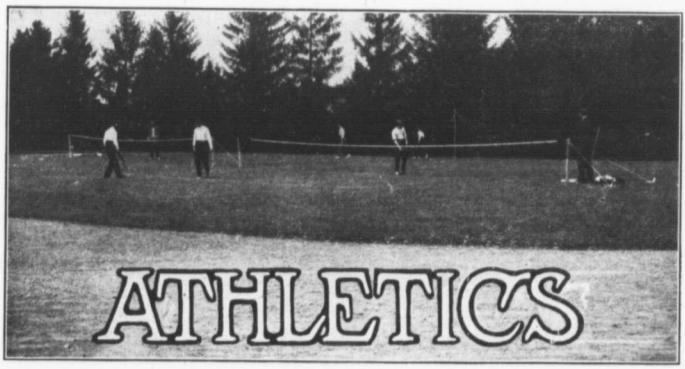
Hon. President, Professor S. B. McCready.

President, R. Schuyler.

Secretary, W. I. Rogers.

Treasurer, H. M. King.

Auditors, Messrs. G. H. Unwin and Eastman.



The Indoor Meet.

THE annual indoor meet which was held on the afternoon of March 15, was in every particular quite up to the standard of excellence of former meets. There was a very large entry list, especially from the First and Second Years, and there was a keen fight for first place in many of the events. There were four records broken, and the newly-established ones look good enough to stand for some time to come. Pope was the champion all-around man, his work being a feature of the meet. He again won the Pringle cup, and it only remains for Jim to carry on the good work for another year and then become the permenant possessor of the cup.

List of Events.

Fence Vault—Pope, Mollison, McRostie.

Standing Broad Jump—Pope, Culham, Mollison.

15 Yard Dash—Pope, Hextall, Meredith.

Running High Jump—Mollison, Winslow, Pope.

Chinning the Bar—Nourse, Crawford, Stanley.

Putting the Shot—J. E. McRostie, G. P. McRostie, Pope.

Three Stand Jumps—Pope, Mollison, Fay.

60-Yard Potato Race — Meredith Hextall, Whaley.

Hop Step and Jump—Pope, Mollison, White.

Standing High Jump — Mollison, Pope, McRostie.

Rope Climb—Fay, Evans, Crawford.

440-Yard Potato Race—White, Davies, Farmer.

Hitch and Kick—Robinson, Thorpe, Kingsmill.

Rope Vault—Fay, Angle, Farmer.

Obstacle Race—Meredith, Hextall, Fleming.

Pole Vault—Pope, McRostie, Fay.

Inter-Year Relay Race—Third Year, Second Year, First Year.

Running High Dive—Madden, Angle, Farmer.

Swimming Meet.

Novice 50-Yard Swim — Leppan, Waterhouse, Hirst.

Long Plunge—Heggie, Foster, Rogers.

50-Yard, open—Davies, Wearne, Rebsch.

Fancy Diving—Rogers, Jarvis, Wearne.

Back Swim—Davies, Evans, Spaltenholtz.

Novice Relay—First Year, Second Year.

100 Yards, open—Davies, Puliston, Heggie.

Senior Relay—Second Year, First Year, Third Year.

200 Yards, open—Davies, Puliston, Heggie.

Beginners, 35-Yard Race—Whaley, Reilly, Stansfield.

Davies was champion in the swimming events, with a total of 15 points.

Boxing and Wrestling Tournament.

The annual boxing and wrestling tournament proved to be an excellent afternoon's entertainment for the spectators who witnessed it. Some very good bouts were pulled off, but there was too much rough work indulged in, and not enough science displayed to make the event one of the first order.

In the light weight boxing Robertson won out from Petch and Reinecke In the featherweight class Smith won quite handily from Herridge, and in the welter weight Ryan pulled out a hard-fought victory from Heggie. The heavyweight boxing went to Culham.

Smith won the featherweight wrestling from Sorley after six rounds, in which one was about as good as the other. In the middle weight wrestling Kyono won from Gardiner in easy fashion. The heavyweight wrestling went to Carroll and the welter weight to Heggie.

The New Executive.

On Tuesday, April 4th, the election of officers for the new Executive took place. Great care is always taken in selecting these officers, and the following list of representatives for the coming year is assurance that the men appointed to the different offices were well chosen, and we feel certain that nothing will be left undone to make athletics better than ever for the coming year.

Honorary President—Prof. S. F. Edwards.

Honorary Vice-President — G. H. Unwin, B.S.A.

President—E. W. White.

Vice-President—Geo. O. Madden.

Secretary—E. J. Weld.

Treasurer—W. H. Tisdale.

Football Manager — Professor W. Squirrell.

Hockey Manager—J. English.

Basketball Manager—W. H. Smith.

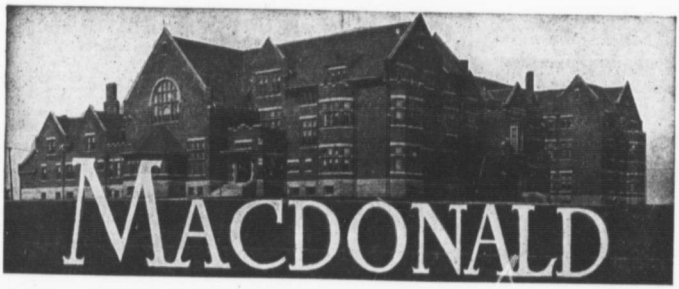
Baseball Manager—G. G. Bramhill.

Aquatic Manager—W. H. Wright.

Track Manager—J. Miller.

Fourth Year Representatives — Petch, McRostie.

Second Year Representatives — English, Kedey.



Domestic Science

Why Teach It in the Public Schools?

TO fit a boy to be a man, and a girl to be a woman, in the fullest sense of the word is, or at least should be, the object of education in both primary and secondary schools. Since the spheres of boys and girls in later life are in most cases so widely different, it is reasonable to conclude that both need some special training. Domestic Science seeks to provide this for the girls.

The problems concerning the education of girls to-day are quite different from those, which agitated the minds of educators a generation ago. No one questions now the capacity of a girl's mind! Educators formerly failed to make provision for any special training along these lines most practical and useful to the pupils. Now where home economics are taught the girls receive instruction of infinite value to them, since it is practical and concerns their everyday life and the influence of it will be felt for time to come.

And, withal, while it is practical no other phase of technical education is more popular with girls than Household Science.

Household Science Defined.

It may be asked "what is Household Science?" The term is a very wide one; it embraces both a scientific and practical knowledge of all subjects pertaining to the home.

Domestic Science courses in the Public Schools are concerned mainly with the practical side of the subject; sufficient theory only is taught to ensure the pupils gaining an intelligent idea of the reasons for the various processes.

At first, Domestic Science courses were experimental. When the beneficial results following on these were noted, the work became firmly established; now it is being commenced in more remote districts, even to the Public School.

Guelph Consolidated School.

In the case of the Macdonald Consolidated School at Guelph the children from the rural districts have the advantage of technical training, which would be denied them in the ordinary rural school. To the girls, three branches of Household Science are taught, viz.: Cooking, Sew-

ing and Care of the Sick in the Home.

The course in cooking includes a detailed study of the various methods of cooking, with each method applied in practical and economical examples. The different food substances are studied and numerous methods of combining them are carried out in actual practice. This course extends over two years of Public School and one year of High School work, each class spending two and one-half hours weekly in the school kitchen. The individual pupil is trained to rely upon her own individual effort as much as possible.

Practical Home Cookery.

To give the work additional practical value most of the recipes are made out in quantities suitable for use at home, although they are such as can easily be divided for individual work in class.

The cookery is simple at first; later when the pupils have once grasped the underlying principles they readily accomplish more difficult work. Pupils are especially encouraged to repeat their work at home, and a record of each pupil's home practice is kept.

The advanced pupils are given especial training in serving luncheons and during the winter term they make and serve hot soup to the children who remain at the school during the noon hour. As a final test, they prepare and serve a dinner, having previously made out the menus, calculated the cost and planned the work.

Pupils Learn Sewing.

The course in sewing is also made a practical as possible. After having learned the rudimentary principles, pupils are taught to apply them in making simple articles of daily use. In the higher classes, besides making plain garments both by hand and by machine, they also learn to repair old ones—a very practical phase of education you will agree!

The study of the Care of the Sick in the home has but recently been introduced at the Guelph Consolidated School, and is designed for the benefit of the more advanced girls. It includes a knowledge of the nature and course of all the common diseases, first aids to the injured, and the preparation of food for the sick and convalescent.

That Bugaboo! Expense.

Some people protest against the additional expense of all this training; they advance the argument that school children could be taught all these things at home. We know, however, that in most cases, this side of the girls' education is neglected, at least during the school period.

Do the advantages outweigh the cost of this special school training? Those who study the question answer in the affirmative, since they realize that by arousing the children's interest in ordinary home duties, children are led to derive some pleasure from performing these duties and they cease to regard such work as drudgery. Then, too, while the girl pupil is keeping up with the ordinary branches of school study, she is able to bring to the acquisition of these "hard facts," a mind broadened and stimulated by her practical work, which becomes evident in increased proficiency.

Domestic Science will have served its purpose if it helps to arouse among the young girls an interest in the noble art of home-making; if it brings the home and school into closer contact through this practical branch of education it, furthermore, will have been well worth while.

NETTA M. NIXON.

Among Ourselves

Entertaining the Short Course.

UPON the Old Girls in the spring term devolves an extra duty, that of entertaining the new girls so successfully that they may not notice the marked absence of the men who are the great diversion of the other terms.

So far the theatre parties, spreads and the initiations have been the chief features. But now that the theatre is closed, the initiation almost forgotten, and the novelty of spreads is wearing off, we welcome the season for tennis, and open car rides, May-Day and picnics, when we may introduce the Freshies to the further joys of College Life.

The Initiation.

On the first Friday of the term the members of the spring Short Course saw posted on the bulletin board a notice which filled them with the most horrible apprehensions, it was a warning of the initiation to take place that evening, and was vague enough to be very terrible in its import; yet of so indomitable a courage were they that one and all assembled in gym. suits at 7:30, as commanded, prepared for whatever fate might be theirs.

The Junior Normals and Housekeepers officiated, attired in the dress of the Order of Merry Milkmaids. They introduced the newcomers to every nook and corner of the Model Farm which was found to be very completely equipped even to its minor furnishings.

Many new and original stunts were required of those who had lately come to join our rural settlement, but whether it was the chicken dance, the leap from the elevated railroad or an impromptu speech or song, the response was equally ready and no newcomer failed to earn her little green guerdon of goodfellowship with the older established citizen.

After the initiation proper, refreshments were served in a form most attractive to the unalloyed appetite of youth, namely, delicious icecream cones, and life-like animal biscuits. Dancing followed of course and there appeared to be no single freshie who regretted having come to Macdonald.

Much Ado About Nothing

Inspired by the Bacteriology Lectures.

Mamma, have you boiled the milk and sterilized my plate?
I think there was a germ or two in the last food I ate.
I saw a micrococcus' track upon the pork and beans,
And there were stap'lococci playing leapfrog in the greens.
We ought to have more screens put on —I read just yesterday
The stegomyia fasciatie love to romp and play
About a little baby's crib and fill his precious veins
With horrid yellow-fever germs and other horrid pains.

Mamma, have you screened the steak, the porridge and oatmeal?
I heard a buzzing sound just now, and for the common weal
Of all of us, we must not let a fly go forth to roam
Wi' germs of ours—for every one should keep his germs at home.
If you will help me catch the fly we'll lay him down and see
With my small microscope upstairs how many germs there be.
And you should learn the names of them, and how they act and look;
I think, if you'll permit me now, I'll vaporize the tea,
And put a sterile compress on the prunes and celery,
'Till quite immune from typhoid germs and kindred kinds we feel
The blessedness of sitting at a quite aseptic meal.

—Saturday Evening Post.

Essay on Grass

By the Spring Gardener.

Grass comes up in the spring. All flesh is grass. Some of it developes into hayseeds, some into grass widows and some into breakfast foods. Grass is worth $14 a ton in the meadow, and not worth allowing to grow in the lawn. Lawn grass is grown from grass seed which is bought from the florist. Grass seed of that kind produces mostly plantain, dandelion, burdock, mustard and raw weed.

Grass will grow between the bricks of a walk, but will not grow in nice, rich black soil, in the yard.—Life.

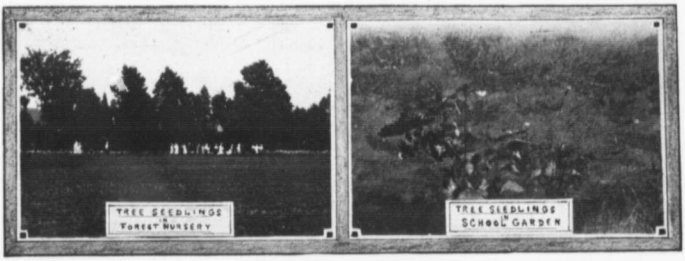
Senior Housekeeper—O, these excuses make me weary, and I'm tired of life. Got a pistol?

Senior Normal—No, but I can lend you a chafing dish.

Schools' and Teachers' Department

Devoted to those interests of the Ontario Agricultural College which pertain particularly to the training of teachers for giving instruction in the schools of the Province along vocational lines—in Home Economics, Industrial Arts, Elementary Agriculture and Horticulture.

ELEMENTARY AGRICULTURE AND HORTICULTURE.



In last month's issue an account was given of the work of the School's Division of the Experimental Union, in providing Ontario Schools with materials and instructions for practical work in Grain Studies.

In this, the plans for encouraging practical studies concerning trees are outlined. These plans have now been in operation for two years and many schools have been assisted in the work. With the growing scarcity of our timber and the advancing prices of lumber it is highly desirable that our young citizens should be educated to the critical state of affairs confronting us and the responsibility of taking steps to prevent a calamity in the future by conserving as far as possible our present resources and developing our waste lands by reforesting. The recently passed legislation empowering counties to undertake reforestry work indicates the awakening of public sentiment in this cause.

In this work, the Schools' Division has the hearty support of the Forestry Department of the College. School collection of forest-tree seedlings are distributed free to schools which undertake to provide suitable plots for the seedlings in the school grounds or, where the school grounds will not permit of it, in grounds adjoining the school to which the pupils have access.

The material for the collections is grown at the Government Forest Nursery in Norfolk County. It is shipped by express from St. Williams about the end of April or first of May.

The collection is made up as far as possible of the following:—White Pine (2-year stock), Scotch Pine (2 years), Norway Spruce (3 or 4 years), White Cedar (2 years). The plants are about eight inches high and so are not ready for final planting; they require to be kept in nursery lines for one or two years before final transplanting. If the school has no need for them, there being already a sufficient number of trees planted, the teacher is free to distribute them amongst the pupils **after they have served an educational purpose at the school for at least one year.**

A plot of ground about 5 feet by 10 feet is required for the collection; this permits of two rows of each kind of tree about one foot apart and the plants about ten inches apart in the rows. The plot requires to be weeded and worked during the season.

In planting out the young trees, teachers and trustees are advised to so place them that they will not need to be cut down or trimmed when they become large. In setting out trees, the future and not the present should be kept in mind. A small school ground should not be walled in with trees so thickly planted that they cannot attain their proper growth and shapes. One fine tree, free and open and natural, is worth a dozen cramped specimens.

Schools which desire to undertake a re-forestration proposition on a near-by piece of waste land that may be put under their control for this purpose, will be supplied by the Forestry Department with material for the work, provided there is assurance of its permanence and usefulness as an educational project.

Suggestions for Lessons.—Teachers are reminded that the following outlined lessons are merely suggestive—They are arranged here to suit the year's work, commencing in the spring. The work should not be limited though to the material put into the pupils' hands by the **Schools' Division.** This is merely for the purpose of opening up a larger interest and of giving the studies a practical and economic turn. All the trees of the neighborhood should be included in the studies. The tree plot commenced with the nursery stock should grow with addition of home found seedlings; in the course of a few years this might overflow into a fair sized school arbortine if space on the school grounds permitted; or, if this were not possible might lead to the school plots providing the whole school district with planting material for worn-out woodlots, or waste ground.

1. **Discussion of Plans.**—Location of Government Forest Nursery in Norfolk County. The purposes of a Government-owned nursery. The unpacking of the seedlings, noticing how they were labelled and protected. Examination of the seedlings to identify them and study their characteristics of leaf, bud and root systems. Laying out the school plot and preparation of the ground. Planting the seedlings. Appointment of committees to care for them.

2. **A Tree Census of the District.**—Have pupils make lists of the different kinds of trees that they **know** in the neighborhood. From these prepare a list of all the kinds of trees growing in the locality. Have tests on ability to identify the commoner trees by twigs, bark, leaves, appearance at a distance, etc. Preparation of maps making location of different kinds of trees about the school, on the roads or streets leading to the school or on the different farms.

3. **Tree Study Excursions.**—A class excursion to the woods to discover and learn about different species of trees. Gathering seeds or seedlings to bring back for planting. Fixing the study in a composition, drawing or map.

4. **Flowering of Trees.**—Reports by pupils on observations of maples, elms, willows, etc. The colors and abundance of the flowers. Whether visited by insects. How far expanded the leaves were. How the fruit developed. Collection of twigs and exhibition at school as bouquets.

5. **Tree Seed Study.**—Examination of tree seeds to learn their structure and manner of splitting. The comparison of the seeds of the different maples in size, shape and color.

6. **Germination.**—Observation of how the seed gets out of its case. How a seed lying on the surface of the ground gets its root fixed in the soil. How the seed leaves unfold; their color, size, shape and growth.

7. **On Growth of Seedlings.**—With the seeds germinated in the plot, the work will become a series of observations on such things as: 1. What happens to the seed-leaves. 2. When the second pair of leaves develops. 3. How

the second leaves compare with the seed-leaves in size, color and shape. 4. The nature of the root growth, pulling out seedlings to measure and examine them. 5. The rate of growth of stem.

8. On Holiday Studies and Work.—Definite arrangements should be made for the proper care and observation of the plot by members of the class. Instructions may be given for learning the different kinds of trees of the district, and making a collection of pressed specimens of the leaves.

9. On Injuries.—Examination of trees for signs of attacks by insects or fungus diseases—(insect injury will likely be marked by stripping of leaves, diseases will show as blotches or dead spots). Sending material to Central Experimental Farm, Ottawa, or Agricultural College, Guelph, for identification and report.

10. On Autumn Coloration and Leaf Fall.—Observation of gradual or sudden changing of color and texture. The effect of frost. The purposes served by the layer of dead leaves in the woods. The depth of the leaf layer in the woods.

11. On Measurements of the Season's Growth.—Measurement of height and thickness of the seedlings in the plots. Comparative growths on the twigs and branches of the older trees.

12. On Twigs and Buds.—Examination of twigs to learn the nature of the leaf scars. Observation of the location of the buds, their relative sizes, colors, coverings, etc.

13. On empty Birds' Nests.—Estimate of the number of birds that nested in the trees along the roads to school.

14. On Seedling Growth in the Woods.—A class excursion to the woods to find out to what extent little seedlings have sprung up amongst the larger trees. (This might be noted on boys' nutting outings). Comparison between a protected bush and one that has had cattle running in it.

15. On Tree Weeds.—Observation of the number of ironwood and hawthorn growing in woods. (These are a sign of poor management of the wood lot).

16. On Simple Surveys and Maps.—1. Observation and report on the bush, swamp and slash land of the School Section—(this classification is used by the assessor). Making of a map showing these areas marked and distinguished. 2. Observation and report on the barren, unproductive land of the School Section, such as rocky areas, gravel ridges, sandy places—making of a map and showing these areas marked and distinguished.

17. On the Original Forest Conditions of the District.—Inquiry to learn of the kinds of forest trees that the early settlers found. How the land was cleared. The uses made of the timber. The building of a log house. Stump remnants, etc., of the original forest. Historical trees of the neighborhood.

18. On Rate of Tree Growth.—Inquiry to learn how fast trees grow. Counting annual rings in logs at saw mills, and sticks of firewood. Collection and exhibition of neatly sawed ends of branches and smaller trees to show size attained in a relatively few years. These may be used for wall exhibits or decorations.

19. On Firewood.—Inquiry to learn what kinds of trees are locally cut for firewood. Examination of the school wood-pile. Measurement of it and estimation of cost. Inquiry to find out how much wood can be taken off an acre of bush land.

20. On Forest Preservation and Reforestation.—Inquiry to learn what action the Governments are taking to preserve the Forests. Forest Reserves (locate on maps), Forest Rangers, Forestry School at Toronto University, the Forestry Association. How the local woods may be helped in their endeavors to perpetuate themselves. The Ontario Government's Forest Nursery in Norfolk County. Distribution of seedlings for farm bush lots.

21. On Identification of Woods.—Examination and comparison of woods to be found at home and school. Woods used in floors, fences, barns, sidewalks, shingles, joists, axe handles, wagon tongues, pianos, doors, desks; picture frames. Inquiry to learn what they are and where they came from. Exhibition by pupils of samples of common kinds.

22. On Visits to Saw Mill and Planing Mill.—Finding out how lumber is made from logs at the saw mill and further prepared for use at the planing mill. The work of the different workmen. The different machines and processes. The waste products and their use. How the lumber is stored and cured. Tracing the **"life history"** of a door, a desk, a window frame.

23. On measuring Logs and Lumber and Estimating Values.—Exercises on actual measurement of logs and estimation of amount of lumber they will make. Inquiry as to how millmen pay for logs. Exercises on actual measurements of boards or lumber that may be about the school. Finding out the charges made for lumber by local dealers. Problems on flooring, fencing, etc.

24. On the Wood Used in the Building of the School.—Observation of the different wood materials used in the building of a house—beams, joists, studding, sheathing (sheeting), lath, rafters, shingles; frames for doors and windows, window sashes and doors. Estimation of the quantity used in the school building. Getting a bill for such goods from a local mill. Figuring on the cost of material used in sheds, poultry houses, etc., that may be building at pupils' homes.

25. On Woods Used for Special Purposes.—Inquiry regarding woods used for high-grade furniture, pianos, buggies, work-boxes, carpenters' rules, hockey sticks, lacrosse sticks, baseball bats, lead pencils. Location on map of countries that supply these.

26. On Veneers and Graining.—Examination of chairs, etc., to find if veneers are used. Explanation of wood-grains. Exhibition of pieces of veneers and fancy woods to show the beauty of the grains. Examination of the artificial graining done by painters to find where the designs are taken from.

27. On Sap Flow and Sugar Making.—Investigation of the local industry. Comparison of the olden-time methods with the new. The number of trees tapped. The best method of tapping. The causes determining the flow. Whether the sap comes from the root. The strength of the sugar solution determined by finding the amount of sap required to make one pound of sugar. Adulterations and the need for honest methods. Care of a sugar bush. Whether trees are injured by repeated tappings.

28. On the Unfolding of Buds and Leaves.—Observation of the manner of opening of the buds. The unfolding of leaves. Rate at which they attain their full size (for this, certain leaves should be marked with colored yarn and watched carefully). Daily changes in the colors of the trees on the horizon and date when all the woods are green.

29. Arbor Day and the Planting of Trees.—The reasons for the institution of Arbor Day. Consideration of the places trees might be planted about the school. Inquiry as to the number previously planted, the number that grew, the reasons for the death of any that did not grow. Instruction in best methods of planting, protecting and caring for young trees. History of any well known local trees. Special school exercises. Talks by trustees and others.

The Lay of the Lazy Man.

Breathes there a man with soul so
dead,
Who never to himself hath said,
"To-morrow morning I will rise,
Before the sun lights up the skies.
I'll set the clock so it will ring
Before the birds begin to sing;
It's strident bell will me awake
An hour or two for work I'll take."
And when at an unearthly hour,
Next morn the clock with all its power
Made noise enough to stir the dead,
And woke the man upon the bed,—
Breathes there a man, I now repeat,
Who wouldn't chuck it in the street,
And back into the bed then leap;
And with a sigh go off to sleep?—Ex

Rah! Rah!

The hen stood on the river's brink,
And gave her College cry,
Until a frog in pained surprise,
Politely asked her why.
She said, "Kind sir, you see that duck
Out there upon the water?
Well, that's a winning College crew,
And I'm its Alma Mater."—Ex.

Gems from Sophomore Banquet.

President Jenkins—I wish publicly to deny the accusation of the last speaker that I am a married man. Nevertheless, I have my hopes.

Rev. W. G. Wilson—Mr. President, members of the faculty and gentlemen! ! (Loud applause.)

Dr. Reed (replying to the toast to the faculty)—The last speaker has expressed very amiable sentiments towards us, and I was glad to hear him do so, but he had better have withheld them until he had seen how I marked his paper on my subject.

Mr. Unwin—All the great orators of the world are dead. Demosthenes is dead. Cicero is dead. Burke is dead, and I am not feeling well myself.

Mr. Jarvis—What animal is satisfied with least nourishment?

Foster—A moth, because it eats nothing but holes.

Mr. Hart—Can anyone mention an-

other plant suitable for the perennial border?

Harding (with his thoughts, as usual, on the material side)—Strawberries.

Tregillus—I know what you were doing yesterday afternoon.

Stairs—I'll bet you don't. I was working.

Stanley—What did the doctor say was the matter with you?

Stark—Nothing much, here's his prescription.

Stanley (reading)—For external use only. Apply every day between 4 and 6, one overcoat, one hat, and one pair of gloves.

Grange (eagerly, as plate of Johnny-cake appears on the table)—Reid, do you want any of this?"

Overheard at the Skating Club.

What is your valency, Mr. McKay? I heard it was two, with a strong affinity for one.

Smith (singing)—"What's the use in Dreaming."

Murray (interrupting)—That isn't a dream. It's a nightmare.

Hampson (popping his head inside the door of room 75)—Say, where does Whaley hang out?

King—I hardly think they have hung him yet.

In First Year English lecture, a cat began to yowl in the basement, while Hogarth was reading.

Professor Reynolds—That will do, Mr. Hogarth, we wanted a monologue, not a catalogue.

From First Year paper on "Ivanhoe"—The next morning the Jew's cell was entered by Front de Boedf and was demanded of a large sum of money, and if not paid, he was to be tortured on red-hot coals.

Athelstane—A tall man, but not as wide in proportion as De Bois.

Rowena—A tall, slim girl with black hair, and always dressed extra nice. She did not like to work.

Professor Graham — One hundred pounds of chicken will shrink five or six pounds in shipping one hundred miles alive.

Dougall—Isn't that rather a large chicken, professor.

Hurndall—Have you got good water on your farm

Hunter—Yes, we have a spring. I always wash in the spring when I am home.

Hurndall—Well, I wash in spring and fall both, and sometimes in between.

Next Year—M. A. C. vs. O. A. C.

Our intermeet is past and done,
And out of three we got but one,
Though Macs. the other two did get,
Old O. A. C. will trounce them yet.

—H.G.M.

Hill-Tout (writing essay on "Macdonald Hall")—If there is anything in the world that needs education, it is the young ladies.

Pevey Light (strolling over campus)—Wont you take this seat?

Fair maiden (after gazing at the seat's narrow proportions)—After you.

Hopkins—What option will you take in your Fourth Year, Miller?

Justus—Oh, I intend to specialize in athletics.

Freshman—Mr. Rettie, will you tell me something about how to raise turnips successfully?

Rettie—Why sure! Catch hold of the tops and pull.

Prof. Hutt—Mention one of the styles of landscape gardening now in vogue.

Staniforth—Kindergarten, sir.

Haydon (explaining Hydro-Electric machinery to party of fellow students)—This here whirligig is driven round by the H_2O. or something, and is connected with that thing-um-bob by this what-you-may-call-it.

Mr. Jarvis (in Entomology)—Can anyone in the class give me an example of negative photo-tropism, that is, where it is the nature of an organism to appear in the dark.

Clemens—Tom-cats, sir.

Main—How did you come out in the judging competition at the Fair?

Shorthill—It wansn't my fault I din n't secure a prize. I knew that reasons counted 40 per cent. and I had the dandiest reasons written out and memorized but those confounded animals we had to judge didn't agree with them.

MASSEY-HARRIS MOWERS

HAVE AMPLE POWER FOR CUTTING THE HEAVIEST HAY

And will cut close so as to save all the hay, which is especially desirable when the crop is light.

Cutter Bar is free to follow uneven ground.

Lift Spring may be adjusted to carry as much or as little of the weight of cutter bar as conditions demand.

Raised Ledger Plates give extra long cutting edges and the edges are serrated.

Cutter Bar has great range of tilt.

No "flying start" required—knife begins to cut the instant the horses start

The easily operated Foot Lift enables the driver to quickly raise the bar for passing obstructions.

The Royal Military College of Canada

The Royal Military College of Canada.

There are few national institutions of more value and interest to the country than the Royal Military College of Canada. Notwithstanding this, its object and the work it is accomplishing are not sufficiently understood by the general public.

The College is a Government institution, designed primarily for the purpose of giving instruction in all branches of military science to cadets and officers of the Canadian Militia. In fact it corresponds to Woolwich and Sandhurst.

The Commandant and military instructors are all officers on the active list of the Imperial army, lent for the purpose, and there is in addition a complete staff of professors for the civil subjects which form such an important part of the College course. Medical attendance is also provided.

Whilst the College is organized on a strictly military basis the cadets receive a practical and scientific training in subjects essential to a sound modern education.

The course includes a thorough grounding in Mathematics, Civil Engineering, Surveying, Physics, Chemistry, French and English.

The strict discipline maintained at the College is one of the most valuable features of the course, and, in addition, the constant practice of gymnastics, drills and outdoor exercise of all kinds, ensures health and excellent physical condition.

Commissions in all branches of the Imperial service and Canadian Permanent Force are offered annually.

The diploma of graduation, is considered by the authorities conducting the examination for Dominion Land Surveyor to be equivalent to a university degree, and by the Regulations of the Law Society of Ontario, it obtains the same examination as a B. A. degree.

The length of the course is three years, in three terms of 9½ months each.

The total cost of the course, including board, uniform, instructional material, and all extras, is about $800.

The annual competitive examinations for admission to the College, take place in May of each year, at the headquarters of the several military districts.

For full particulars regarding this examination and for any other information, application should be made to the Secretary of the Militia Council, Ottawa, Ont.; or to the Commandant, Royal Military College, Kingston, Ont.

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