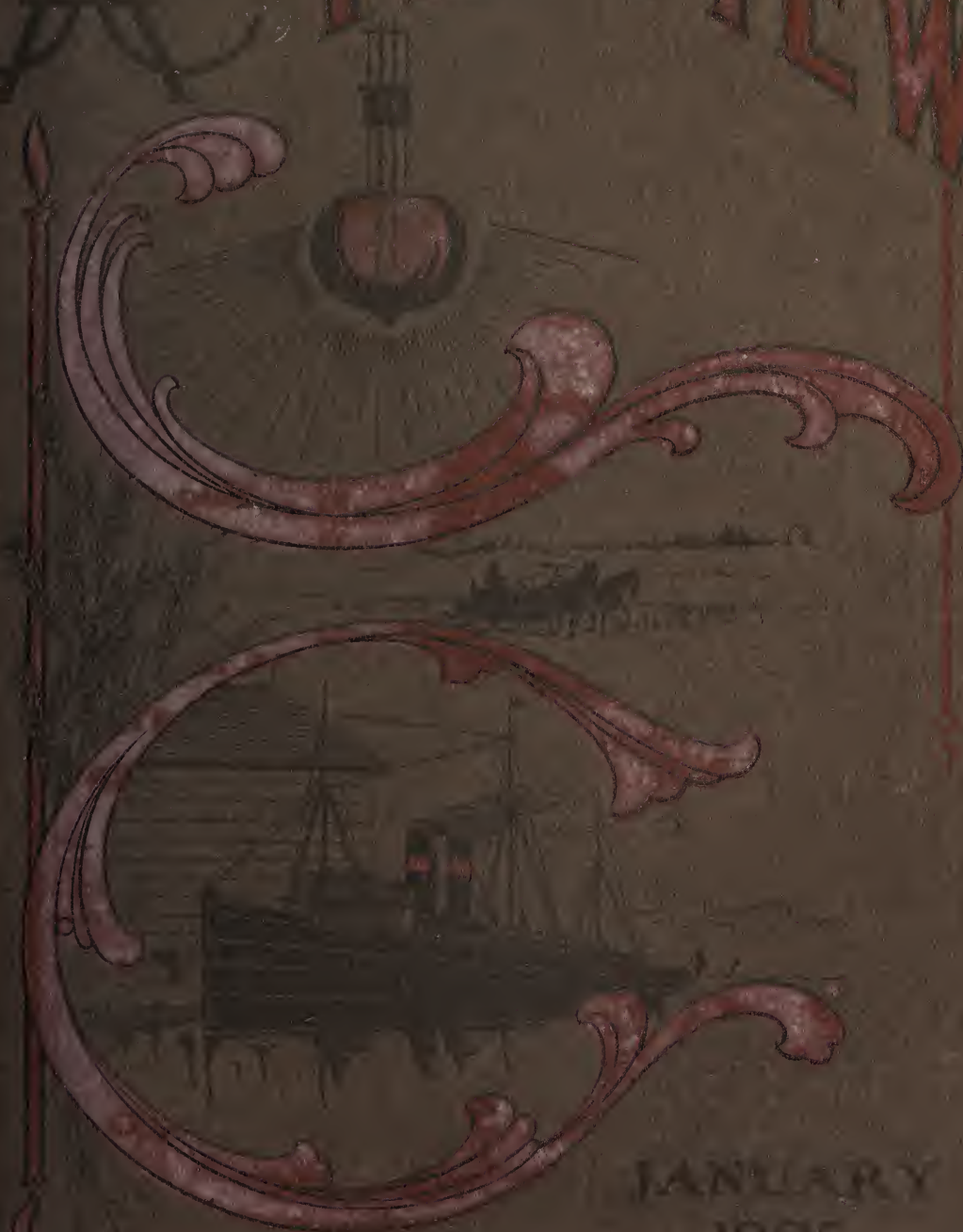
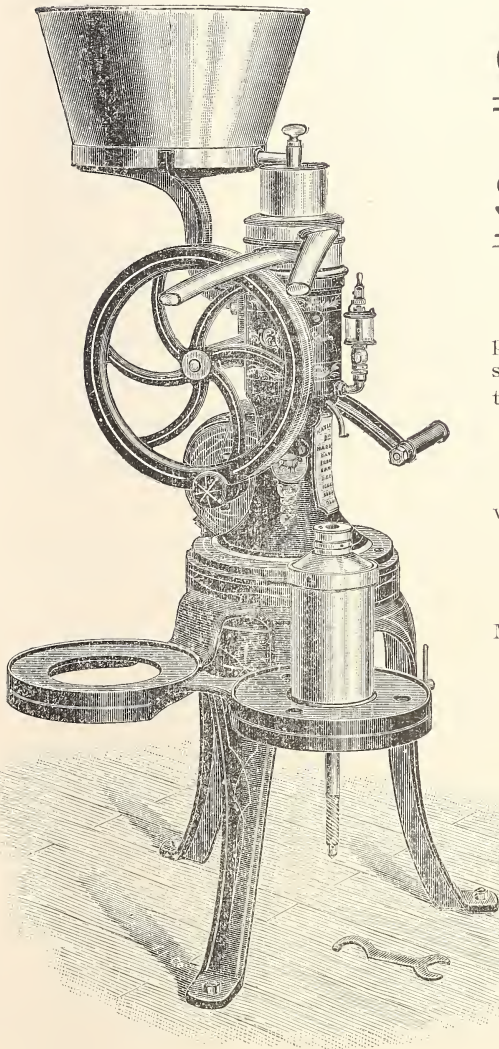


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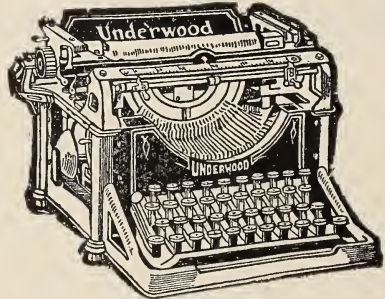
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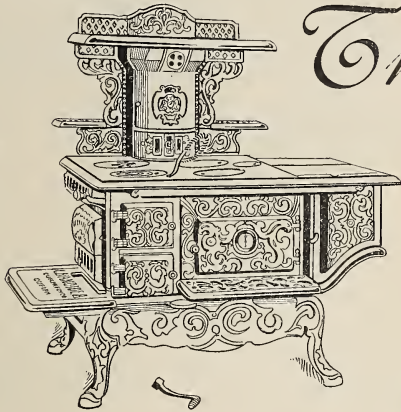
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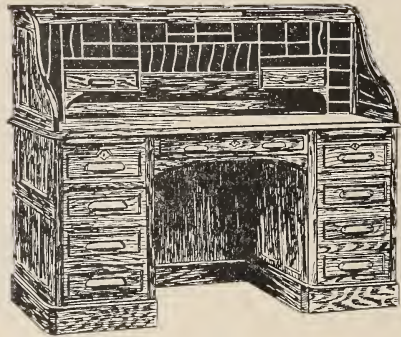
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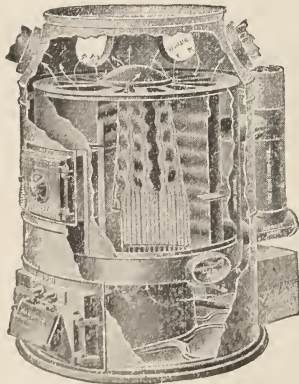
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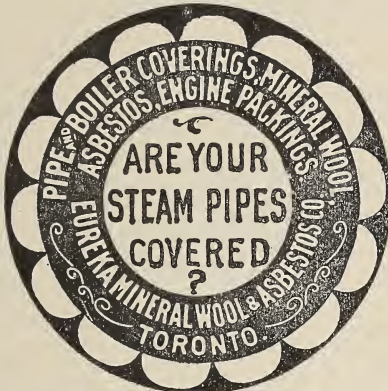
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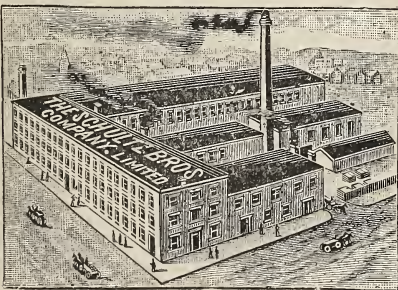


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Vol. XVII.

ONTARIO AGRICULTURAL COLLEGE,
JANUARY, 1905.

No. 4

Our Horse Interests.

DR. J. H. REED.

Every little while they tell us that the horse has got to go ;
First the trolley was invented 'cause the horses went too slow,
And they told us that we'd better not keep raisin' colts no more,
When the street cars got to moting that the horses pulled before
I thought it was all over for old Fan and Doll and Kit—
S'posed the horse was up and done for—But - he - ain't - went - yit !

When the bike craze first got started people told us right away,
As you probably remember, that the horse had saw his day ;
People put away their buggies and went kitin 'round on wheels ;
There were lots and lots of horses didn't even earn their meals.
I used to stand and watch 'em with their bloomers as they'd flit,
And I thought the horse was goin'—But - he - ain't - went - yit !

Then they got the horseless carriage, and they said the horse was done,
And the story's been repeated twenty times by Edison ;
Every time he gets another of his batteries to go
He comes whoopin' out to tell us that the horse don't stand a show.
And you'd think to see these chauffeurs as they go a'chauffin', it
Was all up with Mr. Dobbin, But - he - ain't - went - yit !

—London Road.



YES, the horse is still with us and likely to remain. I do not think there have ever been brighter prospects for the Canadian horse breeder than at present, and the indications are that this will continue for at least a score of years, notwithstanding the many inventions that are on the market to take the place of the horse. There is, and probably always will be, a

ready market at good prices for good horses of any breed or class, and even the mongrel bred nondescript can at present be sold for a price profitable to the breeder. At the same time the production of the latter class—if we can call it a class—can not be too highly condemned. There are several classes of horses that can be profitably bred by the Canadian farmer, viz—the heavy draught, the agricultural horse, the carriage or

heavy harness horse, the roadster and the saddle horse. It is, in my opinion, out of the province of the farmer to endeavor to produce the race horse, at either the running or trotting or pacing gait. This is, and doubtless will remain, the pleasure, or fad of the rich man, and even he can seldom breed, train, and race horses, and show a balance on the proper side of the ledger at the end of the year. Of course there are rare instances of a man of ordinary means producing an animal that showed remarkable speed and sold for a fancy price, but where one such breeder is thus fortunate, hundreds fail, and instances are not rare of farmers losing money, and even their farms, in the attempt to produce and train a "world beater."

The prospective breeder, if he purposes breeding for the market, should carefully study the demands of the market and endeavor to produce the type of horse that will sell well and that he can put on the market at the least trouble and expense.

Having decided upon the class he will breed, he must provide himself with one or more mares. Unfortunately our country is not well supplied with pure bred mares of any breed, hence few are in a position to produce animals eligible for registration. In regard to other classes of stock, as cattle, sheep and swine, circumstances are different, and horses are usually spoken of as being of a certain *class*, rather than *breed*.

A very large percentage of our horses are of composite breed. Where the breeder has, or can provide pure bred mares, of course he is in a better position to produce valuable animals than his neighbor, who is not so fortunate in the possession of dams. But where the possession of registered mares is not

expedient or possible, he should provide those as near to the type of animal he wishes to produce as possible, and then generation after generation improve the type by the judicious and careful selection of the very best sires of the special breed he is producing. While the use of impure dams is practically unavoidable, and if carefully selected and intelligently mated, usually profitable, there are, in my opinion, no circumstances that will justify a breeder in patronizing an impure sire. At the present time in England an effort is being made to produce a "Hunter Class." A stud book has been introduced, and animals of both sexes of the desirable conformation and actions are eligible for registration. Of course the Thoroughbred is the foundation. An ambition exists to produce a horse with more substance and bone, less impetuosity and nervousness, not so excitable and erratic as the Thoroughbred, at the same time with the necessary speed, courage and ability to stay that is required in a hunter. Such a line of breeding is costly. There is no doubt that many animals of both sexes, with a strong infusion of Thoroughbred blood can be found that have the characteristics of the hunter, both in size, quality and action, and hence will be eligible for registration in the "Hunter Stud Book," but when these are bred, neither sire nor dam being pure, each having more or less foreign or cold blood, it is problematical what the progeny will be. I have little doubt that the experiment, if carried on for a sufficient number of generations, will eventually be successful and a practically new breed will be established, but it will require a long time to establish a sufficient prepotency in these animals to enable them to reproduce type with reasonable certainty, and there is little doubt in my mind that

there will be a large percentage of "misfits" in the mean time.

The ordinary breeder of horses cannot afford to experiment on such lines; his object is to produce an animal that is as nearly typical of his class as possible; hence, though he cannot provide pure bred dams, he can at least patronize registered sires. The produce of a good mare, not pure bred, by a registered sire, is often a typical animal, even though of composite breed. If this produce be a filly and is bred to a registered sire of the same breed, the blood is necessarily intensified in the progeny; but if she be bred to a sire that has been bred in the same way as herself, even though he be very desirable in all respects but pedigree, the progeny will be an uncertain and we may say an unknown quantity, and in many cases is very disappointing. A little consideration will teach us why we may expect this. Both sire and dam, while of the desirable type, etc., are both impure, hence do not possess the prepotency that we expect in pure bred, and when two impure bred are mated the foreign element in the blood of either, or both, is liable to predominate in the progeny, hence the offspring may be vastly different from either parent. I think probably this mistake in breeding is more often made in carriage horses than in other classes. Many of the carriage stallions we notice at exhibitions and in the stud are not eligible for registration in any stud book, being the offspring of a good mare by a Hackney, Standard bred, Coach or Thoroughbred stallion, and while a typical carriage horse as regards style, quality and action, he is impure, hence he lacks the necessary prepotency to stamp upon his progeny his own characteristics with any degree of certainty. I again emphasize the remark, that under no circumstances

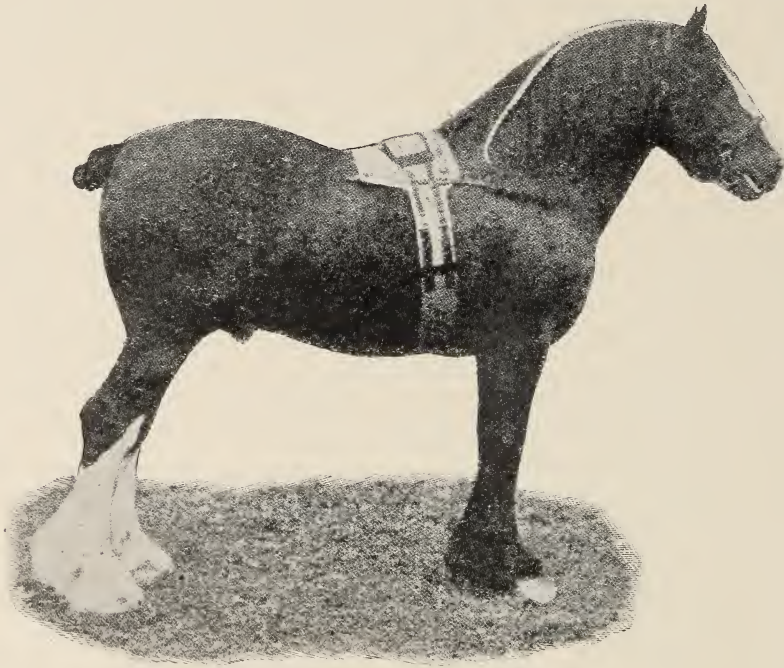
should the ordinary breeder patronize the unregistered sire.

Unless the breeder's tendencies are especially favorable to the production of horses of the light classes, he will probably find it more profitable to produce the draught or agricultural horse. These two classes are identical except as regards size. A horse of this type that is not heavy enough for the heavy draught class, is classed as an agricultural horse. The sires that produce these classes are the Clydesdale, Shire, Suffolk, Percheron and Belgium Draught. The first two mentioned are undoubtedly the favorites in this country, but any of them, if intelligently mated, produce good horses. The principal reason why horses of these classes can be more profitably bred than those of the lighter classes is, they are less liable to become injured during colthood, on account of their less impetuous disposition. When a blemish does appear it is not looked upon as so serious as in the lighter classes, and he is ready for the market at as early an age and with less fitting and handling. So long as he has the necessary weight and conformation, he will find a purchaser, while the lighter breeds require education in order that they may show to the prospective purchaser the necessary style and action for an animal of the class.

That the market for the heavy horse is in no danger of disappearing is indicated by the vast amount of railway that will be built in the Dominion the next few years, by the vast amount of new land that will be broken in the west and north-west, by the increasing demand for work horses in our rapidly growing cities and the constant British and United States demand. For the production of heavy horses there is a good supply of stallions, principally Clydesdales in most sections of the Dominion,

while in others the Shire is more plentiful, but there is a scarcity of pure bred mares, or even fairly good grade mares. In order to overcome this difficulty there have recently been imported and sold at public auction a number of fillies of both breeds, which have been sold at reasonable prices and been distributed through the Province. If this venture prove profitable to the importers, the importations will doubtless continue and we may

his own the automobile may continue to do service, but there exists in most men an inherent love for a horse. There is an affinity between a man and a horse that demands (where financial and other considerations will allow it) association, and to such a man an inanimate, homely, noisy and odorous thing like one of these machines cannot long take the place of the horse. Between the horse lover and his horse there exists a com-



Clydesdale Stallion.

look for an improvement in our class of draught horses.

CARRIAGE HORSES.

While the present demand for the carriage or heavy harness horse is not as brisk as usual, owing to the fad of using automobiles at present existing among the rich, I do not think the depression will continue. To the man who uses horses simply for convenience in getting from place to place in a conveyance of

radeship that cannot be substituted by any inanimate object, hence I predict that these machines will soon be cast aside in the same way as the bicycles have been by a large number now using them and the owners will return to their first love, the horse.

This class of horse must be a fellow of fair size, about $15\frac{3}{4}$ hands being the favorite height, but from 15 to $16\frac{1}{2}$ hands is permissible. He must be of good conformation, stylish and well-

mannered, and must have good action, both fore and rear and be able to go at a fair pace. The more flashy his action the more he is worth, and we can to a limited extent sacrifice style and smoothness of conformation for action. The breeds of stallions that produce him are, the Hackney, the big stylish, high acting Standard bred, the Coach horse and the Thoroughbred. Of course if the breeder has pure bred mares of either the Hackney or

lected the progeny is often a disappointment. The Thoroughbred sire is the only safe light horse to cross with a cold-blooded mare with the hopes of producing a high class light horse, and even here the cross must not be too violent. While this cross will usually produce a foal of good quality there is usually a deficiency of action for carriage purposes, unless the dam possesses extreme action. In a large percentage of cases the progeny

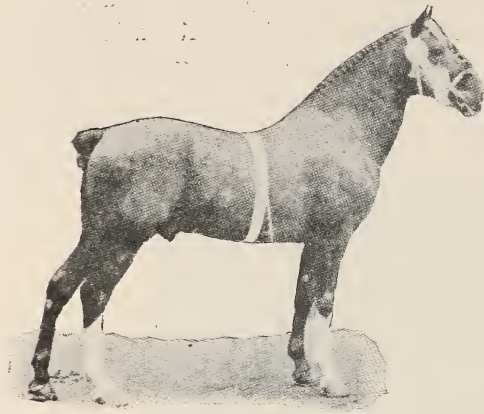


A Brood Hunter.

Coach breeds, he should mate them with stallions of their own breed. In the selection of a sire to produce carriage horses much depends upon the individuality and characteristics of the mare. When impure mares are bred to the Hackney, Coach horse, or Standard bred, care should be taken that they (the mares) have considerable hot blood, as there is not sufficient prepotency in these sires to overcome the cold-bloodedness of the dams, hence where this point is neg-

makes a saddle horse or hunter rather than a heavy harness horse. As regards general type and action for the heavy harness horse the Hackney may be said to be the most ideal, but so long as the animal has fair conformation and style and possesses the extreme height of action and sufficient length of stride he will sell for a fancy price. He is practically the rich man's horse and there is little trouble in finding a rich man who is able and willing to pay well for the

animal that suits him. For this horse we have a local demand in our cities and also a British and American demand, which, as before stated, will in all probability soon increase.



The Hackney Stallion.

SADDLE HORSES AND HUNTERS.

The demand for good saddlers and hunters is always with us. It, like the demand for other classes, exists in our own cities, and in Britain and America. There can be no question as to the breed of the sire we should select for his production out of our ordinary mares. The thoroughbred is pre-eminently the sire of saddle horses and hunters, with few exceptions all noted animals of these classes have thoroughbred blood close up on either sire or dam's side, usually the former. If a man makes up his mind to breed and cannot procure suitable mares for the production of any particular class, but has in his possession one or more good mares that are not heavy enough to breed draught or agricultural horses and at the same time are not too coarse, the thoroughbred stallion is the only light sire from which he can reasonably expect to produce a saleable colt. Some will say, "breed her to a small sized sire of the draught breeds or to a big coach

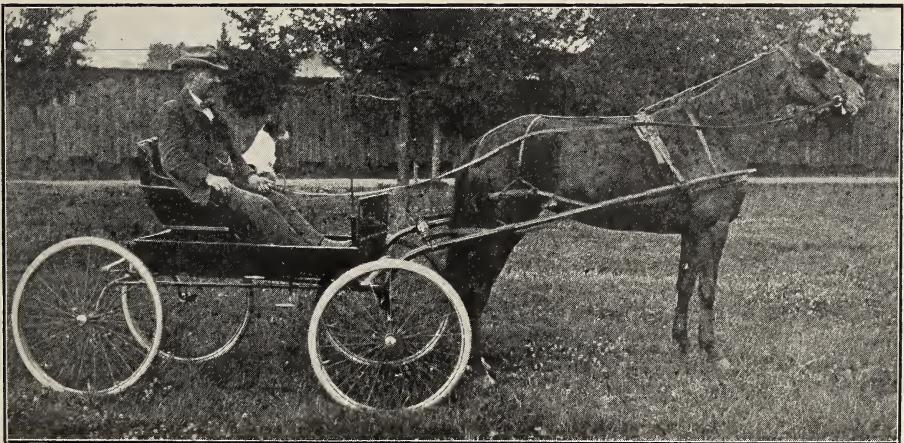
horse and produce a general purpose horse." In my opinion the "general purpose horse" is an animal that should not be recognized in any show ring. He is an animal for which no general type has been recognized, and hence has no particular breeding, cannot be produced with any degree of certainty by any system of breeding, is, in fact, a misfit, and has little market value. He is certainly a very useful animal for home use, but having no particular value in the market, it is certainly not wise for the breeder who is breeding for the market to try to produce him. Breed the mare described to a good, big, sound thoroughbred; the result will in all probability make a heavy weight saddler or hunter and if he be deficient in quality for these classes, he will make a useful farm horse, in fact he should make what I consider "the general purpose horse." If the prospective dam of our saddle colts be a half or three-quarters bred and we are afraid we will not get sufficient size if we mate her with a Thoroughbred, we can select a Hackney or good sized Standard bred stallion, the former preferred. This cross will give substance and action to the progeny, and while he probably will not make a hunter he will make a park saddler, in which rather high action is demanded, and besides he will go well in harness, making a combination horse.

ROADSTERS.

As for the production of saddlers out of ordinary mares there is no question about the selection of sires as regards breed, so with roadsters. The Standard bred stallion is of course the horse. There is always a demand at reasonable prices, for the big, stylish roadster that can go along at a good pace and look well. We cannot expect to produce

high class roadsters out of a coarse mare even though we mate her with the best sire procurable. The Standard bred animal is of composite blood and has not attained sufficient prepotency to stamp his characteristics upon his progeny when there is a large percentage of cold blood to be overcome in the dam. The dam out of which good roadsters are to be produced must have considerable hot blood, got either from Thoroughbred or Standard bred progenitors. Unfortunately horses of this class were for generations bred with the sole desire of producing extreme speed at the trotting or pacing gait, (either of which is allowed,) regardless of size, quality, style or other characteristics. As a consequence we notice many little horses, that are not large enough for any purpose except to draw a light load over good roads, and have not speed enough for road, much less racing purposes. In breeding roadsters we should select registered sires

that have size, quality and style, and of course the more speed the better. A road horse need not have racing speed, in fact it is seldom a race horse makes a satisfactory roadster. By reason of his training or racing he wants to go either too fast or too slow, and in many cases becomes erratic; but at the same time he must be able to go fast and be strong enough to draw two men in a buggy over heavy roads at a fairly fast clip. He may either trot or pace, the former gait is certainly the more desirable for heavy roads, as through mud, deep sand or snow, but some men like a pacer, many of which will trot at a slow gait, say eight or ten miles an hour, and if asked to go faster will pace. Some judges will not give a pacing horse a place in competition with trotters. I do not consider this right, for while we admit that on general principles the trotting gait is the better we do not think that it should overbalance everything else in a pacer.



Ready for the Road.

Causes of the Russo-Japanese War.

BY B. R. NAG-TANY.



RUSSIA intended to annex Corea as soon as she had completed the encroachment of Manchuria. A score of years ago Russians looked upon the map of Corea with blood-shot eyes, in jealousy of China, who had maintained strict protection over the peninsula, and never allowed Russia to interfere. Russians entertained this ambition for more than a hundred years in the past, but she did not advance lest China might declare war. As the mighty Roman Empire had seen her last day the mighty Chinese Empire had also declined. The Chino-Japanese war completely ruined her influence in Corea and gave Russia the long expected chance to carry out the grand scheme of her great imperialism. Russia came down slowly but steadily. Her scheme was first to overcome the Japanese influence in Corea and then to bring the Korean sovereignty under her control. In order to play against the Japanese influence she sent her most skilled and crafty diplomatist as her representative in Corea. She was trying to gain by skilful diplomacy what Japan gained by war. The artfulness and arbitrariness of Russian diplomacy had never been so well tested as it was in Seoul during the past ten years.

Japan started to revolutionize the government of Corea, which was polluted with many years' corruption. The king Tai-En-Kung retired from the throne according to the

advice of the Japanese Minister Inoue and in 1896 transferred the power to his son the present Emperor.

The Japanese minister prepared his scheme of reform and presented it to the emperor to be executed.

The Emperor, who is the son of Tai-En-Kung, was well trained by his father to understand "How to obey and how to make love with stronger nations." He reformed his government, swept away all corruptions and ordered Boku-Akow to form a new cabinet. He was the leader of the strongest political party in Seoul, which favored Japan and was backed up by the Japanese minister. He selected men from his party for the members of the cabinet. The government employed a number of Japanese advisers for several departments and a number of army officers to train the troops. Thus everything was going on very satisfactorily for Japan. Although she had many opportunities Japan did not satisfy her selfishness but observed strict sincerity in preserving Korean prosperity and earnestly hoped to see the day when Corea would become civilized.

Japan's persistence in idealizing the Korean government and all the new methods which were introduced therein caused discontent among the court officials.

They loved to adhere to old styles and hated to adopt new methods. They were led by Empress Bin, who had a masterly influence in the Court.

**Diplomatic Contest
between Japan
and Russia.**

The Russian minister for Corea was a man called Waber. He quickly learned the situation. While the Japanese minister was absent visiting Tokio, Waber sent his wife to the Court and kindly presented his deepest sympathy with the Empress and her followers, and expressed his strong determination to help the Empress in counteracting all the Japanese pressure on the government. He succeeded. The Empress was exceedingly delighted and at once ordered that all members of the cabinet be apprehended and sent to the court, under suspicion of conspiracy against the throne. All of them were executed, save the prime minister, Boku Akow, who escaped to Japan.

A new cabinet was immediately formed by Kin-Ko-Shoo, who was known as the supporter of Russian influence. The anti-Japanese party and the Russian supporter joining together became the pro-Russian party against the pro-Japanese party.

The Japanese minister soon returned to Seoul, and being greatly provoked by the event proceeded to the court and demanded reasons for the execution of the previous members of the cabinet. During his negotiations with the court, a mob which is said to have been conducted by the pro-Japanese party suddenly broke out in Seoul, broke into the palace on a dark stormy night, and cruelly assassinated the Empress Bin. This most regrettable incident frightened the faint-hearted Emperor and caused intense resentment in the government. Public opinion was turned anti-Japanese and pro-Russianism grew stronger than ever.

The Russian minister took advantage of this splendid chance, presented his strong sympathy to the Emperor,

advised him to rely upon Russia hereafter and concentrated his efforts on gaining ground in Corean politics. A few days after, the Emperor and the Prince were both lost in the court and were found in the Russian legation.

During the night he escaped from his court to the Russian legation with all his family and treasure. He had forgotten his country but remembered his own body. He feared assassination, although there was no more danger.

The Emperor, from the Russian legation, ordered the arrest of all those who were under suspicion of having participated in the assassination of the Empress Bin.

A great *coup d'etat*, conducted by the pro-Russian party smote the pro-Japanese party. Many prominent Coreans were executed and those who escaped lost their nationality. The pro-Russian party, supported by one hundred Russian sailors, who landed at Chemulpo from a Russian warship, helped in the capture of the pro-Japanese party. The pro-Japanese fainted away and Japan lost her foot-hold in Seoul.

The coronation of the Emperor, Nicholas II, was celebrated in 1896, and Japan sent Marquis Yamagata as her ambassador to represent the Mikado on the celebration. He made a treaty with the Russian government regarding Corea. In this treaty Japan yielded to Russia to the extent that she recognized the Russian interest in Corea as equivalent to that of the Japanese.

By another treaty which was made later between Japanese and Russian representatives at Seoul, the Emperor and his family were released from the Russian legation and allowed to return to the old palace. In the former treaty Russia promised Japan not to interfere

but to co-operate with Japan. This was, however, soon forgotten by the Russian representative at Seoul.

The Russian minister Waber wilfully acted upon the Korean government. He demanded that the Korean authorities employ Russian officers for training Korean soldiers instead of the Japanese officers. This was done without any trouble. He was succeeded by Spare at this juncture.

The new minister upon arriving at Seoul demanded the authorities to employ Russian advisers for the financial department, instead of English advisers, who were employed previously. A Russian named Alexieff was employed and the English adviser, Brown, was thereupon dismissed, although he was re-employed later by the representative of the English government.

The Russian minister again demanded the authorities to lease Zetsu-Aye island to Russia for her coal storing station. It was previously leased to Japan, but the Korean authorities were compelled to approve the Russian demand.

Even by this time, the Koreans were not too late to perceive the mean spirit of Russian diplomacy. The credit of the Russian minister was entirely lost in the court. The Pro-Russian party became considerably weakened and anti-Russianism obtained great power.

Knowing the unfavorable outcome of his diplomacy the Russian minister, Spare, quickly retired from Seoul. He was succeeded by a new minister, Machyunin, and in the meantime all the army officers and financial advisers were ordered to evacuate Korea.

What Japan lost was gained by Russia and what Russia gained was lost again. And what Russia lost is now being gained by Japan as the result of the Russo-Japanese war. Upon the failure of the

Russian diplomacy, another treaty was signed in 1898 between Japan and Russia covering all Korean affairs. This new treaty was a written promise of non-interference with Korea's internal government.

After the treaty was signed both Russia and Japan kept reticent about Korean affairs and she was left alone for a while. But in 1903 the hermit kingdom was again brought into trouble. Previously in 1896 a Russian named Prino had secured license to cut the wood along the banks of the Yalu River for a duration of eight years.

There is a story concerning this license related by one of the prominent diplomats who resided in Seoul during the time in which it occurred. A few days after the presentation of Prino's petition for the special license, Bin-Shoo-Mok, the minister of foreign affairs, called at the Russian legation with a message from the count, which was the strict refusal of the petition. He hesitated to speak about it and spent a long time in conversing of other things. When it became dark he asked, "What time is it?" "It is only half past five," replied the Russian minister Waber, looking at his gold watch and he inquired, "Have'nt you got a watch?" "No I haven't," answered the Korean minister. "O, that's too inconvenient," said the Russian minister, "I'll give you mine, it's French make and the best in the world."

The Korean minister thanked him more than five times and left the legation in a delightful mood, without fulfilling his official message. And a week later the Russian legation received an announcement to the effect that Prino's petition was fully granted, It

**The Direct
Cause of the
Russo-Japanese War.**

is too comical a story to believe but still it is claimed to be true. This story furnishes some idea as to the real management of the Korean government. The license was neglected for years by the Russian himself until 1903, when he commenced the cutting. On April the 20th, under the name of Russian Lumber Co. a number of Manchurian bandits were brought by the Russians to cut the woods. They went on with their work and began to cut the trees on the great mountain called "Gray Horse," which stood far from the Yalu banks and was doubtlessly situated without the limit of the grant.

The Korean government ordered the Russians to stop, and protested to the Russian minister against this blunder. The Russian minister refused to comply and insisted upon the correctness of the enterprise. On the 29th of the same month a great number of Russian troops invaded Korea across the Yalu, on the pretence of protection for the Lumber Co. The Russians continued all their works. In August of the same year the Russians secured the base of the port of Yon-gampo, which is situated at the mouth of Yalu River, for the purpose of establishing the Lumber Co's shipping station. Without paying a bit of attention to the repeated protests from Japan and England, the Russians proceeded to establish another shipping station at To-Roo-po. The Russian station on the Korean boundary was part of a military preparation disguised as a business enterprise. On the 24th of September another company of Russian soldiers crossed the Yalu River and garrisoned in the Yon-gampo. It was soon found that the Russians were fortifying these ports, and strong forces were pressing the Korean border from the Manchurian side. Japan paid keen attention to the Russian

movement. When the Russian intention revealed itself, as a military preparation, public opinion in Japan reached its extremity, and instigated the government to declare war, for this was during the course of the negotiation with Russia. From the outset of the Russian intrigue Japan persistently warned the Korean Government not to grant any further extension of the license. But all the efforts had no effect upon the Russians. Japan instantly determined to negotiate directly with Russia.

The most important communications were commenced on the 11th of July, 1903, and closed on February 6th, 1904, when Japan notified Russia of the rupture of the diplomatic relation between two countries.

THE STRUGGLE FOR THE COMMAND OF THE FAR EASTERN SEAS.

The term "command of the Seas" simply means the freedom of the sea in time of the war, and is to be secured by destroying or blockading the enemy's fleet. To be able to do this a nation must have a superior navy. This has been the theory that caused nations to redouble their efforts in strengthening their navies.

The command of the seas is of the greatest importance in modern warfare. Japan, like Great Britain in Europe, must maintain the superiority on the Far Eastern Seas against any aggressive nation. Not only for defensive purposes is it necessary that she command the seas around the coast but also for sending troops into Manchuria and Korea. Without command of the seas her army would have been of no use on these wastes.

This is sufficient to explain the importance of commanding the Yellow and Japan Seas in case of war against Russia.

The difference between the great advantage of gaining the command and the fatal disadvantage of losing it virtually decides the fortunes of war. Suppose Japan once loses the command of the seas what would be the result? Not only has she to abandon all campaigns on land but also must cease trading.

The Russian Pacific squadron at the close of the Chino-Japanese war in 1895, was but a very insignificant factor in the Far East. Vladivostock being the only base of supplies Russia could not bring many warships. The fleet consisted then of a small number of cruisers and minor men-of-war.

In order to realize her instinctive ambition of dominating Eastern Asia it was urgent that Russia establish a strong navy, and consequently she looked for a good naval base in the Yellow Sea.

No wonder that she fell in love with Port Arthur. By armed threatening and diplomatic skill she gained possession of the beloved fortress. Having constructed a great naval base within a very short time preparatory to establishing a strong Pacific squadron, Russia began to send out many of the big warships in the Baltic Sea at the early date of 1898. The intention was to out do all other nations on the earth. Magnificent was the scheme and prompt was the execution, having planned the building of a tremendous number of warships to serve in the Far East, they completed the work within a few years. As soon as a warship was finished she was despatched to Port Arthur.

Thus one after another the Port Arthur fleet was receiving reinforcements of battleships, cruisers and torpedo boats. And in January of 1904 their fighting strength was as follows :

BATTLESHIPS.

Poltava—10,950 tons.
 Petropavlousk—10,950 tons.
 Sevastopol—10,950 tons.
 Peresvet—12,674 tons.
 Pobieda—12,674 tons.
 Retvisan—12,700 tons.
 Csarevitch—13,100 tons.

ARMORED CRUISERS.

Gromoboi—12,336 tons.
 Bayan—7,800 tons.
 Rossia—12,200 tons.
 Rurik—10,940 tons.

PROTECTED CRUISERS.

Bogatyr—6,750 tons.
 Askold—6,500 tons.
 Varyag—6,500 tons.
 Diana—6,630 tons.
 Pallada—6,630 tons.
 Boyarin—3,200 tons.
 Novik—3,000 tons.
 26 torpedo-boat destroyers.
 53 torpedo boats.

On the other hand the Japanese having fully understood the serious nature of the Russian policy, not only did they refuse to be idle onlookers but diligently set about expanding their navy and vigorously competed with the rival. Japan started to build up her new navy immediately after the Chino-Japanese war. Over two hundred million dollars were spent upon this national enterprise, which covered all the expenses of building battleships, cruisers, torpedo boats, arsenals and docks. Most of the large warships were built in England by private firms.

It required ten years to complete the following list of the Japanese fleet, effective in January of 1904.

BATTLESHIPS.

Mikasa—15,200 tons.
 Hatsuse—15,000 tons.
 Asahi—15,000 tons.
 Shikishima—15,000 tons.
 Yashima—12,300 tons.
 Fuji—12,300 tons.

ARMORED CRUISERS.

Tokiwa—9,750 tons.
 Asama—9,750 tons.
 Yokumo—9,850 tons.
 Azuma—9,436 tons.
 Izumo—9,800 tons.
 Iwate—9,800 tons.
 Nissin—7,700 tons.
 Kasuga—7,700 tons.

PROTECTED CRUISERS.

Takasago—4,300 tons.
 Kasagi—4,784 tons.
 Chitose—4,784 tons.
 Itsukushima—4,277 tons.
 Hashidate—4,277 tons.
 Matsushima—4,277 tons.
 Yoshino—4,180 tons.
 Naniwa—3,727 tons.
 Tokachiho—3,727 tons.
 Akitsushima—3,150 tons.
 Niitaka—3,420 tons.
 Tsushima—3,420 tons.
 Suma—2,700 tons.
 Akashi—2,700.

20 torpedo-boat destroyers.

47 modern torpedo boats.

When Japan had just succeeded in establishing her new navy she found Russia steadily progressing with the new plan of increasing the navy on a large scale.

With her mighty resources Russia, in time was destined to overcome the little island nation in the ship building enterprise.

Japan, knowing the absolute necessity

of commanding the Far Eastern Seas, in order to protect her national existence and to extend her enlightened regime, keenly felt the danger of subjugation on the seas by the Moscovites, but she could not allow herself to compete with Russia by further augmentation of her navy.

Japan found herself in this dilemma, that, if she does not increase her navy, within a very short time she will lose the command of the seas and if she does so she will be nationally bankrupt.

There was only one course open for Japan and that was to destroy the existing navy of Russia in the Far East.

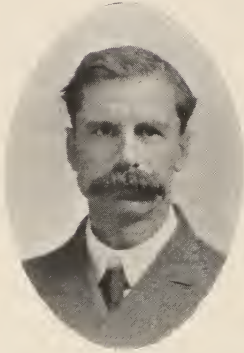
This is to be counted as one of the most significant causes of the war, because it was largely responsible in tempting the minds of the Japanese statesmen to open hostilities.

On the 13th of October, 1903, Admiral Togo was appointed to command the combined fleet of the Japanese navy and on the 6th of February of 1904 he was ordered to attack the Port Arthur squadron of the Russian Navy. By constant attacks, battles and bombardments during the past eleven months he, co-operating with General Nogi, gloriously accomplished the great task of completely destroying the Russian fleet at Port Arthur.



An Educational Experiment.

BY DR. CEPHAS GUILLET.



Dr. Cephas Guillet.



THE present writer had the hardihood to found and conduct for five years a day school, which should be limited to twenty boys from eight to fourteen years of age, and which should devote only half the day to the usual school regime of text-books, reserving the afternoons, and occasionally a whole day, for manual work and the direct study of environment, both natural and cultural. In this undertaking he had a fourfold ideal in view, namely, to try to make the education of the boy healthful, practical, liberal and natural.

Healthful, in neglecting the demands neither of the growing body nor of the growing mind; but endeavoring to make a well-developed, well-knit brain, while not only not interfering with the growth of the body, but actively encouraging and stimulating its growth. Practical, not in fitting the boy for some special calling, but in leading him to apply his knowledge in a practical way to real things, to real work. Liberal, in addressing itself to the whole organism. And natural, in being based on a knowledge of the boy's nature and needs.

From eight to ten the child grows very fast in size and strength, and displays much wider activity of body and mind. In my own school I tested the boys' strength of grip with the hand dynamometer every month for about two years, and found that, between $8\frac{1}{2}$ and $10\frac{1}{2}$ years of age, the boys' strength of grip in the right hand increased $6\frac{1}{2}$ kilograms, while from $10\frac{1}{2}$ to 13 it increased only $2\frac{1}{4}$ kilograms. After 13 the increase was again very rapid, more rapid even than between $8\frac{1}{2}$ and $10\frac{1}{2}$ years. This would indicate that the years from 8 to 10 are a transition period between childhood and boyhood, while the early teens are a transition period from boyhood to manhood. As my boys ranged from eight to fourteen



GEOLOGY.

Studying Formation of Parliament Cliff.

years of age, I had them throughout the period of boyhood, with very little overlapping either to childhood at one end or to adolescence at the other. My problem was thus simplified. It was to properly educate, not the child, nor the young man, but the boy.

The characteristic mental quality of boyhood is curiosity. The boy is a born investigator. His curiosity is many-sided and he takes a keen interest in the facts of nature and history. This is the time, then, to bring the boy into close touch with nature, to lead him to learn her facts at first hand, and, in so doing, to gain true, clear, and beautiful perceptions. The curriculum cannot be too rich and liberal for the boy. All his budding interests should be appealed to, all his budding capacities developed, to the end that he may *find himself*.

The teacher should get down to the boy; get his point of view; enter into his feelings; educate him from within by growing with him, not from without by trying to push or pull him upward. The teacher should learn things over again with him, help him actively to discover, to invent, to produce, rather than passively to imbibe, for the boy is naturally an investigator, an experimenter, a doer and a maker. His knowledge should issue as well as begin in action.

With this end in view, then, I led the boys in several expeditions a week throughout the year to study their native environment of town and country; the buildings of man and of nature; rock and soil, river and forest, in their native state and also as exploited by man; in a word all the busy, varied life of nature and of man.

The nature of the investigation and work was conditional largely by the season. In the Fall we studied the crust of the earth, beginning at the soil and working downwards, examining the successive geological formations as we proceeded, and getting acquainted with the varied life that has its home in the surface soil and water.

One year we made a special study of shells of land and water; another year, of the fossils of the Flood or Pleistocene period; another year, of the fossils of the sedimentary rocks; another year, of the metamorphic rocks and minerals. In this connection we study together the topography of the locality and the changes large and small that have been, and are being made in it by various forces of nature, and in particular by the erosive power of water,



NATURAL HISTORY.

Becoming Acquainted with Inhabitants of the Ottawa River.

The winter afternoons we devoted partly to manual work,—drawing, designing, simple carpentry, modelling in clay and in snow, and carving in oak and other hard-woods—and partly to the study of our human our historical and cultural environment; the city and country, their history, their institutions and industries as conditioned by the physical resources and advantages at hand. From this as a centre we could broaden out in space and time as seemed most interesting and appropriate.

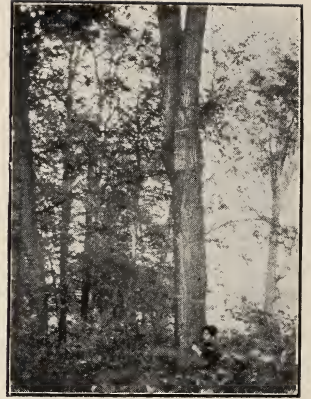
In the spring we studied the life springing up all about us—the life of earth and water and air, and in particular the birds, sometimes attempting a somewhat exhaustive investigation of some small and homogeneous locality.

But we were not content with observing outdoors: we sought to do things, to form an acquaintance with the actual out of doors life of the pioneer and the farmer, with their primitive occupations so dear to the primitive heart of the boy. We played scouting games in the woods in the fall. We conducted in the fall and winter a valuation survey of a piece of woods, charting it and ascertaining the nature and value of the timber it contained. In the spring, we made maple syrup and sugar, going through the whole process intelligently from the tapping of a

score of trees to sugaring off. We transplanted shrubs, herbs and ferns from the woods to our gardens in spring and to pots for winter. We set up vivaria and aquaria.

The boys were weighed and measured regularly. From these records I have plotted curves showing the increase in height and weight of each boy during his attendance at school. Comparing these curves with the average curves of increase of English boys as ascertained by Roberts, I was gratified to find that on an average my boys gained, during an average attendance of a little over two years, each over two pounds in weight and over seven-tenths of

an inch in height *relatively to the normal*. That is to say, if a boy on entering was below the normal, he was not so far below the normal, if at all, in leaving; and



Scouting.



Transplanting.

if he entered above the normal, he left further above the normal. As a boy, if he does not get his normal growth at the proper period of growth, he will likely never get it, but will be to that extent forever stunted, the significance of these facts and their application to our present day bookish education can easily be imagined. The reader must judge whether the education here sketched is what it set out to be—healthful, practical, liberal and natural; and whether the education commonly given in our schools is characterized by all or any of these ideals.



BOTANY.

The Flora of Pine Island.



A Toast.

Here's to the year we are just beginning,
 May it bring us friends both good and true,
 Our faith to the West we are firmly pinning,
 Ready to dare and ready to do.

So here's to the land of the laughing water,
 And here's to the land of the setting sun,
 And here's to the home of the prairie daughter
 Who stands at the door of a Hope begun.

Here's to the West—may it live forever,
 Here's to the pioneer—heart of gold,
 May its friendships never sever
 The hearts of the Westerner's brave and bold.

Free Press.

Agriculture.

The International.

MAGNITUDE and magnificence were the first impressions one received on passing through the Union Stock-yards during International week. As one traversed the gorgeous stables where were quartered in comfort and luxury those noble specimens of the equine race, or reviewed the long lines of lordly Herefords and grand Short-horns, or the douce, hardy, and thrifty Angus and Galloways, with other breeds too numerous to mention, he could but feel that true art is not confined to figures painted on canvas or chiseled in marble. He would feel rather that the noblest art consists in modeling God's living creatures into forms that will best supply the needs of humanity. The same feeling would remain as he wended his way among the sheep, and noted the blocky Southdowns and the graceful, hooded Shropshires, or the lordly Leicesters, Lincolns and Cotswolds. Somewhat in contrast to their more active associates of stable and pen appeared the recumbent porkers who, by their size and smooth proportions, suggested the wealth of the golden corn-belt, but they told the same story of comfort and plenty.

Throughout the classes, the overwhelming evidence of type proved that, in the main, animals are being bred for utility that man's standard of comfort may be raised. When such complete fitting and such great individual excellence are combined with breeds so num-

erous and numbers so large, we have a show that can only be conceived of by bearing a big name. And when the best of the United States and the best of Canada meet at an exhibition, it is truly International in its character.

As is well known, there are no special educational features at this show, such as we have at our Winter Fair. One gains his information by studying the animals in the stall and show ring, and in watching the awards of the judge, who, however, never gives reasons for his placing. This is rather unfortunate from the educational view-point of both spectators and exhibitors. It might not be possible to accommodate the crowd of visitors at a series of lectures, but it should not be difficult for a judge in the ring to give clear and concise reasons for his awards.

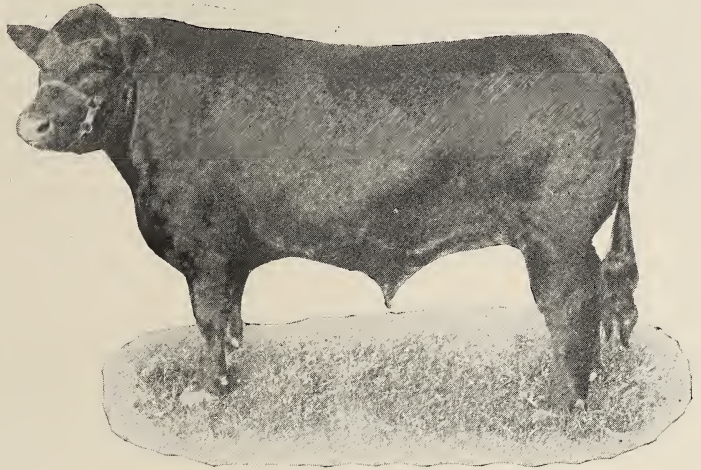
But, with this exhibition as with all others of its kind, it is not the purely educational features that are always most important. The rank and file of the agricultural community has, to-day, a very fair conception of the proper type of the different classes of animals, but for certain reasons they fail to incarnate these ideals in the living flesh and blood. At a great round-up of magnificent stock such as the International, these backward individuals may, and often do receive enough inspiration to carry them through at least one year, and, in many cases, the remainder of a life-time. The

glare, the glamour, and the conquests of successful exhibitors all tend to animate in the hearts of farmers the dormant love of competition, and a desire to enter the fray, which often culminates in the blossoming and fruition of show-yard triumphs. Thus, as we combine education with inspiration, shall we reap the best results from exhibitions.

The International was strongest from the inspiration standpoint. After reviewing the great number of model animals of all classes, no farmer could return home without being impressed by the greatness and nobility of the breeding art, nor without a desire to produce similar animals on his own farm. It was a show of especial inspiration to Canadian breeders. The place taken by Canadian sheep, Canadian horses, and by Canadian cattle where shown, points with no uncertainty to Canada's proud position among the nations breeding live-stock. The United States has its corn, and may fatten stock more readily, but we have our bracing climate to develop the vigorous animal, and we have skilled men to fix and improve the type of our animals, while we do not by any means lack the wherewithal to feed them.

We turn now to what savours of both education and inspiration, the part played in this great show by various Agricultural Colleges. Illinois exhibited cattle illustrating the various types fed by the farmer and bought by the butcher and drover. Above each animal was a placard giving the class, the trade it supplied, the weight and the values at

the beginning and at the end of the feeding period. From this the relative value of the various classes could easily be determined. Other colleges, notably Iowa and Minnesota, competed for honors in the classes of the show, and Minnesota succeeded in winning championship honors with the great "Clear Lake Jute." These methods bring the colleges prominently before the eyes of



"CLEAR LAKE JUTE."

Champion Steer at International, Owned and Fed by Minnesota Agricultural College.

the farmers who are quick to appreciate the close relation between teaching and practice. This prominence is a useful and legitimate means of advertising the colleges, and the more widely it is practised the greater the number of that class they are specially intended to benefit, will be drawn to the agricultural schools.

I cannot close these observations without remarking what the International stands for. It is more than a mere show. It is an outgrowth of the live-stock industry of the continent, and an indication of the desire for progress and advancement. The greatness of this industry, the parent of the great show, may be judged by the vigor of its offspring. It may further be judged in

passing through the stock-yards, by the miles of pens filled with cattle, sheep, and hogs, and still further by the several great packing-houses within its precincts, each of which slaughters swine at the rate of from 500 to 1000 per hour, and

other animals in proportion. The bustle and activity of this great centre, tells of the millions of broad acres devoted to the industry from which the International has sprung.



The Winter Fair.

As inspiration was the key-note of the International, so was education the characteristic of the Winter Fair. The crowds who thronged the lecture-room and the judging rings, showed that there is a genuine thirst for knowledge of the best methods in agriculture. But it must not be inferred that, while education was the chief feature, inspiration was totally lacking. Nothing could be more inspiring than to listen to the experience of practical men, who have made a success in this or that branch of agriculture. Inspiration and education went hand in hand in the lecture-room.

Very instructive were the classes of live animals, but we must say that, except in the swine classes, their numbers were not such as to arouse enthusiasm. The cattle classes were most noticeably deficient in this respect. However, it is not surprising that the highly susceptible dairy cow should be left at home during a season and at a point in her milking period when she cannot make a good showing. But we may well ask if the exhibit of fat cattle is indicative of Ontario's cattle feeding industry. We hope it is not—we believe it is not, but judgment is likely to be influenced by the show, and farmers will pass sentence against the cattle-feeding business unless breeders and others see that it is placed

in a more favorable and truer light. True, we have not, in Ontario, an abundance of cheap corn for fattening purposes, but we have other foods almost as cheap, while we most assuredly have very skilful feeders, and there is no real reason why a large number of superior fat cattle cannot be shipped each year from a country potentially richer than the cattle-feeding districts of Scotland. In a province which produces such excellent pure bred beef-animals as Ontario, there should be a large number of superior fat cattle, and their presence should be proved by large numbers and strong classes at the Winter Fair.

This present time would seem particularly favorable for going into the breeding and feeding of beef cattle. In the Western States, the number of steers fed has greatly decreased, and the decrease in the number of breeding cattle has been even more remarkable. In many districts it is believed that the breeding stock has been reduced almost by half, and all over the West, sheep have been gaining the favor which the cattle have lost. Indications point to a similar tendency in Ontario, but here we can profitably experience a great increase in our flocks, and, if there is anything in the advice "to go into business when it is at a low ebb," we can also profitably extend the breeding and feeding of beef animals

very largely, for the signs of the times point to a shortage of beef in the near future.

But this is aside from the subject. Another feature which seems lacking at the Winter Fair is an exhibit of heavy horses. At the farmers' show intended for the education of the agricultural community, it would seem fitting that this very important class of farm animals should be recognized. The horse-breeding industry has been growing and still continues to grow. It would seem wise, therefore, not only to encourage the breeders, but also to show the farmer the importance of the business, and educate him as to the best classes of horses to raise.

In conclusion, the management must be complimented on its energy and on the success that has attended its work. We believe that they have great things

in view. The Fair is to grow both in size and usefulness. New departments will be added when wisdom demands it,



Campbell's "Shenstone Star."

A First Prize Winner at Toronto, St. Louis and Chicago.

and all possible encouragement will be given those phases of agriculture best suited to the conditions of the Ontario farmer.



The Use of Artificial Fertilizers.

AS men continue to remove crop after crop from the soil and fail to return to it the important constituents taken by the plants, they find that it becomes less and less able to produce food for man and beast. We are led to look upon the soil as a storehouse, which contains a definite quantity of nourishing material for plants, and each successive crop diminishes the total amount present. And yet, in most soils, so great is the store that it may be considered practically inexhaustible, but in practice, the profit from the soil depends on the amount of plant food which is available to the crop, and the food

removed by each crop draws upon this. Various methods of tillage do much to make the great mass of insoluble plant food available for assimilation, but this means becomes inadequate after a time, for it adds nothing to the soil, while the crops are continually removing the valuable substances, and it even causes a loss outside of this, because, in rendering plant food soluble, it brings it to a condition where it leaches readily from the surface soil. Addition of the necessary substances to the soil must, therefore, be made if continued good results are to be obtained.

The addition of farm-yard manure to

the soil and the growing of leguminous crops upon it, as methods for increasing fertility, are justly the most popular and important of these. It is not necessary to discuss the reasons at length for they are well-known. Farm-yard manure is a by-product, so to speak, of every farm where stock is kept, and is thus cheap and readily available. When applied to the land it not only increases the total amount of plant food present, but also it adds vegetable matter to the soil, improves the physical texture, and helps, to a certain extent, to render other plant food available. The legumes, and of these the clovers especially, very greatly improve the physical texture, but their special function is to add nitrogen. The supplying of nitrogen to certain lands is very necessary, and, besides, the physical effect of the clover on the soil is very beneficial. The physical effect of farm-yard manures is likewise beneficial, and it also supplies all the elements of plant food in varying quantity. The growing of clover and the application of farm-yard manure will continue to be the most important methods for increasing the fertility of the soil.

A glance at the composition of farm-yard manure will however help us to see its limitations, especially when employed in conjunction with leguminous crops. It is difficult to find figures which apply to the average manure, but it is safe to say that there is at least twice as much nitrogen present as either potash or phosphoric acid and often the ratio of nitrogen to the other two is even greater. It is easy to see therefore, that when clover is regularly grown at intervals of four or five years, and farm-yard manure is liberally applied, the amount of available nitrogen will soon be out of proportion to that of potash and phosphoric acid, and, since the yield of a

crop is limited by the element which is present in smallest quantity, the most profitable results cannot be obtained on such land. The same condition holds in respect to swamp lands. As the years have passed, this soil has been enriched with nitrogen from the decaying vegetable matter, until when cleared and cultivated, it is unbalanced, so to speak. The evil of this unbalanced condition is seen in weak straw, poor, light heads, and often in badly lodged grain.

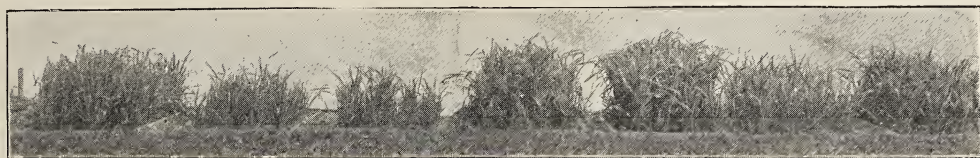
The importance of a perfect or balanced ration for live-stock, one in which all the necessary constituents for growth and flesh-production are present in proper proportion, is generally recognized. Of equal importance is it to the plant, that its food supply in the soil be rightly proportioned to its needs. We have noticed the nitrogenous character of the two great natural manures. From noting their composition, it is easy to see that, for a balanced store of plant food, the addition of ash constituents to a soil liberally supplied with natural manures is likely to give good results.

It might not be necessary to add both potash and phosphoric acid to such soils, for one constituent might be present in sufficient quantity while the other would be lacking. It would be necessary first to experiment to discover what the soil really needed. Potash is usually most deficient in sandy soils, as compared with clay or loam, and it is almost entirely lacking in some swamp soils. Dr. Hopkins found this true in his work on Illinois swamp soils, and states as a result of his investigation, that only potash requires to be added to the deep swamp soils of the State to make them productive, and, on the sandy swamp soils, nitrogen added to potash gives the best results. It is also profitable at times to apply potash to various crops such as

potatoes and clover, which require a large amount, and find difficulty in obtaining it.

Swamp soils are also often deficient in phosphoric acid. Prof. Harcourt has found, as a result of extensive investigations, that this constituent is decidedly lacking in many of the deep vegetable soils of Ontario, and thinks that its addition is necessary to the successful production of crops. On ordinary soils,

to a clay soil consists in its improving the physical texture and in replacing potash in its combination, thus making this substance available to the plants. Its beneficial effect upon sand is to bind it together. In humus soils, it corrects acidity, and in all soils, is a very favorable base for nitrogen to combine with in forming nitrates. Many humus soils only require an application of lime to correct their acidity, in order to



Nitrogen

Potash

Phosphorous

Nitrogen
and
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Potash

A Soil Deficient in Nitrogen.

the turnip responds most readily to superphosphates. Grain crops also are often greatly benefited by the application of phosphates, especially where the soil is rich in nitrogen, and the crop slow in maturing.

Even nitrogenous artificial fertilizers may at times be used profitably, though they are the dearest to buy, and the nitrogen may be very cheaply obtained by growing clover. In the spring, nitrates are likely to be largely lacking in the surface soil, owing to leaching over winter, and crops such as fall wheat and barley, whose period of growth in the early summer is short, may be greatly benefited by a supply of readily available nitrogen which will carry them along until nitrates are produced in the soil in the warm spring and early summer.

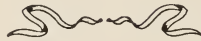
There is yet another important substance which cannot be correctly spoken of as a fertilizer because its addition to the soil does not directly increase the store of plant food. The value of lime

become productive. However, since the action of lime on all soils is rather that of a stimulant than that of a food, it is not to be used too freely, lest the soil quickly becomes exhausted.

There seems to be no short, easy rule to guide the farmer in the use of artificial fertilizers. The composition of the crop, or its appearance when growing, is no reliable indication of its requirements. It is necessary to have some means however, which will indicate what a certain soil requires to produce a certain crop, for in no way can money be lost faster, than in the buying of useless fertilizers. The plan for finding out the needs of the soil, which recommends itself to practical men is the use of small quantities of the various fertilizers on plots in the field whose requirements are being investigated. By this method, the results can be seen and the profits calculated, so that the farmer knows exactly whether he will be justified in using any special fertilizers.

There is a mistake often made in the use of fertilizers which should be mentioned in closing. Many people imagine that these may partly replace cultivation, but far better is thorough cultivation without the addition of plant food, than the application of fertilizers and insufficient cultivation. It is only by having the soil in the very best tilth that one can be justified in applying high priced fertilizers, for it is only then that the latent powers of the soil are exercised to the full, and the increased yield from the use of fertilizers goes to the payment for and the profit from the use of them.

It is not to be understood for a moment, that the value and the importance of farm-yard manure and clover are discounted in the least. They will ever remain as the readiest means at the farmer's disposal for enriching his soil. The object has been to show that on certain soils under certain conditions, the use of artificial fertilizers may be decidedly profitable, and also to stimulate an interest in this subject that farmers may be led to study their conditions and learn if they may or may not profit from the use of such additions of plant food to their soil.



AUTUMN.

Oh! the green and the gold of the Autumn woods,
 The haze o'er the Autumn sky,
 The carpet of leaves on the soft brown earth,
 And the warm wind's trembling sigh.

They are full of the glory of vanished days,
 Of the peace of the ripened year,
 Of the mystery deep of their coming sleep,
 When the winter snows appear.

— *Marion L. Moodie.*

Horticulture.

Cover Crops for the Orchard.



N every hand may be seen marked evidences of development in all branches of agriculture. Nowhere is this progress more noticeable than in horticulture.

A few years ago fruit was looked upon as a luxury to be obtained only by the well-to do classes. Now the conditions have changed. The products of the orchard are classed among the necessities of life.

With the increased use of fruit must come increased production, and with greater production must follow larger areas devoted to supplying the demand. Large areas devoted to a crop which must be sold off the land means reducing the number of head of live stock which may be kept, consequently a decrease in the general fertility of the farm. To assist in overcoming this undesirable condition, cheaply and effectively, cover crops have been introduced.

What is an orchard cover crop? It is a crop sown on the ground at that season of the year when trees have ceased their growth. If man makes no effort to cover the ground, nature forms a cover of weeds and grass in her endeavor to protect the soil.

Cover crops may benefit in many ways,

of which the following are some of the most important. (1) A cover crop, by adding a large amount of fibre to the land, prevents hard soils from cementing or puddling. (2) On bare and rolling land, where the rains quickly run off and snows blow off the high portions, a growing crop tends to hold large quantities of these until they have time to soak into the soil. (3) Land covered by a growing crop dries out more quickly in the spring, owing to the transpiration of moisture through the leaves, and consequently may be plowed much earlier in the season than land which is bare. This is a very important point as it enables the orchardist to gain several days in the busy season of spring. (4) Ground covered with vegetation will hold the snows in winter and thus prevent such deep freezing of the ground. Many tender varieties may therefore be cultivated and brought to perfection which otherwise could not be successfully raised. (5) Humus contains readily available plant food. This can be obtained most economically by means of green manure which when decayed is vegetable humus. (6) A large amount of plant food is liberated in the summer after the tree growth has ceased. This may be prevented from leaching away by the growing crop and will be in a readily available form for the following season. (7) Certain mineral plant-foods in the soil are rendered available by the action

of the roots of plants and thus the trees may more quickly make use of them. (8) Leguminous crops such as clover, vetch, alfalfa, peas and beans, by virtue of certain bacteria which form nodules on the roots, are able to assimilate nitrogen from the air. As nitrogen is one of the most expensive fertilizing elements, the value of this class of plants cannot be too highly appreciated.

Cover crops should be sown about the middle of July so that they may make a good growth the same season. It is also wise to check the growth of the trees about this time so that they may mature their wood before winter sets in. Thorough tillage should be practised until this season, in order that the ground may be moist and fine to give the young plants the best possible chance to start.

Plow your crop under as early in the spring as possible and begin cultivation at once. If the crop is large and the soil rather dry this is imperative, as the vegetable matter lying between the surface and the lower strata of the soil will act as foreign matter and to some extent check capillary action.

That a cover crop may be of the greatest value, it should be capable of withstanding the winter and continuing its growth next spring. This, however, is not necessary and many of the most common crops of the present day do not live through the winter.

Different classes of soils require different kinds of crops. This has led to a division of cover crops under several heads. The most important class is the nitrogen gatherers, which through the agency of the nodules on the roots can make use of the nitrogen of the air. Such plants as clover, vetch, alfalfa, peas and beans come in this class and should be used where the soil is deficient in nitrogen. Another class is known as the

potash plants, such as turnips and rape, which although they do not add any-



“Hairy Vetch,” 3 feet high, when thirteen weeks old.

thing to the soil, as do the leguminous plants, do change the form of the mineral potash so that it may be more readily acted upon by the roots of succeeding crops. Then there is the miscellaneous class including the cereals so often grown, which add only the humus formed from their decayed bodies, but which are nevertheless valuable on that account.

During the past two seasons, a number of the most common cover crops have been grown in the College orchard with a view of ascertaining their relative values. Among the most promising might be mentioned the Hairy Vetch, which when sown at the rate of thirty-five pounds per acre gives a very close mat over the ground. This is a very valuable crop owing to the fact that it collects nitrogen, lies close to the ground so that it does not inconvenience the pickers when gathering the fruit, and also withstands the cold of winter and continues its growth early in the spring.

Red and Mammoth Clover sown at the

rate of twenty pounds per acre stand about equal in value, make a fair growth, are low growing and winter well on drained soil.

Crimson Clover in the past has not made quite so good growth as the red or the mammoth, nor will it resist the winter here, which is a rather serious disadvantage.

Alfalfa, or lucerne, is one of the best leguminous crops for dry land. It makes a good growth and winters well. The

acre, sown broadcast, will give a stand as shown in the illustration.

Rye, the favorite crop of many growers, gives us a fair amount of top and winters well. One advantage of rye is that it may often be grown on lands where clover will not start, owing to the incongenial physical condition of the soil. In this way humus is added to the soil, and conditions made more congenial for the growth of clover in succeeding years.

Space will not permit mention of all



Rape, thirteen weeks after sowing.

saying that alfalfa will not make sufficient top the first season is a fallacy. Thirty pounds per acre sown in July will give a good stand the same season.

Rape has been grown here with good results. It makes a very heavy growth of stiff stems which although they are nearly all killed in winter stand up well enough to hold the snows. Rape can scarcely be recommended for apple orchards, where much fruit is to be harvested in autumn as its tall stalks are difficult to walk through and remain wet nearly all day. It may be used to good advantage as a rotation crop especially if few fruits are to be harvested. Eight pounds of seed per

the crops but these are considered among the best that have been tried here.

In conclusion allow me to add that the question, as to the value of cover crops for the orchard, is past the debatable stage. Prominent fruit-growers all over the continent are advocating more and more each year the use of green manure for orchards. By growing cover crops the green manure is obtained and coupled with it are the other previously mentioned benefits. To those orchardists who have never grown such a crop, let me advise the sowing of at least a small area next season and thus prove for themselves the great value of cover crops as soil improvers.

H. S. PEART.

Experimental.

MR. F. C. Elford, the newly elected President of the Ontario Agricultural and Experimental Union, is an ex-student of the Ontario Agricultural College. Mr. Elford, after returning to his home in Huron County, made a marked success on the farm. He



F. C. Elford.

ducted Institute work in different parts of Ontario was recognized by Prof. Robertson, who recently appointed Mr. Elford as head of the Poultry Branch of the Department of Agriculture, Ottawa.



The Union.

The annual meeting of the Agricultural and Experimental Union was held Dec. 5th and 6th, and as was anticipated proved very interesting and instructive to those who were privileged to attend. Space will not permit us to report the session in full, but we feel that this is not necessary, as the leading newspapers and journals contained detailed reports, which were readily accessible to those of our readers who could not attend the meetings.

It is gratifying to note the rapid and continuous progress, which has attended the work of the Union since organization. The work has spread not only throughout the southern part of the province, but within the last few years it has been extended into New Ontario. There are now 4050 co-operative experiment stations, 480 of which are to be found in New Ontario. Improved methods of conducting experiments and collecting results have been employed and the field of operation has been widely extended until to-day the Union is recognized as one of the most useful and progressive agricultural organizations of the province.

This year the Union is again fortunate in having competent men elected to fill its various offices. The work of the past is such that those who have been connected with it may well be proud, but

made a specialty of the growing of alfalfa for hay and for pasture, and obtained from it very excellent results. Mr. Elford has taken a deep interest in poultry raising, and became so successful that Prof. Robertson established a Dominion Poultry Experiment Station on the Farm, appointing him as director. The excellent manner in which he handled his own farm, managed the Poultry Experiment Station, and con-

if one may judge by the reports of last year, and the enthusiastic tone of the session, which has just closed, one may confidently look forward to even better work and great success in the future.



The Experimental Work of the Bacteriological Department from 1895 to 1903.

About 1893, the Experiment Station of the University of Wisconsin appointed a Bacteriologist to investigate problems connected with the Dairy industries of that state, and to give lectures and demonstrations to the agricultural students. Shortly after this appointment, the present Minister of Agriculture for the Province of Ontario, the Hon. John Dryden, visited Madison, Wisconsin, and was so impressed with the value of the instruction given there in pasteurizing milk and general dairy bacteriology that he thought it necessary to organize a bacteriological department at the Ontario Agricultural College. This led to the installation of a Bacteriological Laboratory at the College; but it was not until 1899 that the bacteriologist devoted his whole time to the subject of Bacteriology. For the four years, 1895-1898, inclusive, all the microscopical work conducted at the College was done in the bacteriological laboratory; this included animal and vegetable histology, cryptogamic botany and plant pathology, and for several terms instruction was given in systematic and physiological botany and plant breeding. These subjects are now taught in the departments to which they rightly belong, and the services of at least two instructors are now required to give the above mentioned subjects the attention they deserve.

During these years in which botany engaged so much of our attention, two

bulletins were published, "The Grasses of Ontario," and "The Weeds of Ontario." The latter, revised by Prof. Lochhead, has just been reprinted by the Ontario Department of Agriculture. In addition to the preparation of these bulletins, some work was also done on the fungous diseases of greenhouse crops; on the effect of spraying Bordeaux mixture on foliage, and on fruit preservatives for exhibition purposes.

Mention also must be made of a large collection of microscopical material, consisting of various stems, roots, leaves, buds, ovules, embryos, which were prepared, stained, and imbedded in paraffin and cellulose for class work. A part of this collection of over 250 specimens was subsequently transferred to the Biological Department and many of our present students are still using portions of this collection.

In 1896 research work in Dairy Bacteriology was started, and a short paper on the Bacterial contamination of milk was contributed to the College Report for that year, and owing to the great importance of the Dairy Industry of the Province, more or less investigation of some phase of dairy work has been in progress ever since.

In 1898 a Thistle milking machine operated by steam power was in more or less constant use in the College Dairy stable. This machine operated naturally, quickly, thoroughly and without any annoyance to the cow; and many opinions were expressed by various Dairy associations that the use of the machine would strike a blow to hand milking, and further that the use of the machine would guard against the entry of all dirt and that "machine milk" would be absolutely filth free, and consequently little or no souring would come. In order to settle all dispute, the purity of the milk was

tested, by bacteriological methods, immediately after being drawn by hand and also immediately after being drawn by the milking machine. The result of 235 analyses of "machine-drawn milk" gave an average of 153,000 bacteria per cubic centimetre, while the average of 98 analyses of the hand drawn milk gave 12,000 bacteria per c. c. Further experiments showed that machine drawn milk contained very many injurious species of bacteria, which seriously impaired the flavor of butter and cheese made from such milk.

The investigations of bacterial life in normal and abnormal Cheddar cheese may be grouped together. Of late years, no subject has awakened greater explanation than the curing or ripening changes which occur in normal cheese. As a result of numerous investigations of various cheeses made in United States, England, Switzerland, etc., we know a great deal about the changes which occur when cheese ripens, that is to say, when it changes from a insoluble indigestible, tasteless mass to a soluble, more readily digested, palatable product. These changes are brought about by the digestive action of rennet which is favored by the growth of the lactic acid bacteria in cheese. The investigational work on the particular type of cheese made in Canada related to the number and kind of bacteria which were present in the cheese. Numerous samples of cheese obtained from all over Ontario were bacteriologically examined in order to obtain information as to the normal bacterial flora. Following this work, a quantitative determination of the lactic acid bacteria was made in a series of cheeses analyzed at various ages, and the result of this work was summarized and published in the Transactions of the Canadian Institute for 1900.

The interest aroused by the good results of the cool curing and cold curing of cheese suggested further experiments in order to find out the effect of various temperatures upon the bacterial life in cheese. In this work, we had the co-operation of Dr. Connell, Prof. of Pathology of Queen's University, and as a result of more than 300 analyses of cheese cured at different temperatures we were able to announce "that the bacterial content of cheese remains high for the longest time, and the decline is also most gradual, in cheese kept in ice cold storage at an average temperature of 40 degrees Fahrenheit. In cheese kept in a cool, well regulated room, similar results occur but the decline in the number of bacteria is more rapid. As this higher bacterial content constantly corresponds with a better flavor in the cheese, we infer that it is the chief factor in determining the flavor of cheese made from good pure milk."

A number of studies of abnormal fermentation of cheese have also been made. The most extensive of these had reference to an affection known as "bitter" cheese. An organism new to science was discovered, which produced this affection, its habitat, life history, and cultural peculiarities worked out, and remedial measures suggested. Other so-called "cheese diseases" have been investigated, such as the abnormalities known as "mottled cheese", "fruity cheese", "rancid cheese." In the last named trouble, the infection was found to be due to a bad water supply.

The constant presence of bacteria in freshly drawn milk is a matter of considerable importance, as it explains the ineffectual attempts to obtain milk in commercial quantities uncontaminated by bacteria. The bacterial flora of freshly drawn milk has been the subject

of several of our investigations. Samples of foremilk of a number of cows were carefully collected in sterile tubes and studied as regards the number and species of bacteria present, and evidence was brought forward which pointed toward bacterial infection by way of the blood or lymph rather than through the test.

The efficiency of several makes of continuous pasteurizers operated at different temperatures was the subject of a number of tests. The average number of bacteria per cubic centimetre found in milk pasteurized at 140 degrees F. was 631,000, at 160 degrees F. was 17,800, at 185 degrees F. was 81, and at 195 degrees F. was 40, and as a result of these tests, pasteurization of milk at 185 degrees was advised as the best method of securing uniformity, keeping quality, and the mild flavor requisite for export butter.

Several years ago, clarified milk, or milk that has been passed through a separator, was quite extensively advertised by some milk dealers. They claimed that this operation reduced the number of bacteria and enhanced the keeping quality of the milk. This claim, however, was at variance with the reports of a number of investigators who showed the centrifugation did not decrease the number of bacteria in milk. At the suggestion of the Ontario Department of Agriculture, we investigated this subject, and averaging the results of 240 analyses found that there were 400,000 bacteria per cubic centimetre more in centrifuged milk than in the same milk before centrifugation. Further, there were nearly 25,000 more liquefying (putrefying) bacteria per c. c. in the centrifuged milk. This paradoxical result is explained by the fact that bacteria in milk exist in clumps and masses and the centrifugal force breaks up and distributes them

through the milk. These results fully confirmed those of other investigators.

Ontario, as well as other countries, has long suffered from a disease of bee larvae, known popularly as "Foul Brood," and the destruction of bee stock by this disease and the discouragement arising therefrom, has been one of the greatest influences that has retarded the development of the bee industry. Although this disease has been known since the time of Aristotle, (B.C. 340,) it was not until the year 1885 that the true cause of the disease was discovered. This disease has been studied in our laboratory by bacteriological methods and we also had the opportunity of comparing the various characteristics of the disease as it occurs in Europe and America. Additional facts in the life history of *Bacillus alvei*, the cause of Foul Brood, were discovered, the various methods of cure were compared and explained, and a new remedy, known as the formalin treatment suggested, which has given excellent results.

We have also given a little study to that important disease—Tuberculosis.

First, we may mention the preparation of a tuberculin which would give reactions in animals extensively diseased, and also in animals which have been previously inoculated with tuberculin in order to mark the effect of an official test. Owing to the lack of a proper isolation stable, this work had to be stopped when we were on the point of obtaining important results.

A number of tests of milk coming from tubercular cows have also been made. Our results corroborate the conclusions of Rabinowitch and others,—that the milk obtained from cows, which react to tuberculin, but which do not show clinical symptoms of tuberculosis or tubercular mastitis, may contain the tubercle

bacillus in sufficient numbers to cause death in guinea pigs inoculated with their milk.

Two investigations have been made on the duration of the life of the tubercle bacillus in Emmenthaler and Cheddar cheese. The results of these experiments showed that the tubercle bacillus died out between the thirty-third and fortieth day in cheese made after the Emmenthaler method, and between the sixtieth and sixty-second day in cheese made after the Cheddar method, and hence if the latter cheese happened to contain tubercle bacilli naturally present, it may be assumed that none of these bacteria will be living when the cheese becomes ten weeks old; hence no danger need be apprehended of acquiring the disease known as consumption by eating well cured Cheddar cheese.

During the last five years, we have made more than 500 post mortem examinations of diseased fowls. About 300 of these examinations were made on fowls suffering from, or dead from, a disease which is commonly called "Roup." From the careful study of these diseased fowls, and also from the inoculation experiments with healthy fowls and pigeons, we were able to show the infectious nature of the disease. We were also able to produce the disease, with all its varied symptoms, by the inoculation of a new germ, which was isolated from diseased hens and which we have named *Bacillus cacosmus* (ill smelling,) into the tissues of healthy fowls and pigeons. We have also produced Roup by the inoculation of another organism, which is well-known as the blue pus germ, *Bacillus pyocyaneus*, and hence we have regarded Roup as simply a complex suppurative process which differed from ordinary forms of suppuration in that the pus in fowls appeared in the form of a solid, cheese-like, yellowish white mass, without any tendency to become soft or liquid, or to perforate the surrounding

skin. Methods of prevention were advocated and a treatment suggested by which the milder forms of the disease could be cured.

In this connection, we may also mention experimental work on the supposed identity of human and avian diphtheria. We have shown that diphtheria antitoxin inoculated into birds suffering from fowl diphtheria produced no practical or permanent results and the inoculation of healthy fowls with human diphtheria bacilli showed that this bacillus was not disease-producing for hens. This evidence, together with the isolation of the Roup bacillus, *B. cacosmus*, and the blue pus germ, *B. pyocyaneus*, and the production of typical fowl diphtheria by the inoculation of either of these bacteria into healthy birds showed the unsoundness of the theory of those who believed in the identity of human and avian diphtheria.

Although one important bacterial disease of plants has been known in Canada for some years, yet comparatively little study has been given to plant affections induced by bacteria.

During the last year or two, however, we have recognized some five or six bacterial plant diseases in Ontario, some of these are well known in the United States, but one of them is a new disease, which has been worked out in this laboratory. This disease is a soft rot which has done much damage to cauliflowers, cabbages and white turnips, and is caused by a bacillus (*B. oleraceae*.) which has the power or property of dissolving the cell wall of the infected plant, thus separating the cells and breaking them down into a soft, pulpy mass.

Several other diseases of this nature have been investigated and further research along these lines is at present in progress.

I cannot close this article without recording my appreciation of the efforts of my former and present assistants, Messrs. McCallum, Ross, Streit and Barlow, who have labored with dexterity, skill and readiness in the various research work which the Bacteriological Department has undertaken.

F. C. HARRISON.

The O. A. C. Review

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Editorial.

They say that half the world does not know how the other half lives. Half our own country does not know how the other half lives. **A Home Study Idea.** Where does a Canadian go, when worn with work and busy with business he feels the necessity of a rest accompanied by a change of scenery? His jaded brain pilots him to the tense, terse atmosphere of the dense Southern cities or to the pitifully populous paths of the professional globe trotters on the continent.

This is owing to a mistaken conception of learning. As in all other matters, distance lends enchantment to the view. To announce a trip abroad leaves an impression of affluence, but to mention a journey to the West freezes the hearer's blood, and instead of arousing envy excites a certain sympathy for the poor unfortunate who is thus preparing to work his way up in the world. Why

should this be so, why should people who are anxious to travel think of every foreign, darkly dirty, and outlandishly uncomfortable watering-station before considering the pleasure and profit of knowing Canada? We have a young and growing country, which is developing new features every year. We cannot appreciate its growth nor our own position unless we can in some way arrive at the progress of development by comparison. On the other hand the continental institutions will remain the same during a life time, and their greatest attractions, ancient relics and conservatism, will be rendered more valuable by added age.

Does not the command "know yourselves" apply as well in modern days as of old? Do years of travel amongst strangers and careful assimilation of English gardens, French art galleries, Italian studios, and German scientists

constitute learning in a man if he has not once been across his native land? If you have become fully conversant with all in your limited circle, arise and survey your surroundings. Study your country's own fresh scenery and do not labor over the soiled and trodden Meccas of generations of Cook-chaperoned tourists. If you wish a change of climate go to the far North; if your ambitions are to place your name on the roll of intrepid explorers, five days travel will effectually erase all traces of man; if you long to study human nature as misrepresented in other people seek some of our varied types in their native haunts on the Western plains, if your goal is stirring adventure, whet your courage and conjure up your sterner nature to meet in fatal combat the lords of the Canadian wild; if these fail to satiate you and your soaring spirit has higher aims hasten to the Canadian Alps.

Then, when from the Pacific to the Atlantic, and from the 49th parallel to the Arctic Circle, you have travelled at home, go abroad, stumble over the languages and the boundaries, view the world as it was, and return to the world as it is, proud to be a Canadian.



The New Year has not brought un-
mixed joys to the REVIEW. With the
advent of this month we lost
A LOSS. our strongest supporter, bright-
est thinker, and most willing worker,
the late Managing Editor, Mr. R. J.
Deachman. For the last year he has con-
centrated his ideas and ambitions on the
College paper, until, under his infusion of
radical improvements, it has grown to a
College Magazine. His ideal was "the
best that is," and he never lost sight of
it. No proposition was ever too hard
for him to face, and no difficulty too
great to surmount, nor no situation too

impregnable to storm. When there was
no copy he made it; when there were no
cuts, he got them, and when a man
wouldn't advertise he made him. It was
by these tactics that he placed the O. A.
C. REVIEW in its present position, and it
will be by this persistent driving policy
that he will build up in Canada an
agricultural magazine that will know
no peer.



We are indebted to Dr. Cephas Guillet,
of Toronto, for the article on "An Edu-
cational Experiment," which appears on an-
other page. Dr. Guillet

**An
Acknowledgment.**

is an enthusiast and a pioneer in this
work, who has had the courage of his
convictions, and has been willing to
sacrifice time and self to prove his
theories. The school which he estab-
lished has been an all-round success, and
when the modern Canadian educational
system has been developed and completed
Dr. Guillet's work will serve as a land-
mark to show its rise and progress in the
past.



The question has sometimes been asked,
"Have the students of the O. A. C. the
same outside privileges as
students of other colleges and
universities?" Undoubtedly

**Wider
Education.**

in some respects they have not, more
especially since public speaking by the
great thinkers of our country is a com-
paratively rare occurrence here. A
suggestion which has lately been grow-
ing in favor, is to arrange, if possible,
a series of addresses from some of Ontario's
most prominent men in agricultural,
commercial, intellectual and spiritual
life. The proposal seems to merit
more than a passing notice, and hopes

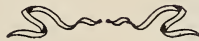
have been expressed that the authorities may, in the near future, see fit to give this subject serious consideration.

Since the agricultural class form the back bone of any country, and since many of those enrolled in our College may reasonably expect to be future centres in agricultural circles, it is most important for them to come in personal contact with great thinkers, and thus obtain an intelligent grasp of questions of the day. Men whose names rank high in their own professions could not fail to arouse interest, and the benefits derived by our students would be many and lasting.

It would, in the first place, lessen the danger of narrowness, which is so characteristic of many educational centres, whose graduates have become so imbued with the spirit of their own institution that they view national events only in their relationship to their own calling. Then, too, how much greater interest

can we take in a man after we have heard him speak. When we afterwards see his name in large type in some of the great dailies, how much more it conveys to us, and how much more likely are we to read carefully what follows. Thus, though an address of one evening may contain but little which would be long remembered, future references in the press, and the reports of the speeches and actions of the man would exert an influence which could not be estimated.

If our College is to have the educational influence which it should have among agricultural people, its graduates must be broad enough in their views to see clearly beyond their own small spheres. That the proposed innovation would do much to accomplish this must be admitted, and it is the opinion of many that definite action would meet with the appreciation of the student body.

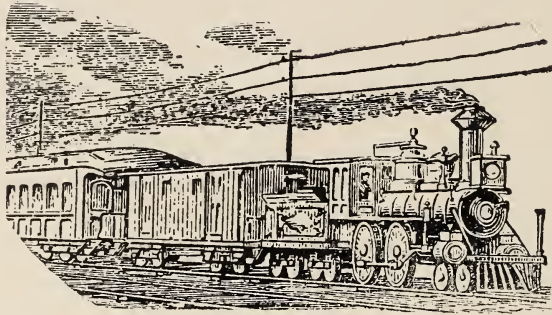


A PARTING.

Only a press of the hand—
 This, and only this !
 And a broken " Good-bye " in the gloom,
 From lips that dare not kiss.
 Then on through the dark and the wind,
 That laughs at its own black jest—
 On—on, with an emptied heart,
 To a hungrier troubled rest.

JAS. A. TUCKER,

Somewhat Personal.



“Ties.”



W. J. Black.

W. J. Black, '01, to say the least, is a man who is rapidly making history. He is an Editor to-day, and a Minister to-morrow; is single one day and married the next. On Dec. 29th, as the old year was fast drawing to a close, our genial friend Black, secured the necessary

clearance orders and induced to become his assistant engineer, on Life's great mountain railroad, Ida M., daughter of Mr. and Mrs. James Day, Creemore, Ont. Black is a graduate of whom the O. A. C. may well be proud; not only for this recent act of bravery, but for the distinction he has attained among the live men of the West. After securing his B. S. A., he went to Winnipeg as editor of the Western Edition of the "Farmer's Advocate," and by his enthusiasm and business methods has made many friends among the hustlers of the plains. He has recently accepted the position of Deputy Minister of Agriculture for Manitoba, and his name is frequently mentioned as the probable President of the new Agricultural College, now in course of erection at Winnipeg. Mr. and Mrs. Black have started under most favorable circumstances, for a long run over the great double tracked system of wedded life; that the curves may be few, and the grades light, and that no disobeyed orders by the head engineer may ever

cause a collision, that obstructions on the track may never bring disaster to their "Private Car" is the wish of the REVIEW staff, and their many friends at the O. A. C.



Our intimate acquaintance with C. Fred. Fawcett, while he sojourned at the O. A. C. during the college terms of '01 and '02, convinced us that he would embrace one of the following as a means to an end: Commit suicide, enter the ministry, or get married. To prove that he is human, he has accepted the easiest proposition and has set sail across that matrimonial sea, which has wrecked many another worthy craft.

In a letter unfolding the secret, he has neglected to divulge the name or sex of the one whom he has taken for better, to *fare* worse, but knowing his choice of associates in the past, we feel certain that it was with some bewitching specimen of the Genus Femininity. Coming from the land of Roberts and Carmen, he too possessed poetic ability, although perhaps, his style as compared with theirs, is somewhat different. Fred's intense love of nature (principally

human) often caused him to break forth into *Blank* verse, or to form Heroic couplets.

Among the productions from his pen, while yet in his Freshman year, we have found the following, which doubtless has had somewhat to do with this event whereby he has surrendered his youthful independence, and his rights as a public citizen.

Hark, oh hark, 'tis the voice,
'Tis the voice of my girl,
Lovingly saying to me,
Come this way Freddie, come this way
 Freddie,
Come, I am waiting for thee.

In true ministerial style Freddie has accepted the "call." May his pastorate be pleasant and the flock harmonious and obedient. May the fascinations of a divorce court never prove of any interest to Mr. and Mrs. Fawcett, but may their wedded life be one grand, sweet song.

Fred writes that his father has intrusted him with the old farm, and that he keeps cows to occupy his time between meals. He believes that there is a great future for New Brunswick.

Old Boys' Union Formed.

During the week of the Fat Stock Show, which was held last month in Amherst, N. S., fifteen of the ex-students belonging to the Cold Water Provinces assembled at the festive board, and formed a Maritime O. A. C. Boys' Association. The following officers were elected:

Hon. President—Dr. James Mills.
President—Prof. Cumming.
Vice.-Pres.—H. R. Ross.
Sec'y & Treas.—W. D. Albright.

A very enjoyable evening was spent, and the scheme was voted a decided success. Occasions such as these give

ex-students an opportunity of talking over old College days, (often the happiest of our lives) and we think the idea of making this an annual affair is a good one. We take this opportunity of congratulating the Secretary, W. D. Albright, who is largely responsible for its formation and success. He would like to have any ex-students residing in the Maritime Provinces send him their names and become members of this family group.

The fee is light, and the cause a good one; send your name along.

The world wide reputation of the O. A. C. brings to her portals students from all parts of the terrestrial sphere. (Any coming from celestial abodes would naturally take the course at the Macdonald Institute.) One of our most recent additions to the list, is H. J. Neethling, Bloemfontein, Orange River Colony, South Africa. Mr. Neethling has been employed for some time by the British Government as manager of an experimental farm at Bloemfontein, and is now on a leave of absence for two years, to gain information which will better qualify him for that position.

He states that Mr. Palmer, who went from Ontario as Agricultural Commissioner, is getting along exceedingly well, and is much liked by the farmers. Dewar and Galbraith of last year's graduating class, who are employed as Entomologist and Experimentalist respectively under Mr. Palmer are also proving good men, as Canadians usually do. Mr. Neethling, although of Dutch descent, speaks with a decided English accent. He served through the long South African War, fighting under the Union Jack, and being familiar with the country, also the circumstances leading to the war, could doubtless tell many an interesting tale. He says that irrigation is the question which concerns Orange River Colony farmers most, and he intends visiting, before his return, countries which are similarly afflicted, and thus be enabled to take back with him the latest ideas on the subject.

We present the photo of W. W. Ballantyne, of the class of '79, who is now farming very successfully, near Stratford, Ont. Mr. Ballantyne makes a specialty of Ayrshire cattle, and has by careful breeding and selection, pro-



W. W. Ballantyne.

duced one of the finest herds in Canada. He is considered an expert judge of dairy stock, and is frequently in demand at the Toronto and other exhibitions to act in that capacity. We need no better proof of Mr. Ballantyne's faith in agricultural training, than the fact, that this year he has sent his son to take the Course. His is an example worthy of an ex-student and we trust that it will be followed by many others.

C. I. Bray '04, writes us that he is on the staff of the Agricultural College, Mississippi, engaged as dairy herdsman and experiment feeder. He thinks seriously of taking the M. S. course, which is about what we would suppose, knowing Charlie's studious nature and commendable ambition. We wish him every success. He states that R. N. Crane of the '05 class is also at Mississippi College. He is lecturer of Apiculture and Poultry, also manager and experimentalist in the Poultry Department and is getting along well. Crane always was an industrious chap with unusual business ability, and we have no fear but that he will make a success of life.

“A Second Edition of the Old Boys.”

The year 1904 is one of marked changes for the O. A. C. We have a new “pilot at the helm” in the person of President Creelman, who thus far has proved a very successful navigator. The next feature in importance is perhaps the opening of the new residence for McDonald students. But there is another feature, while of small importance as compared with the events mentioned, is nevertheless, an important era in the history of the College. The year just past is the first when any of our students could claim as paternal ancestors on their father’s side ex-students of the O. A. C.

We consider the event of considerable importance and thought it fitting to present photos of the boys, who should be proud of this distinction. They are



N. M. Ballantyne.

both members of the first year, and having inherited a certain amount of appreciation for the institution they should prove loyal students of the O. A. C. N. M. Ballantyne comes from Stratford, Ont., and is the good-looking son of his father, W. W. Ballantyne, whose photo appears on another page.



A. L. Dunkin.

A. L. Dunkin was born at Norwich, Ont., when quite young, but has out-grown this drawback to the extent of about eighteen years, and doesn’t seem to mind it now at all. The photo of his father, Mr. T. L. Dunkin, along with their home, appeared in our last issue.

When these boys grow up to manhood we expect that they will follow the good example set by their fathers, and send their boys to the O. A. C., and thus prevent the breaking of the golden chain, or the losing of the silver coin in ways less useful.

C. Howard Black '83, is another one of our early ex-students who is making a decided success of farming. He is living on the old homestead about a mile from Amherst, N. S., the most alive town in the Maritime Provinces, and is one of the most up-to-date agriculturists in that section. Mr. Black always takes an active part in the Farmer’s Association, and other agricultural organizations and is frequently in demand as a speaker at institute meetings.

Book Reviews.

"Plants."—A text-book of Botany by John Coulter, of Chicago University, differs from other text-books. It merely contains all the information necessary to understand the plant world from diatoms to angiosperms, and this information is accompanied by such engravings as to almost preclude the use of the microscope. Mr. Coulter knows that each teacher prefers his own system, and the energy which other authors have spent in devising and completing a new system, or arrangement, he has spent in selecting his material and engravings, so that with his text-book and a microscope an intelligent student is independent.

The life-like half-tones in this volume do credit to the publishing abilities of D. Appleton & Co., New York, who are responsible for its appearance.



Interesting to the student are "The Studies of a Booklover." This volume is an informal treatment, as by an old acquaintance, of the home life, surroundings, faults and virtues of eight of our English household authors. The writer, Thomas Parrott, of Princeton University, is a man who loves his subjects for their faults, and his quiet, natural description, accompanied by splendid engravings, enables the reader to better appreciate, and to peruse with a new zest, the works of our most original thinkers. This book may be obtained from Jas. Pott & Co., New York, for \$1.25.



We must all feel an interest in Canadian poetry. Nothing of the full sig-

nificance is lost because readers and poets alike are influenced and surrounded by the same natural forces. We should find it valuable for the descriptions it gives us of our nature land, and we should love it because it embodies in verse what many of us think but cannot say. The Wm. Briggs Co., the patrons of Canadian song, have published in book form the works of two of our Canadian poets, the late James A. Tucker, and Marion E. Moodie. These little volumes need only to be seen to be appreciated, and every patriot should write for them at once.



Canada may claim for herself the greatest interpreters of animal life. Chas. G. D. Roberts has won his spurs as an animal author by producing "The Watchers of the Trails," and he has shown his thorough knowledge of the wilds by introducing only what is best. His work is characterized by a subtle instinct which enables him to express that knowledge known only to himself; in such language and with such sentiment that the interest of knowing it is felt by all his readers. The illustrations instead of being mechanically exact, are darkly and naturally suggestive of the next movement, and confirm the genuineness of the whole work.

This guide to our wild contemporaries is published by the Copp Clark Co., Toronto.



"Hedges, Windbreaks, Shelters and Line Fences," is primarily a farmer's book. Now that the farmers of Canada

have established homes and insured themselves a comfortable life, they are alive to the importance of replacing that natural beauty which their forefathers removed. Here they realize the necessity of a guide, for a hedge or tree once firmly rooted is not going to benefit by removal. This little publication discusses the subject from all sides, and is full of suggestions for all emergencies. Any person doubtful of the relative merits of varieties, or finding it hard to choose from a multitude of artistic ideas, must finally send fifty cents to Orange Judd Co., New York, for this arboreal mentor.



The Christmas number of the Canadian Magazine, which reached our table some time ago, is one of the brightest of the many good things that journalistic Canada has so far produced. In artistic arrangement and elegance of make-up it certainly lacks much of the brightness of our American contemporaries, but it is beamingly redolent of a spirit of ardent

Canadianism, and should be in the hands of every lover of good literature.

The editor shakes hands with himself over the success of the past year, and predicts great things for the future. He is confident that the price is not too high, and that the trend of magazine prices is upward. May success attend him and prosperity be within his walls, and may the "Canadian" grow bigger and better as the years roll by.



Another of our firmly founded and deeply grounded convictions has been shaken to the roots by that lady-like and innocent monthly, "Vox Collegii." We have always been taught that ladies were averse to hastening the simple approach of time, and dreaded the addition of each oncoming year. But the maidens of O. L. C. are free-thinkers; they realize this weakness of their sex, hold it up to ridicule, and at the same time show how much they themselves are in advance of their age by dating their Xmas number December 1994.



College Life.

AND so the Christmas holidays are over. We wrote off our little exams., joyfully packed our trunks, and rushed for home and friends. And we can assure you that boys who for a time have missed these home friends know how to take advantage of such opportunities as the Christmas season and the snow-covered ground afford. But not all of us were privileged to visit mother and sisters; many of us come one, two, three, four, or five thousand miles, and so about forty of us stayed to keep things running in the old building. And, strange to say, time did not pass slowly. During the day, time was filled up with work, reading or recreation of some kind. The evenings were spent either socially or in the gymnasium. The President kindly supplied the boys with an indoor base-ball set, and had the windows guarded, so that this game, as well as basket-ball, could be enjoyed. The President of the Ontario Agricultural College and some of the Professors joined with the boys in having a good time at these games. At the Christmas and New Year's dinners in the College dining hall, the boys certainly did justice to the occasion and to themselves, and showed no lack of appreciation of the good things provided.

College opened again January 4th. Lectures have again started, and are in full swing for another term's hard work.



Christmas Chapel Service.

The closing service was held on Sunday afternoon, Dec. 18th. Convocation

Hall was filled, and the Christmas sermon was delivered by Rev. Thomas Eakin, M.A., one of the ablest preachers in the city. Special music, in the form of anthems and solos, was supplied by the choir, and the congregation joined heartily in singing the familiar hymns "Joy to the World" and "Hark the Herald Angels Sing." The service took the following form:

Doxology.

Invocation prayer.

Hymn—"Joy to the World."

Prayer.

Solo—"Cujus Animum"—E. G. de Coriolis.

Scripture reading.

Solo—"The Great White Throne"—Miss M. Hunt.

Duet—"The Advent"—Miss A. Springer, Mr. R. Mills.

Sermon—Rev. Thomas Eakin, M. A.

Anthem—"Hark, Hark My Soul"—

Choir—Miss Springer, Mr. Mills, soloists, Mr. D. Weir, violin obligato.

Hymn—"Hark, the Herald Angels Sing."

Benediction.

The officers for the Y. M. C. A. for the winter term were chosen before the holidays:

Hon. President—Professor Reynolds.

President—J. Bracken.

Vice-President—W. J. Kennedy.

Secretary—W. J. Hartman.

Corresponding Secretary—G. M. Frier.

Treasurer—W. A. Kerr.

Chairman Missionary Committee—H. H. Colwell.

Chairman of Bible Study Committee—
C. R. Klinck.

Music Committee—R. W. Mills.

The work of the Y. M. C. A. has been following its usual course, and the interest and value of the various departments are maintained. The boys are finding the Sunday morning classes especially helpful, keeping them in touch with that part of their home Sabbath which they would otherwise miss. Mr. Bracken has the co-operation of his officers and the students in this important work of college life.



Literary Society.

The Literary Society is re-organized each term, that is, a new management is given control. At a meeting of the society held Jan. 7th, these new officers were elected as follows :

UNION SOCIETY.

Hon.-President—President Creelman.
President—F. M. Logan.
Secretary—W. S. Jacobs.
Treasurer—D. A. McKenzie.

ALPHA.

President—J. R. Dickson.
Vice-President—M. C. Cutting.
Secretary—G. L. Barberree.

DELPHA.

President—H. A. Craig.
Vice-President—R. S. Hamer.
Secretary—C. P. Clark.

MAPLE LEAF.

President—G. M. Frier.
Vice-President—H. Newman.
Secretary—J. D. Leach.

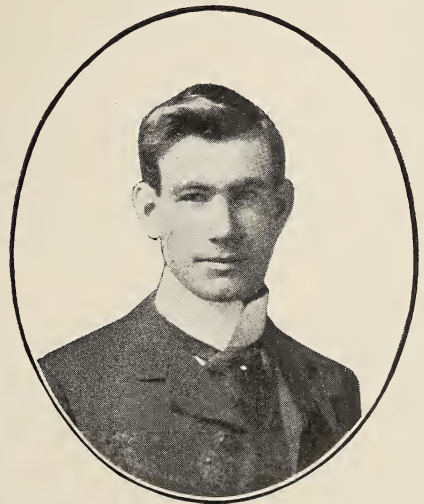
The retiring executive, under the leadership of W. J. Lennox deserve the highest praise for the work they have done in connection with the society. Never have our Union meetings been of such a high order, or more

thoroughly enjoyed. This is due also to the presence and inestimable help given by the ladies at the Hall ; to them belongs much of the credit for the excellence of these programs. Mr. F. M. Logan, the new president, has the interest of the society at heart, and with the help of his efficient staff, and the co-operation of all his friends at Macdonald Hall, will doubtless make this session of the Literary Society a historic one.



A Good Record.

The result of the international inter-collegiate student judging contest at the Chicago stock yards has been announced and the Ontario Agricultural College team, though not taking first place, made a remarkably good record, and has well sustained its enviable record as an institution where the live stock interests



W. C. McKILLICAN,

Who was the best all round Judge at the International.

are well looked after. In the cattle trophy the O. A. C. was fourth, and for the horse trophy it was second. In the single class, where each man was for himself, W. McKillican, of the O. A. C.,

took second prize of \$75. He had 518 points, which was but two points behind the winner, an Ohio man. W. J. Lennox, of the O. A. C., was sixth in the single contest, carrying off \$40 prize money.

General Manager W. E. Skinner, of the International Live Stock Exposition, in commenting on the results, said :

“I think that one of the features of the contest has been the uniformly good work done by W. C. McKillican, of the O. A. C. His work has been, on the whole, ahead of that of any man in the contest. As an all-round man, he handled horses, cattle, sheep and hogs in a very satisfactory manner. The Ohio man was not so good in horses, hogs and sheep, but did remarkably good work in the cattle classes, so that he won out over the Ontario man with a bare two points in a thousand.”

In the contest, the instructors, who have been largely responsible for the work done by their teams, are graduates of the O. A. C.; Professors John A. Craig and F. R. Marshall, of the Texas Agricultural College, College Station; Professor W. J. Rutherford, Iowa State College, Ames; Professor M. Cumming, O. A. C., Guelph; Professor R. S. Shaw Michigan Agricultural College, Lansing, Michigan.

The population at the college has considerably increased this month. Besides some two hundred and ten in the regular course, there is a dairy course of thirty-five members, a poultry course of about twenty, and the stock and grain judging course with an attendance of nearly two hundred students. These, together with the students at the Institute, aggregate in the vicinity of five hundred and seventy-five students at present attending lectures. The short course is certainly a most valuable one, and the regular students take advantage as far as possible of these lectures. The grain judging, under the direction of Professor Zavitz, is carried on every morning for

one hour. The rest of the day is spent in the stock pavilion, judging the various classes of horses, cattle, sheep and swine, and dressed carcasses. In this work the Professors are assisted by our best Ontario breeders and others as Mr. Gosling of Kansas City. Evening lectures of a practical and appropriate nature, are given in Massey Hall by prominent gentlemen.



With such a large number of students at the college it seemed a necessity that the number of the staff should be increased. So greatly did this fact burden the mind of Mr. W. H. Day, our lecturer in physics, that he determined to do all in his power to mend matters. And so when Mr. Jarvis proposed the ten dollar wedding present to which ever one would be married before June, a happy solution of the difficulty immediately presented itself. Of course we do not wish to intimate that Mr. Day had no serious intentions before this. However, about a week after the proposal, (Mr. Jarvis' aforesaid proposal, of course), invitations were issued for the wedding of Mr. William H. Day, of the O. A. C. and Miss Ethel Emily Williams of Aberfoyle. The ceremony took place at the home of the bride'on Dec. 28th. The Consolidated Principal, or Principal of the Consolidated School, Prof. Hotson, acted as second best man. The bridesmaid however failed to make connections, and did not arrive at the scene of action till after the final engagement. But among the many guests were maidens fair and willing, and one was chosen to perform the pleasant task of assisting at a ceremony dear to the hearts of all. Professor and Mrs. Reynolds were present, and Professor Reynolds, as chief of Mr. Day's department, lent his official sanction to the proceeding. The date chosen, Dec. 28th, was unfortunately one on which the boys were home for the holidays, and consequently could not personally give their individual and collective congratulations and advice, but on behalf of the students, the REVIEW extends to Mr. and Mrs. Day, wishes for all the good things of life.



To R. J. Deachman :

We regret that the time has arrived which necessitates your resignation as Managing Editor of the O. A. C. REVIEW. During your tenure of office, THE REVIEW, as well as yourself, is noticeable for a marked improvement of character. This change in regard to our journal is visible to the least observing of our subscribers, but we thought we could best demonstrate this feature, in regard to yourself, by use of illustrations. Your photo at the head of this page is a striking likeness of you when you first became a member of the staff, and your qualifications, which are here indicated, were similar to those possessed by that young member, so essential to the staff of every publication. With energy as your motive power, ability as your capital stock, and excelsior as your motto, you were, (like Coleman's yeast) bound to rise.

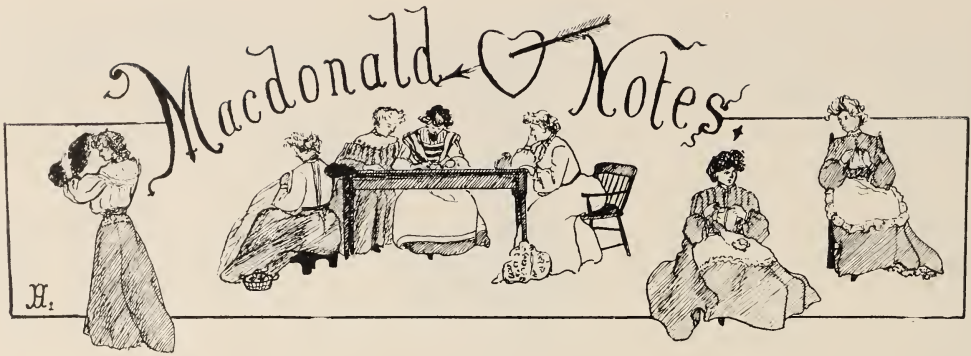
It must be gratifying to you, as it is to your humble associates, that your efforts have been instrumental in producing one of the best College Journals in America; and that you can now sit in the balmy shades of retirement, and like a member of the Court Supreme, pass sentence on your poor followers, who are endeavoring to hold to the lofty heights which you have scaled. Please accept from your fellow students this gold watch, not in any sense as a remuneration for your valued services, but rather as a token of remembrance from those who have been honored by your leadership.

We trust that this little instrument will teach you many valued lessons. May its face, which is spotless, except for *Roman characters*, remind you of your own, that should ever be kept in a similar condition. May its hands, though somewhat smaller than yours, suggest to you the value of pointing to the right thing at the right time; and may the little wheel which regulates its movements impress upon you, that, in your single condition, you too, require a regulator. Under her influence may you become an honor, not only to your adjustor and your Alma Mater, but to your native land.

Signed,

THE O. A. C. REVIEW.





Re-Opening of Macdonald Hall and Institute.

ON Jan. 3rd, the doors of Macdonald Hall and Institute were opened for the second term. Again the spacious halls were filled with the bright faces and ringing laughter of girls returning to their work with renewed vigor after a pleasant holiday.

It was with feelings of mingled joy and sorrow that the long course students thought of returning, but when they entered, and were greeted so warmly by Mrs. Fuller and their friends, they verily felt that in leaving one home they had come to another. Most of the faces seen the first day were strange, there being a conspicuous absence of old girls. It is rumored that next term fines will be imposed on late-comers,

During the following days of the first week the girls arrived, and with reluctant feet (not as the new-comers, who had at least the advantage of a new experience) wended their way to the Institute and deposited part of their worldly possessions with the genial bursar, receiving from Miss Watson in return a small card, marked, "Programme." When these were read, and seen to be overflowing, they, verily, felt they had their money's worth.

We miss the Nature students, and the three month girls of Fall term, 1904, but

the new girls are doing their best to fill their places, and we trust they will enjoy their term as much as their predecessors, and find Macdonald Hall a happy home. On account of the large number of short course girls, it has been found necessary to form them into two classes, both of which have the same course as the one class of last year.

The teaching staff has been increased by the appointment of Miss Pierce, a graduate of State Normal Training School, Potsdam, N. Y., and Clarkson School of Technology. This has been found necessary owing to the increased attendance. This speaks well for the Institute, showing that the people of Ontario and other provinces recognize the benefits to be derived from such a course of study.

In the Hall, the "Heim-weh" of the old and the new girls began to disappear when we met in the dining-hall, where Miss Kennedy so materially adds to our comfort and enjoyment.

Classes resumed work in earnest on Monday, and when we again greeted our teachers we felt that surely it was good to be here.

On Tuesday, January 10th, a meeting of last term's members of the Macdonald Literary Society was held for the nomination of officers for the ensuing term.

Election from the nominees took place on Saturday afternoon in the Macdonald Institute. The retiring president, Miss Ferguson, and recording secretary, Miss Ross, presided at the meeting, which was of a purely business nature. The following are newly-elected officers :

Hon. President—Mrs. Fuller.
 Hon. Vice President—Miss Givin.
 President—Miss Harcourt.
 First Vice President—Miss Wanzer.
 Second Vice President—Miss McDun-
 nough.
 Recording Secretary—Miss Kent.
 Corresponding Secretary—Miss De
 Lary.
 Treasurer—Miss Howitt.
 Committee Conveners—Miss Bell, Miss
 Gow, Miss Watt, Miss Wanzer.

May every success attend the efforts of the new executive in making our Literary Society one of high purpose and noble aim.



Natural Beauty—The Work of the Nature Students from N. S.

On the 15th of December, the students who were attending Macdonald Institute for the past three months, for the purpose of taking up the Nature Study Course, departed from amongst us to return to their homes in the several provinces of the Dominion.

In this course they received, besides observation work in forest and field, lectures in Botany, Entomology, Astronomy, Meteorology, Biology and School Gardening. During the last week of this term and on the day of the formal

opening of Macdonald Institute Hall and Consolidated School, the people who visited the Nature Study Class Room found it ornamented with mounted specimens of shrubs, flowers, weeds, and other collections which had been made during the term.

In this work the students from the several provinces were divided in groups, a section of the room having been given to each province in which to exhibit their work. In this way much excitement was created amongst the students, each group endeavoring to surpass the others in their decorations.

Thus was brought to an enjoyable conclusion a term which had been happily and satisfactorily spent in Nature study by teachers and students.

The Winter Fair held in December was of peculiar interest to the students of

Macdonald Institute, in that it was made the occasion for opening the Institute and Hall and unveiling the portrait of Sir Wm. Macdonald.

The formal opening took place on the afternoon of the 7th. Preceding this, was a luncheon in the dining room of the Hall, at which were many distinguished guests. The luncheon was prepared and served by the students of the Institute.

President Creelman conducted the proceedings.

There were present—Hon. John Dryden, John Millar, Dep.-Min. of Education; Prof. Squair, Tor. Univ.; Provost Macklem, of Trin. Univ.; Wm. Houston, M.A.; Mr. G. Y. Chown, Registrar of Queen's Univ., Kingston. The O. A. C. and Institute were represented by members of the staff.

President Creelman opened the meeting. He was followed by Dr. Mills, who set forth ably and clearly the aims of the Institute. He ended by unveiling the portrait of Sir Wm. Macdonald. Impressive speeches were delivered by Dr. Robertson, Mrs. Hoodless and Mr. Dryden.

Athletics.

THANKS to the untiring energy and perseverance of D. H. Jones and W. E. Byers, our rink is now ready for skating. Though oft discouraged by warm weather, rain and mud, these two gentlemen were able to triumph over the opposing elements and furnish a fine sheet of ice. Our rink however is inadequate for an institution such as we now have here. Its location is not all that could be desired and moreover it is too small, while the difficulties of making and maintaining a creditable sheet of ice are great. No improvement that could be made at the college would be looked upon with greater favor by the student body, than a good covered rink for the accommodation of the students of the O. A. C. and Macdonald Institute, and such an addition to our institution is now almost a necessity.

At a meeting of the members of the Athletic Association held on Jan. 9th, several matters relating to our winter sports were discussed. Messrs. Kerr and Shepherd of the first year were elected to represent their year on the Athletic Executive. Messrs. Foster and "Bob" Baker were elected manager and captain respectively of the college hockey team. It seems however that the duties of those two gentlemen will be light as the college has not entered any league. For various reasons the executive deemed it unwise to enter any intermediate or senior league, and as there is no league in the city this year we are strictly "out of it." It is deplorable that in a city like Guelph there are not enough public

spirited men who take an interest in sports to furnish a first-class rink to afford our hockey players the benefit of at least a city league, that our grand old winter game may not become a forgotten art among our citizens.

A series of inter-year games to be played on the college rink is being arranged by the following men who have been appointed captains of the different year teams:—R. G. Baker, fourth year; H. W. Scott, third year; C. G. Montgomery, second year, and D. M. Johnston, first year.

Owing to the interest and enthusiasm of President Creelman and a few members of the faculty, those who remained at the college during the holidays were afforded the opportunity of indulging in a game somewhat new to the majority of the students—that of indoor baseball.

Our athletic association has also been quite active in affording the boys the means of enjoying a variety of sport for this season. The necessary equipment for basket ball has been placed in the gymnasium, and though a game practically unknown to the majority of the students, it promises to be intensely interesting this season. The Athletic Association has also been desirous of improving the quality and variety of the program furnished at the indoor sports. Towards this end they have secured the services of Captain Clark, who will give the boys some scientific training in gymnastics. So that as we take a forward look over our prospects for sport this term, we have every reason to look

for a busy season and one of the most successful in the history of the college.

SUPPORT THE ATHLETIC ASSOCIATION.

There is no student organization in the college which requires and deserves the hearty support of the individual student more than the athletic association, and none does better service to the college as a whole in bringing our institution into recognition and even prominence among the sister institutions of this province.

the O. A. C. and it is left almost wholly with the Athletic Association, to prevent the disastrous effects resulting from the too great development of this year spirit by developing a college spirit which in a great measure displaces the year spirit. This strengthens the college in many ways. It binds the different years together in a common desire for the success of the college as a whole, honor gained by our football or hockey team is not appropriated by any one class but is shared by all ; and it draws the members,



A CLOSE GAME.

One great good done to our college as a whole, besides bringing it into greater recognition among other colleges, is the developing of a college spirit. In an institution where there are four different classes each with its own interests and amusements, and each often conflicting with the others in many ways known only to those who have had experience in such things, there is a great deal of year spirit fostered, and where there are a comparatively small number of students, such year spirit is liable to weaken the "esprit de corps" of the whole college. These are the conditions that prevail at

of the different years together in a closer friendship which cannot help but make us stronger and fill us with a greater love for our college, when we become ex-students. However the athletic association does not believe in suppressing the clannishness of the different years altogether, but draws out the best that is in them by promoting a friendly rivalry in football, hockey and other sports. Moreover the provision made by inter-year contests in athletics as an outlet for class spirit prevents it from breaking out in other ways, which might be detrimental to the best interests of our institution.

Locals.

Professor in Geology—What are the most valuable minerals?
Mac. Vannel—Potatoes.

How would you tell which strata were older?
Duncan—By their age.

Our distinguished visitor, Mr. Gosling, did not confine himself to his own country nor to his own time, for his sentiments were Canadian and his views were essentially "CummingDay" views.

The moral standard of the Maple Leaf Society is evidently improving since the members insist on either Friar or None for President.

With Mills on the Executive of the Alpha, and a Baker on the Executive of the Delphic, there should be food for thought in our meetings.

There is a "fine" distinction between having one's name on the covered bulletin board and on the students' bulletin board.

Prof Peart—Well, boys! Back for the new year?

Jacobs—No; for Horticulture.

Prof. Harcourt—I am very sorry so many failed in Chemistry.
Culham—So are we.

Take back that heart you gave me,
The angry Maedonald girl cried;
The butcher gave her liver,
And the maid was satisfied.

Miss Hardy—(A visitor inquiring for Mason)—He lives in Ward No. 41.

According to President Creelman, if modern, up-to-date, clean methods are employed on our farms and in our dairies, there is likely to be a scarcity of sweet dairy-maids and housewives; he says: "No matter what the occupation may be, there is no reason why every man and woman in the country should not be a gentleman."



"Please, I didn't mean to."

Echoes from the Dairy School opening:— After commenting on the usefulness of such institutions as the one Sir Wm. Macdonald has established here, Mr. D. Derbyshire, the chairman, remarked:—"If there is anything in this world that needs education, it's the young ladies."

Anxious Visitor—Does political feeling run so high here that such angry arguments as those we hear are common?

Student—Don't be alarmed. That's only the Sophomores rehearsing for Practical English.

Prof. Day (in short course)—Which of these two cattle would probably weigh the most?

Promising student—The bigger one.

We have every reason to believe that Chisholm intends taking the Chemistry option, and that Mineralogy will be his profession. He will make this choice in order that he may oftener

give utterance to the opinion, "I'm a-saying."

Short Course Student to Dr. Reed—
What about the hock?

The Doctor—The what?

Student—The hock—that joint behind.

Little drops of color, little dabs of
paint,
Make the homely woman look like
what she ain't.

We take the liberty of anticipating
the following articles in the January
"Review" of 1925:

Col. R. W—de left yesterday to re-
new old acquaintances in S. Africa.
May the reunion be mutually bene-
ficial.

W. C. McK—ll—n, live stock expert,
recently paid us a visit on his return
from Chicago. He reports increased
interest in the International, but con-
siderable absence of life in the dressed
carcass competition.

Hon. Geo. W—r, Commissioner of
Crown Lands, informs us that the
large number of burnt areas in New
Ontario is probably due to forest fires.

Prof. H. McF—y—n, Superintendent
of Missions to diseased moral patients
in the Regeneration Sanatorium, paid
us a flying visit last week. He re-
ferred with pride to his old reputation
in his Alma Mater.

C. B. T—gg, N. B., D. L. S., Sec-
retary of the Bureau of Information for
Irish Immigrants, often sends a pro-
mising student from the old land.
We are pleased to see that the breadth
of Pat's views is still unexceeded by
their height.

Sir F. M. Logan, Premier of Nova
Scotia, has successfully introduced a
Prohibition measure during the last
Session. He denies the assertion that
it is a "rum" piece of legislation, but
the tone of many of his speeches de-
notes that he is out of spirits, and is
having a dry time.

W. M—n—o, B.A., B.S.A., leader of
the Big Sing Orchestra, at the Him
Sam Station, Japan, recently complet-
ed a tour around the world and half-
way back. He was accompanied by
his friend, Cr—g, from Hal-o-ene,
Pekin.

We see by the Calgary "Eye-Opener"
that Mr. Ch—lm, ex-B. S. A., of the
North-West Mounted Police, had an
exciting experience last week. Mount-
ed on a broncho, he rode one hundred
yards in 40 sec. He was in consider-
able distress at the end of the dash,
but dismounted without assistance.
It is most wonderful to "read."

W. J. L—x, of "Central Please,"
specialist on short-distance telephone
systems, has lately instituted many
improvements. The experience he
gained at the O. A. C. has never been
forgotten.

Rt. Hon. Arch. Le—ch, President
of the Ill-assorted Union of Work-less
Idealists, is becoming better known.
He removed from Stormont last June,
and says he feels much better.

The "many friends" of W. S. J—bs
will be pleased to learn that he now
occupies a prominent position in the
Prevaricators' Associations. Our old
friend is still prominent in literary
circles, and is publishing a modern
Encyclopædia of English Expletives.
He wishes to know if there is any
chance of recovering several which he
dropped around Lower Panton in
former years.

Hon. R. J. De—ch—an, C.O.D., Min-
ister of the Interior in Turkey, has
resigned his position in order to be-
come High Muk-a-muk of the Amalg-
amated Consumers' Trust.

We understand that a corporation,
composed of several ex-students, has
recently secured a corner in hot air.
We have always entertained the idea
that some day these gentlemen would
be awarded corners in hot air, and are
pleased to see that success has already
attended their efforts.

GETTING THE FULL VALUE OF A COW



If you have cows you should have a Cream Separator. Experience teaches that it is the only way to get the full profit out of your milk. So it is not a question of "Do I require a Separator?" but "Which Separator shall I buy?" Of course you want the best: but all makers claim that distinction for theirs. We not only claim but prove and Guarantee the merits of the Empire Cream Separator.

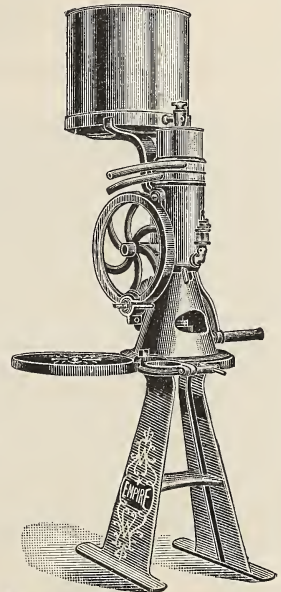
The Bowl is the most important factor in a Cream Separator. The efficiency of the machine depends upon the construction of the Bowl. The

EMPIRE CREAM SEPARATOR

Bowl consists of a few simple parts, thus doing away with a complicated device which goes easily out of balance. The Empire is also a light-weight bowl, requiring much less energy to turn than any of the other makes. The Empire Bowl is easily kept thoroughly clean as there are no corners or crevices in which the milk can accumulate. The inside construction of an Empire Bowl is such as to extract all the butter fat from the milk.



We do not ask you to buy until you are thoroughly satisfied that the EMPIRE is the best Separator on the market. We shall be glad to demonstrate this to you. You should have a copy of our Catalogue; free to any address. Write for one.



The
**EMPIRE CREAM
SEPARATOR CO.**

28 Wellington St., West, Toronto, Canada

HIGH STEPPERS



When Mr. Beith's Hackneys came out to the shows this season did they not create a sensation not only in Canada but at St. Louis? They captured the best that was going. They brought honors to Canada that all good Canadians are proud of. You wondered, and so did everyone else wonder, how he got them in such condition, but Mr. Beith knew, and here he tells you.

Waverley Farm, Bowmanville, Ont., Oct. 25th, 1904.

To the Carnefac Stock Food Co., Winnipeg and Toronto :

Gentlemen,—We have been using Carnefac Stock Food for the past six months, and I take much pleasure in telling of the wonderful results we have experienced since we commenced to use it. Our Hackney horses, led by Saxon, being prize winners at the World's Fair, St. Louis, Mo., require and get, besides the best possible attention, the best possible diet, and this necessarily guides us in our selection of either Stock Food or Condition Powder.

We first used Carnefac for some horses that had the distempes, with the result that it kept their stomachs in splendid condition and that they kept feeding, so the disease was thrown off quietly and the horses did not go back in condition.

To owners of high-class horses we can cheerfully recommend Carnefac.

(Signed) ROBERT BEITH,

Per Duncan Beith, Manager of Farm and Stock.

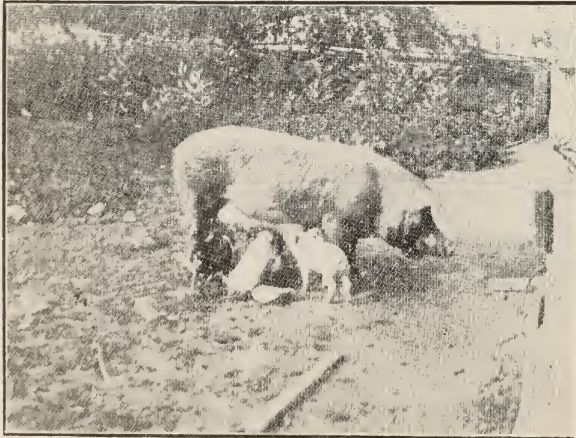
The best cattle men tell us the same story, so do the best hog men and poultry men. There is really no question about it any more,

CARNEFAC IS THE BEST

The Carnefac Stock Food Co.



Toronto Ontario



IMPROVE YOUR STOCK
and
SAVE HAY and OATS
by using
International Stock Food

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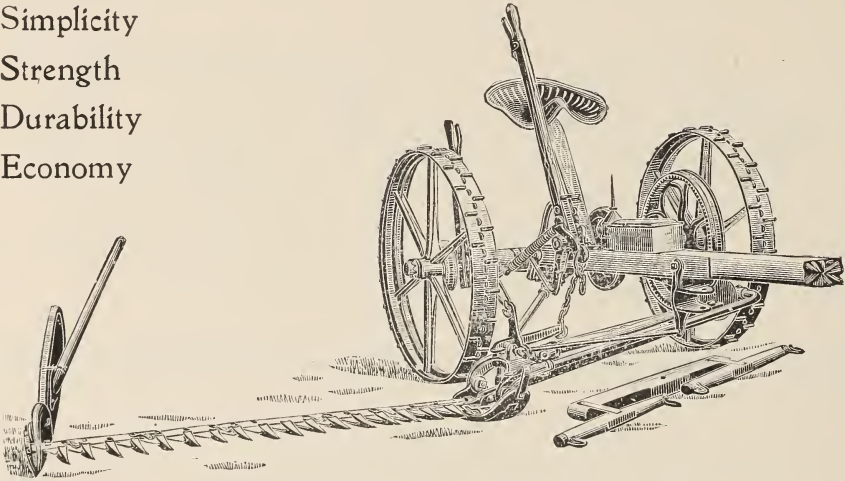
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Continued from page 268.

ADS.

the class, he left the fruit unprotected for a few minutes. On returning he found that the raisins had been raised, presumably by some shortsighted episcure.

N. B.—Since this episode, Craig has inaugurated a campaign against the vulgar practice of terming food "grub."

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If a turkey weighs 10 lbs., how many oysters will a Senior eat?

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If there are not enough tea-pots to go round, is it square?

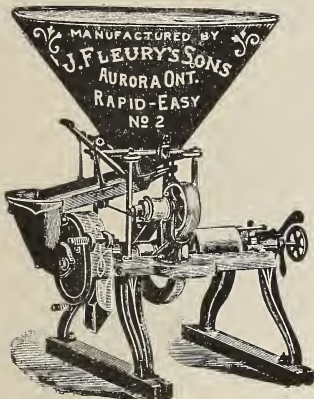
As was said of John Gilpin of old—
When Chisholm next doth ride
abroad,
May we be there to see.

SALE.—On Lower Panton, Feb. 29, 1905, the following articles, no longer of value to the members of the flat, will be disposed of:

1. An empty barrel of apples.
2. Half a gallon of lent coal oil.
3. A no-time table of the street railway.
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3. A quantity of broken resolutions.
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5. The thread of several stories and some old yarns.



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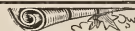
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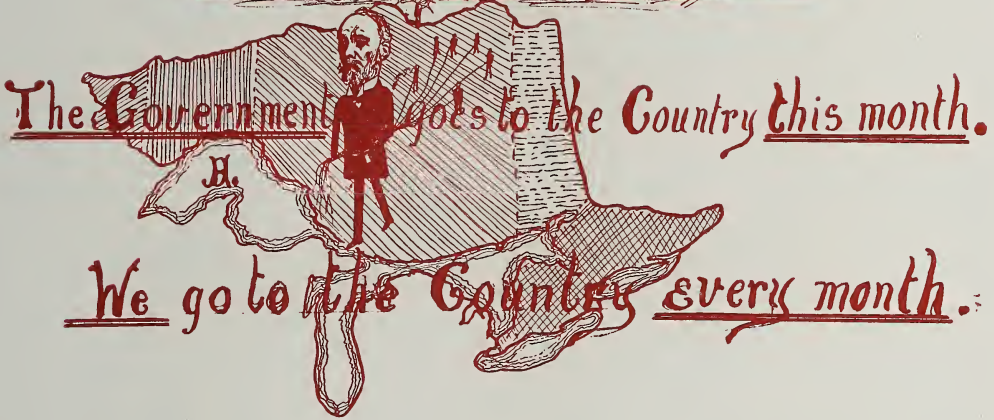
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Increase in membership.....	14,123
Membership December 31st, 1903.....	219,492
Increase in accumulated funds during the year.....	1,234,236.97
Total accumulated fund December 31st, 1903.....	7,453,308.14
Total benefits paid to December 31st, 1903.....	16,290,991.78
Total accumulated funds February 1st, 1904.....	7,518,852.09

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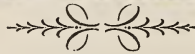
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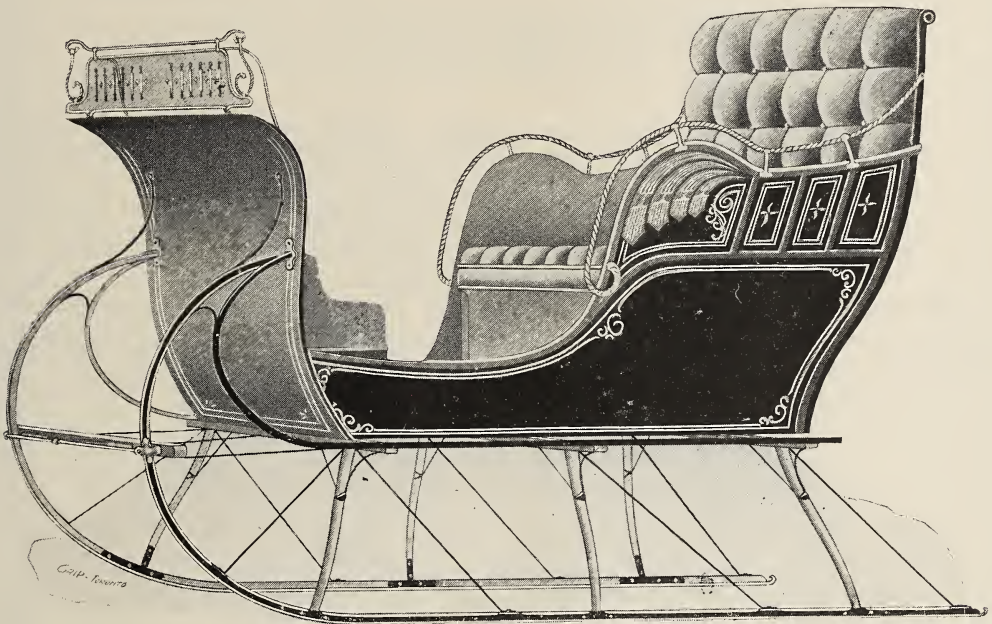
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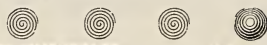
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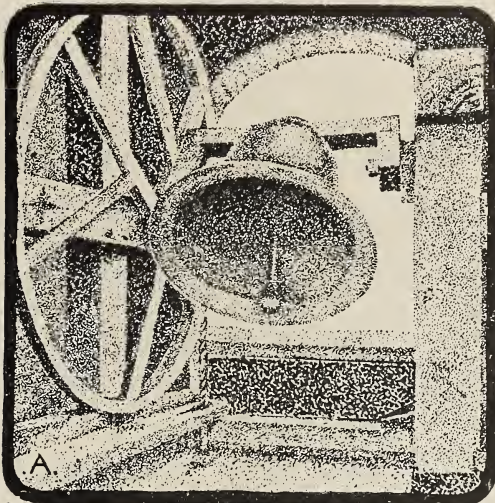
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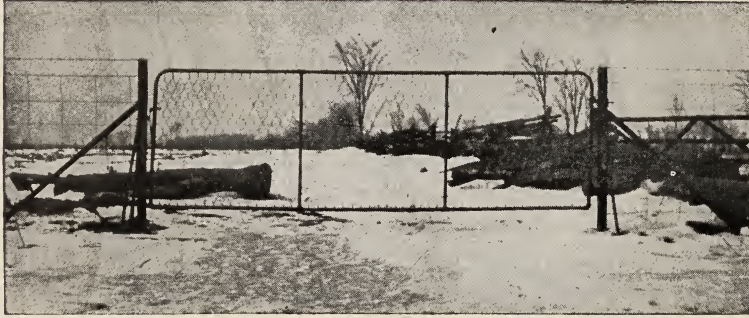
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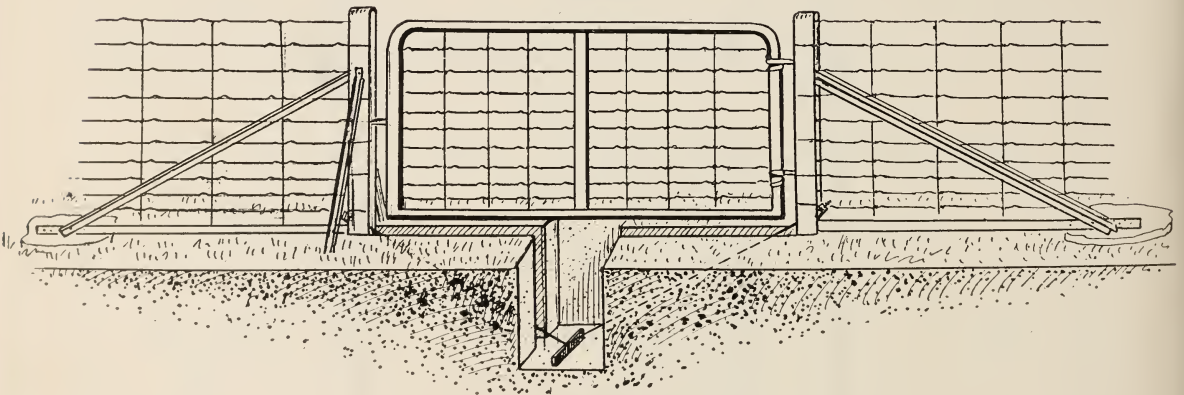
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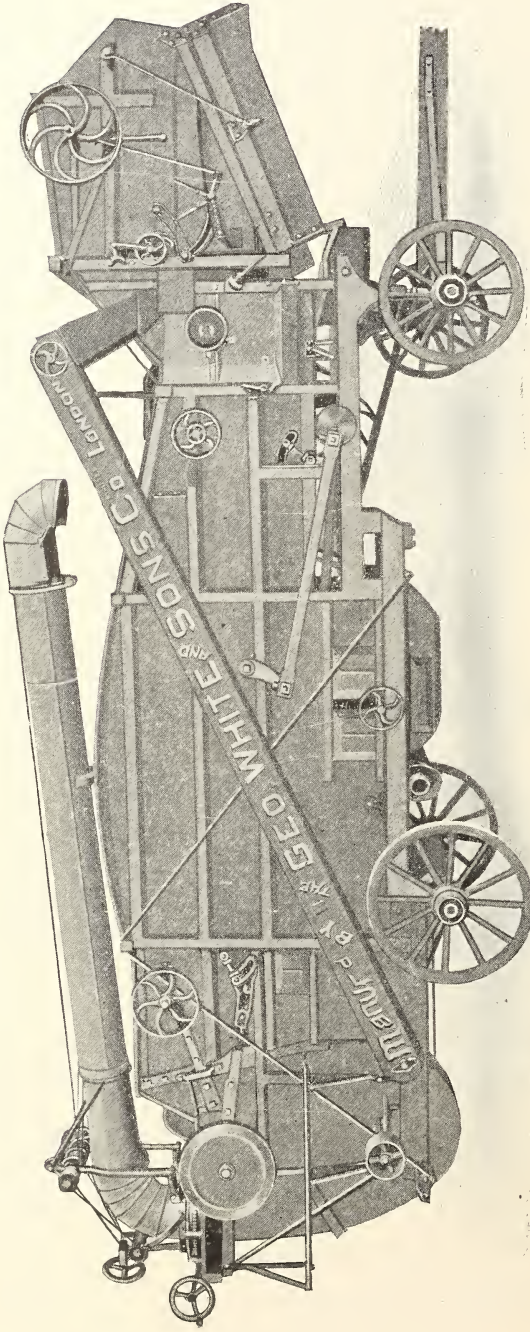
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