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MISSING

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THE DIGNITY OF A CALLING IS ITS UTILITY.

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A Glimpse of the Chateau Country of France

By Alice Rowsome, B.A.

Of the many chateaux that dot the Loire Valley and the Touraine, that garden spot of France, the one at Blois is the most popular among tourists, who, during the summer months, are seen in droves of the "personally conducted" or in detached couples, very often of the honeymoon class, staring up open-mouthed at the beautiful spiral staircase of Francis I., or the hideous monstrosity of the latest addition perpetrated by Mansard. The city itself possesses a great deal of sentimental interest, but probably more than that it is here that the traveller meets the first chateau of state, and there is something about this one that makes the memory of it more vivid than that of others, perhaps more lovable.

The position of this great chateau of the Counts of Blois is a very commanding and picturesque one, being upon an inclined rock, where it towers above the roof-tops of the lower town. It is composed of four parts erected at as many different times; the original chateau of the Counts, the edifice of Louis XII., the palace of Francis I., and the wing of Gaston of Orleans. In these four parts, architecturally distinct from one another, and all, with one exception, beautiful in their own way, is depicted as legibly as on written pages of history, the story of the aspirations and emotions of the builders, from the rough manners of the feudal times in which the structure was begun, through the delicate Renaissance details in which the imaginative brain of Francis I. delighted, down to the hideous concoction of Mansard, produced at the commands of Gaston of Orleans.

The emblems of the various occupants are seen lavishly displayed on every hand, delicately carved in stone; the swan pierced by an arrow of the Counts of Blois, the ermine of Anne of Bretagne, the porcupine of Louis XII., and the salamander of Francis; while in the grand and sumptuous apartment of Catherine de Medici, her device, a crowned "C" and her monogram in gold, often appears on the rich, dark decorations of the walls.

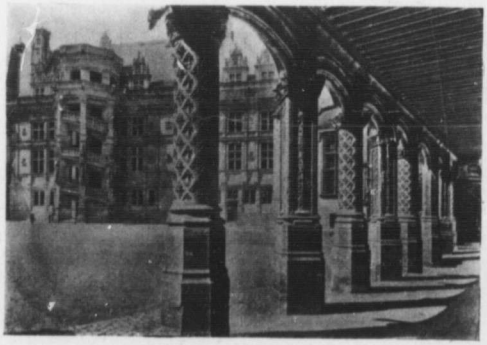
Entering by the central doorway over which is an equestrian statue of

Louis XII., replacing an earlier one destroyed at the Revolution, into the quadrangle formed by these four separate edifices, the object that first strikes the eye, is the famous open staircase of Francis I. Octagonal in shape, florid in its decoration, and shelf-like in its whole effect, it is without an equal in France, and is even unexcelled by any of the Renaissance motives of Italy.

At the southern corner of the chateau but separate from it is a small round tower, called the Tour de Foix. Here Catherine de Medici installed Cosmo Ruggieri, her astrologer, alchemist and poisoner, whom she brought with her from Italy and who accompanied her everywhere. Between this tower and her private apartments there was said to be a subterranean passage.

Time would fail us to tell of the wealth of action, the splendor, gayety and sadness its walls have held, and the scenes that have taken place under its roof. But the prime horror, the one in which the guide specially delights must not be passed over without mention. It was in this chateau that the weak and effeminate Henry III. at last was roused to action by constant repetition of the reproach that he would never really be king until the Duc de Guise had been made away with. De Guise, lured into a trap by a message commanding him to go to the King's closet, was set upon and murdered by the guards of the Forty-fifth, while below in her own apartments lay the queen-mother, dying, listening with dread to the rush of footsteps overhead, for now at last she was weary of bloodshed, and had tried to dissuade her son from this deed.

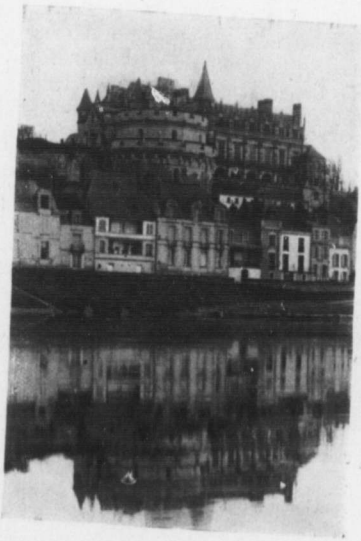
The town of Ambois is old, for we are told that St. Martin, patron saint of Tours, threw down a pagan temple and established Christianity. It was here that Clouis and Alaric held their celebrated meeting in 496 on the tiny island in the middle of the Loire. Not long after, according to our ancient historians, a fortified chateau was built



CHATEAU DE BLOIS.

here on the site of the present one. From 1434 on, when on some pretext it was taken from the Counts of Anjou and added to the possessions of the Crown, it was for centuries a favorite royal residence. Here Charles VIII. was born, and here, while superintending the introduction of some Renaissance details, passing under a low overhanging beam, he struck his head so violently that he died almost immediately afterwards. Here Louis XII. lived for some time, and here Louise de Savoie educated her two children, the

famous Marguerite, called the Pearl of Valois, and Francis, afterwards the great King. In the beautiful garden of the chateau and in the surrounding forest, Francis and Marguerite passed many happy days of their childhood. Here Francis, after his release from captivity in Spain, made arrangements to entertain his imperial captor, Charles V., amid great ceremony and



THE CHATEAU AT AMBOISE.

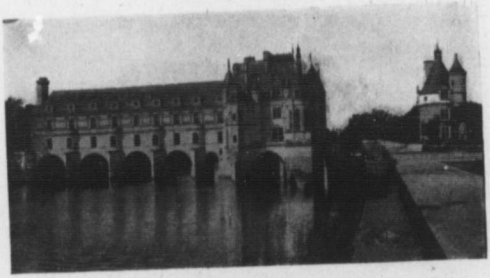
splendor, and, because his guest had a great aversion to climbing steps, he had built, instead of the spiral staircase formerly in the tower, that great inclined plane, up which a stage coach and its horses might go, and which is shown to the present day. Here the weak and sickly Francis II. passed many happy days with his beautiful and beloved bride, Mary Stuart, and here the tender girl and her consort, the King in name only, were forced to become unwilling witnesses of that bloody drama, the slaughter of hundreds of Huguenots, lured hither by false promises of a conciliatory edict by that fierce woman, Catherine de Medici, the real ruler of France. At her command her poor weakling of a son and his young queen were led to the southern terrace, where close beneath the windows of the chateau a scaffold had been built. It was draped in black, and beside it stood the executioner, clothed in scarlet, while his victims were ranged in hundreds along the ramparts, awaiting their doom with bowed heads. When the butchery was over, the corpses of the commoner victims were thrown into the Loire, while those of the chief conspirators were left hanging in chains from the castle walls. Here they succeeded in gaining some sort of revenge, for they rendered the chateau uninhabitable, even for the iron-nerved Catherine.

The chief architectural attraction of Amboise is the chapel of St. Hubert, erected under the direction of Charles VIII. in the full-blown Gothic of that period. Aside from its architectural beauty a sentimental interest attaches to it from the fact that here are enshrined the bones of Leonardo da Vinci.

After the assassination of the Duc de Guise at Blois, Amboise became a state prison, in which were confined the Cardinal de Bourbon, Fouquet and Lauzun, the Emir Abdel-Kader having been imprisoned here as late as 1852. At the present day it belongs to the family of Orleans, to whom it was given by the National Assembly in 1872, and by whose generosity it has become a retreat for military veterans.

As Francis I. and Henry II., two

luxury-loving kings of France, have spoken in praise of Chenonceaux, the visitor will come prepared to admire it, nor will he be disappointed, for, while not one of the large or grand chateaux, it is one of the most attractive. The little village in which it is situated and through which one passes to reach it from the railway station is a charming one; it is composed of one long street bordered with tiny houses, each one of which has its garden so lavishly supplied with roses that they overflow into the roadside and tempt the passer-by. After a walk of about a mile, with probably a halt for dinner at the Hotel du Bon Laboureur, you see the turrets of the chateau peeping through the trees at the end of a long avenue of oak and ash. Lying in the lovely valley of the Cher, removed from the traffic of great thoroughfares, it probably owes its immunity from the furies of the Revolution to its isolated position, and to-day it remains as picturesque as ever, with all its former glory of pointed turrets, spires and perpendicular roof-tops undimmed, but rather mellowed by the passage of ages.



THE CHATEAU AT CHENONCEAUX.

At the right of the entrance to the chateau proper still stands the tower, which was a part of the establishment of feudal days, but which now is used as a place for the tourists to inscribe their names in the visitors' book and buy picture postcards and other souvenirs. One enters the precincts of the chateau itself by a drawbridge, over a moat, formed by an arm of the Cher. Thus it is completely surrounded by water, and is like an island-chateau in the midst of the rapidly-running Cher. Round about a gentle meadow and a great park, give it a beautiful setting. On the southern side of the chateau a bridge was built over the river, forming a beautiful promenade, and leading to the other bank, whence one could get a charming view of the turrets and spires of the chateau. Later a covering, matching in style and beauty the rest of the structure, was built over this bridge, thus forming a veritable house over the water and adding a spacious wing of two stories to the original building, the lower one being called the "Long Gallery," and being used as a banqueting hall.

It is this gallery over the river which is the distinctive feature of Chenonceaux. The name usually given to it is "Diana's Folly," so called because the fair chatelaine, Diana de Poitiers, the favorite first of Francis I., and later of his son Henry II., originated the idea of the bridge over the river, though it was Catherine de Medici who had it roofed over.

That Diana should be the possessor

of this gem of a chateau was for a long time a thorn in the side of Catherine, but her turn came at last, after long waiting, upon the death of Henry II., when the power of the fascinating Diana was over, and Chenonceaux and all else possible were taken from her. But her memory will always cling to its walls and pervade the shady walks and secluded nooks of the surrounding garden.

No horror such as the massacre of the Huguenots at Amboise or the murder of the Duc de Guise, darkens the history of Chenonceaux. Interwoven with its shades are memories of gay garden fetes and water-masques, such, for example, as the one ordered by Catherine to celebrate her triumph over her fallen rival when she first came to take possession of this long-coveted domain. Catherine, surrounded by her bevy of feminine charmers, was accompanied by a gallant band; the young king, Charles IX., two cardinals, Lorraine and D'Este, and the two poets, Ronsard and Tasso. When darkness had come, torches were lighted and myriads of lights shone forth from the windows of the chateau and blazed from the boats on the river. The hunting-horns resounded through the wooded banks and from under the arches of "Diana's Folly," shot barges gaily decorated and devised in fantastic shapes of birds, shells and butterflies. Farther out to one of the secluded nooks in the tangled coppice, stole the gay young princess, Marguerite, to meet by stealth her lover, the Duc de Guise, who had come hither uninvited, and indeed against the command of Catherine, who regarded with disfavour the idea of an alliance between the houses of Valois and Lorraine. In the shadow of a shell-grotto beside the dashing spray of a fountain, they sit together, pouring out their mutual love, until the spell is broken by a message from the imperious Queen, who suspects the cause of her daughter's absence. Hurriedly they separate, Marguerite seeking one of the gaily-painted barges, while the duke strides off and is lost in the darkness of the forest.

Road Construction.

By A. W. CAMPBELL, Commissioner of Highways.

GOOD roads are of vastly more importance to the development of any country, than is commonly attributed to them. A vague impression prevails that railways have superceded them, and that so far as industrial, commercial and social progress is concerned, the condition of the common road is of little consequence. A more indefensible position could not be taken. Railways mean, above all, further development, and that development demands the improvement of country roads as feeders to the railway, and for communication with the adjacent country. Every nation that has achieved supremacy has been a builder of roads. Good roads are not merely an index of, but a means towards national greatness.

Since the days when Rome built the Appian way, and those other great highways over which the commerce of her colonies passed, the art of road-making has been materially changed. These old roads were—and many of them still remain—masses of rock and masonry several feet in thickness. The necessity of this great depth of material has been done away with by the very simple discovery—yet one which is still but tardily accepted—that the natural soil, if kept dry by drainage, will support any load. As contrasted with ancient methods, the keynote of modern roadmaking is drainage, both surface and deep drainage.

A well-built broken stone road near Carleton Place.

A good country road has two well-defined features. These are

(1.) The foundation of natural soil over which the road passes, and which must be kept strong enough by drainage to support not only the weight of

vehicles, but the road covering as well.

(2.) The surface covering of broken stone or gravel, which resists wear, and distributes the concentrated wheel load over a greater area of sub-soil.

If one of these is of more importance than the other it is the former—the natural or sub-soil—and it is the one, the proper treatment of which is most frequently neglected. The right way to make a good gravel or broken stone road is to first make of the natural soil, on which the gravel or stone is to be laid, the best earth road that the soil is capable of producing. This is a matter of drainage and grading, and if possible, rolling. The grading and drainage are largely the same thing, and have to be considered together. That is, the grading should be such as to give good surface drainage.

The first step that naturally presents itself in opening an entirely new road, is to throw up in the center of the road allowance, a smooth and level wagon track. This work is most cheaply and effectively done with a grading machine. In throwing up this grade, the excavation of earth at the sides forms the open drains.

The completed earth grade should, for the average country road, have:

(1.) A circular rise or camber of about two inches to the foot from the bottom of the side drains to the center of the road. This "crown" will carry water from the roadway to the side drains.

(2.) A slope following the axis of the road such that the open drains at the side will have a constant fall to a free outlet. That is, the side drains should carry water away—not hold it in pockets and depressions. Drains which hold water instead of carrying it away are as useless in draining roads, as they would be in draining farm land.

Almost any soil, when kept dry, is strong enough to support the traffic of loaded vehicles. Good drainage is the only means of keeping the soil of a road dry, and consequently strong. If the open drains are not sufficient, then deep tile drainage can be adopted.

The effect of deep drainage is that whereas the raised grade and the open drains beside it may keep the natural soil dry for a foot or so in depth, the tile will greatly increase this thickness of dry soil, which will give proportionate strength of foundation.

The round shape of the roadway is particularly important. It sheds water quickly to the side drains. Whereas if flat or hollow in the center, the rain falling on the road does not run off, but is held on the surface to soften it and turn it into mud.

The soils found in the sub-grades may be described in three general classes: (1) clay; (2) sand or gravel; (3) sandy loam.

Clay.

(1.) Clay, as found in the sub-grade, is variable in quality. It may be a pure blue clay, or it may have sand mixed with it in different proportions. With blue clay, the ground water must be removed as far as possible if stable results are to be secured. In addition to the open surface drains, one or two deep tile drains should be laid along the roadside underneath the open drains, and leading to free outlets. It is customary to place one tile drain on an up-hill side, and one on each side in a cut or on a level grade.

If the clay contains a considerable proportion of coarse sand, it drains more freely than does pure blue clay, and one tile drain along the roadway

will do all that two can do, if placed at sufficient depth. If, on the other hand, the sand is fine-grained, it may be in greater need of deep drainage than if it were pure clay, becoming when wet almost a fluid in consistency.

Sand or Gravel.

(2.) Sand or gravel sub-soils may demand little or no tile drainage to produce a reasonably strong foundation. Tile drains may be omitted at the time of construction, but can be put at crowned roadway, open drains, and deep tile drains, will do all that can be done to make a good earth road, and thus to provide a firm, dry sub-soil on which to lay the gravel or broken stone. If the soil is newly thrown up, however, a roller should be used to compact it, before spreading the road metal.

On clay soil, a standard thickness of consolidated road metal is six inches. On sandy loam, the thickness should

A good gravel road in Simcoe County.

points where the condition of the road under traffic indicates that the "water line" should be lowered.

Sandy Loam.

(3.) A sandy loam is a soil which is often difficult to treat. As a rule, in addition to good surface drainage, a tile drain at one side will be of benefit, particularly in drying out the road quickly in the spring when it is most subject to injury under traffic.

The perfect drainage of the earth sub-soil in this way, by means of a ordinarily be greater, particularly at any points where the soil is noticeably weak. On a sand or gravel sub-grade, the thickness of road metal (broken stone) may be reduced to four inches. On low ground between hills, or on a flat road, a greater thickness of road metal is required than on a slope or on the top of a knoll.

Having made a good earth road, and over this having spread gravel or broken stone, the next point is to see that the metal is compacted into a

closely-knit layer. Loose gravel or stone on a road is an abomination. A roller should be used to consolidate the metal in order that it may perform its office of making a smooth, hard surface for traffic, which will distribute over the sub-soil the concentrated wheel loads, and which will form a water-proof coating that will shed water quickly to the open drains at the side of the road. If a roller cannot be procured, the wheel tracks made in the loose metal should be raked full from time to time until they are thoroughly consolidated by traffic, and flush with the rest of the road.

The materials commonly used for the surface of country roads are gravel and broken stone. Broken (or crushed) stone is, as a rule, much the better of the two. Roughly estimated, for average qualities of each, six inches of stone will make as durable a roadbed as will a foot of gravel. Gravel is a natural broken stone, but is rounded and water-worn, and contains a considerable proportion of sand, clay and earthy material. Crushed stone, on the other hand, is made up of stones of a more suitable size, that are angular, and so bind together with a firm mechanical clasp; nor is there an objectionable amount of earthy material.

Whether gravel or stone should be used in any instance will depend on local circumstances. In some districts there is no gravel; in others there is no stone suitable for crushing; while in others there is little or none of either. This is a matter to be determined by the relative cost under the conditions of travel to be served. There are, however, some municipalities using inferior gravel at a cost of haulage almost equal to the cost of procuring a good quality of crushed stone by rail.

Gravel for roads should be clean. Dirty gravel binds quickly after being put on the road, but dissolves readily in the wet weather of spring and fall, becomes rutted, and is not durable. The best quality for road has a good proportion of stones the size of walnuts, with enough finer pebbles to fill the voids. Certain qualities of gravel should be screened to remove earthy material; and others should be put through a stone crusher. Screening can be economically done by means of a rotary screen, operated by steam, either separately or attached to a crusher.

Broken stone is now invariably produced by means of crushing machines operated by steam, these turning out from 50 to 100 cubic yards a day. The stone is obtained from quarries or is collected in the fields, care being taken in the latter case to discard such boulders as are badly weathered. Limestone is largely used in Western Ontario; and in Eastern Ontario, limestone, gneiss and granite.

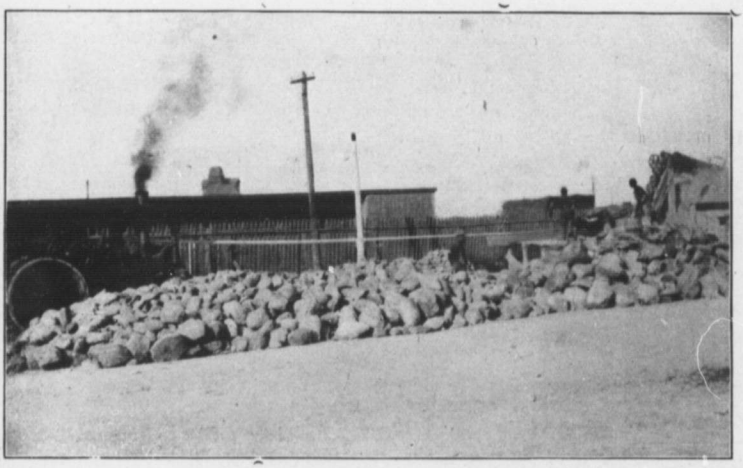
Stone crushers are essential in municipalities having no gravel, but a plentiful local supply of stone. Formerly stone was broken by hand, but the process is too expensive and slow. By means of the stone crusher, broken stone roads have become practicable throughout the Province, as large quarries, with extensive plants, are now crushing stone and shipping it by rail for this purpose.

One of the most commonly-used roadmaking machines is the grader. Graders reduce largely the cost of earth work; but unfortunately their misuse in repairing old gravel and stone roads has done very much harm. These old roads are commonly wide and flat with square earth shoulders at

the sides. With a view to crowning the road, the earth shoulders have been cut off, and instead of being turned outward, the material composing them, earth and sod, has been drawn to the center of the road. This soft material lying on top of the old, impervious stone or gravel roadbed, in fall and spring becomes a river of mud. Miles of road have been almost ruined in this way.

Road rollers are steadily coming into more common use. A large number of towns and cities use heavy rollers operated by steam, for their macadam roads. These weigh from ten to fifteen tons. Rollers drawn by horses, and weighing from five to eight tons are also used. A roller should first be used on the earth grade of a new road to compact the loose earth, so that the gravel or stone, when applied, will form a distinct coating. When the roller is used on the metal, the road is at once made fit for service instead of undergoing a period of settlement under traffic. By the use of a roller, a more durable road can be made, and a considerable saving of broken stone (or gravel) is effected.

In the foregoing survey of the art of road construction a number of the principal branches have been briefly suggested. Each, however, is capable of extended discussion. If their application were intended for only a mile of road, the subject would be of little consequence. But in Ontario with 60,000 miles of road to build and maintain, the reference is to a great public work costing not thousands but millions of dollars. To finance and direct this undertaking is another problem. That much is being attempted is evidenced by the fact that, in the ten years 1896-1905, there has been spent on the country roads of Ontario, the equivalent of twenty million dollars.



Crushing stone for roads at Collingwood.

Investigation in Incubation During 1906.

By Professor W. H. Day.

IN the spring of 1906, upon the invitation of Prof. Graham, the Department of Physics entered into co-operation with the Poultry Department to investigate some problems in incubation. It is an open secret that incubators have not been a phenomenal success—they do not hatch as well as hens, nor do they impart the same vitality to the chicks. To discover the cause of these defects was the object of our research. As is usual in attacking any problem, we had some preconceived notions upon the subject. We were inclined to believe that moisture played a more important part than previously conceded to it, and hence our first endeavors were directed toward ascertaining the humidity in incubators as ordinarily run, intending to vary it in later hatches, and thus arrive at the best humidity for hatching purposes. But we had only begun when we concluded that for our work to have the greatest value, we must determine the conditions existing under the hen, as well as those in the incubator. The humidity under hens was found to be pretty constant for each individual, and nearly uniform among a large number tested, and in all cases from 10 to 20%. higher than in incubators as ordinarily run. The next step was the introduction of moisture into various incubators to bring their humidity up to that found under hens. The result was somewhat disappointing—the hatch was not increased and the appearance of the chicks but slightly, if any, improved. Notwithstanding this, for reasons that will appear later, we believe the high humidity is valuable, if not essential.

At this juncture we hit upon a rather remarkable discovery, viz., that there is a fairly rapid change of air under the hen! The method of establishing this fact, as well as of determining the humidity in the hen's nest, will be discussed in detail farther on.

While the work on humidity was being carried on the amount of carbon dioxide under hens and in incubators had been determined regularly from day to day; it was found to be 3.25 times as plentiful under the hens as in the incubators. We had been accustomed to look upon CO_2 as detrimental, yet its presence in such abundance led us to ask whether it might not, in reality, have some function in incubation.

With these three conditions in mind, high humidity, rapid air change, and high carbon dioxide, we procured a machine in which we could regulate these conditions to some extent. A couple of tests with high humidity and high circulation gave what appeared to be a better class of chicks. But the work had to be practically suspended when the students entered in September, and no further tests were made until during the Short Poultry Course in January. By this time we had procured three more of the same machines.

All of these were run with rapid ventilation, but one was run dry, two with moisture, and the fourth contained a tray of milk innoculated with bacteria that produce carbon dioxide. Besides these a large number of other machines were run at the same time. The percentage hatch in the four special machines was not notably different from that in others, but in the two that were run moist the chicks were thriftier looking, and in that containing the milk and CO_2 bacteria they looked much better still. The chicks from all the machines of whatever make were marked and distributed among several brooders. The "milk chickens," as we called those hatched in the machine containing the milk, always appeared larger, stronger in bone, thriftier and livelier than the others. If a person visited a brooder and tapped on the boards, the "milk chicks" were invariably the first to appear on the scene in quest of something to eat. Up to date the mortality among them has been very small indeed, while among those hatched in any other way it has been great. One swallow does not make summer, however, and from one test we cannot draw conclusions, but the result is interesting as being the outcome of our first attempt to reproduce the conditions we found under the hen.

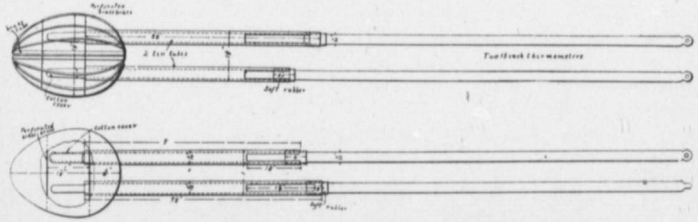


Fig. 1. Nest Hygrometer. Wet and dry bulb thermometers in egg of wire gauze.

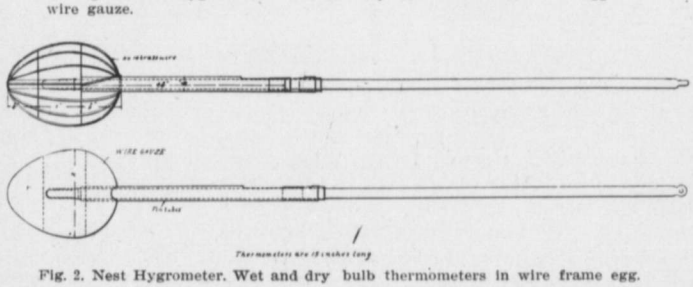


Fig. 2. Nest Hygrometer. Wet and dry bulb thermometers in wire frame egg.

Having thus taken a general survey of the field, let us examine it more in detail. Since the work on humidity occupied such a large portion of our time, it may be well to notice the exact meaning of the term. At all temperatures the air is capable of holding certain quantities of water vapor, the amounts varying with the temperature, if the air pressure is constant. At 70° and standard barometric pressure a

room 10'x10'x10' is capable of holding 1 lb. 2 oz. of water; at 105° it could hold 2 lb. 11 oz., or more than twice as much as at 70°; at 32° it could hold only 4.8 oz. or about one-quarter as much as at 70°, and so on for all temperatures. If the room held all the moisture it was capable of holding at any time, it would be said to be *saturated*. This condition is reached only when rain, snow, dew or mist is falling. At all other times the air has less than its saturation amount. If it has half of its saturation amount, then it is said to have a "relative humidity" of 50%, or as we say in short, "a humidity of 50%." If the room contained one-quarter of its saturation moisture, its "humidity" would be 25%, and so on. The actual amount of water in the air per cubic foot, at any time, is called the "absolute" humidity. This term gives no indication as to whether the air is near saturation or far from it.

The determination of humidity by fundamental methods is a very difficult process, yet one which has been carried out for all ordinary ranges of temperature, and the results tabulated. An auxiliary method, however, has been found that is simple and may be used by any one, in conjunction with the fundamental tables. It is well known that evaporation absorbs heat, or as we popularly say, produces cold. The higher the humidity of the air the more slowly will evaporation take place, and the less cooling will be produced, but the lower the humidity, the more rapid is the evaporation, and the greater the cooling produced. The rate of evaporation may be measured by the amount of cooling, in the following manner: Take two thermometers of the same make and sensibility; over the bulb of one slip a fine close-fitting linen gauze, moisten the gauze with a drop or two of water, and hold the two thermometers, now known as "wet and dry bulb" side by side. It will be observed that the wet bulb indicates a lower temperature than the dry bulb, the difference being due to the evaporation from the gauze on the bulb of the former. The greater the difference, the more rapid is the evaporation, and hence the lower the humidity; the less the difference, the higher the humidity. When the fundamental determinations were being made the wet and dry bulb readings were also taken and tabulated. Hence if we wish to know the humidity of a room at any time we have only to take the wet and dry bulb readings, look these up in the tables and note the humidity set down opposite them.

For determining the humidity in incubators the wet and dry bulbs were mounted in a horizontal position on a small frame that could be set on the egg-tray. A candle wick led from the wet-bulb into a small horizontal vial, with upturned neck, containing water. One of these was placed in each incubator, and since the circulation was somewhat slow we thought the wet and dry bulb or "hygrometer," as we shall call it, should be fanned in order to give the correct humidity. Accordingly, a small motor fan that could be run by a couple of dry cells was placed in each incubator, and so set as to blow right across the hygrometers. We found that in a room, whose temperature ranged from 65° to 75° and whose humidity was about 50 to 60%, the difference between the wet and dry bulb readings was not much affected by blowing a current of air over them, but when the humidity was high or low, fanning increased the

difference, thus giving a lower humidity. We found the humidity of the incubators without fanning to be low, and with fanning to be lower still. Determinations were made daily during eleven hatches in seven "dry" machines of three different makes, Chatham, Model and Old Prairie State. During the eleven hatches the average humidity in the room was 65.1%, in the incubators without fanning 47.6%, and with fanning 39.0%. It was finally concluded that the fanning was unnecessary. We were trying to arrive at the effect of humidity on hatching, which is equivalent to determining its effect on evaporation from the eggs, and since this takes place in the stagnant (?) air of the incubator we concluded that the humidity as determined without fanning, i. e., 47.6%, was the effective humidity of the machines. This, it will be observed, is 17.5% less than the humidity of the air outside the incubators. Three "wet" machines, i. e., machines containing trays of water, were also tested, showing an average humidity of 74.8%, while the room showed only 57.6% during the same time. The "humidity" columns of Table I. will show the details with regard to the various machines. Figure III. gives a view of some of the incubators, and shows the dry cells used for running the motor fans.

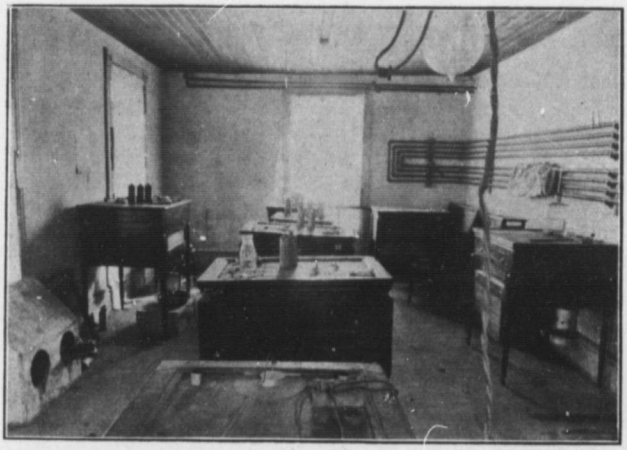


Fig. 3. Experimental Machines and Dry Cells, running Ajax motor fans to fan wet and dry bulb thermometers in Incubators.

The next problem confronting us was the determination of the humidity under hens. How should we accomplish this? There was no hygrometer that could be placed in the nest. Obviously we must devise and construct one if we were to reach a solution. Figure I. represents the form evolved after repeated trials. It consists of a mock egg made of wire gauze, with about 45 meshes to the inch, made rigid by

two diaphragms of brass, into one of which is fastened two metal stems through which to insert the wet and dry bulb thermometers, the whole forming what may be termed a *nest hygrometer*. Our first fear in using this instrument was that the water on the wet bulb would saturate the air under the hen, or, at least, raise the humidity very much higher than before the hygrometer was put in. The air under a hen sitting on fifteen eggs is approximately 1,000 cubic centimetres, or about 1.76 pints. And there is enough water on the wet bulb to saturate 1,000 cubic centimetres twice over, at a temperature of 100°, approximately the temperature in the nest. To test the effect of the hygrometer on the humidity of a small amount of air, it was put in a pint bottle fitted with a rubber stopper, perforated by two holes through which the stems projected. The air in the bottle was the same as that in the room, to begin with, and had a humidity of 62.9%. In five minutes after the hygrometer was inserted, the humidity in the bottle was 85.6%, in ten minutes 87.9%, in twenty minutes 90.2%, in forty minutes 92.7%, and in three hours 95.2%, and the gauze on the wet bulb was still thoroughly wet. Then the hygrometer was put under a hen. In five minutes the humidity read 70.6%, in ten minutes 69.7%, in fifteen minutes 69.8%, in twenty minutes 69.9%, and in thirty minutes the gauze was dry! It was wetted again and the humidity which remained the same as before, was read every ten minutes. At the end of eighty minutes the gauze was dry again. It was wetted and the readings continued until two hours had elapsed from the first reading; and the last humidity read was practically the same as the first! In that two hours we had introduced into the nest enough moisture to saturate the air six times over, and still the last reading was the same as the first. That disposed very effectively of our fear that the water introduced by the hygrometer, while one reading was being taken, would saturate or even materially increase the humidity of the air in the nest.

But another fear was suggested! Since the moisture from the wet bulb is dissipated so rapidly under the hen, does not the wire gauze of which the mock egg is constructed hinder diffusion and partially bottle up the moisture around the wet and dry bulb, and hence give too high a humidity? To answer this question another form of hygrometer was devised, shown in Figure II. In principle it is the same, but the wire gauze of the egg gives place to a wire frame just sufficient to protect the thermometer. We shall call the first form the egg hygrometer, and the second the frame hygrometer. These two were now placed side by side in the room, but they did not indicate the same humidity, the former giving on an average a reading about 15% higher than the latter. They were then put under a hen; they showed the same difference as when subject to free diffusion in the room! This seemed incredible. They were next put into a quart pail at a temperature of 100°, and the pail covered with a book. In a quarter of an hour the humidity in the pail rose from 54.6% to 68%. At the beginning the two hygrometers showed a difference of 9% in readings, but at the conclusion only a difference of 4.5%. This showed their behavior in a closed atmosphere. They were then put under another hen for a period of one hour and a half, and placed in

all conceivable positions and interchanged from time to time, but they always showed approximately the same difference in humidity, the averages of all differences being 15.9%. Hence our second fear, viz., that the egg hygrometer bottled up the moisture and gave too high a reading proved to be well founded, and this hygrometer was henceforth discarded for humidity readings.

But the frame hygrometer might not give the correct humidity—these wires might be sufficient in number to hinder diffusion. To test this an ordinary, unprotected, wet and dry bulb were placed beside the frame. There proved to be a slight difference. When the humidity was 39% the frame read 3% too high at ordinary room temperature, but when the humidity was raised to 70% and the room temperature at 100°, they both gave the same reading. Hence we concluded that the frame hygrometer determines pretty accurately the humidity in the hen's nest.

Turning now to Table II. we observe that the average humidity under all hens was 59%. But if we omit the hens on ventilated nests, whose hatches on the whole were very poor and whose nests were very artificial, we have an average humidity under the remaining hens of 60.2%. This is seen to be about 7% lower than the humidity of the air near the hens. Comparing the hens with incubators we note a marked contrast, for the latter run dry had an average humidity of only 47.6%, or 12.6% less than that of the hens.

Then if the egg hygrometer is useless and is to be discarded, why have I mentioned it? Why have I dwelt at such length upon the method of testing it? Because the results of those tests suggest the idea of change of air under the hen. If the egg hygrometer in a pint bottle raised the humidity from 62.9% to 85.6% in five minutes, and to 95.2% in three hours, and the gauze still remained wet, why does it not act in a similar way under a hen? Why does it not gradually increase the humidity under a hen, especially since in two hours we wet the gauze three times, thus introducing enough moisture to saturate the air under her six times over? What becomes of all the moisture introduced into the nest? Or, if the egg and frame in a two-quart pail raise the humidity from 54.6% to 68% in fifteen minutes at 100°, why do they not increase the humidity under a hen although left under her an hour and a half, and although sufficient moisture was introduced to saturate the air eight or ten times over? Again, the egg and frame differ by 15% in the room subject to free diffusion, but when placed in the pail they differ by only 9% at first and by only 4.5% in fifteen minutes. Then why is their difference under the hen even greater than that in the room, and why do their readings not approach as in the pail?

Either of two principles will account for all these phenomena. The moisture might escape into the air outside the nest by free diffusion of water, no air leaving the nest nor any entering. Although the outside air has a higher humidity than that in the nest the temperature of the latter is much higher, hence the vapor pressure is higher although the humidity is lower, and hence the vapor would pass from the nest into the outer air. In other words, although the *relative* humidity in the nest is lower, the *absolute* amount of moisture per unit volume is greater, and hence the transference of moisture will take place outward. The

second principle is that of convexion. The air in the nest is warmer, and hence lighter volume for volume, than that outside, hence there is a tendency for the heavier air to gradually press in and displace the lighter with its moisture. This tendency is aided by the breathing of the hen and the gentle rising and falling of the feathers. No doubt both of these principles unite in producing the rapid dissipation of the moisture introduced by the hygrometers. These considerations led us to believe there is a rather rapid change of air under the hen.

The egg and frame hygrometers were placed in the incubators to ascertain if their difference would indicate the same circulation of air as under hens; the work was interrupted by the incoming of the students, but the tests made seemed to indicate a low, fluctuating circulation in the machines.

Fig. 4. Drawing air from hen's nest for determination of Carbon Dioxide.

There is another point worthy of notice here. The average evaporation from the eggs under hens is about 11%. Taking this amount on thirteen eggs, the usual number under our hens after the infertile ones were removed, we find it is sufficient to saturate the air four times an hour, or 96 times a day, during the whole period of incubation! This accounts for such a high humidity under the hens. In an incubator the egg chamber is large and the evaporation from the eggs, although about 14%, is only sufficient to saturate the air eleven times in twenty-four hours. This accounts for the low humidity in the incubators.

Figure IV. shows the apparatus used for drawing the air from the nest for the determination of the carbon dioxide. The large bottle constitutes the aspirator, the small one contains the caustic potash of known strength which absorbs the CO_2. The excess KOH is titrated with $\frac{N}{10}$ acid and the carbonate with $\frac{N}{100}$ acid, and the amount of CO_2 thus determined. Reference to Tables I. and II. will show that the average carbon dioxide in machines was 7.3 parts in 10,000 of air; under the hens 24.4, or more than three times as much as in the incubators.

Referring to hatches, we see that on the selected eggs the machines were 14.2% behind the hens if the percentage be calculated on the fertile eggs, but 17.9% behind on the total selected eggs.

As a net result of the year's work, we have reached three conclusions: (1). The relative humidity under hens is much higher than in incubators, and slightly lower than in the room. (2). There appears to be a considerable

change of air under the hens, and this change seems to be pretty nearly constant, but the circulation in incubators appears low and somewhat variable. (3). Carbon dioxide is much more plentiful under hens than in the incubators. Just what the functions and relative values of these factors may be, we are not yet in a position to say. It is significant, however, that the very first test with circulation and moisture, approximating to the amounts under the hen, should give us what appeared to be an improved class of chick; and still more significant that when we endeavored to produce the high carbon dioxide, together with moisture and circulation, we should get chicks that surpass all the others in both appearance and vitality. It is possible these factors supplement one another. Water has a strong affinity for CO_2 and both are present in abundance. Neither might be as effective without the other, and both might fail without the proper ventilation.

Table I.—Humidity, Evaporation, CO_2 and Hatch of Incubators.

Incubator.	When Set	How Run.	Humidity of Room	Humidity		% Evaporation From Eggs	CO_2 in 10,000	PER CENT. HATCHED	
				With Fanning.	Without Fanning.			Of Fertile Eggs	Of Total Set
Chatham, 5.....	June 25	Dry, fanned during day.	62.9	40.5		11.0			
	July 20	Dry, fanned during day.	66.2	38.5		12.5	8.9 (3)	61.5 (Selected)	53.3 (Selected)
	Aug. 20	Moisture in bottom.	51.8	62.4	76.1	11.1		85.7 (Selected)	80.0 (Selected)
								76.3 (Total)	61.0 (Total)
Chatham, 6.....	June 25	Dry.	62.9	37 4		9.1			
	July 18	Dry.	62.3	41 0	47.2 (7)	14.6	8.1 (2)		
	Aug. 12	Dry.	68.1	40.7	51.2 (8)	14.8	6.5 (3)	78.6 Selected	73.0 (Selected)
								65.0 (Total)	47.0 (Total)
Chatham, ...	July 20	Dry.	66.2	34.6		15.8	9.3 (3)		
Chatham, 4.....	July 20	Dry.	66.2	37.3	51.0	14.6	7.8 (2)		
	Aug. 20	Moisture on top.	51.8	60.3	71.7	14.0		71.4 (Selected)	66.7 (Selected)
								71.0 (Total)	57.0 (Total)
New Prairie State.	Aug. 7	Moisture on bottom.	69.3	58.9 (3)	76.6	9.2	3.3 no eggs	72.0 (Selected)	53.0 (Selected)
New Prairie State.							7.3 (19)	68.0 (Total)	50.0 (Total)
New Prairie State.						9.1		65.4 (Selected)	56.6 (Selected)
								70.0 (Total)	61.0 (Total)
Old Prairie State.	July 17	Dry.	62.3	33.9		15 8	6.7 (2)		
	Aug. 12	Dry.	68.1	33.0	42.3 (12)	15.3	5.6 (3)	69.0 (Selected)	60.0 (Selected)
								65.0 (Total)	45.7 (Total)
Cyphers, Chas. A. Model	July 17	Dry.	62.3	35.9	44.8 (6)	16.6			
	Aug. 12	Dry.	68.1	37.4	50.4 (12)	16.7	5.4 (4)	78.0 (Selected)	68.0 (Selected)
								70.0 (Total)	48.0 (Total)
Dry Machines...	Averages		65.1	39.0	47.6	14.6	7.3	71.8 (Selected)	63.6 (Selected)
								66.7 (Total)	46.9 (Total)
Wet Machines...	Averages		57.6	60.5	74.8			73.6 (Selected)	64.1 (Selected)
								71.3 (Total)	57.3 (Total)

Table II.—Humidity, Evaporation, CO_2 and Hatch of Hens.

Hen.	When Set.	Nest.	Humidity of Air Near Hens	Humidity Under Hens.		% Evaporation From Eggs	CO_2 in 10,000	PER CENT. HATCHED	
				By Egg Hygrometer	By Frame Hygrometer			Of Fertile Eggs	Of Total Set
Bu. O	July 17	Under brooder.	62.3	75.7	59.8	10.7	39.3 (3)		
Bu. O	July 17	Damp earth in room.	62.3	73.4	57 5	11.1	27.4 (3)		
Bu. O	July 20	Damp earth in room.	66.2	76 0	60.1	11.4	24 5 (1)	91.7	73.3
S. L. W	July 28	Ground, open air.		76.9	61.0	11.8	20.0 (8)	84.6	73 3
W. R	Aug. 7	In artichokes.	77.7	80.0	64.1	9.8	28.5 (10)	85.7	80.0
Bu. O	Aug. 17	Earth, room.	73.4	75.4	59.5	11.5	26.0 (3)	92.3	80.0
B. R	Aug. 22	In evergreens.	67.0	76.2	60.3	11.5	23.4 (2)	75 0	60.0 (2 Broken)
Averages		Ground beneath box.	68.1	76.2	60.3	10.17 11.0	27.0	100.0 88.2	73.0 73.3
S. L. W	July 17	Chaff.	62.3	73.9	58.0	11.4	22.2 (1)		
Bu. O	Aug. 17	Colony house.	67.1	75.9	60.0	12.1		85.7	80.0
Averages			64.7	74.9	59.0	11.7			
Bu. O	July 20	Board.	66.2	76.9	61.0	13.3	18.9 (2)	78.6	68.8
Bu. O	Aug. 17	Board.	73.3	75.9	60.0	12.8	26.0 (3)	80.0	53.0 (5 Broken)
Averages			69.7	76.4	60.5	13.0	22.4	79.3	60.9
L. B., 2	July 4	Ventilated.	61.1	64.4	48.2	14.7			
Bu. O	July 17	Ventilated.	62.3	73.3	57.4	13.1	26 6 (3)		
Bu. O	July 20	Ventilated.	66.2	70.4	54.5	14.7	13.3 (1)	77.0	66.7
Averages			63.2	69.4	53.4	14.2	19.9		
B. R., 3,866	Aug. 7	Rubber.	62.3	77.1	61.2	10.8	21.4 (10)	100.0	80.0
Averages	All hens		67.4	70.1	59.0	12.0	24.4	86.0	71.5

CONTRASTS.

Always the shadow of war, but on go the works of peace;
Always the shadow of death, but of joy life feels no lack;
The battleship plunges along, a fortress aswim in the seas,
But over the self-same waves, the wind drives the fisherman's smack.

What rules the world? Is it might? What rules the world? Is it love?
Is it hunger that drives? Is it wit that thrives? Shall subtlety triumph or right?
Hunger drives, and gumption thrives, and subtlety's envy's glove,
But knowledge and truth shall drive out ruth, and love, in the end is might.

—*E. S. Martin.*

Agriculture.

Sheep in Ontario.

IN several counties visited during the past twelve months, many farmers regret having discarded sheep from their barns and fields during recent years. It is being now realized, as never before, that few are the farms on which a flock cannot have a profitable place. Necessity is causing people everywhere to count the cost of things. Never did the common saying that "time is money" go home with greater force than now. It is not so much, how many dollars' worth can be produced on the farm, as what amount of profit remains after all the cost of production is totalled up. It is well to as largely as possible increase production, if the proportion of cost is kept in hand, so that profits are correspondingly increased.

It is quite evident, to even a casual observer, that the expenses in operating the different branches of live stock husbandry have been greater during the past five years than at any other time in our country's history. It requires good management to get profitable results in these years, and that oversight which should always be on the alert for the lines which yield the largest profits, has often missed the industry which leads all others.

It is not to pure-bred sheep raising that this special reference is made. The breeding of pedigreed sheep of the different breeds has brought many Ontario farmers much pleasure, profit and satisfaction in by-gone years. Indeed, there have been but few years in the past twenty-five when the owners of pure-bred flocks have had any reason to grumble over the returns from their flocks; and in the large majority of years full pockets of the "needful" have been in order. When butchers' stock is considered in comparison with other lines of meat-making, there we find sheep able to give a good account of their doings. Not only is by far less labor required, and less *cost in production* the unvarying rule, but the market value of the well-finished lamb is higher now, and has been higher on the average the past ten years, than any other kind of live weight put on the common markets.

We read frequently and hear it stated at many gatherings that notwithstanding the large aggregate of dairy products, yet *the average dairy cow does no more than pay her cost of keep.* That being so, where does the fun come in, in milking that cow ten months in the year, day in and day out, Sunday and Monday and all days, when no profit is resulting? The farmer, with the dairy cow as his income-producer, will not suffer a sheep in his fields. Still the innocent sheep, with practically no labor called for during the busy summer and fall months, and far less in winter than

that demanded by horses, cattle or hogs, will, and often does, give inside the year a return of an amount greater than the value of the original stock at the beginning of the twelve months. Why, then, the mystery of the sheep, the most profitable of all, and the greatest labor-saver, being so discarded from the Ontario farm that no trace of a sheep can be found in many sections? Truly the cost of things has not been reckoned, and want of due consideration must be set down as the cause of it all.

John Campbell.

HOW DID YOU DIE?

Did you tackle that trouble that came your way
With a resolute heart and cheerful,
Or hide your face from the light of day,
With a craven soul and fearful?
Oh, a trouble's a ton, or a trouble's an ounce,
Or a trouble is what you make it;
And it's not the fact that you're hurt that counts,
But only how did you take it?
It's nothing against you to fall down flat,

You are beaten to earth? Well, well, what's that?
Come up with a smiling face.
But to lie there—that's disgrace.
The harder you're thrown, why the higher you'll bounce;
Be proud of your blackened eye,
It's not the fact that you're licked that counts,
But how did you fight? and why?

And though you be done to the death, why then,
If you battled the best you could,
If you played your part in the world of men,
Why, the Critic will call it good.
Death comes with a crawl or comes with a pounce,
And whether he's slow or spry,
It's not the fact that you're dead that counts,
But only—how did you die?

—*Edmund Vance Cooke.*

Experimental.

The Selection of Crops for Breeding Work in Semi-Arid Sections.

THE tide of emigration moves in a westerly direction. This is true not only in northern sections of the continent, but also in the south. The great American desert has been invaded and opened up for settlement. This movement to western sections has given rise to new problems in the field of agriculture, and if the farmer, who is located in the semi-arid sections of the west, wishes to attain success, it will be necessary for him to build upon a solid foundation. Many of the settlers in this new country have come from the east and middle west, where the annual precipitation ranges between thirty-five and forty inches. It should also be observed that this rainfall is, generally speaking, well distributed, or in other words the crop receives its supply when the need is greatest. In the semi-arid west, this is not the case. The rainfall is low, and it may or may not be well distributed. Dry farming is carried out in districts where the average precipitation does not exceed twenty inches. This moisture must be stored within the soil, and must be held in reserve for the crop. Our soils must be placed in the best possible physical condition so that a maximum amount of moisture may be secured. Such conditions can be maintained by following the proper cultural methods. In addition to this treatment, the supply of plant food must be properly

Sorghums and Cowpeas—An Excellent Combination for Forage.

balanced; thus if deficiencies occur, as in soils where one or more elements are lacking, the material containing the necessary plant food should be supplied.

Crop yields may be maintained by giving due attention to the mechanical condition of the soil and by supplementing those elements of plant growth which are found in the soil in limited quantities, but there is a third factor that should not be overlooked. The plant possesses certain well-defined characteristics. The members of a single group present many variations, and many of these afford possibilities for improvement in quality of yield. The staple crops of the east and the middle west have been introduced and are now cultivated in the great plains region. It is at this point that we are compelled to ask ourselves the question, Does the plant adapt itself to the new environment? Is it possible for the grower by adopting a systematic plan of seed selection, or by introducing an approved method of breeding to bring about definite results in the plant structure? A partial answer can be given in each instance, and it is safe to predict that additional light will be thrown upon these questions in the near future.

The subject of plant adaptation has received careful consideration at the hands of our most eminent botanists. De Candolle reaches the following conclusion after years of careful study: "I have not observed the slightest indication of an adaptation to cold. When the cultivation of a species advances towards the north, (maize, flax, tobacco, etc.,) it is explained by the production of early varieties, which can ripen before the cold season, or by the custom of cultivating in the north, in summer, the species which in the south are sown in the winter. The study of the northern limits of wild species had formerly led me to the same conclusion, for they have not changed within historic times although the seeds are carried frequently and continually to the north of each limit. Periods of more than four or five thousand years, or changements of form and duration, are needed apparently to produce a modification in a plant which will allow it to support a greater degree of cold." (*a*) Does the same fact apply when the drouth resistant qualities of a plant are paramount? The same author also intimates that the choice of species is more important than the selection of varieties, and that there must be valuable qualities in a wild plant in order to lead to its cultivation. Prof. Hansen, of the South Dakota Experiment Station, has made some interesting observations in regard to plant adaptation. He makes the folowing statement:

"Over a large area of the prairie northwest, many of the fruits grown in eastern and southern states are deficient in hardiness. This has been demonstrated by thousands of planters. The climatic extremes of the northwestern prairies do not make fruit culture impossible; but care must be taken in the selection of varieties. The beginner should confine his first main planting to the sorts which have stood the test.

"The reader will now ask how can plants be bred more resistant to cold. This is done by crossing them with hardy species. Many examples might be given of this. In a general way, it may be stated that by crossing hardy wild fruit plants with the tender cultivated ones new individuals may be

(*a*) "Origin of Cultivated Plants."—*DeCandolle* pp 460.)

produced combining the hardiness of the wild with the size and quality of the tame fruit." (*b*).

If the question of plant adaptation is important, and it must be conceded that the evidence presented is conclusive, then it will, most certainly, be a paying proposition to give attention almost exclusively to the improvement of those plants which are at the present time best suited to our conditions. It appears to me that this is one of the first principles which should be observed in planning extensive breeding experiments for the semi-arid districts. The field tests at the Oklahoma Station point in this direction. Owing to the fact that the rainfall has been abundant during the past three seasons, the writer has not been so situated that a large number of observations concerning the drouth resistance of special crops could be observed. Dry seasons may be expected, and the grower should be prepared for them. A few facts, however, have been gleaned, and these, in a measure, will furnish a basis for future work.

Two well-developed stalks and heads of Kafir corn.

The Indian corn crop is at present the most important crop in Oklahoma, not only from the standpoint of acreage, but it also returns the largest total money value. For the past three years, the seasons have been exceptionally favorable, thus good yields have been secured, and as a result the culture of the crop is pushing rapidly to western portions of the state. What will be the ultimate outcome of this gradual change which has taken place under ideal conditions? In 1904 the writer prepared some work from the station records on the comparative yields of Kafir and Indian corn. A study of these results brought out two important facts. In the first place, it was observed that Kafir corn had given fair yields under adverse conditions, and for average upland soil one might expect to obtain better results with Kafir, than with Indian corn. In the second place, it was noted that the hot, dry weather, which frequently occurs about the time that Indian corn is tasseling was very detrimental to the process of fertilization. This latter item was given as an explanation for the exceedingly low yields which were obtained from the Indian corn during certain seasons.

The reason for such results is self-evident, but in order to make these statements clear a general outline of the work in question will be submitted. Kafir corn is a native of South Africa. Prior to its introduction into America the plant was cultivated in places where the climatic conditions might well be

(*b*) South Dakota Station, Bull. 88.—(pp 3 and 32.)

described as hot and dry. Kafir corn has possibly been cultivated for centuries in its original home, thus the plant has acquired certain qualities which enable it to overcome adverse conditions, such as periods of prolonged drouth or excessively hot weather. These qualities, which are so advantageous, have become more intensified as the plant has been grown in those portions of the country where extreme conditions are met. This crop makes its best growth on rich mellow soils, but at the same time good crops can be raised on medium and upland soils where the supply of moisture and plant food is not as abundant as in bottom lands.

Indian corn is indigenous to America and it appears to thrive best in those sections of the country where the July temperature ranges between 70 and 80 degrees Fahrenheit. The rainfall affects the yield to quite a marked extent, and in the semi-arid west high yields are not certain unless irrigation is followed. In Oklahoma the average uplands soils of the western part of the state are not especially adapted to the growth of Indian corn. This is also true in the sandstone region of the eastern part of the state. If the season is favorable good yields can be obtained from fields of this description, but past experience would lead one to form the opinion that undesirable conditions may be expected occasionally. In the table herewith a comparison is made of the results which were obtained at this station with Indian corn and Kafir corn grown on unmanured, medium upland soil.

In examining these figures, it will be seen that Indian corn was a complete failure during the season of 1901 so far as the grain alone is concerned. Wide variations are apparent both in the yields of stover and in the yields of grain which are reported for Indian corn. With Kafir corn, however, the results are quite uniform throughout the entire period. The average yield of Kafir corn for the four years is 634 pounds per acre in advance of the average yield made by Indian corn. The sparrows gave some trouble each season on the Kafir corn plots, thus the actual yields for this crop were reduced somewhat. The difference in the average amounts of stover produced by these two crops is 2,471 pounds in favor of the Kafir corn. From these results it will be safe to assume that there are certain plants which will give much better results under semi-arid conditions than other plants. Possibly the members or species in one group may all possess this characteristic to some extent. Milo maize, broom corn, and even sorghum are making

Year.	KAFIR CORN PER ACRE.		INDIAN CORN PER ACRE.	
	Lbs. of Stover.	Lbs. of Grain.	Lbs of Stover.	Lbs. of Grain.
1900	4600	1744	3260	1063
1901	4230	1506	1380	5
1902	4500	1154	1424	1440
1903	4360	1620	1740	979
Average, 4 years.	4422	1506	1951	872

successful records in this western country.

Our first step in selection and breeding for drouth resistance includes a study of certain groups of plants which are known to possess the desirable characteristics. In the second place, a variety within a given group may evidence some superiority over another variety, and this in turn may lead to a general use of the better variety. The Turkey Red wheat is now cultivated extensively in the west and it will undoubtedly continue to supplant other well known varieties, largely because of its hardihood and greater productivity. The drouth resistant qualities of the Turkey Red were clearly shown in the spring of 1904. Generally speaking, the major portion of the wheat in Eastern Oklahoma made a fair growth during the preceding fall and gave promise of good returns for the coming harvest, but the dry weather throughout the latter part of the winter and early spring changed the outlook materially. In fact, when the latter part of the month of April was reached, it was doubtful whether the wheat crop would even return the seed that had been used. The rainfall from November 1, 1903, to May 1, 1904, was but 3.08 inches. Subsequent showers brought the wheat through in fair condition. The Turkey Red wheat exceeded all other varieties in point of yield, giving a return of 17.05 bushels per acre. The seed of this variety was originally imported from Russia by the National Department of Agriculture. One might conjecture that the previous environment had something to do in fixing the quality of hardiness in this variety. A large number of our standard varieties failed to reach the ten bushel mark under like conditions on account of their inability to withstand the dry winter. A decided gain may be made possible by crossing the Turkey Red with a variety like Sibley's New Golden or Missouri Blue Stem, thus combining the drouth resistance of the former with the excellent producing, or high yielding power, of the latter. The durum wheats appear to be particularly well adapted to many sections of the

Continuous Culture Experiment with Kafir Corn.

west, which is explained by the fact that these wheats possess to a certain degree the character of drouth resistance. "The qualities of rust resistance and yield, and apparently that of drouth resistance are obtained in the highest degree from the durum group." (*c*) The same author also observes the fact that the quality of non-shattering, and to a certain extent, the qualities of rust resistance and drouth resistance are secured by crossing with the emmers and spelts. Greater progress can, unquestionably, be made by using as foundation stock those plants which have the desired characteristics fixed either by long years of breeding, or have inherited these desirable features by a process of selection in their natural environment. Other crops might be used to illustrate still further the facts which have been presented, but this paper has already exceeded its limit.

In conclusion, it can be stated that the past history of a crop may be taken as a (partial) indication of the record which the plant in question is likely to make in a section where the climatic conditions correspond with those found in the original home. If the Indian corn plant is to be grown successfully in semi-arid sections, hardy drouth resistant varieties should be selected. It is possible that we may be able to secure strains of corn from Mexico or South America which will exhibit a greater ability to stand dry weather than our home-grown varieties. So far as the wheat crop is concerned the grower can make his selection with safety. The drouth resistant qualities of the Turkey Red variety, and the durum wheats as well, are outstanding. In the legume group alfalfa stands without a peer. Although alfalfa is well equipped to meet dry weather, varieties which exhibit special hardy traits have been observed.

L. D. Moorhouse.

(*c*) A. B. A. Rept., Vol. 2, (p. 135).

Horticulture.

Horticulture As a Profession.

I AM asked by the Horticultural Editor of the Review for a short discussion on the professional side of horticulture as a life's work, if we may make a distinction between the professional and the practical sides. And I gladly respond to the invitation.

To the young man who is inclined to select this line of work as a profession there are naturally two general considerations which he must weigh. First, "Does it offer a reasonable expectation of financial success; can I make a living at it and something more; will there be a demand for my services?" And second, "Can I accomplish something that will be worth while? Is there an opening for work that will have value, that will help the world forward and possibly give me a permanent place among those who have benefitted mankind?"

Naturally, the degree of weight which these two considerations will have will vary greatly with different men, yet I believe that both will appeal more or less to all; certainly the first will, and I believe that the last will too, for we all like to feel that we are doing some good in the world, especially if at the same time we can work for our own good.

Let us look then at these two questions briefly. Is there a demand for such work? Will it pay? Certainly! There are a dozen gilt-edged openings to-day in the Dominion, and scores across the line in the United States. The new Fruit Experiment Station in Niagara district, Ontario, will need a head; the authorities of the Macdonald College at St. Anne de Bellvue have been looking long for a head to their Horticultural Department. Perhaps they have found one, but at last accounts they had not. If they have, the place that he stepped out of doubtless needs a new occupant. There are persistent rumors that this year will see the establishment of a Fruit Experiment Station in the Annapolis Valley, Nova Scotia, and when that happens there will be work to be done, and good work. These are only a few samples of this class, and the secondary positions as assistants are still more numerous.

Then if we go across the line to the United States (which, perhaps, as loyal Canadians, we ought not to do, but which men in all lines of agricultural work are doing, many of the first positions on the faculties of most of their agricultural colleges being filled by Canadians), if we look into the condition there we shall find the dearth of good men and the abundance of good positions striking indeed. Not a month goes by without some good position being in the market. And within the past year the writer knew at one time of eight excellent positions,

either full or associate professorships, which were looking for occupants.

Turning now to the question of managers of large enterprises like fruit farms, which I think should be included here, since the desire usually is to get a college man for such places, we find the situation practically the same. Only, there being a hundred times as many such enterprises as there are agricultural colleges and experiment stations, the positions of this sort are correspondingly greater in number. As in the other case, the number of such openings in Canada is not so great nor the salaries so high as in the United States, but this is merely because that is an older and wealthier country. There are every year more such openings and better ones in Canada and their number will continue to increase with even greater speed.

Another phase of this question, which applies with more or less force to all the lines spoken of, but particularly to college work, is the present tendency to subdivide the subject. Just as the field which was formerly covered by a single "professor of agriculture" is now divided up into animal-husbandry, dairy-husbandry, field-husbandry, etc., so horticulture is beginning to be subdivided into pomology or fruit growing, vegetable gardening, landscape gardening, floriculture, etc. At least one of the agricultural colleges in the United States has plans on foot to divide its horticultural work into these four divisions with a full professor at the head of each, and others have made beginnings in subdivision. Certainly this is the only rational way to handle such work, and when this is done in all lines and in all institutions it will mean four men where we now have one. And this specializing means not less work for the men, but better work.

As to the second point, the opportunity for work of permanent value, I hardly see how one could ask a better field. Take the single line of the development of new varieties of fruits and see what chances it offers. Here is an apple which bears abundantly and is of the highest quality, but its season is too early for the greatest profit. There is one which keeps well, but is a shy bearer. Still another is an excellent keeper and a good bearer, but is so poor as to make it a standing joke. And still another is good in all ways but is so subject to black spot that its growing is attended with the utmost uncertainity. All of these faults might be corrected by a proper blending of the different varieties and an infinite number of other changes can be produced when we systematically and scientifically attack the problem.

Take the question of the influence of fertilizers on fruit bearing. How infinitesimal is our knowledge of the subject compared with what we would like to know. And the same might be said for any one of a dozen different questions, each big enough to give a man a life's work; the reciprocal influence of stock and scion, the effect of cross-pollination, methods of pruning, of propagating and of spraying.

Surely the man who is not satisfied with the array of horticultural problems awaiting investigation is indeed difficult to please.

For the sake of the oratorical effect, and to have my case in the best shape with the jury of my readers, I ought to close this discussion with a peroration setting forth in glowing terms my belief that in no other profession has a young man brighter prospects or

greater possibilities than in horticulture. And in a certain sense I most assuredly believe that. But were I consulted by a young man as to what he had better take up as a life's work I should feel like following the example of Prof. Bailey, of Cornell, who, when asked by an exceptionally bright student, which of the professions he would advise the inquirer to go into, replied that if it were at all possible he would go into farming. So I would say that if any young man is thinking of horticulture as a life's work let him, if possible, go into fruit raising. But if this opportunity is not open to him, and if he has a liking for horticultural work, then I would with equal certainty advise him to take up professional horticulture as a line of work giving every assurance of financial success, and at the same time a work which is worthy of his best efforts.

F. C. Sears,
Agricultural College,
Truro, Nova Scotia.

Horticulture in Practice.

AMONGST the many and varied opportunities that are presenting themeslves to the young man of vigorous physique, active mental powers and a laudable ambition to make the most of himself in this Canada of ours—the young giant of the North amid the nations of the world—to some may come a desire to investigate the possibilities that may lie in that phase of our agricultural life that comes properly under the head of Horticulture, or more definitely, if you will, fruit, flower and vegetable growing in all their branches.

Although but a young nation, comparatively speaking, Canada has long been favorably known for its production of timber, furs, minerals, and the excellence of its cereal crops and live stock. As a country, however, in which not only the more hardy fruits and flowers may be produced, but one where many of the more tender varieties reach an excellence and beauty unsurpassed, Canada's possibilities were long unsuspected.

True, the area in which these conditions flourish may not be extensive when compared to the broad expanse of the Dominion as a whole. There are however, scattered throughout the various Provinces from the Atlantic to the Pacific, many thousand acres of the very best soil for this purpose, with a climate that will produce fruits in abundance of the highest quality, both in texture, flavor and appearance.

To the young man, then, looking around him for a suitable occupation that will promise as a reward for diligence and the exercise of a moderate degree of intelligence a reasonable assurance of a comfortable livelihood, with a snug competence for declining years, surrounded at all times with much that is beautiful and attractive in life, elevating and widening his powers of mind and bringing him into closer touch with the universal

Creator, there is no more attractive avenue open to-day than that of Horticulture.

It is not by any means a "get-rich-quick" proposition, neither are there as yet many millionaires amongst the fruit growers—they have scarcely had time to acquire the habit—but for a comparatively safe investment of whatever means may be available, coupled with a degree of energy and determination to succeed, no occupation in Canada offers greater attractions.

Are there no difficulties? Yes, many. But where is there a young man with good, red blood in his veins, worthy of the name, who does not glory in an opportunity to compel success in the face of obstacles and impediments that obstruct the way? Have not our Canadian youth shown in many a well-won contest that this northern air breeds men of activity and energy unknown in more southern climes? And so in the business of the production of fruits of beauty and value, while there may be at times climatic uncertainties, fungus and insect pests of many kinds, and much that will discourage the faint-hearted and weak-kneed, these difficulties only serve to heighten the enjoyment and satisfaction of having successfully overcome them and of having produced a crop of fruit, which is not only a satisfaction to the consumer and a credit to the grower, but also a source of financial reward.

Nova Scotia and Prince Edward Island in the east, British Columbia in the far west, and Ontario, the gem of the Provinces, midway, all have soil and climate suitable for the production of large quantities of valuable fruit, and the possibilities of these Provinces in this respect as in many others, have been but slightly developed.

Markets are opening up rapidly in this growing time, and for many years the probability of over-production of high-class fruit is very remote indeed. Better methods of production are being adopted, the gathering and packing of the fruits for the several markets for which they are intended is receiving greater attention; better distribution is being provided for. Co-operative organizations, scattered throughout the fruit-producing districts, are working wonders through inspiring confidence in the reliability of the output, and in many ways the industry is being placed on a foundation which is broad and stable and gives evidence of still greater success in the future.

Any young man with a love for the beautiful in nature in his heart and soul, who delights in the growth and development of living things from an embryonic state to a full fruition, can with every confidence undertake as a life work the growth and production of high-class fruits, flowers and vegetables, feeling assured that a reasonable degree of energy and the application of those principles of success that are necessary and germain to all vocations in life, will be amply rewarded.

W. H. Bunting.

The O. A. C. Review

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Editorial.

The Question of Athletics

Although it would not be correct to assign to physical development the place of primary importance, yet to a very large extent, it is upon a student's physical excellence that his ultimate success or otherwise depends. The sound body, the active, supple, well-controlled muscle makes for the active fertile brain, and in so far as athletics make for the development of men of great mental capacity and of good moral instincts, in so far are they of value to the College student. In our own college, athletics have in the past two years made great strides, and today more men than ever before are reaping the benefits of regular, systematic exercise. This is as it should be, and every student should undoubtedly provide space in his daily programme for sufficient exercise to keep his blood flowing swiftly, his head clear and his nerve steady.

Athletics are, however, menaced by a danger which, if it continues to grow at its present rate of increase, will ere long threaten to destroy a great portion of the value of sports. The steady growth of professionalism is undoubtedly exercising a detrimental effect upon our great outdoor games, and in some cases causing them to become exhibitions of bad temper and violence. It is not that the professional players themselves are more brutal in character and more nearly related to the animal than are amateurs, but the fact is that the conditions under which they play the games tend to arouse jealousy and hate. So soon as "sport" becomes professional, so soon are the true objects of games lost sight of. Instead of games being forms of relaxation for the mind and of recreation for the body, they become competitions in which the sole object of participants and supporters is "to win."

In itself, a desire to win is a laudable

one, but when carried to the extreme and made the whole raison d'etre of a team's existence, then its influence is pernicious, producing unfair play and sometimes brutality in players, and often deceit and dishonesty in managements and officials. So true are these statements that to prove them is scarcely necessary, yet the recent death of a Cornwall hockey player as the result of wilful injuries received in a hockey game, and the dishonesty which this season has been revealed in many of the senior teams of the O. H. A. should convince the most skeptical of the evil effects of the "to win at any price" idea.

Up to this time such evils have not been evident in college athletics upon this side of the line. Yet to the south of us they are not entirely unknown, and in some large institutions in the States the "to win" idea is all too prominent. For years Harvard has maintained the principle of having none but amateur coaches in rowing and baseball. Two years ago this principle was abandoned with regard to rowing, for the publicly expressed reason that in order to compete (successfully) with Yale on the water, professional coaches must be employed. Now comes the announcement that professional coaches are to be employed in baseball, for the same worthy purpose—abandoning a principle merely to defeat a rival.

As long as the desire to win is the dominant one in outdoor games, then so long will they continue to grow more and more corrupt. As soon as a return is made to the playing of games as a means of amusement, as a recreation, and as a means of physical, mental and moral training, then the evils which now exist will disappear. It should ever be borne in mind (particularly by college men) that however engrossing athletics may appear to be at the moment, they are not the business of life, but simply one of its passing pleasures.

College Debates

As the college year draws to a close the work of the various college organizations is subjected to the scrutiny of the students. Our literary societies accomplish a great good in the opportunities they offer for training in public speaking and debate. Each year, however, the fact is noticeable that many of the debates are not up to the standard they should attain. This is partly explained by the fact that men often fail to make a good choice of a subject, whether it be for a debate or for a speech. A subject must be debatable. It should be such that much can be said on either side, and yet one side of the question must not so merge into the other as to admit of confusion. Much benefit is derived by the debaters in working up the subject matter in the library and thus gaining a store of information on the question; but questions of such a nature that the men would be compelled to do a good deal of thinking and reasoning, instead of taking the subject matter wholly from books, should occasionally be chosen.

Another explanation may be found in the failure to give the subject careful preparation. A man has no right to ask the indulgence of an audience if he has not carefully prepared his speech, whether it be delivered at the Union Literary, at the meetings of the sub-societies or the Practical English Classes. A man should not only know his speech, but he should be so filled

with his subject that he has the reserve power to combat with telling effect any arguments his opponents may bring forth, and, if need be, throw away his prepared plan of debate altogether. In this does the man accomplish most, from this does the man derive most benefit, and only this constitutes true debate.

Medals in Agronomy and Stock Judging.

The Zenner Disinfectant Company has donated three silver medals for competition among the students of the First, Second and Fourth Years, to be awarded as follows:

1. One medal to the student taking the highest marks in the written and practical work of the First Year in Field Husbandry.

2. One medal to the student taking the highest marks in the written and practical work of the Second Year in Animal Husbandry.

3. One medal to the student taking the highest marks in the subject of Stock Judging in the Fourth Year.

In the Fourth Year the medal will be awarded to the student making the highest aggregate score in judging beef cattle, dairy cattle, horses, sheep and swine at their final examinations in May.

With the above prizes in view, as well as the Union Stock Yard Company's trophy, which we are going to endeavor to retain for the third and final time, the outlook is bright for an interesting session in the Animal Husbandry Department next fall.

A COOKING-SCHOOL BRIDE.

Can she make a loaf of bread—
This fair maid that you would wed?
Can she make a loaf of bread?
(Tell me true!)
"Nay, she cannot make my bread,
But a fine souffle instead;
And if I do not complain, why should you?"

Can she cook a good beefsteak
Without making a mistake?
Can the cook a good beefsteak?
(Tell me true!)
"Nay; but, then, her salad cream
Is delicious as a dream!
And it's something that my mother could not do!"

Can she brew a cup of tea
Good enough for you or me?
Can she brew a cup of tea?
(Tell me true!)
"Maybe so and maybe not,
For I really have forgot;
But she'll freeze a cafe mousle;
Pray can you?"

—Helen Knight Wyman.

An Evening With Charles Dickens.

THIS was the subject of an intensely interesting illustrated lecture delivered in Massey Hall on the evening of Feb. 20th by Mr. E. S. Williamson, of Toronto, who is what we might designate not "a Dickens of a specialist," but a real enthusiastic Dickens specialist, having made an extensive study of Dickens' life and works. Mr. Williamson, moreover, has in his possession a very valuable and interesting collection of Dickens' relics and curios. The lecturer has admirably sustained the high reputation with which he came to us for the first time, and has fully borne out in his lecture such journalistic comments as the following:

"A charming entertainment."—Toronto Globe.

"Graphic, complete and connected."—Ottawa Citizen.

"A literary treat."—Cleveland Leader.

"Held the audience in rapt attention."—Dayton Journal.

Of the many good things in the shape of popular lectures which we have been privileged to enjoy here, this has undoubtedly been one of the very best. Every seat in the large assembly hall was taken.

Successful Literary Meeting.

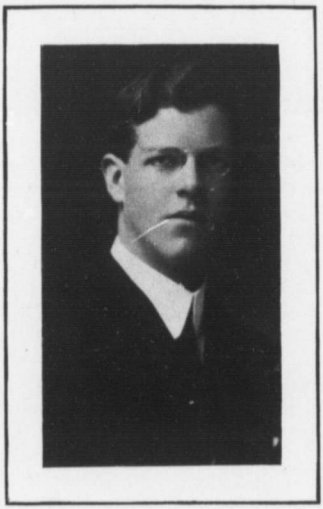
The second meeting for this term of the Union Literary Society was held in the usual place, Massey Hall, on Saturday evening, February 23rd. The President of the Society, Mr. A. McKenney, occupied the chair. A leading feature of the programme was an address by President Creelman on "The Southern Negro," with the environment, habits and characteristics of whom Mr. Creelman is so familiar, by reason of his having lived for a time where they formed a large part of the poulation, and by reason of his having travelled in the "Sunny South" quite recently.

Those participating in the debate on this occasion were: Messrs. S. E. Todd and H. W. Newhall for the affirmative, and Messrs. W. S. Jacobs and H. Sirett for the negative, the resolution

being, "That it is in the best interests of a municipality to adopt local option." The debate was won by the affirmative.

Professor Dean acted as critic, and gave the debaters many useful suggestions. To the critic on these occasions speakers look for criticisms and suggestions, by means of which they will be able to improve their oratorical abilities, and they are always disappointed if not told plainly and fearlessly where they erred or came short. Professor Dean in this instance, as on other occasions when he has acted as critic, discharged his duties in a very satisfactory manner.

On Sunday afternoon, March 3rd, Prof. Matthews, of McMaster University, Toronto, preached a powerful and impressive sermon in the Massey Hall, to an audience composed mainly of students of the O. A. C. and its sister institution, Macdonald Institute. The speaker's discourse was based upon the words, "For he looked for a city which hath foundations, whose builder and maker is God."—Hebrews, 11:10. The subject of the sermon may be said to have been, "Faith," and ably and effectively it was dealt with.



A. E. SLATER,
Winner of Oratorical Contest.

Philharmonic Society Concert.

That we have a Philharmonic Society of no mean order, was amply demonstrated on Tuesday, March 5th, when this organization's annual concert was given in the college gymnasium. In the society is to be found the best musical and dramatic talent and enterprise that the college affords. Once a year at least an entertainment is given; that of last year was held in the Opera House in the city, the proceeds going to one of the charitable institutions of the community. The proceeds of this season's concert are to be applied to extending the usefulness of the society and placing it upon a broader and more permanent basis. The officers at present are: Honorary President, G. C. Creelman; President, T. D. Jarvis; Vice-President, R. W. Mills; Secretary-Treasurer, Alex McLaren; Dramatic Critic, J. B. Reynolds; Pianist, Mrs. Fuller.

Oratorical Contest.

The ninth annual oratorical contest of the O. A. C. Literary Society was held in the college gymnasium on Friday evening, March 8th, in the presence of upwards of six hundred people, including many from the city. This contest is always the Literary Society's leading event, and the one which brings out the best oratorical talent among

the students from year to year. As the matter and manner of delivery of the addresses are supposed to be of a rather lofty order, and as the preparation involved is necessarily extensive and thorough, great interest is taken in the event, and the competition among the contestants is keen.

The chief object of the contest is to encourage public speaking among our students. In addition to the benefit derived from the preparation and delivery of an oration each contestant has before him the prospect of a place among the winners and thus the securing of one of the four prizes offered, namely, for first place, a copy of the "Standard Dictionary" (presented each year by the class of 1888); for second place, $10, for third place, $7, and for fourth place, $5.

In this year's contest five took part, namely Mr. A. E. Slater, an Englishman, whose parents have for some years lived in India; Mr. T. H. Binnie, an Ontario boy; Mr. F. E. Millen, of England, Mr. A. G. Turney, also of England, and Mr. Pelayo Diaz, a native of the Argentine Republic.

Mr. Slater was declared by the judges to be the winner, with Mr. Binnie second, Mr. Millen third, and Mr. Turney fourth. Mr. Slater's oration was on "National Greatness," and was one which did the speaker much credit. The speaker has an extensive vocabulary, a quick, fertile mind, a ready tongue, a clear, strong, well modulated voice, and withal, a good appearance. He held his audience from the first. There was a magnetism in his voice, in his language, in his thoughts and in his manner. His oration was by all odds the outstanding winner. To give an idea of Mr. Slater's diction, thoughts and ideas, a few extracts from the oration are here given: "There must be the sublime emotion of a patriotism which, soaring toward heaven, rises far above all mean, low or sordid things, and is absorbed by one soul-transporting thought of the good and happiness of one's country; that patriotism, which, catching its inspiration from the immortal God and leaving at an immeasurable distance below, all lesser grovelling, personal interests and feelings, animates and prompts to deeds of self sacrifice, of valor, of devotion, of death itself. This is true patriotism; this is true national sentiment; this it is that will uphold a nation in the darkest hour of her history."

"Let us aspire to those higher ideals that are still before us, the great problems that our age alone can solve; the great tasks that the Anglo-Saxon race alone can accomplish; the great reconciliation of things old with things new, of things human with things sacred, of man with man, of class with class, of nation with nation, of church with church, of all with God."

Mr. Binnie gave an excellent oration on the "Canadian Race Question." Mr. Millen's subject was "The Awakening of China," which was ably dealt with, as was Mr. Turney's on "The Peril and Preservation of the Home."

A special prize, donated by Mr. C. L. Nelles, to the speaker who displayed the best gestures and platform bearing was won easily by Mr. Diaz, who in this connection is worthy of very high commendation. Mr. Diaz's oration "Canada, the Priceless Gem of the British Crown," is worthy of special mention and would have won for its author a place well up in the prize list were it not for lack of ability to handle the English language sufficiently well.

W. E. Buckingham, Rev. R. W. Ross, and Rev. H. W. Crews acted as judges. Mr. Ruthven McDonald and Miss Mae Hunt were the soloists for the evening.

Public Speaking Contest.

The sixth annual public speaking contest took place on Saturday even-

S. E. TODD,
Winner of Public Speaking Contest.

ing, March 16th. Six speeches were delivered by Messrs. Todd, Crow, Bowes, Metcalfe, Waddell and Angle, respectively. First place was won by S. E. Todd, second by P. Angle, third by J. W. Crow, and fourth by I. F. Metcalfe.

This year a change was made in the character of the contest. Speakers were required to choose subjects of a distinctly practical nature, thus making the contest a thing altogether separate from the oratorial contest, the sort of speaking being quite different.

To enliven the programme Mr. Le Roy Kenney, humorist, of Toronto, was secured. Miss N. Murby rendered, very beautifully, several vocal solos.

The Wellington Field Naturalists' Club, and the Entomological Society jointly, held one of their fortnightly meetings on Wednesday, March 13th. The principal subject on the programme was "Mice and Rats." It was opened by a short talk from Mr. Barlow, in which he presented the characteristics, habits and place in nature of these interesting rodents. The discussion was carried on in a lively manner, by many of the members and students present. Of the seven or eight species of mice known in Ontario, only a few are considered common, but further information is being obtained through the efforts of the junior members of the club. As a result of their work in trapping, a species of mole, new to the county, was reported at this meeting.

Mr. Jarvis spoke for a few minutes on collecting parasites from birds and small mammals, and showed this to be a fruitful field for original research.

Athletics.

HOCKEY.

McMaster vs. O. A. C.

AFTER 'Varsity had put us out of the running for the I. I.-C. H. U., the College seven determined to show that the 'Varsity series was only a fluke, and for this purpose brought up McMaster, the only hockey team which has been able to defeat 'Varsity this season. McMaster claims to have a better team than 'Varisity, for after winning the first game, lost the second and the round to 'Varsity through an unfortunate accident to one of the best players. Our game was played on the evening of Feb. 25 at the Royal City Rink, and both sides had on their strongest possible lineup.

When play started it was seen that the teams were very evenly matched. McMaster had a most wonderful defense, the coverpoint being the fastest skater and all 'round stick handler seen here this season, but their forward line was very medium. For the College all departments were equally strong, and every man played a fine game. Near the end of the last half McMaster led by 3—1, and it looked like a cinch for them, but College shoved in one and rushed matters. On a flukey rush, the Toronto seven scored once more, and it looked to be all over but the cheering, as time was nearly up. But College scored again in one-half a minute, and, encouraged by a couple of hundred wildly-cheering supporters, fairly peppered their opponents' goal for the remaining few minutes of play. But McMaster were lucky enough to keep the puck out till the call of time, and won by the small majority of one goal. On the whole the O. A. C. boys had rather the best of the play, and next winter should see some fast hockey between our boys, 'Varsity and McMaster.

The College team were: Goal, Hoffman; point, Christie; cover, Johnson; rover, Middleton; center, Foster; right, Barton; left, Hodson.

Already the captains for our two major sports, hockey and football, have been elected for the session of 1907-08. Mr. J. M. Lewis, one of our strongest football players, has been selected to fill the arduous position of captain, and we have no doubt but that with the hearty co-operation of the rest of the players, he will produce a winning team next fall. Mr. Norman Foster was elected football manager, and the two should work well together. For hockey captain our clever center forward, Foster, was found to be the favorite with the majority of the team, and will fill that position for the second time.

First Year Inter-Year Hockey Champions.

As the freshmen had defeated the sophomores 6—0, and the seniors had defaulted to the juniors, these two teams played off for the inter-year championhsip. The match was played

in the Royal City Rink, on the afternoon of Feb. 28. Both teams were represented by their strongest possible lineups, and the followers of both teams waxed enthusiastic in their rivalry. First year based their hopes on their strong defense, while Third year pinned their faith to their fast forwards. When play started the most strenuous kind of hockey was played, and close, hard checking and fast following up were the features. Both defenses were equal to all occasions, and at half time neither side had scored. Play waxed fast and furious after the interval, but it was not until nearly full time that Christie, by a fine rush, scored the freshman's first goal. Third year forced the playing, but in a mix-up in front of their own goal lost the puck, which was batted in just as time was called, giving the freshmen the game.

BASKETBALL.

Galt Y. M. C. A. vs. O. A. C.

On the evening of March 1st Galt Y. M. C. A. paid us a friendly visit, and as a side recreation played the college basketball team a little game. Galt evidently had not played much basketball before, and our boys simply played tag with them. The college team were in fine fettle, and gave an exhibition of lightning passing, pretty catching, bewildering combination, and deadly shooting that was well worth seeing, and made the game intensely interesting, although one-sided. Galt seemed handicapped by the large gym. and lack of practice. The final score was 56—13 in favor of the O. A. C., and at that our boys did not exert themselves. The college team for this game were: Forwards, Burritt, Moore; center, Brown; guards, Irving, Hoy. The sample of basketball put up by our team this winter has been of a high order, and another year they should be given every encouragement to enter a league with a few of our best neighboring teams.

BASEBALL.

Fourth vs. First Year.

This game was played on Saturday, March 16th, the Fourth year being confident of victory. The latter went on the field without Hamer, their first baseman, his place being taken by Barton, of hockey fame. Neither side seemed to make connections with the ball for several innings and runs came slow. At the end of the seventh innings the score was 8—7 in favor of Fourth year. The first of eighth soon told a tale, and by spicy base running accompanied by a few timely hits by Jacobs, the star second baseman, the score stood 14 to 7. The First in their innings managed to get two runners over the plate. The first of the ninth saw the Fourth year go out 1, 2, 3, and the First came to bat, wanting six runs for victory. Excitement reigned intense and the crowd cheered wildly. Timely hitting by Green, Reek and Petrie and a few errors by the other side and the score was tied. With two men out, on a nice single by Knauss, the winning run was scored. This was the most exciting game seen for some time in the gym. and the First year certainly made a garrison finish, final score standing 15—14 in favor of First.

Third vs. First.

The Third year baseball team opened their season on March 2 with a game with the First year nine. The juniors were very confident as to the final result, and indeed regarded the match more as a practise game than anything else. As a natural result their lax

work was taken advantage of by their young opponents, and for a while it was nip and tuck for the lead. At the end of the sixth, Third year only led by one run, but from that on they made a runaway match of it, winning quite handily by the good score of 17—7. Green was landed on quite heavily, while Dan Johnson, as usual, beguiled his opponents into whaling the air time and again. Sharp fielding and good base-running made the game interesting to see, and First year were well satisfied with their showing.

Second vs. First.

As the Second year team had been practising steadily since Christmas they anticipated little trouble in disposing of the first year. With the redoubtable Coke in the box, they went on the field with the avowed intention of smothering their opponents with runs. And for a while they certainly did bang the ball, piling up 12 runs in the first two innings to the first years' cipher. But then something happened. Greene slammed the ball in to his catcher in regular strike-out fashion, and the men behind him fielded everything that came their way. First year held their opponents even in the last seven innings, each side crossing the plate four times, leaving the final score 16—4 for the Second year. If the freshmen had taken their brace a little earlier it is hard to say what would have happened, and the latter part of the game was a fast, scientific exhibition of baseball.

Fourth vs. Third.

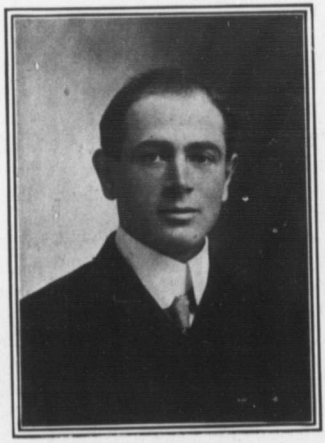
This game was played on Saturday, March 9th, the Third year being without their regular first baseman, Foster. Things went pretty even until seventh innings, when the Third batted lively and brought in four runs, the score standing 10—7. Neither side scored after that innings. The Fourth played good ball, fielding sharply, while the Third batted as if they felt sick, and never seemed to gather up the situation when a critical moment arrived. Twigg and Coglon were on the slab for the Fourth with Capt. Binnie doing the backstop work. The old firm, Johnson and Hare were the battery for the Third.

Dairy vs. Third.

This game was played on Friday, March 15th, the Dairy being without their regular catcher, Kim Packard. The Third went on the field with their regular team and soon set the Dairy boys guessing. Not until the fourth innings did the Dairy reach first base. In the Third years' second innings they batted in grand stand style, and tallied twelve runs. In the Dairy's eighth innings another of their men reached first, but never managed to cross the plate. It looked like a whitewash for the Dairy until, with one man out, Ralph, of Dairy, reached first, stole second and on a sacrifice by McDougall, managed to cross the plate. The Third year fielded and batted in grandstand style, and proved that their baseball days are not quite over yet.

Our Alumni.

WITH a great deal of pleasure we are able to present to our readers a photograph of Wm. E. Mason, one of our ex-students, who is making a name for himself in practical agriculture. Mason entered the college in the fall of 1901. After a very successful career as a student he found



WM. E. MASON.

it necessary to leave college on receiving the Associate Diploma. Since that time he has been engaged in mixed farming, paying particular attention to the production of cloverseed, bacon hogs, and milk. In the last named he has been exceptionally successful. In the recent dairy competition, although not securing the medal offered by Ryrie Bros. for the herd showing the largest returns in cash, he took a high place in addition to having the honor of being the owner of the best herd of cows in the competition. Mason is the proud father of two healthy lads whom he looks forward to seeing students of his Alma Mater. Letters addressed to Tyrrell, Ont., will reach him.

Arthur J. Logsdail, '02, will be remembered as a former Local Editor of the Review. For two years after leaving the college he was connected with one of the largest market nurseries in England, having over forty acres under glass. The experience gained there, with the knowledge acquired at the O. A. C., is proving valuable to him in his present position with the Royal Botanical Gardens, Kew, Surrey, England. These gardens are world-famed for their beauty, and are the headquarters of the British Botanical Survey.

At Cayley, Alta., about forty miles south of Calgary, Geo. D. McVicar, '04-'05, is successfully solving the "science of the soil." Here, in one of the best farming districts of the West, "Mac" is happy in the possession of a half section of land, which is yielding crops that make his heart swell with pride. He would be pleased to hear from any of his classmates.

From New Brunswick, the "land of sea-breezes," comes the news that J. Frank Tilley, nephew of Sir Leonard,

a dairy school graduate of '97, and since then a Provincial Dairy Superintendent, has resigned to become manager of The Maritime Dairy Company. This firm has its head office in Sussex, N. B., and controls twenty-eight factories, scattered over the Province. Associated with him is Harvey Mitchell, of the Dairy Class of '96, who has also been in the employ of the New Brunswick Department of Agriculture. H. R. Ross, '98, Secretary and Treasurer of the Sussex Packing Company, is another member of the O. A. C. colony at Sussex, N. B.

For the past six months R. W. Bartman, '01-'04, has been in South America investigating conditions there in the interests of the Massey-Harris Company. He has lately returned.

R. B. Smith, '01-'03, of Columbus, Ont., is a son of Mr. Wm. Smith, of the firm of Smith & Richardson, the well-known breeders. Consequently it is not surprising to learn that he is possessed of an intense admiration for those two great breeds—Clydesdales and Shorthorns. "Bobby" has tender recollections of the days spent on College Heights, and is watching with interest the strides of progress his Alma Mater is making.

Students of '98 will remember the muscular A. J. Brokovski, champion athlete. "Brok." is living the "strenuous life" at Battleford, Sask.

Possibly few graduates of the O. A. C. are better known than Geo. A. Brodie, B.S.A., '91. Shortly after graduating he commenced general farming, specializing in Shorthorns. In the fall of 1899 he imported a flock of Shropshire sheep. This breed was completely disposed of last autumn. At present Brodie is confining his attentions more particularly to Clydesdale horses. Last year he made two large importations in person and he has a large consignment at present on the ocean. Brodie's address is Bethesda, Ont.

The telephone is yearly becoming more important in agricultural life; and to have telephones we must have poles. D. MacBeth, '04-'05, is in business at Ormsby, Ont., Hastings County, dealing in telephone poles, pulpwood, railway ties, lumber, etc.

J. R. Hipwell, '85, has a pleasant recollection of life at the O. A. C. twenty years ago. Among his fellow-students were President Creelman, Professor C. A. Zavitz, his room-mate, and several others who have brought honor to the college. Hipwell afterwards graduated from the Ontario College of Pharmacy, winning the gold medal in dispensing. He is at present engaged in a very successful drug business at Alliston, Ont.

J. B. Allison, '98, was connected with the Horticultural Department for about a year. He is now a Presbyterian minister at Leavings, near the foothills, in Alberta. Allison still takes a deep interest in horticulture, and regrets that he was unable to complete his course here.

C. Fred. Fawcett enjoyed college life here during '01-'03. He afterwards took the Dairy Course. For some time Fred. has been living under the Stars and Stripes at Fairfield, Maine, but he has been recently attracted back to Canada. We find him at Upper Sackville, N. B.

C. Armstrong, '80, is Secretary and General Manager of the Cuban Ice Manufacturing Company, Havana, Cuba. This should certainly be a business to "freeze to."

Cupid with his bow and arrow seems to have been particularly successful in dealing with our old boys during the last year. Several captures have been reported in this column, but the latest to come to our notice is that of Geo. W. Elliot, '00-'02, "Cedar Lawn Farm," Cathcart, Ont. On Christmas Day he led to the altar Miss Clara Stephenson, of Cathcart. We extend to Mr. and Mrs. Elliot our heartiest congratulations. May their joys be as deep as the ocean and their troubles as light as its foam. Elliot is engaged in mixed farming, paying most attention to potato-growing and dairying.

Although his actions when here would scarcely lead you to believe it, Geo. Robinson, '01-'02, is still unmarried. George is farming at Salmon Arm, in the fruit district, British Columbia.

J. R. Oastler, B.S.A., '96, visited the college recently. Osler is managing a large farm for Sir William Van Horne at St. Andrews, N. B.

J. T. Ware, '02-'03, did not stray far from the old home after completing his Associate Course. John was always looked upon as one of the "solid" men of his class, and one who, when he spoke, said something. Not only was he one of the prominent members of his class, in the studies, but also in athletics, especially the football team, he always taking a lively interest in this game. His interest in his Alma Mater has not apparently diminished any since his departure, for each year we are always sure of seeing his name on the Review mailing list, and the annual meeting of the Experimental Union usually sees him in attendance, taking an active part in all the discussions. At present he is farming at Allansburg, Ont.

W. J. Black, B.S.A., '02, President of the Manitoba Agricultural College, is the happy father of a bouncing baby boy. We bespeak for young Black a fair share of the success which has been a feature of his father's life.

Arthur S. Pipes, '99-'00, is farming at Moosejaw, Sask. Art. wishes to be remembered by all with whom he came in contact while living the strenuous life at the O. A. C.

While in Ottawa recently, Prof. Dean had the pleasure of meeting Jimmie Hayes, '04-'05, who is employed in the seed laboratory, and "Mac" Cutting, who is on the staff of the Ottawa Valley Journal.

Prof. Hutt has heard from John W. Johnson, '05-'06, Unskirkko, Wp. L., Finland, near the Baltic. Johnson is taking up experimental work with fruit trees, and enquiries for hardy apples.

Fred. W. Goble, B.S.A., '99, is a prosperous farmer near Woodstock, Ont.

Macdonald.

The Work Done at Macdonald Institute.

IT is with a view to educating the public mind to an appreciation of the work done at the Macdonald Institute that this article follows the one last month on the growth of Domestic Science. Visitor after visitor remarks—and there are few who fail to do so—"I had no idea of the size of this place and the scope of your work." We would like to show the other ninety-nine what we are doing.

In these days, when for several real or imaginary reasons the home seems tottering to its fall, it behooves us all to think seriously and act reasonably in order to preserve this, the greatest and most beautiful of all human institutions. From the beginning of the world homes of some kind have existed because it was not good for man to be alone. Therefore, the solitary were set in families. It is to the nations of homes that we look for everything that is best—not to the nations of institutional living. There is much to be said on both sides of this question, but this is not a discussion. We believe that the home must be sustained if this Canada of ours is to live, grow and become the great nation which we know it is to be. Suffice it to call attention to the lump which rises in your own throat when you think of your own home being wiped away.

Unfortunately, the "cooking school" idea has caused the impression to be formed in many minds that Household Science means cooking only, and many people look upon it as a purely technical study. This is a mistake. The aim of Household Science is something far deeper and more reaching than simply to teach girls how to cook, sew, wash and "keep house"—important as these subjects undoubtedly are in themselves. The aim is to help girls "make a home" rather than "keep a house"—to establish at an early age respect for and an intelligent idea of the home as the most important factor of civilization; to teach respect for and pride in the performance of duties in the home; to secure greater co-operation between the home and the school; to secure better food and sanitary conditions; to understand the principles of economics as applied to household management and in the relation of the home to the state; and to apply theories acquired in this and other departments of school and college work.

While cooking is undeniably an important branch of our work, it is not by any means the all-important. There is much to be studied about the home as an institution, in addition to the feeding of the family. The regulation of income and expenditure, sanitary and hygienic conditions, order, care of the house and its furnishings, moral influence, the social responsibility of

the home maker, the study of the different individuals in the home, these and many other subjects are included in the Home Science Course of study. Formerly it had been thought that anyone who lacked the necessary brains and intelligence to take any other position might turn to housekeeping as a last resort. She could not possibly fail at that. But we believe that as much art can be displayed in the furnishing of a dining-room as in the painting of a picture; and as much ability is necessary to make a loaf of bread as to write a book. The only difference is that the energy is directed along different lines. And what vocation is more worthy than making a happy home for father, brothers and sisters, and lifting the burden from the strained back of the little mother?

And so wise heads consulted together and decided that it was worth while to spend large sums of money to help along the good work. And wise daughters consulted with wise parents and decided that it was worth while for them to spend three months, or a year, or two years and a little money in order to educate themselves in this way. As a consequence we find the Macdonald Institute each term full of girls from all over the Dominion working enthusiastically with this one object in view. They study cooking, laundry work, sanitation, care of the house and its furnishing, marketing, home nursing, physiology, foods, and as they acquire this knowledge they put it into practice. And lest they may become one-sided in their education, a very broad course in ethics and in English is provided. In addition to this we have the Manual Training Department and the Domestic Art. The latter comprises sewing, dressmaking of all kinds, and millinery. And here is developed not only the hand and eye, but also the mind. This education may be had in three months or in one year.

Then we have those girls whose outlook is broader—those who desire to accomplish the greatest good for all, and so train themselves to pass their education along. This comprises all the other subjects and in addition the necessary professional work. The education is broad and liberal in every sense of the terms. Everything that relates to housekeeping and home-making is taken up deeply—the Chemistry of Foods, Biology, Bacteriology, School Sewing, etc. Two years are necessary for this course, except for those who have had Normal Training and experience in teaching. The latter take the course in one year.

There is yet another course—the professional housekeepers. Graduates in this branch are qualified to take positions as housekeepers in large institutions, hospitals, etc.

But all the education we get here is not at the Institute and during our study hours. In a residence where one hundred or more girls live together they cannot help learning much from one another. It is a splendid opportunity for broadening the mind and for making life-long friendships. The country girls learn the ways of the city, and the city girls learn very much from those who come from country homes. The east learns from the west, and all are mutually improved. No one is left out in the cold—all are friends and members of one large family.

And so we go on for our three months, one or two years, getting all we can out of our course, and learning from one another. We love our work

and our life here—of course we do. We think we appreciate all that has been done and is being done for us, but true appreciation will come only after we have left it all, and we shall realize then what we have gained—and possibly what we might have gained. We know that our education is worth while. It has been said "that the home is the social work-shop for the making of men." Therefore, an education which will create a greater sense of responsibility in the home-maker, establish higher and yet simpler standards of living, and bring into harmony the various forces of society, must prove of incalculable benefit to the country at large.

Y. W. C. A.

The Sixth National Convention of the Young Women's Christian Associations of Canada, which was held in Montreal from Jan. 24th to 28th, is generally conceded to have more than fulfilled all expectations. Excellent preparations had been made by the Montreal Association for the welcome and entertainment of their guests; and from the time the delegates were met at the trains until farewell was said, all agreed in their hearty appreciation of the many kindnesses received. A bountiful luncheon was provided every day by the ladies of various churches, and the opportunity it gave in the middle of the day for social intercourse made a unique and pleasant treat in the business proceedings of the convention. On Friday, despite the intense cold, many took advantage of the opportunity to take a sleighride around Mount Royal at the invitation of the Montreal Association, while on Saturday afternoon at the reception the beautiful rooms of the association buildings were crowded.

Not only was the convention a most enjoyable reunion, but it is considered to be one of the strongest gatherings of Christian workers ever held in Canada. The personnel represented seventeen city and twelve student associations, extending from Halifax to Vancouver, while the secretarial staff of the city associations was strongly represented.

The most marked characteristic of the convention was the deep spiritual power which was distinctly felt in every session. Those of us who have been praying for months past that this gathering would mean just this special inspiration to our individual lives and associations, can only lift our hearts in thanksgiving for the wonderful way in which our God has answered us once again, far beyond what we can ask or think. It may safely be said that one and all received such a vision of the possibilities of our work for Christ among the young women of our country, that they returned to their responsibilities with renewed faith and hope. The spiritual messages of Mrs. Kilgour and Dr. Johnston at the opening session, voiced the keynote of all that followed—a note which was significantly brought out in the banner which hung above the pulpit in the American Presbyterian Church in which all the meetings were held. In red and black letters on a white background was written:

"The Young Women of Canada for Christ—1907."

"What Can We do?—Acts, 11:37."

"Fear Not, He Will Work.—Ex. 14: 13."

The very cordial address given on the first afternoon by Mrs. MacFarlane, president of the Montreal Association, was most fittingly responded

to by Mrs. Mader, vice-president for Nova Scotia. In the evening a hearty vote of welcome was included in the very helpful addresses given by Rev. H. Symonds, D.D., Prof. Scrimger and Rev. W. R. Young, D.D.

The convention speakers did much to create the spiritual atmosphere which was so marked. Dr. Potts was particularly strong in both the addresses given on Friday morning on "The True Missionary Spirit," which was followed by a most valuable discussion, and in the one given on Friday evening, "Soul Winning, the Chief Business of the Y. W. C. A."

Dr. Adams, of Brooklyn, New York, more than fulfilled all expectations. His intellectual grasp and clear understanding of workers' problems, together with the deep spiritual life which lay behind his strong personality, were appreciated to such an extent that full advantage was taken of his ready sympathy and willingness to be used.

The same may be said of both Miss Paxton and Miss Barnes, whose help and practical suggestions were invaluable. Miss Paxton spoke several times in public meetings, ending with a Gospel meeting on Sunday afternoon which was attended by about 500 women. Miss Barnes, in her address on "Club Work," during the city sectional conference, as well as in the address on Friday evening on "Industrial Work," was able to present a plan of association work which was comparatively new to those who heard her. The next three years should mean much for the establishment of industrial movement.

Mr. Budge filled a real need by a splendid talk on finance work, and Mrs. Plumptre brought out, with great force, the war cry for the next three years—strong Bible study and missionary departments in both city and student associations.

Miss Elliott represented the Macdonald and led a discussion on "How to Arouse Interest in Bible Study." Ours was the only one of the young colleges to be represented by a speaker. Miss Elliott brought back much enthsiasm and inspiration, as well as many helpful ideas for the work.

Inspired by the Announcement of the Newest Rule.

The girls are ever ready
For whatever may await them,
But consternation reigns supreme
At this last ultimatum.
The Breakfast Gong at any time
Is not an unmixed blessing,
Although it gives tremendous scope
For very rapid dressing.

Now should some maiden, bent perhaps,
On personal adorning,
Before her mirror linger long
On any single morning,
Her taste for decoration she'll
Have reason to deplore,
For when the dining-room is reached
She'll find a fast-locked door.

Her Sunday naps she, too, will find
Good reason for curtailing,
Or else her many friends will fear
Her health is surely failing.
No more plump cheeks, no rounded forms,
No heaviness of movement,
Nor will the dairy scales record
In weight such vast impromement.

The Gibson girl, the Christy girl,
May well fear dissolution—
That known as the Macdonald type
Is now in evolution.

A. E. F.

Locals.

CLASS in English. Sentence for correction: John's anger was disarmed, etc.

Mr. Jones—Who will give a synonym for disarmed?

Knauss—Soozed.

Mr. Jones—I beg your pardon.

Knauss—Sooed.

Mr. Jones—What is it?

Knauss—Soo-soo-soosed.

Mr. Jones—You tell me what he said, Aldwinckle.

Ald.—Soothed.

Code of Rules for O. A. C. Freshmen.

On the Street Car—

1. If you happen to sit by a Macdonald girl when fares are being collected go to the vestibule for air until the conductor has passed.

2. Never give up your seat to a lady; she is never tired, and besides, girls love to hang on to straps.

On the O. A. C. Rink—

When the girls are specially invited over for a skate it is not necessary to stop playing hockey. The girls don't mind a few sticks and pucks flying around. And whatever you do, don't offer to carry a girl's skates for her. Just because a girl is engaged for the next skate, by no means ask her again that afternoon.

Friday Evenings—

1. Don't bother sending up a card; the girls always know whom to expect.

2. Don't shake hands with the girl on whom you are calling. She might think you are trying to hold her hand.

3. Don't by any means leave when the gong sounds. Gongs don't mean anything, and it is so pleasant to be reminded afterwards to dismiss callers at ten.

4. When the girl you want is out, stick to it until you get one. Of course a girl never knows whether she is first or fifth choice.

5. When you wish to escort a girl, don't ask her early, keep her guessing until the last minute. Girls love to be placed in an embarrassing position.

6. Always telephone during meal times. Girls don't mind missing two or three courses.

Augustine—We are going to leave the hospital on Sunday.

Canby—The Dr. said that depended on how we looked.

Pritchard—Too bad! You'll never get out.

A Peep Into the Future.

Prof. Harcourt (performing the experiment of vaporizing sulphur)—You see it takes a great heat to boil sulphur; water boils at 100° c., while sulphur boils at 448° c. This will give you some idea how warm burning brimstone is.

F. E. Millen is likely to taste the fruits of opposition in the near future. F. Alexander is preparing to do public sock darning.

McKenney (at Union Lit.)—The next number on the programme is "The Southern Negro." President G. C. Creelman.

Several enterprising men on Lower Hunt have opened a lunch counter; shares may be had at 95; apply to A. S. Smith or O. C. White.

Business was opened on Feb. 13th. Parlor hours, 7:30 to 9:30 p.m. daily.

Class in animal structure.

Shaw—Do those red streaks represent the fibres?

Mr. Jarvis—Yes.

Singleton—That is like college beef.

Mr. Jarvis—Yes, except that in college beef the fibres are somewhat coarser.

Prof. Gamble—If you mixed O. H. and a non-metal together, what would you have, Mr. Newhall?

Mr. Newhall—I beg your pardon!

Professor repeats the question.

Mr. Newhall—Oh! A base; oh, no! It would be a salt.

Professor—Mr. Robertson, what would it be?

Mr. Robertson—Er! it, it——

Professor—I am afraid the conversat was too much for you fellows.

J. M. Lewis—Was Scott the originator of that term, "Cast not your pearls before swine"?

Mr. Jones—I think not, you will find that in the New Testament.

Time—Three o'clock, at poultry.

Jerry—Mixing mash.

A. S. Smith (looking on)—See here, Jerry, I want you to hurry up; I want to go to the hockey match at 4:30.

Notice on bulletin board at Macdonald Hall after the conversat: Lost—A heart. Finder please notify E. Stafford. Happily the lost treasure had strayed into a cozy corner, and being found, it was conveyed by Strong hands to the owner, but to his dismay it had never been pierced.

Ferguson—What do you think of that horse?

Bowman—Alright, except those hind legs, his knees seem swelled.

Tweltridge—Hello, Wheeler! Why, twenty minutes ago I saw you here; have you been drinking punch all that time?

Wheeler—Yes, and I intend to be here twenty more. Sad to relate, the doors were closing and Wheeler struggled out with a downcast look in his countenance.

Gillett—My opponent says that Canada ought to be independent and then the two races would draw closer together. I would like to ask him, what in the dickens——or what would bring that about?

The lecture by Mr. Williamson left an impress on one mind at any rate.

Minister—I always look back with pleasure to my youthful days; who does not remember their boyhood days.

A "D. S." Voice—I don't.

A peculiar incident occurred in the last practical Zoology Class held for "A" division of the first year. One of the bright students, being so taken up in drawing an insect, that he began thinking out loud; strange to say, Lelacheur did not use his usual style of good English.

Stafford says he has been experimenting in the new method of execution, "electro plating" in the electric chair.

One Monday morning, the boys on Upper Hunt were awakened by a loud knocking on the door of No. 13. The knocker was saying "Farm cattle! Get up! Farm cattle!" He repeated his calls, when to his surprise a feminine voice from within inquired, "What do you want?" Mason beat an inglorious retreat amid roars of laughter.

Barton—(Critic at Maple Leaf Lit. Soc.)

The next speaker was Mr. McLeod; he did well for a man who had nothing to say, although he got ladies and soil fertility mixed up a little.

Harris—(On debate, "Resolved that ancient men were greater than modern men)—"Goose and duck eggs hatched in ancient times." "If Socrates did commit suicide, so did Mark Twain."

Duff—Do we get one day as an Easter holiday?

Sirett—Yes, and it's Sunday.

Duff (incredulously)—Is it?

Prof. Reynolds—Mr. Curran, what is the meaning of "antique"?

Curran—Old.

Prof. Reynolds—Spell it?

Curran—O-l-d.

King—Who is that new man in B division?

Petrie—That isn't a new man.

King—Who is it, then?

Petrie—That is Everest, but he has had his hair cut.

Observer at conversat—Well! Well! Who ever saw a Crow and a Sparrow engaged in conversation before.

In connection with the craze for corduroys which has sprung up in the college lately, the following remark was overheard:

Clerk (in store, just after selling a pair of corduroys to a Yankee)—Why, I thought it was only "dagoes" who bought these.

McEwen (judging calves)—In judging these calves as they stand now, would you allow anything for their possibilities?"

Mr. Arkell—Yes, certainly.

Edwards—If they were to be slaughtered, would you take that into consideration?

N. B.—Evidently that is not considered in slaughtering the "calves" used as college beef.

Mr. Law would like to know if you could run a turbine water wheel without enough water to run it.

Will some well-informed freshman please inform a Dairy Student how to spell CO_2?

(Ed.—No prize, except the honor, offered to the successful candidate.)

Mackenzie (reading "In Memoriam")—What is a crake, a kind of water fowl?

McGill—No! It's a kind of bird.

Newhall (at Union Lit.)—How many of the ladies present would not be in favor of local option, even if for no other reason than for the sake of their husbands and children?

Professor McCready (calling roll)—Shaw?

Shaw—He's sick, but he's here.

Professor—You're not all here are you?

A sleeper is one who sleeps,
A sleeper is that in which the sleeper sleeps,
A sleeper is that on which the sleeper runs, while the sleeper sleeps;
Therefore—while the sleeper sleeps in the sleeper,
The sleeper carries the sleeper over the sleeper, under the sleeper,
Until the sleeper which carries the sleeper jumps the sleeper and wakes the sleeper in the sleeper,
By striking the sleeper under the sleeper in the sleeper and there is no longer any sleeper sleeping in the sleeper.

Dr. Bethune was talking of the dragon-fly and explained it all thoroughly when Curran "butted in" with the meek question, "Please, sir! Will they bite?"

Doctor (solemnly)—No! No, they won't bite, but there is an old legend arising from the name "devil's darning needle" which says that they will sew up bad little boys' ears.

Mr. Buchanan (to first year)—Barley should have a pair of empty glumes always and never more.

Lelacheur (with the air of a discoverer)—I can only find two on this one.

"Is that all the work you can do in a day?"

Pickles—Well, sir! I suppose I could do more, but I was never much of a hand at showing off.