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Montgomerys' Baron's Pride. The most famous Clydesdale sire living.

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# The O. A. C. Review

Published monthly during the College Year by the Students  
of the Ontario Agricultural College, Guelph.

THE DIGNITY OF A CALLING IS ITS UTILITY.


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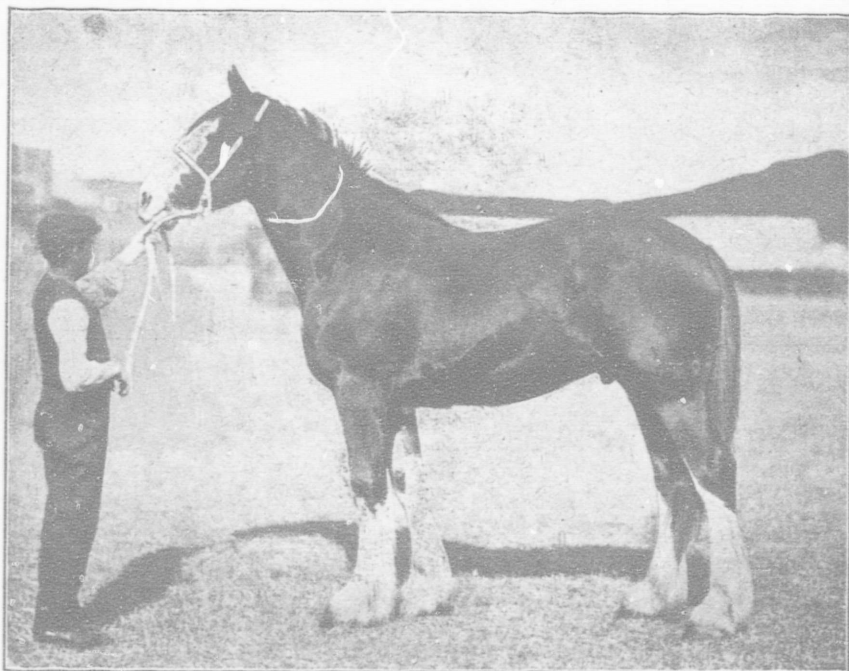
## SOME CLYDESDALES.

M. CUMMING, B. A., B. S. A.

 All the features of the International Live Stock Exposition, of Chicago, the culminating point of the live stock industry of America, none receives so much attention as the draft horses in harness which compete with each other for supremacy in the equine world. For four years in succession the honors of this class have fallen to the mighty Clydesdale drafters, and, if we may judge from the show they made at the last International, it will be a long time before the prizes go elsewhere.

The International has given an opportunity unparalleled by any other organization on earth for the exhibition of, and competition between, the various breeds of live stock, and when, four years ago, it was announced that prizes would be given for the best singles, pairs, threes, fours, and sixes of draft horses, it was realized that the occasion would afford a demonstration of the merits of the leading draft breeds of the world. To a Canadian is due the credit of winning the honors in this class at

the first exposition, for, with his six Clydesdale geldings, Mr. Moore, of Waterloo, practically accumulated all the prizes for which his horses were eligible. These horses afterwards became the property of Mr. Nelson Morris, the well-known packer, of Chicago, in exchange for some \$3,000, and he determined to maintain, with them, the Clydesdale supremacy. However, a rumor arose that Swift & Co. and Armour & Co. had vowed that they would have at the International of 1901, Percheron teams that would beat the Canadian geldings. So, Nelson Morris, not to be outdone, now that his Canadian horses had been thoroughly exposed, enlisted the services of Messrs. Andrew and William Montgomery, the world-famed Clydesdale breeders, of Scotland, who, ever alert to the interests of the Clydesdale, selected six of the best geldings Scotland could produce and had them consigned to Chicago. These are the horses which have called forth such enthusiasm among the admirers of equine flesh, and which carried everything before



**The Evolution of a Champion.**

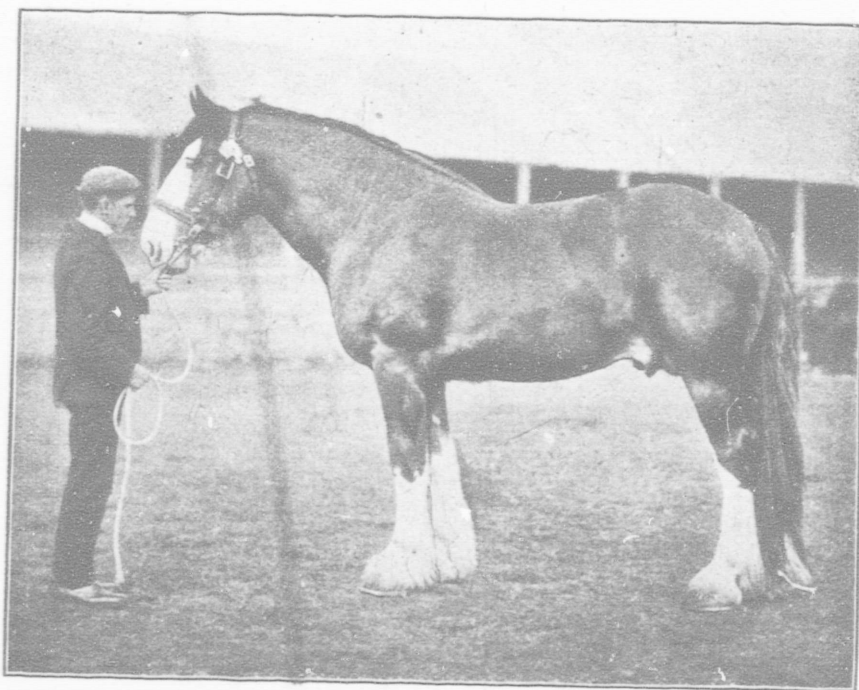
EVELLASTING, one of Baron's Pride's most illustrious sons, in his yearling form. Winner of male championship at the Highland, 1901.

them at the 1901 International, and which, along with one or more of the Canadian geldings, have maintained, since then, the supremacy of Scotland's great breed of draft horses. These are the horses which have been declared by competent judges to be the best that have ever been brought under one whip in the world, and which we have seen people waiting for days to see. These are the horses which have given observers an idea of the possibilities of the draft horse, and have afforded a model of excellence which all other draft horses in America should copy. These are the horses which have advertised the Clydesdale breed in America as it has

never been advertised before, and have shown how quality and size, action and durability, style and substance, and quality of hoofs, legs, and body can all be combined in one horse—the Clydesdale.

Since these horses were first seen at the International, the press has been full of flattering comment upon the judgment of Mr. Andrew Montgomery, of "Netherhall," and his brother William of "The Banks," to whom is due the credit for having afforded Americans such an educational exhibit of draft horse excellence. And so the reader will easily understand that it was with a very great deal of antici-

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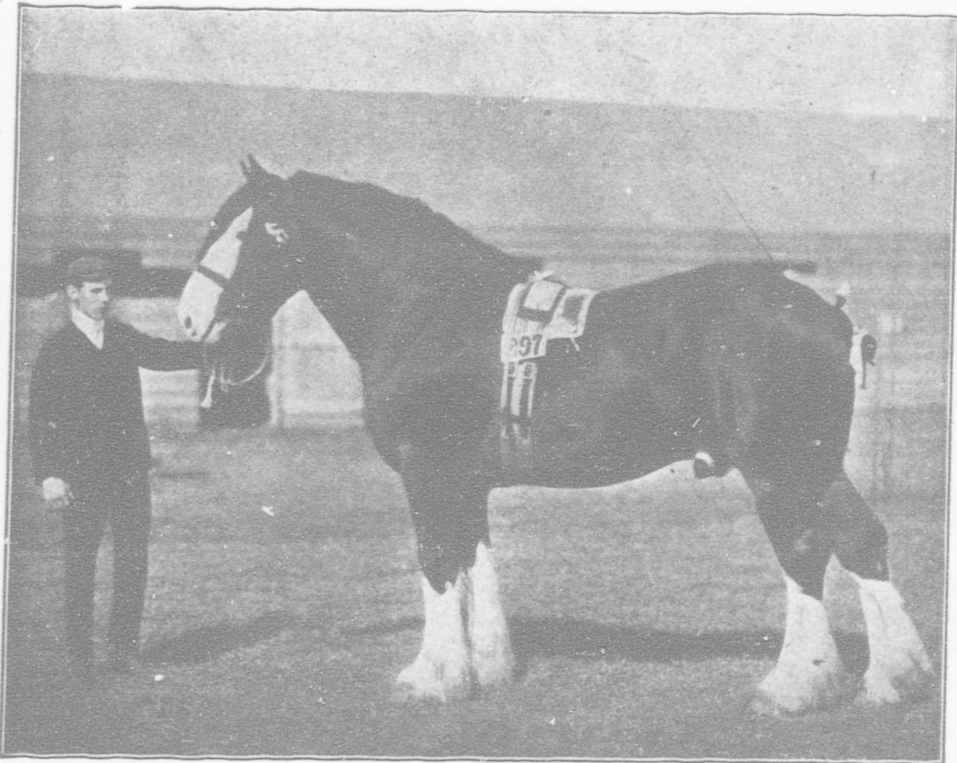
**The Evolution of a Champion.**

EVERLASTING, in his two-year-old form. Winner of male championship at the Highland, 1902.

pation that the writer, in company with Mr. Gamble, planned a visit to the world-famed stud of the Messrs. Montgomery, to see for himself the kind of breeding horse that could produce such drafters as the Chicago winners. Nor were we disappointed.

Few men are better known in Scotland than Andrew Montgomery, the laird of "Netherhall." We met him first at the Royal, at Carlisle, Eng. He is a conspicuous man among men—in fact, a veritable Clydesdale type. Besides, he possesses a genial manner and a personal magnetism which make one feel thoroughly at home in his presence. We afterwards enjoyed his hospitality in his home, called

Netherhall, near Castle Douglas, and never have we been more lavishly entertained. His brother, William, lives at "The Banks," some few miles west of Castle Douglas, and just a short drive from Kirkcudbright. His comfortable residence, from its position on the banks, commands a magnificent view of Kirkcudbright bay. By the by, reader, be sure to pronounce it Ker-ko-bri, and, moreover, take my advice and never pronounce a Scotch name until you have heard it pronounced by a Scotchman, for the Scotch have a most incomprehensible way of interpreting the pronunciation of some syllables. Some say it's due to a very strong national beverage.



**The Evolution of a Champion.**

EVERLASTING, in his three-year-old form. Winner of male championship for third year in succession at Highland, 1903.

Anyway, William Montgomery is also a magnificent type of manhood, and, in almost every particular, is the counterpart of his brother, Andrew. It was at Kirkcudbright that we saw the horses whose pictures are printed herewith, and, as this article is more particularly about Clydesdales, we must at once to them.

Anyone who knows aught of Clydesdales "kens" that the Montgomerys are the leading Clydesdale men of the world, and that more prizes fall to this firm than to any other firm in the old country. But almost synonymous, nowadays, with the name of

Montgomery is that of Baron's Pride, the famous horse that has been and is doing so much in maintaining the excellency of the Clydesdale breed in general, and of their stud in particular. He is a horse of about some 14 years of age, but when we saw him, nearly two years ago, was as fresh as many a horse years younger. We almost missed seeing him, as he was away with his groom at the time of our visit to "Netherall" and "The Banks." However, when William Montgomery told us that the "Baron" would be at Kirkcudbright station when a certain train was due, we

made sure that we would be passengers on that train. As the train came in, we saw him walking, with that sprightly, but firm, straight step which is so characteristic of the Clydesdale of to-day. While of good size, he is not a large horse, but such full, well shaped hoofs, springy pasterns, clean, flat bone, and general quality throughout we have never seen surpassed. By some he might be considered a little light in the forearm, but, with this possible exception, we do not know where a more compact, well-muscled and well-carried horse could be found, and his head and neck possess that style and masculine character which mark the prepotent sire. And he is a prepotent sire—in fact, the most prepotent of any Clydesdale in existence, for, since about 1898, the get of Baron's Pride have won as many leading prizes at the "Highland" as the get of all other horses combined. Here, for example, is his record as a sire of prize winners at last year's "Highland" in Dumfries:

Aged Horses—First, second, third, fourth and fifth prizes.

Three-year-old Colts—First, third and fourth prizes.

Two-year-old Colts—First, second, third and fifth prizes, the fourth prize winner being sired by the Baron's Pride horse, Boreland Pride.

Yearling Colts—First, second and fourth prizes, the third prize winner being sired by the Baron's Pride horse, Pride of Blacon.

Brood Mares—First and fourth prizes.

Yield Mares—First, second, third and fifth prizes.

Three-year-old Fillies—First, second, and fourth prizes.

Two-year-old Fillies—First, third and fifth prizes.

Yearling Fillies—Second, fourth and fifth prizes, the first prize winner being sired by the Baron's Pride horse, Balmedie Queen's Guard. The champion gelding was also sired by Boreland Pride, the Kelso premium horse of this year.

Such a record as that of prepotency on the part of a sire is, we believe, absolutely unique.

That the reader may have a fair idea of the get of this great sire, we present with this article pictures of one of his most illustrious sons, Everlasting, in his champion yearling, two-year-old, and three-year-old form. In regard to his merit, we quote from the *North British Agriculturist*: "At the Inverness 'Highland,' in 1901, when Everlasting was only a yearling, he was, with universal consent, awarded the male championship of the breed, and at the Aberdeen 'Highland,' the following year, where he came out as a two-year-old, he was an equally easy winner of the supreme honor, so that his outstanding merit as a prize winner cannot be cavilled at." Since the above lines were penned, Everlasting has crowned his previous successes by once again winning the male championship, this time as a three-year old. He possesses all the quality of his sire, and, when we saw him, bid fair to combine with it a little more size, a point which must be emphasized in the Clydesdale of to-day, for it cannot be gainsayed that, in some cases, the Clydesdales have gained their quality at the expense of size and substance, and that there is a danger of getting a little too much of the pony type in the Scotch drafter.

Anyone who examines the pictures of the horses presented here must con-

fess that their legs, pasterns and hoofs, as well as their bodies, are practically beyond criticism, and form a model after which all our Canadian heavy draft horsemen, no matter what breed they represent, should copy. And it's not hard to see the reason for this excellence. In the show ring, the Scotchman always starts at the ground, taking as his maxim "no foot, no horse." In the stud, such men as the Montgomerys must have their horse "right at the ground," and will allow no extra weight or muscling to atone for this all important part of a good draft horse. This is why it was possible for the Montgomerys to select such geldings as were shown at

the International, which combined with symmetry, weight and muscling of body such clean legs and hocks, such feet and such action as have never before been seen on this continent in any team of six drafters.

We can present to our students no better model of a draft horse than they will find in Baron's Pride and Everlasting, for which pictures we acknowledge our indebtedness to the Messrs. Montgomery and Andrew McNeilage, of the *Scottish Farmer*. The one of Baron's Pride is an exceedingly good one. Of the three of Everlasting, that which does him most credit is the one taken of him in his two-year-old form.







General View of Experimental Flats, Tennessee Experiment Station.

## LIFE ON THE FARM.

ANDREW M. SOULE, B. S. A.

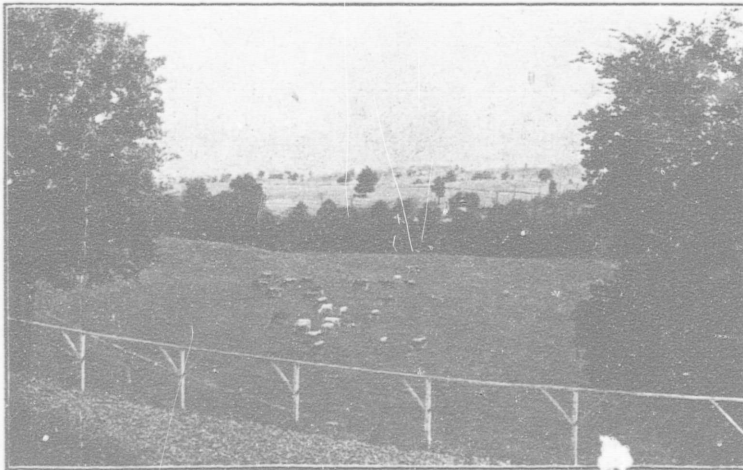
**T**HE thoughtful observer must be impressed with the social unrest of the present day; with the struggle for place and position. The young man's ambition is no longer in the direction of agriculture, because farm life to his mind is too circumscribed, too quiet, and too exacting. There is not the glitter of city life that excites and stimulates for the time being, but often leaves one a nervous, if not a financial, wreck in middle life. What future is there for the average young man who enters a factory to-day, or learns a trade? Each year the period of apprenticeship is lengthened, and the trades union dictates to him what he shall and shall not do. Time was when the quiet, peaceful life of the

country was more thoroughly appreciated and enjoyed than it is to-day. Time was when success was not measured by the standard of gold alone. Time was when people were more nearly equal than they are to-day. Then the social line was not so strictly drawn as now, and a man who preferred to farm for a livelihood was counted as good as the professional man or the merchant of the neighboring city.

The change in sentiment with regard to agriculture, and the great increase in urban population due to the extensive development of our manufacturing interests, would not make so much difference if they brought happiness and contentment

to the majority of men, who cannot hope to rise above the level of the laborer. But unfortunately they do not. Shutting men up in close factories, at laborious tasks, breeds discontent, jealousy and covetousness, with their attendant train of evils. And this is the atmosphere in which the youth of the city is expected to find nourishment for his body and mind. Little wonder that the country boy should excel him in many respects, and grow up a brawnier and

mere youth he has a chance to develop brain and muscle in the open air. Unless his home is more isolated than the average, there are brothers and sisters and neighboring children for playmates. What greater pleasure is there than to roam the fields hunting for wild flowers and gathering nuts in the autumn season, chasing the squirrel and catching the 'possum? Then, there is the stream in which to fish and to bathe on hot days. There are shady woods to stroll in and ver-



Part of the Dairy Herd, Tennessee Experiment Station.

a more independent, thoughtful, industrious, and God-fearing citizen. What a contrast between the crowded tenement of the city and the open fields and woods.

The question has frequently been asked, why the country boy succeeds so well when transferred to the city. This is not difficult to understand when one has lived under both sets of conditions. Did you ever think of the many activities which enter into the life of a country boy? First, as a

dant fields for play grounds; and when one gets hot and tired and thirsty, there are the luscious fruits of the tree and vine and the big, red-hearted watermelon to soothe the aching void which constitutes so large a part of every healthy boy. And these are only a few of the things that engage his attention, even in the course of a day. It may be that he is called on to render some useful service. He may have the cows to bring home, or the pigs to feed, or the chickens to

look after, or the mules to ride to water. And these, in their way, are all pleasures, and they are teaching the boy a thousand useful things. In the good country home there are books of travel and history to read in the evening, which help to round out and build a perfect man. It is the great variety of conditions he has to meet that develops in him the characteristics which are invaluable in later life.

When the country boy is transferred to the city and finds a new set of conditions to face, his training stands him in good stead, and though he may be green and awkward at first, and inexperienced in the deceits which men practice upon one another, it will not take him long to master the situation; and then because of his splendid initiative, his fine constitution, and his strong moral fiber, due to the purity of the social atmosphere in which he was reared, the rest is plain sailing. All this goes to show

the advantages of the country as a place of training for the youth of the nation. And if it is the best place to grow the boy, is it not the best place for him to live? Will he not render the country a greater service, and will he not accomplish more for himself ultimately than by seeking a livelihood in the city?

In choosing a profession one should consider carefully the opportunities it offers the average man. And it is the desire of the writer to emphasize the word "average." There are geniuses born in all walks of life; there are men who will acquire great wealth or produce some wonderful invention no matter what their surroundings may be. But the question of chief concern at the present time is, "What is best for the average man?" for that is best for the nation. In choosing a profession one should consider a number of questions. First, is the business honorable and legitimate? Second, is it pleasant and likely to prove profit-



Cutting sorghum with corn harvester, Tennessee Experiment Station.

able? Third, does it offer opportunities to rise, as in the case of a physician or a lawyer? Fourth, will it permit of the acquirement of riches by honorable means? Fifth, does it suit the individual taste? Sixth, is it a sure, reliable business, or is it one that is subject to change? Seventh, is it one that will render as nearly certain as possible the acquirement of a competency for old age? Eighth, is it an exacting, wearing business?

Considered from the standpoint of opportunity as set forth in the foregoing examples, farm life offers many favorable conditions. It is not a business by which one may as a rule obtain great wealth, though some do make large fortunes out of the soil, and there is no reason why many others should not do so if they followed strictly business principles. The majority of men cannot hope to acquire great wealth in any vocation, and farming offers them the means of gaining a livelihood as good as the city laborers can hope to enjoy, if not much better. At the same time it permits them to increase their wealth through the development of flocks and herds and the improvement of their farms. Thus, in old age, they will be able to retire.

The cost of living is rapidly increasing, and though the mechanic and the laborer of the city may be well paid, they can never enjoy the good things of life that abound in the country. A man with even a small farm can have the choicest meat in season; the most desirable vegetables fresh from the garden; the choicest fruits from his own orchard and vineyard; and the best of milk, butter and cream from

his own dairy herd. He has horses and carriages for pleasure driving that would cost hundreds of dollars in the city. There is no reason why his lawn should not be as well kept as anybody's, and as well provided with flowers.

One of the objections to rural life has been its isolation. But the country is more densely populated now, and it is quite rare for one not to have neighbors close at hand. The churches in the country are much improved, and the farmers are building pikes here and there. They have telephones in their houses, and the daily paper is delivered at their doors. Over yonder is a school house. Thanks to recent legislation, this is greatly to be improved, and one of the most serious objections to country life will disappear. The primary school is to be made stronger and more effective, and a central secondary school will afford the children of the community the same advantages they could hitherto obtain only in the city.

The farmer is frequently dissatisfied, and says there is no money in tilling the soil. His desire is to get away from the farm and go into business or enter the professional field. He forgets that if he makes a good living and gives his family the pleasures that have been enumerated, he is doing all the average man can hope to do, and much more than the great majority of men succeed in doing. He is dissatisfied with living in the country, because he has false notions of what constitutes success. He is dissatisfied, because he is hard to convince of the errors he is making which seriously interfere with his profits. This is due to his suspicion of men, and to his

prejudice against new methods, and to the fact that he is more ready to take up with some fraud than to improve upon the methods he is following in his own business.

The farmer is afraid of "book larnin," or, he terms it, "scientific farming." He calls that "theoretical farming," and yet there is nobody who has more theories that are curious, improbable and incorrect. Science, which is simply an array of facts systematically arranged, is nothing more or less than common sense. If one understands that bacteria causes the souring of milk, and that under certain conditions they are more active than under others, the fermentation of milk can be controlled, and butter of good or bad quality made from the same lot of milk at will; and an education that would teach a man these things could hardly be called "theoretical." The farmer thinks he makes new discoveries every day, and so he does, but he is simply finding out what he might have learned years before in the school of agriculture. The want of education leads the farmer to many false conclusions. He believes that chess turns to wheat; that the hollow horn is a disease of the cow, when it is the natural condition; that when the cow loses her cud, it will be recovered if she is given a ball of rags.

As to the future of the farm there can be no question. Look at the con-

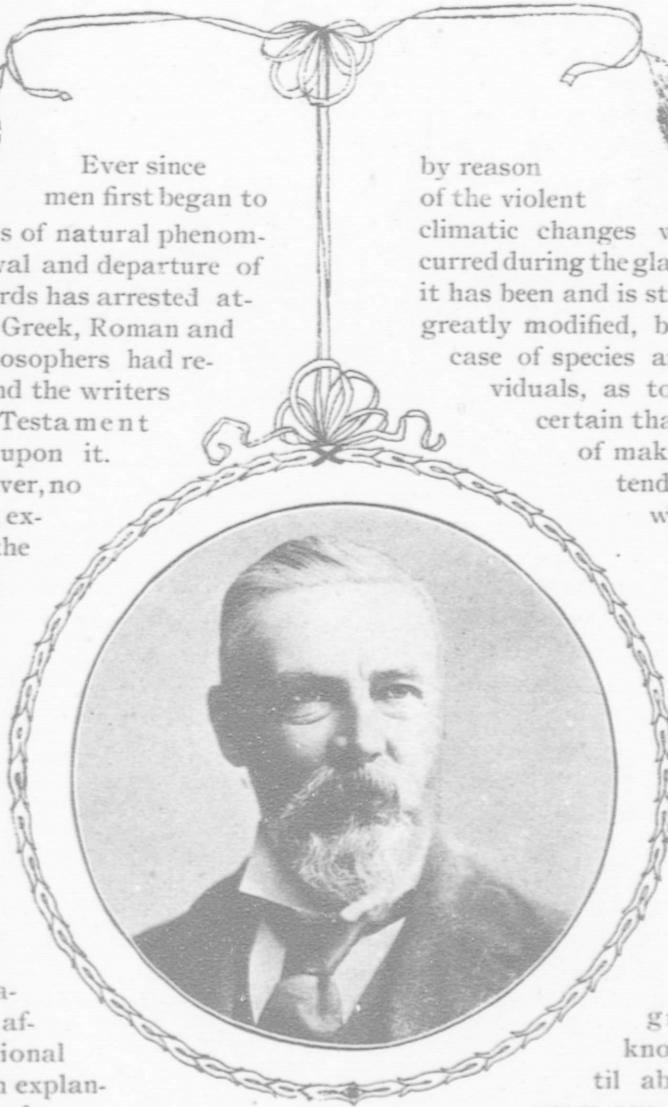
dition which has grown up in Europe because of the ancient systems of land tenure, which prevented the average citizen from owning a piece of ground, and made every tenant a peasant of some landlord. In America, until the present time, many men have been interested in manufacturing plants, railroads, steel and iron furnaces, etc. A period of leisure will come, a time when the output of factories will offset consumption. Then there will be millions to invest in something. Will it not be natural for these men to turn to the country and invest in lands? Will the time not come when there will be many landed estates in America? Will the farmer who tills the soil, who is the most important factor in the welfare of the country, give up his land? Will it not be better for him to keep his land, and to maintain his independence by living on it, than to suffer the indignities that have come to the peasantry of Europe? The cost of living, as already mentioned, is increasing in America; the demand for all farm products is very great. There never was a time when the intelligent farmer could earn a larger revenue; there never was a time when land could be bought for less in many sections than to-day; and there never was a time when men had a better chance to make wealth from the soil. Young men, possess yourselves of land and the inalienable rights of citizenship.

# MIGRATION OF BIRDS.

By C. W. NASH, TORONTO.

Ever since men first began to make records of natural phenomena, the arrival and departure of migratory birds has arrested attention. The Greek, Roman and Eastern philosophers had remarked it, and the writers of the Old Testament commented upon it. As yet, however, no satisfactory explanation of the origin of the habit of migration has been given. Some modern naturalists think that change of climate, such as that which took place during the glacial period, affords a rational and a certain explanation of the phenomenon. When examined closely, however, under the light of recent research, this theory is open to many objections. At any rate, if the general habit of migration originated

by reason of the violent climatic changes which occurred during the glacial period, it has been and is still being so greatly modified, both in the case of species and of individuals, as to render it certain that the habit of making the extended northward migrations now undertaken by certain of our American birds has been acquired recently and by degrees. We know that until about thirty years ago, such birds as the Meadowlark, Bobolink, Baltimore Oriole and others did not extend their flight beyond our southern borders; because the interior and northern part of the Province



C. W. NASH, Toronto.

An authority on insect enemies of the farm.  
Author of "Birds of Ontario."

was then heavily wooded and unsuitable to their requirements, but now these birds migrate in increasing numbers every year, as far north as the Ottawa river. They have taken advantage of the clearing of the forest and the cultivation of the land, to disperse themselves over an area which was previously not adapted to their way of living. In the early eighties I noticed a similar movement in Manitoba. As the land there was brought under cultivation, and the prairies were peopled, birds which were previously unknown came in as migrants and established themselves as regular summer residents. Failure of the food supply and the severe cold of these northern regions, drive these birds southward for the winter, where they remain until returning spring gives the impulse for their return flight for the north. If all the individuals of the so-called migratory species were in the habit of entirely leaving their winter quarters and resorting to some northern region peculiarly adapted to their requirements during the breeding season, we might well assume that migration was an inherited instinct transmitted from remote ancestors, who had acquired it by reason of climatic changes, which had forced them at certain seasons to leave what had been originally their permanent habitat. This is true, however, of only a few American species, the majority of which, in greater or lesser numbers, breed almost all through their range.

It seems to me, therefore, that the impulse to migrate, is the result of a natural law which provides for the dispersal of birds over the world, dur-

ing the season when their services are more required in maintaining the balance in nature, and that when the physical features of a country are changed, as ours have been, from heavy forests to open fields; the species of birds which migrate into it will change also, so that the land will be occupied by those best specialized to perform the function required of them in nature's economy.

As the study of the migratory movement of our birds has progressed, and the peculiarities of method adopted by each species have been traced, the difficulty of assigning any general cause for the habit, except that already stated, becomes greater. The movement from the north in the autumn presents many instances showing that various species act upon an impulse which differs from that of others closely allied to them. Generally speaking, it is assumed that birds leave the northern regions, where they have nested, at the approach of winter; when cold weather is imminent and their food supply is failing. Many species do linger in their summer homes, until it would seem as if they required to be driven out, but others again leave while food is most abundant and the temperature at its highest. Among the thrushes this difference is very marked. Wilson's Thrush, the Hermit Thrush and the Olive-backed Thrush, resemble each other very much in appearance and in all their habits except their migration. Wilson's Thrush arrives here early in May, and breeds abundantly from our southern border northward. About the middle of August their return flight begins, and by the twenty-

fifth of the month they have all gone. The Hermit arrives early in April, breeds sparingly in Southern Ontario, and remains until the beginning of November. The food of these two species is exactly the same, consisting of insects and such small berries as are to be found in the woods. The Olive-backed Thrush moves at the same time as the Hermit, but goes further north to breed. It seems quite impossible to discover any reason for the difference in the migration of these closely allied forms. Failure of food cannot be the cause of the early migration of Wilson's Thrush, for at no time in the year are insects and wild fruit more abundant than in August and September, nor can it be attributed to cold, these two months being the warmest of the year. The same difference is found between the Night Hawk and the Whip-poor-will. These birds are much alike in everything, and would seem to be adapted to the same conditions, yet the Whip-poor-will remains here for a month or five weeks after the Night Hawk has gone; the bulk of the Night Hawks leaving about the end of August. Among the shore birds (Plover and Sandpipers) the difference in the time of their departure is still more noticeable, many species commencing their southern migration early in July, and leaving us entirely by the beginning of September, while closely allied forms do not appear here until October and remain until the first hard frost. Instances of this difference between closely allied species, may be found in so many groups of our birds as to render it certain that neither failure of food supply nor unfavourable climatic con-

ditions can be accepted as the immediate influence which governs migration in all species. When the spring migration from the south northward is studied, the difference in method and range between allied species, and of individuals composing the species, is very great. Among the warblers are some interesting examples of variation in the extent of migration. The Yellow Warbler, Black-throated green Warbler, and black and white Warbler, and some others, winter south of the United States. On their return they do not travel far before they begin to select summer quarters and they breed from the Southern States all through their range to Northern Ontario. The Magnolia, Myrtle Blackburnian and Black-throated blue Warblers winter in the same region as the others, but they pass over the United States entirely, and, with few exceptions, go to the north of this Province before nesting, while the Blackpoll Warbler undertakes a most extended migration, the equator and the Arctic Ocean being the objective points of its journeys. The same difference in extent of migration of the species is to be found in almost every group of our land birds. Not only is there a great difference in the extent of the migration of allied species, but in certain cases some of the individuals which compose a generally migratory species, never migrate at all. The common Bluebird affords an example of this peculiarity. All through the Southern States the Bluebird is a resident, its numbers in the winter being increased by migrants from the north. At the approach of spring they gradually spread out from their base, working northward as the sea-



son favors them until they reach the limit of their range; which, by the way, has been considerably extended as the land has been brought under cultivation. All over the area from the Gulf of Mexico to Northern Ontario and Southern Manitoba the Bluebird finds suitable breeding conditions, and so do other species. Why then do birds incur the perils involved in migration? As winter comes on in the north we know that they must leave that region, or the intense cold and failure of food would destroy them, but that does not explain the spring movement at all, for we see that many individuals of migratory species find the climatic conditions and food supply of the South perfectly suited to their requirements. I can only infer, then, that, as I have said, the impulse to migrate is an express provision for the dispersal of birds over the earth during the period when their services are most required for the maintenance of the balance of nature. This impulse is undoubtedly hereditary, in regularly migrant species, for young birds brought up from the nest in captivity, always become possessed of a spirit of restlessness during each flight season, particularly at night.

While it is undoubted that the impulse to migrate is inherited, many ornithologists are of opinion that the ability to do so is not hereditary, but has to be acquired, and is in fact the result of the education of the young by old and experienced birds. This theory might be accepted as an explanation of the wonderful faculty which enables them to find their way over the thousands of miles which sometimes intervene between their

summer and winter homes, if all birds were gregarious at the time of migration, and if the old and young united and made the journey together. Some species do this, but in other cases the adults migrate before the young, and there are still other species, the individuals of which strike out singly and perform the whole journey alone. Birds of this last class must have inherited the ability to migrate, as well as the impulse. A striking example of individual migration is afforded by the Ruby-throated Humming bird. These little creatures migrate by day, so their movements can be observed. In the spring they reach southern Ontario early in May, the males preceding the females by a week or more. Through June they are occupied in nesting, and early in July the adult males abandon their mates and go south. In September the females and young gradually take their departure. Just at this season dozens of them in a day may be seen flying swiftly from east to west, along the shore of Lake Ontario, following the route usually taken by all our migrants here, though this course is not so invariably followed by them as by all other day flying species, for I have, on several occasions, seen a little Humming bird strike out over the lake, flying directly from north to south, the distance here from shore to shore being about thirty-five miles. Humming birds, when migrating, always fly low, so that it is impossible for them to gain any knowledge of their course by the exercise of their vision. It seems evident, then, that, as they have no opportunity to be educated as to the route they should follow, and that even their acute sight cannot be

of very great service in guiding them over a course, which may in some individuals extend from Hudson's Bay to Brazil, that they must be possessed of a peculiar faculty which enables them to act upon their inherited impulse to migrate when the season for flight arrives.

Of this wonderful instinct, which plays so important a part in migration, there is, I think, but one explanation to be given, viz: That, as nature provided the periodical migrations of certain forms of life, for the purpose of maintaining an equable distribution of these forms over all parts of the earth during the seasons best fitted for their maintenance, the necessary faculties to enable them to carry out this provision were developed with the impulse which induces the movement of dispersal.

We know that this so-called instinct exists in many other animals besides birds; some fishes possess it to a marked degree, and among insects it is to be found also. Perhaps the fact that education is not necessary to enable migrants to find their way over the long journey which lies between their seasonal homes may be as well, or better, exemplified by the migrations of a butterfly than in any other way. We have in Ontario a large and common butterfly known as the Monarch (*Danais archippus*). This insect is as regular a migrant as any of our birds, and travels quite as far as most of them. It arrives here early in June, the first to appear being battered, dull looking specimens.

These arrive singly, at least I have never seen any number of them together at that season. They deposit their eggs upon the milkweed plant, and, having few enemies, soon become abundant. Early in August they begin to congregate, gathering into large flocks and roosting together upon trees in sheltered places. In September a general flight takes place, myriads of them streaming along near the lake shore from east to west, following exactly the same route as is taken by the birds. Just how far they have to go before they can hibernate, or live actively through the winter months, is still in doubt. They are, however, found in great swarms in Florida from November to February, and are active during the whole period. The butterflies which fly from here in autumn are certainly insects of that summer. It cannot be supposed for a moment that any of those making the southward migration can be individuals which have made two previous journeys. Where, then, can these butterflies obtain their education as to the route to be followed in travelling from Ontario to Florida, if not implanted in them with the impulse which starts them on their journey?

So far I have only touched upon two of the mysterious features of the interesting movement we call migration. At some future time I hope to have an opportunity to deal with others, which, while less mysterious, are not less interesting.

## Lundfren's Vigil.

BY H. K. COCKIN.

HEAR the altar, in death, a young student lay sleeping,  
And the incense of flowers rose faint on the air,  
As the gloaming of even came silently creeping  
And enswathed in its shadows the dead, lying there.

Ah! ineffably sweet was the life of the sleeper,  
Though unknown to us all but one short year ago;  
How we loved him—dear exile from shores where the reaper  
Blends his song with the echoes from San Angelo.

In the chancel we laid him, our custom in Sweden,  
And bedecked him with flowers, more exquisite far  
Than the roses which bloom in that garden of Eden,  
From whose thousandfold fragrance springs India's attar.

In the bowl and the wine-cup we pledged our deep sorrow,  
As we gathered at night in Carl Weisselgren's room,  
And we lovingly spake of the one, whom the morrow  
Would behold as he passed from the church to the tomb.

But the saddest of all was a pale-featured student,  
On whose shoulders, in curls, fell the long flaxen hair;  
All impulsive was Lundfren, and, oftimes imprudent,  
Yet the soul of affection and honour dwelt there.

As in accents all broken by passionate weeping,  
Whilst the pathos of sorrow bedew'd his young face,  
"Oh, Da Conti," he murmured, "I would I were sleeping  
In the Valley of Shadows, in thine honored place.

"In the solemn death-watch, of the love that I bear thee,  
Ah! how earnest, indeed, was my heart-stricken prayer,  
I entreated of heaven, in mercy, to spare thee,  
E'en tho' I, even I, should be sacrificed there.

"Ach in Schlingel!" he cries like a weak-minded maiden—  
Spake the harsh voice of one, as he entered the room,  
"Not a heart ever beat, sirs, howe'er friendship laden,  
Would surrender one throb for the sepulchre's gloom."

With a frown, each one turned to confront the intruder,  
 Fellow student was he, yet not one of our band,  
 'Twas Von Bartel, a German, in bearing far ruder  
 Than the boar of the woods in his own native land.

"Is there one of you all, tho' thus sighing and moaning,  
 Who, to prove that affection is stronger than dread,  
 Ere the echoes of midnight have ceased their intoning,  
 Dare imprint but one kiss on the lips of the dead?"

"Is there one? Ay, there's Lundfren, thou cynical scoffer,  
 On whose forehead would mantle the hot blush of shame;  
 Was there one, save thyself, but would willingly proffer  
 The oblation of self in affection's sweet name.

"When the dank dews of midnight are softly descending,  
 Ere the blush of the Orient each mountain crest tips,  
 By the corpse of Da Conti my form will be bending,  
 As I press the cold features of Death with my lips."

Hark! The midnight booms out. On the face of him sleeping  
 At the Altar of death, is a dim halo shed,  
 By the candle that stands, like a sentinel, keeping  
 Watch and ward, through the night, by the side of the dead.

In the shadowy aisles, 'neath the carved stones are sleeping  
 The Lion of the North, and his queen, Elenore,  
 And (sad emblems of Sweden's long vigil of weeping)  
 The heroes who bled in the Thirty Years' War.

From the gloom of the nave, glides a figure, advancing,  
 With the chill wave of fear on his brow and his heart;  
 God! how keenly that start and his timorous glancing  
 Mark the soul that is stricken by horror's fell dart!

All alone near the dead, and with footsteps that falter,  
 Whilst the gloom of the shadows their grim terrors lend,  
 By an effort he reaches the foot of the altar,  
 And there gazes on him that in life was his friend.

With a gasp of repugnance, he bends low and stooping,  
Leaves a kiss on the lips and the cold ashen cheek,  
As a hand all unseen grasps his mantle, and drooping,  
Riddarholmen\* re-echoes his blood-curdling shriek.

For a moment he writhes in the throes of convulsion,  
Oh, the agonized wail of that sad parting moan,  
As the soul from the body, in sudden expulsion,  
Wings its flight in dismay to the regions unknown.

And the maidens who gathered in awe-stricken wonder,  
By the bright flashing sunlight of morning-tide said  
'Twas the pangs of despair snapped his heart-strings asunder.  
And he cared not for life, since Da Conti was dead.

No, alas! it was terror. When swiftly uprising  
From the lips of Da Conti, the long trestle rod  
Caught his gown, and it seemed to his heart's agonizing,  
That the pressure, above, was the hand of his God.

And the granite stemm'd winds that from Malar came sweeping,  
Breathe a sad lullaby, where the pine branches wave,  
In the Acre of God, o'er two student forms sleeping,  
Who, together in life, share in death the same grave.

But forever are silent the tones of their laughter,  
Till Eternity dawns, and all Time is no more,  
When the loud blast shall summon the solemn Hereafter,  
And the nations are met on the far-away shore.

\* The Westminster Abbey of Sweden, at Stockholm.



## Agriculture.



G. E. Day, B. S. A.



M. Cumming, B. S. A.

The men who are moulding the Canadian agricultural thought of the rising generation. Chief of the Agricultural Department at the O. A. C. and his Associate.

### FOREST INFLUENCES.

I. At the present time much is being said and written concerning the forest. Forestry problems include a consideration of forest management, of the forest as a resource, and of the forest as a condition. The last question, the forest as a condition, comprises the subject of this paper, and upon this subject I shall try to present the best information available.

Dr. Fernow states this question topically, as follows:

The forest exerts an influence

I. Upon the climatic condition within its own limits and beyond.

II. Upon the distribution and character of the waterflow.

III. Upon the mechanical condition and erosion of the soil under its cover.

I. The climatic influence of the forest is, conjecturally, fourfold: (1) Upon the temperature of the air and of the soil; (2) upon winds and storms; (3) upon evaporation and the humidity of the air; (4) upon the precipitation,—rain and snow. I say conjecturally, for the influence of the forest upon precipitation is by no means established, or generally admitted.

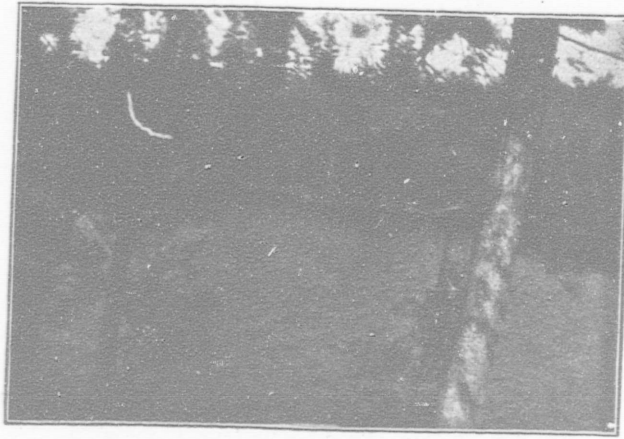
#### CONTROL OF TEMPERATURE BY THE FOREST.

The forest exerts its influence upon temperature by reason, principally, of the tree-crowns. These shade the ground and prevent the heat of the midday sun from having its full effect; conversely, the same crowns check the radiation of heat from the forest soil and air at night and in winter. Thus the maximum temperatures within the forest are lower than those in the open, while the minimum temperatures are somewhat higher. In summer, the lowering of the maximum is much greater than the raising of

The moderating effect of the forest is much greater than its cooling effect. The amount of influence thus exerted depends, of course, upon the character and the closeness of the tree-crowns,—a thick stand of forest having a greater quantitative effect, in the direction indicated, than a thin stand; while an evergreen forest has less effect in summer, and greater effect in winter, than a deciduous forest.

#### CONTROL OF WINDS AND STORMS BY THE FOREST.

One of the most important influences of the forest is due to its action



Forests Tend to Retard Evaporation.

the minimum. In winter the extremes are about equally reduced. Hence, the net effect of the forest in summer is, to lower the mean temperature of the forest air; and in winter, this cooling effect almost or entirely disappears. The net annual result is to cool the air,—the mean annual temperature within the forest being lower than that in the open; and to moderate it, the extremes of high and low, both daily and annual, being reduced.

as a wind-break. On its windward side, the effect of the forest is slight. But on the leeward side, the checking of the velocity of winds results in partial or complete stagnation of the air, with the phenomena attendant upon stagnation, namely, increased humidity of the air, decreased evaporation from the ground and from plants, higher temperature during the day, and lower temperature at night. Hence the effect of the windbreak is

occasionally injurious, in favoring night frosts. But this is only occasional. The ratio between the *width of the area protected*, and the height of the windbreak, has been variously stated by different observers, but a moderate estimate is, that for every foot of height of the windbreak, an area ten feet in width is protected. Thus a belt of trees 30 feet high will protect from cold, drying winds, objects on its leeward side at a distance of 300 feet back from the belt.

*Protection from lightning* is, in all probability, afforded to buildings by single trees, to a greater extent by clumps and belts of trees, and it is equally probable that extensive forests, while they may increase the frequency, reduce the intensity and destructiveness of thunderstorms over their own areas and beyond.

#### INFLUENCE OF THE FOREST ON EVAPORATION AND HUMIDITY.

In the forest, evaporation from three sources is to be considered: (1) Evaporation from the soil; (2) transpiration from the leaves; (3) evaporation from rainfall intercepted by leaves, branches and trunks of trees. German experiments have established for these quantities the following values: As compared with the amount evaporated from a free water surface in the open (1) the evaporation from soil under forest litter and within the forest, is 13 per cent; (2) transpiration from the leaves, 77 per cent.; (3) evaporation of intercepted rainfall, 61 per cent.; total 151 per cent. On the same basis of comparison, the amount of moisture added to the air over cereals on the average is 173 per cent; over sod, 192 per cent.; over bare soil, 60 per cent.

The forest, therefore, is more conservative of moisture than sod or cereal crops, but returns to the air  $2\frac{1}{2}$  times as much moisture as does bare soil.

The absolute amount of water-vapor in forest air is very slightly greater than that in the open, and, on account of the lower temperature of forest air, its relative humidity is generally higher than that of air in the open.

#### THE INFLUENCE OF FORESTS UPON PRECIPITATION.

It has been frequently stated by those anxious to emphasize the deleterious effects of deforestation, that the wholesale destruction of the forests has resulted in decreased rainfall over the deforested areas. This may be the case, but positive proof is lacking. It seems probable that the rainfall over certain parts of Ontario has decreased within the last 25 years. But whether this is a consequence of the clearing of the land, or merely a result of those changes of climate that occur over large cycles of time, who can say? There is no component of the climate that is more variable and uncertain than the rainfall. An experimental inquiry into the relation between the forest and rainfall is, from the very nature of the problem, exceedingly difficult. To conduct such an inquiry all factors, other than the forest, that can cause a difference in the observed rainfall, must be eliminated, and the experiment must cover a long series of years. Many such attempts have been made, with conflicting results. Experimentally the question is still undecided, but the consensus of opinion is that



the forest has little or no influence on the amount of rainfall.

The question may be examined theoretically with some interest. Rainfall is the consequence of evaporation of moisture from the earth's surface, with subsequent condensation of vapor caused by cooling of the air containing it. Where there is no evaporation there can be no rainfall, unless vapor is carried over from some other area. Deserts are rainless because there is no evaporation there, and because the air above desert regions is too hot and dry to allow of cooling and condensation of vapor that may be carried over them; also these areas are usually so situated that vapor-bearing winds do not reach them.

Rainfall over any locality may be increased either by an increase of evaporation from the area in question, and a subsequent condensation and fall over this area, or by an attraction exercised upon large air movements whereby clouds and vapor-laden winds are diverted to the locality and precipitate rain thereupon.

Of the various causes of rainfall, the principal is the upward movement of moisture-laden air and the cooling by expansion as the ascending air reaches levels of less and still less pressure. This upward movement may be part of a great cyclonic movement, covering hundreds of miles in horizontal extent, such as one of our winter storms; or it may be part of a merely local air-movement, such as our summer showers usually are; or it may consist of a forced movement up the slope of a mountain-side. The question is, to what extent may the forest

modify any or all of these movements, so as to affect rainfall?

First, as to the cyclonic movement, even if evaporation is increased over a forested area, the vapor is carried possibly hundreds of miles by the great horizontal movements of air in this class of storms; hence, increased evaporation over a forest does not increase the rainfall. Next, can the forest induce atmospheric conditions that will divert the storm-path? Theoretically, this seems impossible for great cyclonic areas, and doubtful even for local storms.

Secondly, as to storms of local origin, such as the thunder-storm, vapor formed from any region may be deposited again over that region. Hence, if evaporation is increased by the forest, it seems likely that rainfall also in the summer time, when local storms abound, may be increased. Referring now to the table of evaporation given above, we may see that evaporation from a forested region is less than that from sod or cereals, but more than that from bare soil. The substitution by the farmer of grass, root, and cereal crops for the forest in Ontario, would, therefore, tend to increase evaporation from the cultivated areas, and thus, whatever effect the forest may have upon local rainfalls, would be intensified by deforestation and cultivation.

As it does not appear probable that the forest on a mountain side can intensify the effect of the mountain in causing rainfall, we are forced to the theoretical conclusion that the effect of the forest in increasing rainfall can be but slight, and is probably in most regions nil. This theoretical conclu-

sion is, on the whole, supported by such experimental data as have been obtained by the various investigators.

II. We come now to the consideration of the influence of the forest upon the distribution of the water-flow.

The forest controls the distribution of the water (precipitation) that reaches it, in the following ways:

(1) By intercepting part of the rainfall.

(2) By diminishing evaporation, within its own borders and beyond.

(3) By transpiring large quantities of water, and thus diminishing the water-content of the soil.

(4) By the influence of the forest-litter, (a) absorbing part of the precipitation, (b) offering a mechanical obstruction to surface flow and thus preventing run-off, (c) protecting the surface soil from the beating of heavy rains; and thus keeping it in a more loose and receptive condition.

(5) By the shade and by its control of the winds it holds the snow cover until late in the spring, thus giving opportunity for the water to penetrate the ground slowly instead of running off in floods.

Of these factors 1, 3, and 4 (a) tend to diminish the amount of water in the soil, and thus to lower the water-table. The other factors tend to increase the water supply relatively and to raise the water-table.

(1) The amount of rainfall intercepted has been variously stated by different experimenters. Of course, a light shower is almost entirely intercepted by the tree-crowns of a dense forest, and given back to

the air immediately as vapor; while the greater part of a heavy or long continued rain must reach the ground. On the average from 10 to 20 per cent. of the total rainfall is intercepted. This amount is, of course, a direct loss to the forest soil.

(2) As has been already stated, the wind-breaking power of the forest is one of its most important influences. The cold, dry winds of winter, sweeping unchecked over the vast treeless plains of the North West, make it exceedingly difficult to rear fruit trees. Still more destructive to tree life is the warm, dry winds known as the Chinook. The Chinook, in Western America, has been known to consume entirely in twelve hours a snow cover 2½ feet deep, and to raise the temperature 57 degrees in 24 hours, while the humidity fell in the same time from 100 to 21 per cent. It is probable that the treeless state of the North West is the result of these sudden and extreme changes of temperature and humidity. If a forest could be interposed in the path of the chinook, its well-known action in checking the velocity of the wind, and in preventing extremes of temperature and humidity, would result in self-preservation. At any rate, the beneficial effect of shelter belts, clumps of trees, or wooded areas, upon orchards and crops that lie to the leeward is unquestioned. The high winds are checked, and the fruit trees are not subjected to winter drought. The snow is allowed to lie evenly and to remain longer. The general effect, summer and winter, of the forest in reducing evaporation is most beneficial. An Illinois farmer sums up his observation upon this matter thus:

"My experience is that now, in cold and stormy winters, wheat protected by timber belts yields full crops, while fields not protected yield only one-third of a crop. Twenty-five or thirty years ago we never had any wheat killed by winter frost, and every year a full crop of peaches, which is now very rare. At that time we had plenty of timber around our fields and orchards, now cleared away."

To mention the influence of the forest-litter (4), and the holding of the snow cover (5), suggests the third topic of my article.

III. The influence of the forest upon the mechanical condition and the erosion of the soil under its cover, is due simply to the impedance offered to the fall of water by the forest litter. A heavy rain falling, unimpeded upon bare clay soil, almost invariably packs it, puddles it and injures its texture, its capacity to convey water. Upon lighter soil the effect of the rainfall is less injurious, but is always in the direction of compacting. The forest litter, by breaking the force of the rain-drops, allows the soil to remain open and friable. The tree roots also, penetrating the soil, form channels for the entrance of water. Then, on sloping ground and

on hillsides, the loose litter retards the run-off, and allows the water more time to percolate the soil. Thus the rainfall is encouraged to become ground water, which, from the resistance offered by the compact subsoil, flows slowly down to lower levels, and supplies springs and streams perennially. The forest with its litter removed, the rainfall and the melted snow, instead of becoming seepage water, largely runs off the surface, denuding the hillsides of serviceable soil and stripping them to the bare rock; while the rapid rush of surface water occasions destructive freshets. Later in the season springs and streams dry up.

This has been the universal accompaniment of deforestation in Ontario and elsewhere. For the Ontario farmer this last consideration is of great practical importance. The question of preserving or renewing forests on a large scale is not for him. That is a state affair. But the denuding of local hillsides and water sheds can yet, in many sections, be stayed, or, if denuded, they may without excessive labor and expense be replanted, and the evils of wholesale removal of the forest, to some extent, mitigated.

J. B. REYNOLDS.

## Experimental.

### Incubator Experiments.



The experiments with incubators have not been very numerous, and when one stops to consider the large amount of experimental work needed, or the small amount that operators of incubators really know to be facts, it appears strange.

It might be well in the commencement to consider what are the main points to be solved. Nearly every incubator operator is puzzled as to the reason why chicks, apparently fully formed, die in the shell at about the twentieth day of incubation; and as to the cause or causes of chicks that are hatched dying of dysentery or bowel trouble, usually spoken of as non-absorption of the yolk. True, bowel trouble may be caused by poor feeding and brooding, yet it is known to be a fact that this trouble is found where the food and brooding is all that can be desired.

To solve either of these problems means years of very careful work, involving numerous trials under varying conditions, as to moisture, ventilation, etc. The main difficulty is to get eggs that are in every way alike for the different experiments. We know that the season of the year affects the vitality of the germ and the condition of the birds in the breed-

ing pen has much to do with the getting of good strong chicks.

All things considered it would appear that a series of co-operative experiments, conducted by operators over the Dominion would be most likely to result in giving the most reliable results. This work is being conducted by the Experimental Union. Incubator cards have been designed whereby an accurate record may be kept of the amount of moisture in the air daily, the percentage of fertile eggs, percentage of dead germs, and the number of chicks hatched, as well as the number of living chicks at two weeks of age.

These experiments have been going on for three seasons, and while the results have not been conclusive, yet there is some valuable information found.

From the experiments conducted at the College, as well as those over the Dominion, it would appear that a moderately low temperature on the eggs, of say 100 degrees F. during the first week of incubation and a temperature of 102½ degrees F. during the third week of incubation, is favorable for hatching good strong chicks, if other conditions are proper.

Excessive ventilation, especially if accompanied by a high temperature during the early stages of incubation, appears to be favorable for the development of chicks subject to bowel trouble.

An abundance of ventilation during the last week of incubation has given most excellent results. This would seem, for the results so far received, to have special influence in reducing

the number of chicks dead in the shell.

The introduction of oxygen gas, especially during the last week of incubation, has been advocated by some operators, but the results obtained at the College, tend to show that the gas is harmful rather than beneficial.

Many operators pay little attention as to whether eggs lie flat on the trays or with either end raised. From experiments conducted there can be little doubt but that the most favorable position is when the eggs lie on their sides on the tray, or with the large end of egg slightly raised. When the small end of the egg is kept raised throughout the hatch, poor results have followed.

The experiments with an incubator are exceedingly interesting, but as mentioned previously the question of getting eggs exactly alike as to strength of germs, etc., is so difficult, that nearly all experimenters feel it to be almost useless to undertake investigations.

We are in need of a large number of operators to join in this co-operative work in order that by the results of many, some more definite conclusions may be drawn.

#### Dairy Experiments.

The object of an experiment is to ascertain the truth with reference to the particular point or points under investigation. Now truth is a plant of slow growth but of great vitality. Opinions multiply rapidly and grow very fast, but they lack vitality. The careful experimenter sows the seed of truth carefully, cultivates it thoroughly and distributes it cautiously.

Truth, however, has a very wide range of application and many investigators try to apply their experiments over too great an extent of territory. Experiments may be divided into three classes,—Simple, Compound and Complex. The first aims at securing the facts about one single truth. As the conditions can be more easily controlled in this class of experiments, it is the one into which most experiments come. The second class has two or more phases of truth under investigation. The work is more difficult, the conditions are not so easily controlled and the results are more apt to be misleading. In the third class, fall those experiments which are very complicated and in which apparently, in many cases, neither the experimenter nor anyone else is able to arrive at any definite conclusions.

The two chief requisites in an experimenter are, first, that he must, as far as possible, be free from preconceived notions or opinions regarding the work in hand. He must be open for the reception of new truth, though it may not agree with his former opinions. Secondly, he must be a doubting man, i. e., he must not jump at conclusions too hastily from the results of one or two experiments. It is only after repeated trial that we are safe in assuming that we have discovered the truth, or at least a partial truth. All important experiments at the Dairy Department of the College are conducted for from three to five years and repeated as often as possible—usually ten to fifteen times during each year. We thus are able to allow for the variations in condition of milk, season, etc., and an aver-

age of results obtained during these years will furnish fairly reliable data.

It has been objected that these experiments are conducted with too small a quantity of milk or cream. In answer to this, would observe that we can control the conditions with a small quantity much better than can be done with a large quantity. From 1500 to 2000 pounds of milk is ample for most experiments in cheese or butter-making.

To indicate some results of experiments made in the pasteurization of cream for butter-making, I may be allowed to quote from a letter received recently from Cape Colony, South Africa: "I notice in one of the American or Canadian papers some reference to your advocacy of pasteurized cream for high class butter. Do you remember my visiting the College and asking you where I could get a ton of butter made with pasteurized cream and you referred me to the—creamery? That butter was made in their usual method, plus a very small addition, at my request, of preservative."

"Results as follows: butter made in November, 1902, arrived in South Africa early in January, 1903, exposed to a good bit of very high temperature at Cape Town, brought on here after certain delays, and owing to poor market was put in cold storage, the last of which was used in August of the same year. It was so perfect that it took first place in imported butter as against fresh arrival of both Australian and Argentine goods."

This is a fair indication of some work done in the Dairy Department of the College by which it has been

proven that pasteurization does materially improve the keeping quality of butter.

The letter also suggests the question of preservatives other than salt. Our correspondent does not mention what preservative was used in this butter, but it was doubtless some form of borax. We have some investigations under way at present to test the various preservatives for butter which are being placed on the market. Personally, we have not favored the use of preservatives in butter, but the question is of sufficient importance to warrant some investigation, in order to ascertain the truth about these articles which are now offered to Canadian butter-makers. From tests made, it would seem that pasteurization alone is not sufficient to prevent butter from going off in flavor when held for three or four months in cold-storage, at a temperature of about 28 degrees F. If a harmless preservative will prevent this deterioration it may be advisable to use it.

Our South African correspondent also suggests another line of investigation. He says: "In several leading Journals, I find some account of the comparatively recent method of producing milk flour. \* \* I should be deeply grateful if you would let me know if it can be had in quantities large enough to be used in a large retail milk trade, and where it can be obtained. Would you consider condensed water the proper thing to add, as the water supply of our town is not good?"

I was glad to be able to refer him to a firm in Canada that is now man-

ufacturing "milk flour," and who expect to have it in large quantities in a short time. This is comparatively a new field in dairy work, yet one which promises well for Canadian dairying.

Pepsin, instead of rennet, as a coagulating agent in cheese-making, has been studied by us during the past winter. The results are not startling at all, but indicate that pepsin may be used instead of rennet. Whether or not it will supersede rennet for coagulating milk, time and further experiments will tell. There is not very much difference in the quality of the cheese, so far as we have results.

The ripening of cheese at a *uniform* temperature of 40 degrees F. has given the best results during a series of experiments, conducted for several years. There is apt to be some misapprehension in reference to this work, as we have heard of factorymen allowing their cheese to ripen in a room where the temperature went so low as 40 degrees F. at night, or during cold snaps, with bad results. The ordinary factory is not equipped to ripen cheese at low temperatures. The temperature must be *uniform*, in order to get good results. This work can best be done at central depots or cold storages, where the conditions are under control.

There is need for co-operative experiments in dairying, so that the results obtained in one place may be verified at another place where the conditions are somewhat different. This requires trained men, and somewhat expensive apparatus, which means considerable expenditure of

money. As the importance of dairy experiments becomes recognized, the means will be forthcoming. In the meantime, we shall continue to sow the seeds of dairy truth.

H. H. DEAN.

#### Some Phases of Cattle Feeding.

The person not familiar with experimental work in feeding animals, can form no idea regarding the difficulties which have to be overcome, and the long time it takes to procure anything like satisfactory results. We have now been working from seven to eight years with experiments in fattening steers, and the work accomplished looks very small indeed. Experiments must be repeated over and over again in order to make sure that differences in results are due to the methods of feeding and not to the individuality of the animals under experiment, or to other causes which are not under the feeder's control. There are so many problems facing the man who feeds cattle, that it is difficult to decide upon which of these are the most important and should, therefore, be given precedence in our experiments. This paper will deal with only two of the problems in cattle feeding which we have attempted to investigate up to the present time.

In selecting steers for feeding, the farmer has a choice between two well defined classes. The first class is what is known as short-keep cattle. This comprises steers that are in good fleshy condition and weigh, roughly speaking, anywhere from 1100 to 1300 pounds. Such steers can be finished for market by increasing their

live weight from 150 to 200 pounds, and, therefore, it is necessary to feed them for a comparatively short period. Of course, in some cases they have to be fed longer than in others, but, in any case, they should be in sufficiently good condition that they can be finished in from 3 to 4 months feeding. The second-class comprises lighter and thinner steers, weighing, say from 950 to 1150 pounds. Owing to their thin condition, it is necessary to increase their live weight very considerably in order to have them properly finished for the export trade. Possibly, 300 pounds is a fair estimate of the average amount of increase in weight which it would be necessary to put upon these steers. Owing to the greater length of feeding period, this class is frequently called long-keep cattle.

The first problem which we set out to investigate was the best method of feeding long-keep steers; that is to say, whether it is better to feed them a heavy meal ration and finish them in the shortest possible time, or whether it is better to feed a lighter meal ration and carry them on for a somewhat longer period. The results of our experiments along this line seem to be very conclusive. In every case where we attempted to force the cattle by feeding a heavy meal ration, we found that it cost considerably more to produce a pound of gain than where we fed a lighter meal ration. It would take too long to go into all the details of our experiments, and therefore, we shall concern ourselves only with what we found to be the most economical method of feeding this class of cattle. When the steers were first put in the stables, they

were fed mainly bulky food, such as hay or chaff, with roots or silage, and they were given little or no meal during the first month of the feeding period. In this way, the animals gradually became accustomed to eating meal, and the quantity of meal was very gradually increased from month to month. The rate of increase in the meal was not the same in all our experiments, because we had to adapt our methods to circumstances and increase sufficiently to have the steers finished by a certain time. Some years the steers required rather less meal than others in order to bring about the desired result, and in this matter, as in all other matters pertaining to feeding live stock, the feeder must use his judgment. On an average, the steers would receive about one-quarter of a pound of meal per day per 100 pounds of their live weight during the first month of feeding. The next month the quantity was gradually increased until, as a rule, it reached about one-third of a pound of meal per day per 100 pounds live weight. After this time, the increase in the amount of meal was usually somewhat more rapid, and during the last month of feeding they were usually as high as from two-thirds to four-fifths of a pound of meal per day per 100 pounds of their live weight. On an average, they usually received about  $\frac{1}{2}$  of a pound of meal per day per 100 pounds of their live weight for the whole feeding period. With this method of feeding, and with good average long-keep steers, it usually required about six months to make the steers ready for export.

This method of feeding is not in accordance with the accepted feeding



standards for fattening cattle, and yet it seems to me to be in accord with common sense, and is certainly in accord with the practice of many of our most successful and shrewdest feeders of cattle. Before being put in the stable, the steer is used to eating bulky, succulent food. If he is placed in the stable and required to consume a large amount of concentrated food in the form of meal, we would naturally expect that digestive troubles would be the result. By commencing according to the other method, and feeding the steer bulky food, his digestive organs gradually become accustomed to changed conditions, and, as time goes on, he is able to make use of a large amount of meal without suffering any inconvenience therefrom. One of the great troubles in feeding cattle is the so-called "burning up" of the cattle with meal. This simply means that their digestive organs have been called upon to do more work than they were able to perform, and the result is disaster. Where cattle are handled judiciously, and the change from one kind of food to another is made gradually, one next to never hears of such a thing as "burned out" cattle. So far, then, as the method of feeding long-keep steers is concerned, we feel quite certain that our experiments are reliable, and that our conclusions are quite in accord with what one would naturally expect.

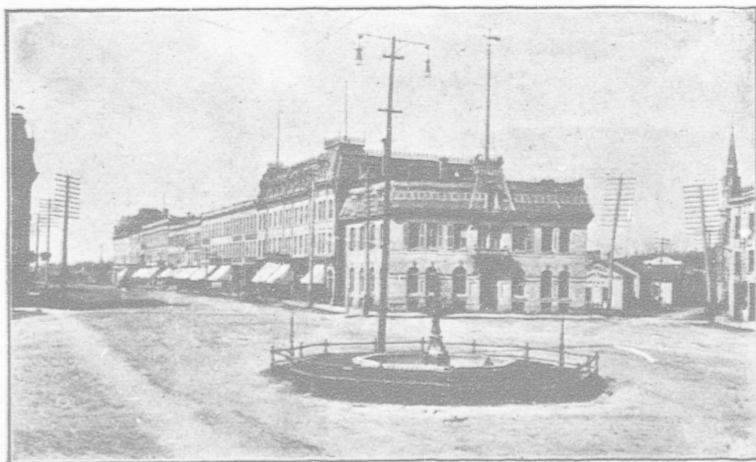
We have now commenced another series of experiments upon a very important subject; but it is going to take a number of years before anything like definite conclusions can be obtained. One of the great problems facing the farmer is whether he should

buy long-keep or short-keep steers. The long-keep steers can be bought at a lower price per pound, but, as already pointed out, they must be fed for a longer period, and made to increase considerably more in weight than the short-keep steers. The problem is, therefore, "how much more per pound can a farmer afford to pay for short-keep steers than for long-keep steers, and come out equally well financially." So far as we have gone, our experiments indicate that the long-keep steers will make somewhat cheaper gains than the short-keep steers; but there is another phase of the question, which must not be overlooked. In fattening steers, especially with the present prices prevailing for foods, it is impossible to produce a pound of gain in weight for the price which that pound of gain is worth on the market. In other words, if finished cattle are worth 5c. per pound, we could not put on the necessary gain in weight at a cost of 5c. per pound. The chances are that each pound of gain in weight would cost between 8c. and 9c. There would, therefore, be a loss of between three and four cents on every pound of increase in the weight of the cattle, and the only way in which this loss can be made up is by increasing the value of the original weight of the animal. Thus, if a steer weighed 1,000 pounds when purchased, and had to be increased 300 pounds in weight before he was ready for market, and if it cost 9c. to produce a pound of gain, the cost of producing 300 pounds gain in weight would be \$27.00. If the selling price of cattle is 5c. per pound, this 300 pounds would sell for \$15.00, or a net loss of \$12.00 on the 300 pounds increase in

weight. Now, if the purchaser had paid 5c. per pound for the 1,000 pound steer, then twelve dollars would represent his total loss on the steer. If, on the other hand, he had paid 4c. per pound for the steer, and sold him at 5c. per pound, there would be a profit of \$10.00 on the original weight of the steer, to balance against the \$12.00 loss which was incurred in increasing his live weight by 300 pounds. From this, it will be seen that, the smaller the increase in live weight necessary to make a steer fit for market, the smaller will be the loss to be made up by increasing the value of the original weight of the steer. This is the reason, therefore, why short-keep steers command a higher price per pound than long-keep steers, because the feeder can accept a smaller margin between the

buying and selling price per pound, and come out equally as well as in the case of long-keep steers. As already intimated, this line of work has merely been commenced, and, as yet, we have no definite recommendations to make. It is an important problem, however, and we trust that, in the course of two or three years, we may have something more or less conclusive to offer the public. The explanations regarding the advantage possessed by the short-keep steer are offered in the hope that they may help to clear up a point which is but imperfectly understood by the average feeder, and the problems we have set out to solve in our experiments, is just how great an advantage the short-keep steer possesses.

G. E. DAY.



## Horticulture.



In a California Forest.

## FORESTRY IN SOUTHERN CALIFORNIA.

By ROLAND D. CRAIG, B. S. A.

**S**OUTHERN California is so frequently referred to as the "land of beauty, sunshine and flowers," that the eastern mind is apt to picture it as covered with luxuriant, sub-tropical vegetation, always green and beautiful. This happy conception is rudely shattered as one looks out of the window of a Santa Fe train as it approaches Los Angeles on a warm July day. There is plenty of sunshine, to be sure, and though you are told by the Cali-

fornians that one does not feel the heat out there as much as back east, you are sensible of a certain warmness which makes you want to take off your coat, and perhaps your collar too. The orange groves with their dark green foliage are certainly beautiful, but they cover such a small portion of the country that they do not hide the bare, brown mesas of the valley, or the dry mountain-sides to the north, where the eye seeks in vain a patch of green grass or a decent

sized tree. As a forester, the writer felt somewhat as a sailor might if sent to the middle of a desert to pursue his vocation. The disappointment was, however, only temporary, for on further study Southern California presents a very interesting and important forestry problem. It is, as a worthy Congressman lately said, "To make two drops of water flow where one *flew* before."

The very life of that great citrus fruit belt depends upon the supply of water which comes from the long range of mountains directly to the north. Without this water the land is practically a desert, where greasewood, sage-brush and jack-rabbits struggle for existence; with it the far-famed orange and lemon groves are possible. The supply of water at present developed is sufficient to irrigate only a very small portion of the valley and the people have been forced to realize the fact that future expansion is impossible without more water. With this in view the U. S. Government through the Geological Survey and Bureau of Forestry has undertaken a series of investigations in the hope of conserving all the water possible for use in irrigating.

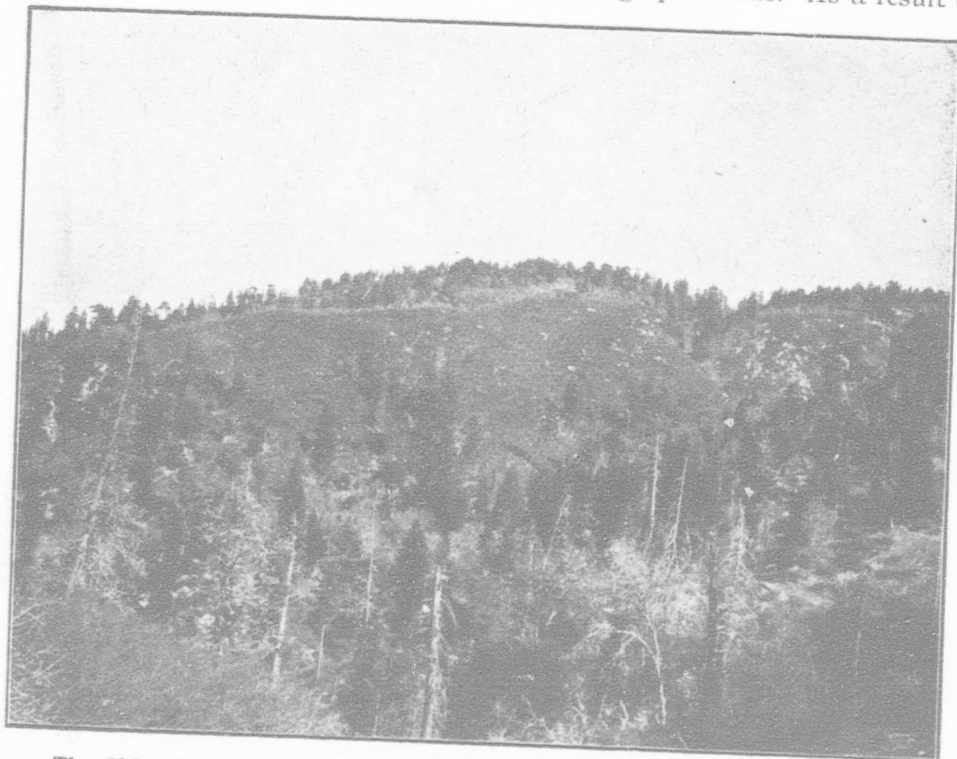
All the precipitation falls between October and April, and by far the greater part during December, January and February, so that it is of extreme importance that the watershed should have the most complete protection in order that the water may not be lost in winter floods, but be retained in the soil to feed the streams during the long, dry summer. As hinted before, the sun is hot, so hot that on the south slopes every-

thing becomes very dry, and as long as we have any record for, these mountain sides have been periodically burned over, till now, except in the canon bottoms and at high altitudes (over 5000 feet), the south slopes are treeless, and a low shrubby growth (chaparral) is the only protection the soil has. Many of the north slopes are also covered with chaparral, but frequently, fairly good stands of Live Oak (*Quercus chrysolepis*) and Big-cone Spruce (*Psuedotsuga macrocarpa*) remain as if the fires had run up the south slopes and stopped exactly on the crest, leaving these remnants of a forest on the north sides, above 5000 feet elevation, especially in the San Bernardino and San Gabriel Mountains, there is considerable timber growing in open park-like stands, but sufficiently dense to shade the ground and suppress all underbrush. The most important species in this timber belt are the Bull, Jeffrey, Sugar and Coulter Pines, the Incense Cedar and White Fir.

A most marked difference in the value of chaparral and timber as soil protectors is evident on these mountains. Under the pines, even where the stand is quite open, there is usually a good mat of needles covering the soil and there is very little evidence of washing, while under the chaparral there is seldom any litter and deep gullies are cut in the soil by the sudden run-off during the winter rains. In the regions covered by chaparral springs are hardly ever to be found, and streams with quite a large drainage area dry up during the summer. In timbered areas, however, there is a spring in nearly every little draw, which flows the year around

For the last fifty years lumbering has been carried on in the timbered regions, and much of the merchantable material has been removed. The first mills to operate were unable to handle the large sized material, so only medium sized trees were cut; later, mills with large machinery

an almost even-aged stand from 3 to 15 feet high, which in forty or fifty years will be ready to harvest again. This reproduction would, no doubt, have been general had it not been for the fires, which in California, as elsewhere, seem invariably to accompany lumbering operations. As a result of



The Skirmish Line in the Struggle Between the Pines and the Chaparral.

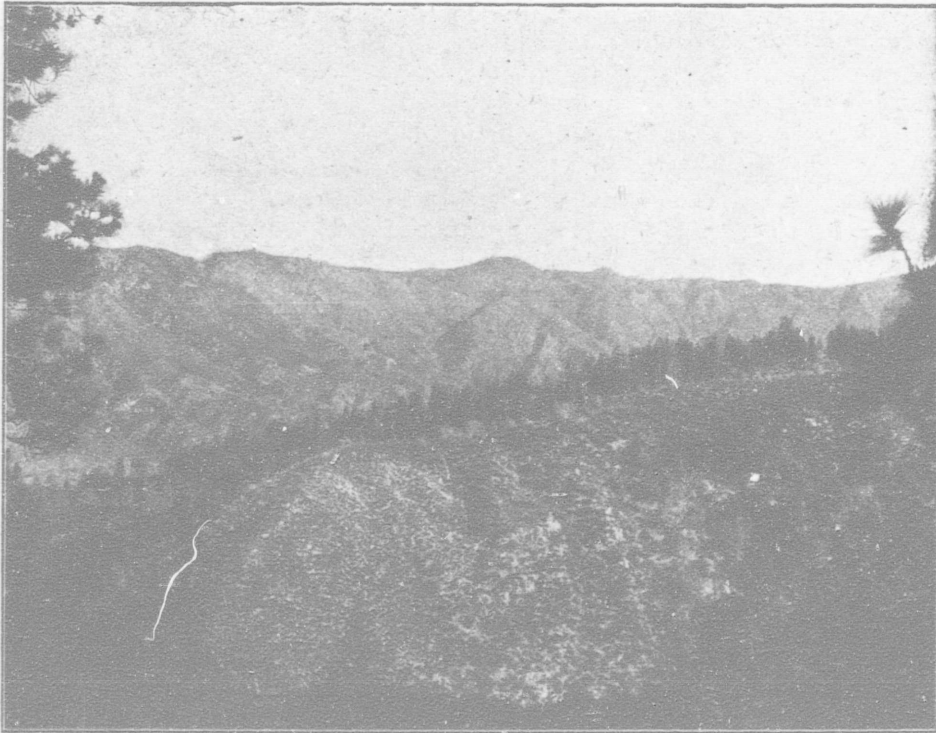
were introduced, and the big stuff taken out, and now it is found profitable to cut everything which will make box material for the packing of oranges. This process of successive cutting has resulted in splendid reproduction; the first cuts loosening up the seed-bed and letting in light for the young sucklings, and now, when the new stand is established and no longer needs protection, the old trees are being removed, leaving

these repeated fires the coniferous reproduction in many places has been completely killed out, and chaparral has taken possession of the soil.

From the standpoint of water conservation, as well as timber production, it is of the utmost importance that the forest should be extended rather than diminished. For this purpose, the first requisite is protection from fire by an efficient ranger

service, and by the enforcement of the laws against malicious and careless firesetting. Planting experiments have been started on the foot-hills in the vicinity of Pasadena, but, on account of the drouth, little success has so far attended the planting of conifers. The area that should be re-

A very important feature of California forestry is the growing of Eucalyptus on the mesas along the coast. The first eucalyptus were imported from Australia about thirty-five years ago, and now there are many fine groves and wind-breaks over 100 feet high throughout the



Nearing the Limit of Vegetation.

forested is so large and so difficult to get at that planting as a general policy is out of the question. If protected from fire, however, the forest will extend into the chaparral, and by the leaving of seed trees, and, perhaps, the sowing of seeds, or setting out of seedlings of more desirable species of chaparral or of hardy trees on poorly covered areas, the condition of the water-shed will undoubtedly be materially improved.

State. The Blue Gum (*Eucalyptus globulus*) has proved the most successful of the many species tried, and it is now used almost exclusively. It grows rapidly and produces a heavy, hard wood, excellent for fuel and piles for wharves and bridges, but is useless for posts or railway ties. I am afraid that the reader may think that I have fallen into the California way of "telling one bigger" when I say that I have measured a eucalypt

13 years old which was 136 feet high and 18 inches diameter at breast-high, but it is a fact, nevertheless.

As far as field work is concerned, the climate of California is not without its advantages, for all during the summer we were sure of having no rain to wet our blankets or grub, and we were able to travel without tents, unrolling our sleeping-bags wherever we could find a place level enough. Our camps were usually beside a noisy mountain brook in the bottom of a deep canon, but sometimes they were on the mountain tops, from which to the south we could look down on the cities and orange groves a mile or more below us, and, away out in the blue Pacific, islands 120 to 130 miles away were plainly visible to the naked eye. To the north we could see the Majava Desert stretched out below us like a relief map, its barren painted hills rising up like pyramids from the dry plains.

In the San Gabriel Mountains there are practically no wagon roads, and so to get from place to place we had to follow narrow, winding trails cut in the mountain sides, using a train of burros to pack our duffle. Burros are wonderfully sure-footed little animals, and, although they have ideas of their own about things, they are very useful in mountain work. The main advantage of burros over horses is that they do not require any feed except what they can pick up along the trails, with an occasional newspaper

or tomato can as a relish. Ours seemed particularly fond of the *Guelph Mercury*, probably because it was not quite so yellow as the American papers, to which they were accustomed.

As usual, there was a poet in our crew, and the following is one of his "efforts," which will give the reader an idea of the life of the "government goat" in California.

For the planting of a forest they have put  
us here to roam,  
With the mountains for a play-ground, and  
the chaparral for home,  
And on these sun-baked hillsides, where the  
sage-brush grows so free,  
In the dim and distant future a pine forest  
you may see.

My respects to Billy Hall,  
He's the guy what runs us all,  
And he'll do this bloomin' plantin',  
if it can be done at all.  
But askin' them what know it best,  
Hosmer, Miller and the rest,  
How, without a drop of water, can  
you plant the Golden West?

We've a cactus for a pillow, and a yuna for  
a seat,  
And our hob-nails, hot and burnin', raisin'  
blisters on our feet.  
But now these things we're used to, and we  
do not give a d—,  
For we're children of the Bureau, and we're  
stances of Uncle Sam.  
Try surveying as we've tried, on shank's  
mare, each mountain side,  
And you'll be so gol-darn thankful when  
you've crossed your last divide.  
Oh, it's better, better let alone, for its drier  
than a bone,  
Every blessed inch of country, from Mt.  
Sowe to San Antone.

### Orchard Management.

**W**ITH each succeeding year comes new ideas and new methods of orchard management. The old plan of allowing the orchard to take care of itself has long since been proved to be a mistake. In this age of enlightenment close attention is being paid to the conditions necessary to successful orcharding. Let us consider briefly a few of these essentials.

That cultivation of the orchard is, for the most sections of Ontario, the proper course to pursue, should no longer be doubted. Experience is our best teacher. We have on every side of us men in the horticultural world, practising thorough cultivation instead of the old time method of leaving the orchard in sod to take care of itself. Should we not then profit by their experience?

Early in spring, as soon as the ground is sufficiently dry to plow, the whole surface should receive a shallow plowing. In bearing orchards the depth should not exceed four inches. Deep plowing cuts off the feeding roots and as a consequence the trees receive a considerable check. On heavy soils all that has been plowed each day should be rolled down so that the lumps may be broken before they become hard. Succeeding tillage should consist of surface cultivation with such implements as the spring-tooth cultivator, disc harrow, or common drag. Tillage should be repeated at intervals of a week or ten days at least, and in case of a heavy rain it is well to work the ground as soon as possible to prevent the loss of moisture. About

the middle of July or the first of August cultivation should cease so that the wood may become sufficiently matured to withstand the winter. At the last cultivation a cover crop may be sown. The advantages of such a crop may be summed up briefly as follows: It improves the physical condition of the soil and adds humus; it holds rain and snow until they soak into the ground; it dries the soil somewhat earlier in the spring by transpiration through its leaf surface; it assists in rendering inorganic plant foods available; if a leguminous crop, it takes nitrogen from the air and leaves it stored in the roots; it prevents the leaching of plant food which becomes available late in the season.

The following are some of the most satisfactory cover crops which have been tried at the College: Hairy Vetch (*Vicia villosa*), which, when sown at the rate of 30-35 pounds per acre will, under ordinary conditions, form a dense mat before autumn. The vetch has an advantage over many other crops in its low dense habit of growth which keeps the fallen fruit from becoming dirty, and is not in the way during the harvest season. Rye, red clover, mammoth clover, crimson clover, and rape all have their place in the rotation of orchard cover crops. Rye makes a very rank growth and when plowed down, adds a great deal of vegetable matter to the soil. Rye is an excellent crop to improve the physical condition of stiff soils. The various clovers give excellent results, being low growing and nitrogen gatherers. Where crimson clover can be grown successfully, it ranks equal to hairy vetch. Rape may be used to advantage on stiff soil as it makes a



very luxuriant growth, but as it does not stand over winter, it is not so desirable as some of the other crops.

We cannot leave the subject of orchard cultivation without mentioning fertilizers. Any piece of land on which crops are annually removed requires some fertilizer to replace the elements of plant food which are removed with these crops. How often is the orchard made the exception to this rule? How many orchards throughout the country are actually starved to death by continuous cropping without any attempt to replace the elements taken from the soil?

Barnyard manure is the general fertilizer for orchards. Unleached wood ashes applied in alternate years with the manure furnish a cheap and desirable form of potash. Manures should be applied lightly every year, rather than heavily one year and none at all the next. If the trees are making too much wood growth, it is best not to apply nitrogenous fertilizers for a year or two until the equilibrium of growth is again established.

While the care of the soil is essential for the best results in orchard practise, the care of the tree must receive its share of attention if we desire to raise paying crops. Systematic annual pruning is one of the prime requisites to successful orcharding.

No two trees require the same amount of pruning. A good pruner must exercise great judgment and be able to tell at a glance what to remove to give the best results. The removal of large branches should as far as possible be avoided. If the trees are carefully watched from the

time of planting, very few large branches need ever be removed. Allow the sunlight to enter the head of the tree freely. Good colored fruit cannot be obtained from trees which are too thick, and unless fruit is of good quality and fine color the best prices need not be expected. All branches which cross should be removed, as cross branches make harvesting of the fruit difficult. Leave the head of the tree open to admit sunlight, thin enough to allow of easy climbing through the centre of the tree, and leave the head in as symmetrical a form as possible.

The subject of spraying is one of which we hear much at this season of the year. It is not the purpose of this article to deal with the details of the operation. It is sufficient to say that systematic and thorough spraying is an indispensable requisite to successful fruit growing.

H. S. PEART.

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Spring, Summer, Fall.

By J. O. McCULLOCH,

President Hamilton Horticultural Society.

One of the greatest drawbacks of a hardy garden is that at certain times there is apt to be a lack of flowers. In a short article it is impossible to give directions as to keeping up a succession of bloom all season, but I will direct your attention to three varieties for spring, three for summer, and three for fall, and after the beginner has mastered the cultivation of these he will soon find a way of filling up the gaps.

The queen of spring flowers is the Narcissus. Why more of them are not grown is hard to understand, as they are pre-eminently the finest cut-flower of the early spring, when we all turn our eyes so lovingly toward the garden. The first requisite of successful culture is a deep soil rich in humus. The advice always given in regard to the Narcissus has been to avoid stable manure, but this only holds good to a certain extent. The ammoniacal properties of stable manure are certainly injurious to the bulbs but good flowers cannot be grown unless the soil contains plenty of rotting vegetable matter, hence it is better to use well rotted manure, putting it a foot below the surface, where it will not come in actual contact with the bulbs and will hold moisture like a sponge. Large quantities of decayed leaves, together with about one and one-half ounces of bone-meal to the square yard will prove the best addition to the soil for Narcissus culture. The time to plant is the earliest possible moment that the bulbs can be secured in the fall. The earlier the planting the better the chance of success. As to the depth of planting the safest rule is to plant the bulb one and one-half times its own depth. It would be folly to give any list of the best varieties, as their name is legion; however, I will mention a few which I know to succeed in this climate:—Emperor, Empress, Horsefieldu, Incomparable, Stella, Sir Watkin, Barrie Conspicuous, Burbidger, Poeticus Ornatus, and Poeticus. Good descriptions of these varieties can be had in any fall bulb catalogue.

The Primrose is another spring flower of great merit, more particu-

larly the Polyanthus group, generally catalogued as *Primula Elatior*. They may be grown from seed or root division. The seed should be planted early in spring so as to secure strong plants by fall for next spring's blooming. A very fine variety is *Primula Verus Superba*, which is best propagated by root division. The plants should be lifted and divided as soon as the flowering season is over, generally about the 1st of June. It is necessary in this method to have a copious supply of water at transplanting time; in fact, large quantities of water are needed all through the summer season, and it is better to choose a partly shaded position if one is available.

The *Myosotis*, or Forget-me-not, needs no description here, though most people buy the plants when they are in full flower, and by the time they transplant them they have lost a great part of their beauty. The Forget-me-not is a perennial, but better results will be secured by growing it as a biennial, that is, planting the seed in August and bedding out the young plants early in September so as to get a good foothold before frost. Old plants never give as good results as the new ones.

To pick out three summer blooming plants is no easy matter, but Perennial Phlox is one we can not overlook. It is hardy, easily grown, and easily propagated. The plants are strong feeders, requiring large quantities of plant food and water; even then they soon exhaust the soil and should be lifted, divided, and replanted about once in three years. They are propagated by root division or cuttings. I have found cuttings the best where quanti-

ties were required. Take the cuttings in May and plant them in light soil in a shady corner; not forgetting frequent watering, and you will soon have nice little plants, which, if planted out in good, rich soil as soon as well-rooted, will nearly all bloom before frost. They can be grown from seed, but you cannot be at all sure what you have until you see the bloom. The taking of cuttings from a plant does not affect its blooming, except, perhaps, delaying the flowering time slightly.

The Foxglove is a plant which can hardly be classed as a perennial, though the plants frequently give good results for two or three seasons. In spite of this, it is not well to depend on them, except as biennials, sowing the seed early in spring, and getting good, strong plants by fall. In planting Foxgloves, it is well to remember that the best results are to be obtained by planting in masses, never singly; not less than half a dozen plants should be planted together, and the more the better. After the first mass of bloom in early summer, the flowering stems should be cut down, and another crop of bloom will be had from the side shoots.

*Campanula Medium*, or the Canterbury Bell, is another grand summer blooming plant. It is a true biennial, and must be grown from seed one year to flower the next, consequently the seed must be sown every spring. It is not quite as hardy as we might wish, still it is so desirable as to amply repay any extra care in the way of winter protection, even to the extent of wintering the plants in a

cold frame where necessary. The colors are rose, blue, and white, both single and double; and there is the Cup and Saucer Canterbury Bell, which is generally considered more desirable than the ordinary Canterbury Bell.

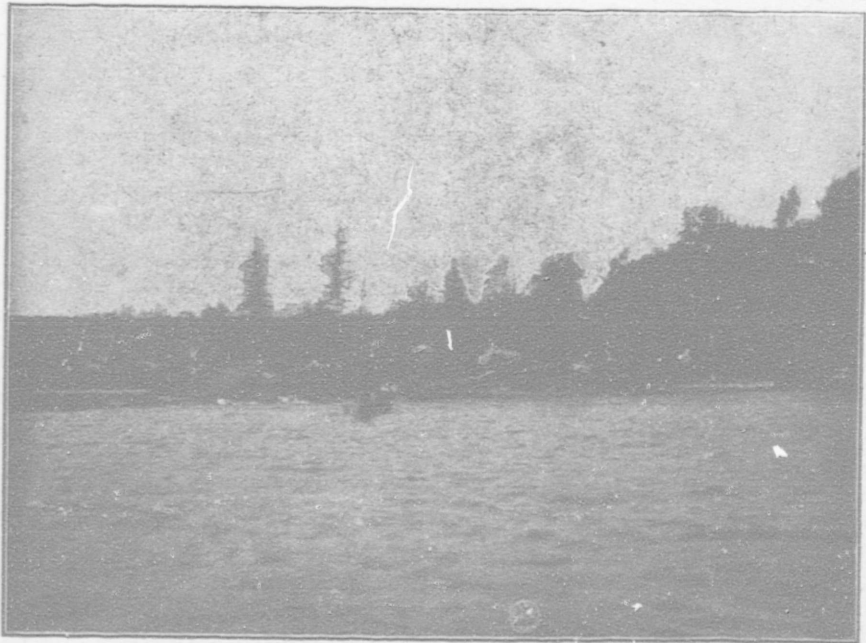
In fall flowers the Japanese Anemone takes a very prominent place, coming into bloom in mid-September, and lasting until hard frosts. They require considerable moisture, and this has led many to plant them in partly shaded positions, but, while they do well in such situations, the finest I have ever seen were grown quite in the open in a deep clay loam with plenty of manure and water. As a cut flower, the white Anemone Japonica Alba is one of the most desirable blooms we have the whole season through. Whirlwind is a semi-double white. That it is beautiful we all agree, but somehow I cannot help thinking, when I see the two together, that the Anemone is one of those flowers which cannot be improved by the addition of a few extra petals. There are several colored varieties, probably the best of which is Queen Charlotte—a bright, silvery pink.

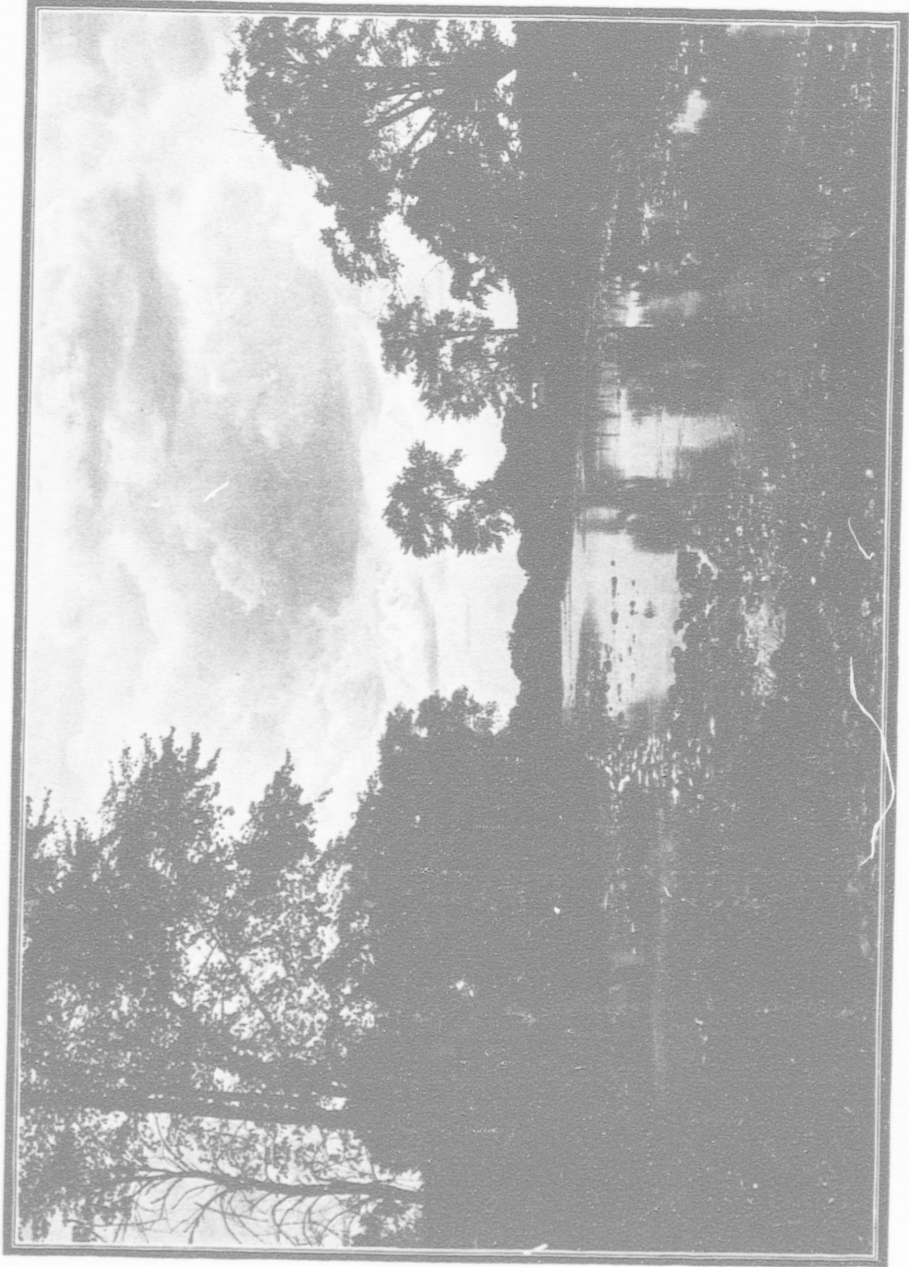
The Giant Daisy, *Pyrethrum Uliginosum*, is another September flowering plant which recommends itself to all who are fond of the yellow-centred white-petaled daisies. The word giant, in this case refers to the plant rather than to the flower, which is of medium size, while the plant grows from four to five feet high. The word *Uliginosum* signifies grown in swampy places, and herein lies the one condition which these plants demand. Water they must have; everything else

is of little importance, though better results can always be had in a rich soil, probably, however, because it will hold more water than a poor one. Propagation is by root division, and as the plants increase in size very rapidly, one small plant will soon supply all the stock needed.

*Campanula Pyramidalis*, the chimney Bell Flower, is another fall blooming plant which is very desirable, not so much for cutting as for garden decoration; the tall flower spikes

forming a perfect pyramid of bloom often five to six feet high. These plants are quite hardy in the neighborhood of Hamilton, but if the climate be too severe for them they can be carried over in a cellar. Propagation is best effected by the growing from seed, sown as early as possible in the spring, as the plants require to be fairly strong to insure blooming the following season. There are two colors, white and blue, both very desirable.





A Quiet Nook on the Winding Speed.

# The O. A. C. Review.

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MAY, 1904.

## Editorial.

**A** *The Ontario Agricultural College College needs a printing Press. press, modern and up-to-date in every respect.* This sudden announcement may appear somewhat startling to our friends, but it is a fact that becomes more and more forcibly impressed upon us with each succeeding issue of the REVIEW. We are now publishing a magazine of one hundred pages, and our total business exceeds that of many of our local papers throughout the country. Yet we are only in the dawn of our growing time, and the hand of progress points to the evolution of greater things in the not far distant future. Within a short time our paper will be issued during the full year, then as a semi-monthly, and eventually as a weekly paper. Published, as it will be, at the centre of agricultural education, the REVIEW can not fail to be-

come the leading agricultural journal in Canada. This prophecy may, perhaps, seem too optimistic, but it is the natural evolution of events in progress, and we do not hesitate to predict its speedy fulfillment. In view of these facts, is it not the most natural thing in the world to expect, at an early date, the establishment of a government printing press at our college? This press would take over the printing of the REVIEW, assist us in turning out a paper that would be a real credit to the institution and in addition do all other college printing.

The REVIEW is not, by any means, the only college institution that requires the services of the press. The different societies use large amounts of printed matter. Hand-books, constitutions, programmes, etc., are constantly needed, and these would

provide job-work for this department. In addition to this we have the printing required by the college proper. Circulars, bulletins, reports, etc., could be handled by our own press with even greater efficiency than under the present system.

What we have said is for the present. What of the future? Our college will not long remain a small institution with only seven or eight hundred students in attendance. We have become the seat of Agricultural, Forestry and Domestic Science Education in the Dominion, and ere long the register will show, not hundreds, but thousands of students who own the O. A. C. as their Alma Mater. Will this influx of students not lead to a large increase in the usefulness of our various college organizations and call, more than ever, for the services of the printing press?

In answer to all this we may be told that it is not customary for a college or university to own its own press or publish a paper for the general public. But we can only answer that if established custom stands in the way, so much the worse for established custom. We should be leaders, not followers, in matters of this kind, and now is the time to grasp the opportunity, establish a printing press of our own, do our own advertising, publish a paper that will be truly representative of the institution, and exerting our efforts in this direction we shall come more closely in touch with the people than any other college on the continent of America.

\* \* \*

**Nature Study.** To the student of our educational system one of the greatest changes of recent years has

been the wide-spread attention to Nature Study. Almost from their inception, our rural schools have adopted a system very different from this. Generation after generation has been trained in habits of thought which alienated the children from love of country scenes and rural life. But fortunately there lies deep down in human nature a law of contrast which brings forth the curious fact that a prolonged devotion to one idea leads to a reaction in which the direct opposite of that idea becomes dominant. This is clearly exhibited in the present case. The reaction has now set in, and we are in the flood-tide of things new, and to many of us entirely unknown.

What the outcome of the change may be is difficult to say. Much of success or failure lies with the pioneers of the work. Great changes may be brought about, and present ideas may be discarded, but in the end there will, undoubtedly, be engrafted upon our rural school system, changes of a radical nature which will bring our educational work into more complete harmony with our national needs.

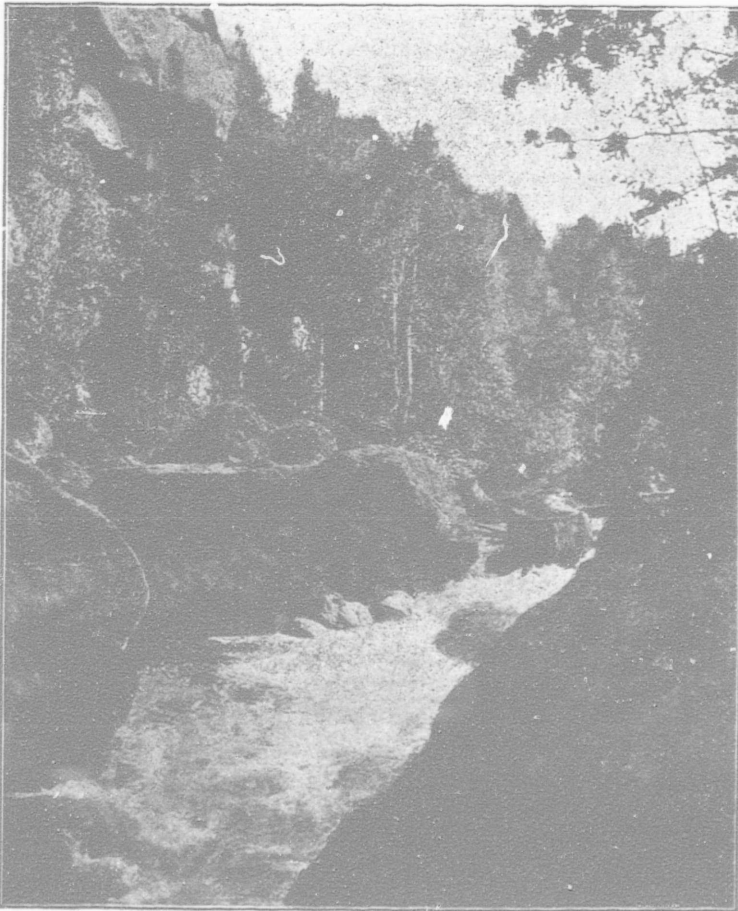
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**Au Revoir.** With this issue the REVIEW bids its friends good-bye for the current college year. During the few months we have been with you we have honestly tried to do our best, but like humanity in general we find ourselves human, vastly human, and in many cases we have failed to accomplish what we desired. Sometimes we have found fault with, at other times we have approved of existing conditions, but during the whole term, we have had no other object than the welfare of our college

and the strengthening of everything that would lead to her still greater prosperity in the future. Throughout the entire year we have had better ideas, and higher ideals of what a college paper should be, than our puny efforts were ever able to bring forth, but such is the life of a college

student that what is desirable cannot always be obtained.

I wonder if ever a song was sung  
But the singer's heart sang sweeter?  
I wonder if ever a rhyme was rung  
But the thought surpassed the meter?  
I wonder if ever the sculptor wrought  
Till the cold stone echoed his inmost thought  
Or if ever a painter, with light and shade,  
The dream of his inmost soul betrayed.





## Our Old Boys.



W. J. Kennedy.

Mr. W. J. Kennedy, whose portrait we present above, is another son of the O. A. C. who has found fame and fortune under the shadow of the American Eagle. Mr. Kennedy came to the college in 1896, and after the two years of his associate course left for Ames, Iowa. He graduated from there two years later, and at once accepted a position on the Animal Husbandry Dept. of Illinois Exp. Station. His success in this work was remarkable, and shortly afterward he was called back to Ames, becoming assistant to Prof. Craig. In a short time Mr. Craig's health failed, and Prof. Kennedy took charge of the work. Since that time his progress has been meteoric. He has now full charge of the Dept. of Animal Husbandry, with five assistants. In addition to this, he is vice-director of the experiment station, and expert in animal husbandry for the United States Government Department of Agricul-

ture. He has lately been granted a full year's leave of absence, and will go to Europe to make some special investigations for the U. S. government. Although only about thirty years of age, he has been very successful in his attempts to popularize agricultural education in Iowa, and the growth of the various short courses under his management has been very marked. The REVIEW joins with his many friends in wishing him continued success in his efforts for the advancement of American agriculture.

F. J. Macdonald, ('84), nephew of Sir William Macdonald, is mining at Coquillan, B. C.

Bully, Geddes! A boy! The REVIEW sends congratulations, and earnestly hopes that the new addition to the *Advocate* staff may prove in every way a hustling, worthy, son of the west.

Mr. L. Owen, otherwise known as "Louie," the artist, poet, phrenologist, and assistant bottlewasher of the 16th Field Battery, was delighted when, on calling at the college two weeks ago, he was presented with a handsome pipe on behalf of the students who went to Deseronto last June. The pipe was on hand nearly a year ago, but the famous parodist of that epic poem, "In the Good Old Summer-time," was not to be found. Those who spent that two weeks—

"Camping near the shady trees  
By the water side,"

with the "stately Captain Harrison," had as many "hearty laughs" at the

witticisms of "Louie" as the previously mentioned officer had when dealing that summary vengeance on his mutinous lieutenant.

Mr. I. N. Beckstedt, B. A. ('88), who was Dean of the Residence two years ago, has recently passed his theological examinations at Queen's with high honors. He won the Glass memorial scholarship in church history, value \$30, and divided the Mackie scholarship in the early apologetics, value \$25, with H. G. Wallace, B. A., of Hamilton. Mr. Beckstedt is well remembered by many who are still at the college, and by many more who have left our halls forever.

#### Ex-Students of the West.

"Scarce uplifted is the curtain to display  
the rolling plains,  
Conquered by a stalwart people having  
freedom in their veins;  
Having freedom in their veins as the peaceful  
scene unrolls,  
Having freedom in their veins which  
inspireth mighty souls,  
Mighty souls that, high and holy, as Time's  
throbbing pulses beat,  
Praise their God, the Lord Almighty, for  
the blessings of the wheat."

More than two decades have passed since the first student withdrew from the halls of agricultural education at Guelph to seek a home in Canada's Prairie-land. During all these years there has been a steady stream; small at its beginning, but gradually expanding, until to-day it is numbered by almost two hundred. Their history in the land of their adoption, were it written individually, would be interesting to those who adorn the "Old Camp Ground" to-day. As a class it is seen in the state of progress which the country between Port Ar-

thur and the Pacific Coast is at present enjoying.

Although the great percentage are still identified with agriculture, the profession of their early choice, yet they are to be found in almost every occupation in which men of great energy and high intellectual powers are required. We see one as superintendent of the traffic department of a great railway, another occupying a seat in the Legislature, a third as Live Stock Commissioner, a fourth as Superintendent of Institutes. A few as ministers of the gospel, others as doctors, managers of implement companies, and dealers in real estate. Among those who are still closely identified with agriculture, not a few are a credit to the Institution at which they received their agricultural training, for some of the best kept farms in Manitoba, British Columbia, and the Territories, are directed at the hands of ex-students of the O. A. C. In all corners of the Great West they are to be found. In the lands of the Red River Valley they are showing that agricultural education is no misnomer; up the Assiniboine, over the plains of Portage, and on to the hills that surround the Wheat City of Brandon, the hand that is being directed by a mind trained at Canada's first Agricultural Institution is demonstrating that those who think must govern those who toil. Follow the Little Saskatchewan, if you will, to its head waters, the line of the M. and N. W. Railway, to its Yorkton termination on the road that leads to Dauphin, you will find them—"The Old Boys" of the O. A. C., and proud to be known as such. In the Territories the story is the same, whether

on the banks of the North Saskatchewan, in the valley of the Qu'Appelle, where lives a worthy representative, the chief of Western Canada's greatest farmers' organization—The Grain Growers' Association; or on the plains, where the cow puncher roams in his glory, and on further north to where the railway leads to the Twin Cities of the north—Edmonton and Strathcona—the story of the boys with colors red and blue is changeless. In British Columbia, too, there are many, and in all the fertile stretches they are reminding those around them, that a course in an agricultural college fits a man for better work.

It was in July last that a happy thought led to the organization of an association calculated to join the scattered members of this great family closer together, and bind them by those cords of friendship which are linked so intimately in the memory of every young Canadian who has at any time wandered within the halls of that noble structure that now adorns Guelph's College Heights. A considerable number have already enrolled as members, and the list is rapidly growing. During Live Stock Convention week in Winnipeg three months ago, a banquet was held, and an interesting evening was spent. A number were also gathered together

recently during Exhibition week at Calgary, when for an hour or more the pleasant memories of the old days were revived, and the boys, whose new homes are far from the old fire-sides, forgot the great distance that separated them, and were in thought and story once more within sight of Canada's Royal City, Guelph.

At a recent meeting of the Board of Trustees of the Iowa State College, Prof. W. J. Rutherford, assistant professor of animal husbandry, was made acting head of the department and acting chief of the animal husbandry section of Iowa Experiment Station during the absence of Prof. Kennedy. Prof. Rutherford has also been appointed expert in animal husbandry by the United States Department of Agriculture, and given direct supervision over the co-operative range sheep breeding experiments.

Prof. Rutherford is another old O. A. C. boy, who is doing well in the United States. He went to Iowa one year ago from the Ontario Agricultural College, and has won the respect and admiration of all who have come in contact with him either in the class-room or elsewhere. He is an earnest, careful, and enthusiastic teacher, an original and thorough investigator.

## Book Reviews and Exchanges.

THE second English edition of Bunge's *Physiological and Pathological Chemistry*, which is translated from the fourth German edition by Florence A. Starling, edited by Ernest H. Starling, M. D., F. R. S., Professor of Physiology, University College, London, and published by P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia, is a text-book in the true sense of the word and differs from the ordinary hand-book style of text-book in that while the latter contains a mass of statements and details both wearying and disgusting to the beginner, the book to which we would invite the attention of our readers, seeks to initiate and interest the student, and to acquaint him with the principal achievements of investigation in biological sequence.

The work is arranged in a series of twenty-nine lectures and, while tiresome descriptions of analytical methods have been carefully avoided, yet everything is introduced that is at present ripe for a connected account, especial care being bestowed on the references.

The organic and inorganic food-stuffs, their paths of absorption, and immediate destination are treated in an unusually able and thorough manner. In the processes of digestion the fermentative action of the pancreatic juice as well as ferments in general are discussed in the light of most recent discoveries and investigations. The action of the saliva and gastric juice, and of the intestinal juice and bile are shown at length in lectures ten

and twelve. Two lectures are written under the heading "Gases of the Blood and Respiration—Behavior of different Gases in the Processes of Internal and External Respiration." Lectures nineteen and twenty deal with the Nitrogenous End-Products of Metabolism, while the Function of the Kidneys and Composition of the Urine are clearly represented in lecture twenty-one. The origin of infection, discussed in lecture twenty-seven, is one of the most interesting in the book and settles once and for all the fact that diseases are not brought about simply by the entry of definite chemical substances into the tissues but by living organisms—"the contagium vivum."

A recent work in the field of current history is the *Anglo-Saxon Century* by John R. Dos Passos. Briefly stated the work gives a resume of the position of the different nations, and makes a strong appeal for the existence of an Anglo-Saxon Union, embracing every branch of the English speaking people throughout the world. This is to be brought about by the fulfillment of five conditions; viz.: Annexation of Canada to the States; absolute commercial freedom between the English-speaking peoples; a common citizenship between all citizens of the United States and the British Empire; coinage possessing the same money value and freely interchangeable everywhere and a uniform system of weights and measures; and finally an arbitration tribunal to decide all questions which may arise

under the treaty. These are his proposals, and although we cannot agree with him in all his opinions, yet we are bound to admit that throughout the whole book there is a breadth of thought and expression unfortunately too frequently absent in American books of this class. Many of the hopes of the author may come true some time short of the millenium, but the trend of American statesmanship has always been repellent, and Canada has seen little of that side of her Uncle's nature that would lead her to favor closer connections. A book such as this has a large field of usefulness. There is prejudice, deep-seated and groundless, existing in the United States against England, and this must to a large extent be ameliorated ere an Anglo-Saxon world-girdling union will become a mighty factor and power for the advancement of civilization. The book is published by G. P. Putnam's Sons, London and New York.

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"The Story of a Grain of Wheat," by Wm. C. Edgar, editor of the *North-Western Miller*, is a book well worth careful perusal. Few men are so familiar as Mr. Edgar with the wheat fields of the world, and in this little volume he gives a history of their development that reads like a romance. The first chapters are an historical sketch of the King of Cereals, and finally, he gives us an account of the development of the great northern spring wheat areas of the United States. Especially interesting to a Canadian is his description of what he aptly describes as "the wheat fields of to-morrow,"—our own Canadian West. A full account

of their rapid growth is given, special reference being made to the recent influx of American settlers. Mr. Edgar predicts that great changes in political conditions will probably result from this shifting of population, and that the tariff barriers will gradually melt away before a desire for freer trade which is bound to exist among people separated by only an invisible barrier; bound by ties of natural commercial contiguity. Altogether the book is a very interesting one and will prove excellent supplementary reading for any student of Agriculture. Publishers, D. Appleton & Co., New York. Price, post paid, \$1.10.

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In this age of agricultural advancement a practical knowledge of the elements of bacteriology is an almost absolute essential to the farmer or student of agriculture. One of the best works dealing with this subject is *Agricultural Bacteriology*, by H. W. Conn, Ph. D. It is not strictly a text-book, but deals with the matter more as a practical treatise of a difficult subject, and is, therefore, well adapted to the ordinary reader. Almost every form of bacterial life is discussed, and occasionally chemical fermentations are also described. For, in a work of this nature, it is impossible to draw definite lines between the different types of fermentation. Four interesting chapters are devoted to bacteria in dairy products, two are given to the relation of bacteria to miscellaneous farm products, and four to parasitic bacteria. Tuberculosis, which was for some time the fighting ground of the bacteriologist is well discussed. Prof. Conn claims for tuberculine, that, if proper-

ly used, it almost, without exception, enables the investigator to pick out the diseased animals. He says, "Tuberculine does pick out with great accuracy, all mild cases and clinical symptoms will pick out the rest. Altogether the book is an invaluable one to the farmer or student. It is published by P. Blakiston's Son & Co., Philadelphia. Price, \$2.50.

McMaster University Monthly is one of the best, if not the best, exchange on our list. Like the rest of things earthly, it is not perfect. We should like to see it better illustrated; the pages should be cut before they come to us—we always cut them—but despite these facts it is a front-ranker and top-notch in the field of college journalism and well deserves the highest praise.



## College Outlook.

### The Graduating Class of '04.

**W**ITH the passing of another year, another class of men leave the College with their B. S. A. degrees. This event, to which the Freshman looks eagerly forward, and toward which time hastens all too swiftly, is one of the epochs in a man's life, and in the history of a college. It is a momentous occasion for the institution, for the quality of its work is brought out by comparison with that of others. It is of supreme importance to the man, because he is facing life, equipped for work and laden with responsibility.

Doubtless, many such thoughts have occurred to the class of Naughty-Four, first coming to their minds when they entered in 1900, and demanding increasing attention as they advanced in their course. We shall not attempt to fathom their inmost thoughts, however, but shall try to give a brief account of their outward conduct as a class, during their college year.

According to historians, most of them entered as Freshmen, fresh and frisky, as the name would imply. Undoubtedly, their thoughts occasionally turned to their responsibilities and to the future, but, in the main, they were buoyant and free. They took part in sports and pleasure with all the abandon of light hearts and minds. As time passed, however, they became more serious and less sportive. At the end of two years, their numbers were reduced by half, but this class, in nowise daunted, pursued their onward way to that goal, the coveted degree. Here we find them, saddened and sobered by experience, but wise in all the learning of the Agricultural College.

They are all good men, excellent men, and possess the esteem of the students. Of their achievements on the field of sport, in debating hall, or efficiency in Y. M. C. A., and in work of the course, we can say that all are excellent. Their strong point, however, is their close application to the work of the course to the exclusion, probably, of all but the social features of life. For conquests in ladies bower they are celebrated, and many and frequent are their pilgrimages to the shrine of Beauty. But this is as it should be, and we may merely pause to congratulate the Romeos on their success.

As we are bidding farewell, we know that we shall miss them, and know that they regret their separation from college life. But it must ever be so. Therefore, let us join in wishing the fullest measure of success to the class of Naughty Four.

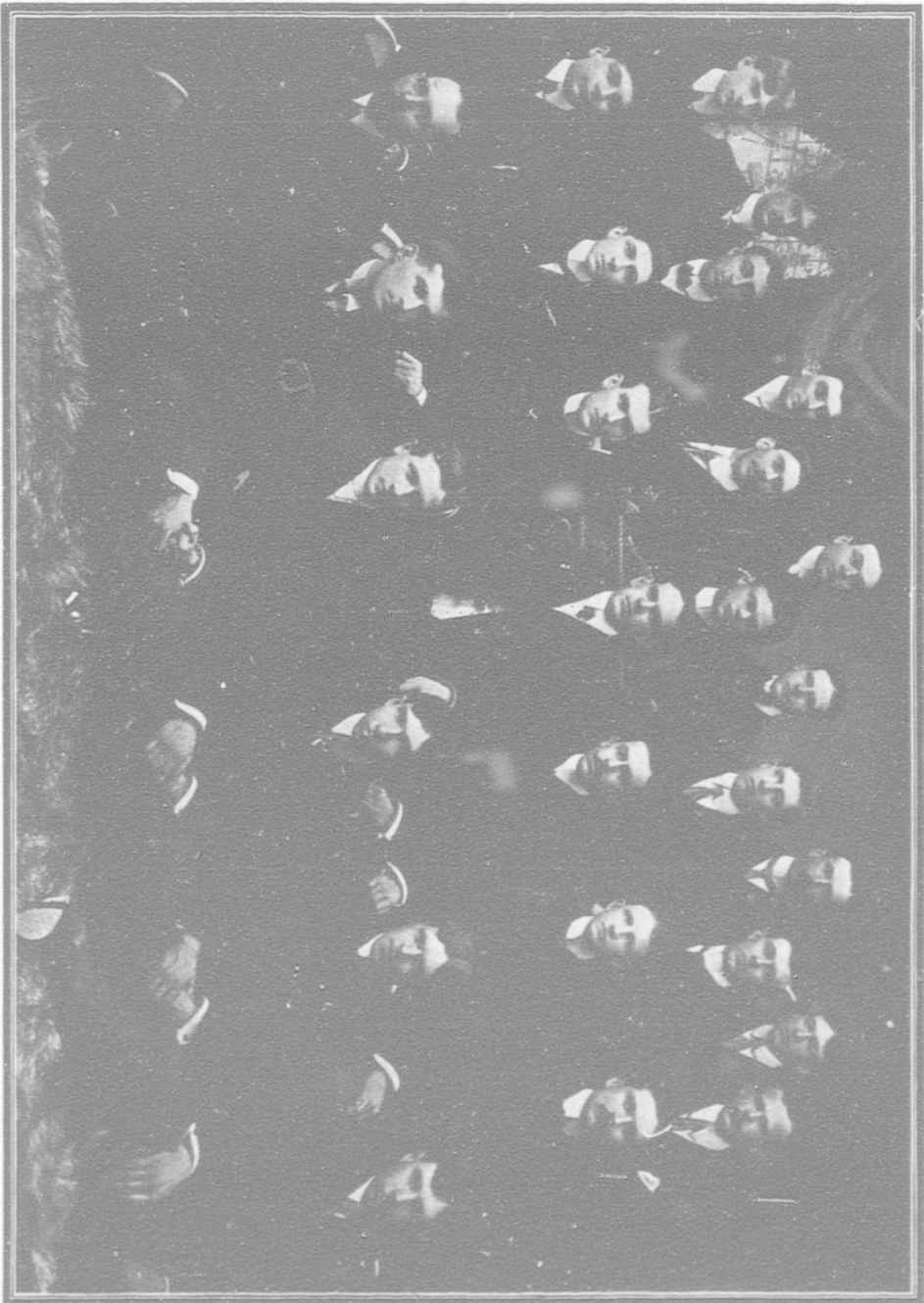
Members of the class, beginning at the left of the group:

*Standing, 1st row.*—Messrs. Guy, Johnson, Pancelo, Peltzer, Galbraith and Fansher.

" *2nd row.*—Baker, Barber, Readey, Arkell, Bray, Thom, Rivett.

*Sitting, 1st row.*—Avlla, Pickett, MacRae, Hamilton, (President), Bustamante, Gunn and Cutting.

" *2nd row.*—Buchanan, Dewar, Henderson, Fulmer, Everest and Carpenter.



The Graduating Class of '04.



# NATURE STUDY.



Wm. Lochhead, B. A., M. S.

Who has charge of the Nature Study  
Course.

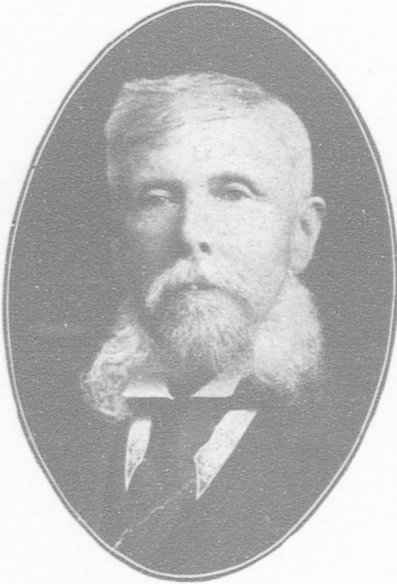
Probably no phase of education is receiving more attention at present than is Nature Study, or the obtaining of knowledge at first hand. If we rightly apprehend the signs of the times, our grand old mother, Nature, is to be studied, appreciated, and loved as never before. The great source of beauty, of inspiration, of truth; the perfection of art, the soul of poetry, the mysterious something which bespeaks a beneficent Creator, will be known to men, and loved because She is known. Beauty, harmony, and truth will fill their lives, learning from Her—the great visible teacher in whom all perfection dwells.

There is a time in the life of every child when Nature is a field of wonder. ment, an open book more delightful than all the tales of fairyland; when springing flowers, singing birds, babbling brooks, and green-clad hills excite the intense interest of the childish imagination with their vivid reality. All things that have color and life, present to children a great field for investigation. Perfection of happiness is theirs, when given unrestrained liberty to wander through green fields, over hills, or to play in the brook. The pale city children grow green with envy of the lot of their more fortunate country cousins. The whole vast out-doors wields a ceaseless fascination.

This is the time when the tendency toward investigation need merely be directed; it already exists, and only wise supervision and encouragement are required to give the child a deep interest in, and a lasting love for the beauties of Nature.

As development proceeds, however, the childish love for beauty and constant desire for pleasure is gradually lost in the practical problems of existence—not that these desires disappear, but that they are forced into abeyance by the necessity of concentrating the powers toward making a living. Unless it be an exceptional case, the child whose investigating tendencies have not

been encouraged, cannot in later life develop a taste for Nature Study. If the tide is not taken at its turn, if the desire to find out is not fostered as a pleasure in childhood, no power, however potent, can lead on the mind of the man to take delight in what can only come as a result from childish investigation. Such an attempt must inevitably be bounded by shallows and by



**F. O. Page, B. A.**  
Our College Ornithologist.

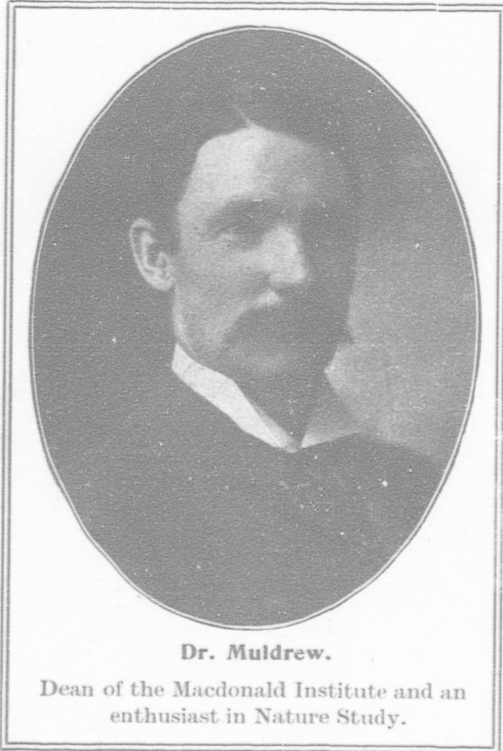


**J. W. Hotson, M. A.**  
Who is to be Principal of the new Consolidated School.

miseries. The close study of Nature's phenomena, except in so far as they have a practical bearing, is repugnant to the average man. The time when his interest in Nature might have been aroused, is past. While he may delight in beautiful scenery, in the sweet songs of birds, he can not take pleasure in the study of her minute details. He prefers to find his recreation merely by a general observation and appreciation, and to leave the study of her minuteae to specialists.

Unless every one became a specialist in Nature Study, of which we cannot well conceive, this would be true, even though every child's investigating tendency was directed in its natural course. All men cannot revel in the beauties of Nature. Some must be Nature students pure and simple—the majority must engage in other pursuits, and learn Her mysteries from specialists. The greater number may merely gain recreation from Nature, a recreation which the senses give, of Her scenery, melody, and harmony. She cannot give intel-

lectual gratification to the jaded, brain-weary merchant, or doctor, or farmer. If these wish to know her laws, they must either become Nature specialists, or study the work of such men. The tendency of the age toward specialization cannot be overcome. Notwithstanding progress and invention, the practical bread and butter problems are just as important now as they were two hundred years ago.



**Dr. Muldrew.**

Dean of the Macdonald Institute and an enthusiast in Nature Study.

Therefore, since specialization is the watchword of the age, since a man must be able to do at least one thing, and to do that well, we believe that Nature Study for adults, especially of those phases without a practical bearing, is largely a waste of valuable time. We may be specific, and refer at once to our Nature Study course of the third year. Practically all the students are men who have passed the stage of childish investigation, and, never having developed this tendency, cannot take an interest in the advanced work. Even the men whose early tendencies had been fostered and encouraged, the majority would find their interest disappearing in the face of preparation for the practical work of life. The few, of whom this is not true, will be naturalists, but the many, of whom it is true, will not be Na-

ture students. To these men, who cannot feel an interest, this course seems to stand in the way of more valuable preparation.

We do not wish to decry the value of such a course to interested persons, much less do we wish to imply inability or lack of enthusiasm on the part of our teachers. It would be hard to imagine more able, pains-taking, and enthusiastic teachers than Messrs. Hotson, Jarvis, Page, and Prof. Lochhead, who is head of the department. Each one a naturalist of repute, they have succeeded in creating an interest among their students, which is truly remarkable. Their careful direction, their excellent suggestions and watchfulness, could not fail to develop every embryo Nature student in the class, if such were to be found. And it is no discredit to them that even the best of teachers cannot create an interest where more practical considerations occupy the place of such interest.

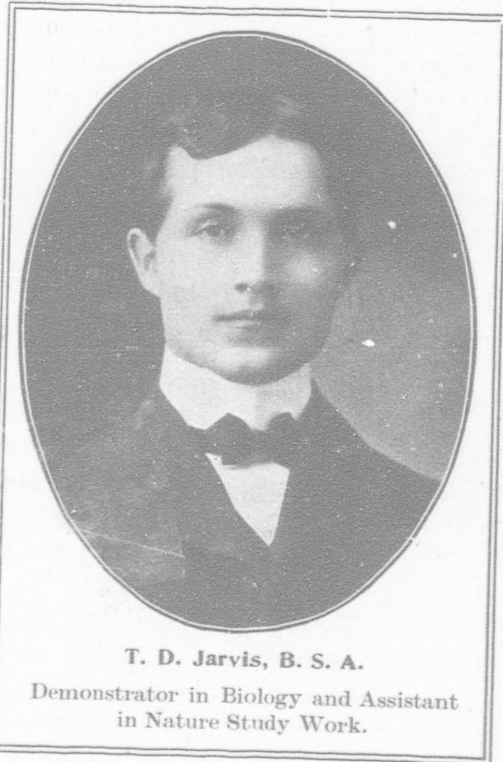
We believe that Nature Study in public schools is excellent and proper. The pupils have a living interest in the subject which makes the teaching comparatively easy. The presence of interest, and the absence of the distracting influences of later life, make this the ideal time for study which develops the aesthetic, and educates one to appreciate keenly all that is beautiful, harmonious, and grand. This, Nature Study will undoubtedly do for the child, for every student of Nature cannot fail to incorporate in his character the truth, the harmony, and the beauty which her kingdom present.

A broad foundation, gradually narrowing to a superstructure of special training, is, we believe, the kind of education required at present. Such education would be obtained by adding Nature Study to primary courses, at a period of life when it is interesting. This addition would complete the all-round training, which, as education proceeded, would gradually be replaced by a specialty.

No one who thinks, <sup>the</sup> doubt the value of Nature Study in schools where a living interest only requires wise direction, but we question the advisability of compelling men who cannot feel a personal interest in the subject, to take such a course. No man can make a success of work that is distasteful to him, and to be forced to do such work, is to increase his dislike for it.

It may be urged that teachers are necessary to inaugurate this movement. Undoubtedly so, and there are men interested in the subject who will make excellent teachers, but *teachers* will never come from the ranks of the uninterested. The utmost that can be done for the average man, is to show him the advantages of Nature Study in public schools, and to enlist his interest and support. This, we believe, has been done, and are confident that when the class of '05 go into active work, they will aid as much as possible to bring in the new era of Consolidation and Nature Study.

Our contention, however, has been against introducing Nature Study at the wrong time of life, and we have merely endeavored to show the feeling of the majority on this subject. We feel that the course is all that it could be, and that our instructors have done all that they could do, but find it impossible to become interested in objects which belong to earlier life.



T. D. Jarvis, B. S. A.

Demonstrator in Biology and Assistant  
in Nature Study Work.

### The Sophomore Banquet.

**T**HE Fifth Annual Banquet of the Sophomore Class was held at the Commercial Hotel, on the evening of the 15th of April, and, in the opinion of those who attended former ones, was the best to date.

The warring elements and snow-bound cars were unavailing to check the enthusiastic esprit de corps of the Naughty Six men, who sat up to Reinhardt's splendid tables from 10 p. m. to 3 a. m., making the most of their last hours together on Second year, with loquacity, lyrics and laughter.

The striking features of the banquet were the vigorous point and wit of the speakers, and the high spirits of the men generally, despite the absence of intoxicants. The speakers represented city and farm, and no less than five different countries, and originality and humor characterized the addresses to the most time-honored toasts. Messrs. Staynor, Atkin, Taylor and McMillan will be heard from later as public speakers. Marino, in speaking for classmates of Argentine, was inimitably droll, and showed a facility for acquiring the North American style of humour.

The toast list was managed happily, and the chairman, in his opening address, struck a note of harmony, which was maintained throughout the evening. Of the staff, Messrs. Cumming, Gamble, Peart, Day, Pickett and Reid were present, and those of them who spoke, contributed greatly to the fun and good sense to which the boys listened.

The singing of Prof. Kelly and Mr. M. C. Cutting was a most enjoyable feature of the evening. The instrumental duet by Messrs. Weir and McCredie seasoned the discourses of many speakers with admirable effect, whilst Thain's orchestra kept things going "ship-shape" during the banquet and other periods of the evening.

Below will be found the toast list and the names of those who so materially helped to make it the success it was:

"The King," by President F. C. Hart.

"Our Country," proposed by J. P. Atkin, responded to by J. Bracken.  
Orchestra.

"Our Alma Mater," proposed by D. H. Jones, responded to by H. S. Peart,  
B. S. A.

Solo, by Prof. C. W. Kelly.

"The Boys of '06," proposed by Prof. M. Cumming, responded to by H.  
R. MacMillan.

Address, H. R. Somerset.

"The Ladies," proposed by H. E. Taylor, responded to by H. B. Smith.

Instrumental, Messrs. Weir and McCredie.

"Our Classmates from Other Countries," proposed by H. S. Stayner, re-  
sponded to by T. F. Ransom and A. Marino.

Solo, M. C. Cutting.

"The Staff," proposed by J. F. Monroe, responded to by Prof. W. P. Gamble

Address, W. H. Day, B. A.,

"The Press," proposed by A. L. McCredie, responded to by H. K. Cockin.

Solo, Prof. C. W. Kelly.



Macdonald



Notes



The mud of the grounds shows some signs of drying up at last, and it is fervently hoped that before it reappears in the autumn our walks will be ready for use.

We are greatly indebted to the college boys who so kindly allow the girls the use of their tennis courts. Next spring we hope to return the compliment, when the Macdonald campus will be in good shape.

One of the boys of the Third year, by his constant association with some of the Eastern Macdonaldites, has become so far advanced in the art of cooking as to be able to make a cake noted for its lightness and chocolate icing.

With the coming of spring, nature study commenced. Once a week the nature study class goes out in search of birds, flowers and trees, under the guidance of Dr. Muldrew. Every day each girl makes an "observation," and puts it down in a book for that purpose, which no doubt will be famous some day.

The young men who are taking the teachers' course in Manual Training look lonesome. They evidently feel themselves in a very decided minority,

but their courage may revive under the influence of the gay young graduates from the Normal College at Hamilton. A dozen or more of these are expected in the beginning of June, in time to catch a few glimpses of the Macdonald Girls before they are gone for the midsummer vacation.

The committee appointed some time ago to select a design for a pin suitable for the Macdonald students has reached a decision. A very appropriate emblem, showing the crest and motto of Sir William Macdonald, with due reference to our relation to the Ontario Agricultural College, is being prepared by Henry Birks & Son, of Montreal, and will be offered for sale in a few days. These will be made in two qualities of like design, the materials being silver and gold.

A luncheon, in honor of President and Mrs. Creelman, was given in the apartment on Tuesday, May 10. This is the first luncheon of the Macdonald Institute. It was given or prepared by Miss Strong and Miss Miles, and the guests were President and Mrs. Creelman, Mr. and Mrs. Hoodless, Miss Watson and Miss Given.

This is but the beginning of many luncheons to be given this term and next by the girls.

The weekly nature excursions have introduced many interesting neighbors. The numerous kinds of sparrows are a source of endless trouble to the beginner, from the sedate Pres-Pres-Presbyterian to the confiding chip-a-chip-a-chip-a-of the garden. Many rarer visitors are now in the woods and fields, including the brightly-dressed and musical warblers, the vireos, the nesting bluebirds, and the bobolinks. The trees are putting on their blossoms and foliage, and the wild flowers appear in increasing numbers. Not much can be learned in a few afternoons, but it is worth while to begin in the hope of doing more in the future.

For the past month and a half the Seniors have been taking practical work in Bacteriology from Prof. Harrison. The work is now finished, and the weekly demonstrations will begin again. The demonstrators for the remainder of the term are as follows:

- "Quick Breads," by Miss Miles.
- "Chicken," by Miss Strong.
- "Made-over Dishes," by Miss Robertson.
- "Cake," by Miss Black.
- "Spring Vegetables," by Miss McVannel.
- "Milk Diet for Invalids," by Miss McEwan.

## Athletics.

Summer sports are in full swing. Every day, students, playing cricket, tennis, lacrosse, and association football, may be seen on the campus.

treasurer. A large number of the students have become members, and the game promises to be quite popular.

The Cricket Club has reorganized, and our boys, under the able guidance of Prof. Harrison, as captain, promise to uphold the good record made last year. Games will be played with Galt and other clubs. In all, the team expects to take part in about ten matches during the season, and we wish them all success. The following officers have been elected:—President, Pres. Creelman; vice-president, Prof. Gamble; secretary-treasurer, Mr. E. G. de Coriolis; captain, Prof. Harrison.

Perhaps the game that receives most attention is Association Football. A club has been organized, and it has also been decided to amalgamate with the Guelph City team, and enter the W. F. A. as the Guelph O. A. C. The following officers were elected:—President, W. C. McKillican; secretary, R. E. Mortimer; treasurer, H. W. Scott; captain, A. J. Hand. Also the following were elected as representatives on the Guelph O. A. C. committee:—Vice-president, H. McFayden; assistant manager, A. J. Hand; committeeman, H. W. Scott.

The Tennis Club has also been reorganized, with W. J. Lennox as president, and J. B. Hoodless as secretary-

A practice game between the city and the college on Saturday after-

noon, May 7th, resulted in a score of 2-2. The team lined up as follows :

O. A. C.		CUELPH.
Hand.	<i>Goal.</i>	Barker,
Everest,	<i>Backs.</i>	Henderson,
Mortimer.		McDonald.
Cooper,		Beattie,
Wade,	<i>Half Backs.</i>	Partridge,
McKillican.		Rudd.
Scott,	<i>Left Wing.</i>	Marshall,
Ballantyne.		Bernhardt.
McFayden.	<i>Centre.</i>	Bain.
Warner,	<i>Right Wing.</i>	Willison.
Bower.		Butterworth.

The score is not an indication of the relative strength of the teams, as the college had the best of the argument throughout, and the city forwards rarely got past the college half-back line. The city scored both their goals in the first-half. Willison scored the first one, and Bain the second. The college did not count anything in this half, although the play was at the city end most of the time. In the second half, the college scored two and the city none. The first one was from a pretty shot by Ballantyne, and the second was shot by Warner on a pass from the left. Five minutes each way extra failed to break the tie. For the city Bain, Willison and Barker played a good game, while for the college, Ballantyne, McFayden, Warner and Wade were probably the most noticeable. A. J. Logsdail acted as referee to the satisfaction of all.

We are pleased to note the alterations and improvements being made

in the basement of the gymnasium. The swimming bath is to be made fifteen feet longer, the lockers and other obstructions removed from the sides of the bath, and all the old wooden floor replaced by cement. These changes will give more room for swimming, and better access to the bath. They will also make the basement a bright clean place, instead of the dark dirty dungeon it was before. Greater interest in aquatic sport should result from this improvement, and next year we hope to see a large number of the boys joining in this excellent exercise.

While this is a move in the right direction, there is another improvement that should be made to our gymnasium, and that is the installation of basket-ball. There is no occasion here to enlarge on the advantages of this excellent sport, which is quite well known, save to point out how it fits in when football and hockey fail. In any kind of weather, and at all seasons, it is an interesting, exciting game, which gives to its participants plenty of healthy exercise and relaxation from their mental labor. Our gymnasium is well suited to basket-ball. It is large enough and of the proper dimensions. The only difficulty, and it is not a great one, would be in protecting the windows and lights. Movable screens could be made for the windows, so that when occasion demanded they might be removed. We hope, at no distant date, to have basket-ball added to our college sports.



While the history of athletics, at the Ontario Agricultural College, during the past year has been one of progress, yet the minds of all those, who have the interest of College sport at heart, have been impressed with one need. This is the lack of an athletic trainer or director. In every branch of our sports this need is felt. Most of our students are boys from the farm, whose knowledge of athletics is necessarily somewhat limited. In rugby, for instance, we are greatly handicapped. Many of the boys never saw a rugby ball before coming here, much less have they played the game. And while those few who have a knowledge of the game try to show the learners, yet the results are not as satisfactory as they would be were there a regular trainer who knew the game, and knew how to teach others to play it. Great credit is due to the football manager, Mr. Milligan, for what he has done in this matter; but his duties prevent his presence at practice, and what he does is simply the outcome of his kindness, and is

unpaid for. Similarly an athletic director could teach the students in other outdoor sports. But it is in the gymnasium that the trainer is most needed. While other branches of athletics have shown great progress in spite of obstacles, unfortunately our indoor sports are not as good as formerly. This is a state of affairs that we fain would deny, but it is nevertheless true, and the reason is not far away. The students come here without any knowledge of a gymnasium, and there is no one to teach them. It is one thing to tell a person what to do, and quite another to show him how to do it. Boys cannot learn the different movements on the bar, rings, etc., without first being helped and guided through them. We have men here with as good physique as ever we had, or as good as any other college has; and all that is necessary to make gymnasts of them is training. and until the necessary gymnasium instruction is provided we cannot hope to have first class indoor sports.

## FINAL EXAMINATIONS.

## FIRST YEAR.



R. M. Winslow.

1, Winslow, R. M.; 2, Kennedy, J. W.; 3, Bunting, T.G.; 4, Higginson, T.D.; 5, Baker, J.; 6, Twigg, C. B.; 7, Wheeler, H. C.; 8, Willows, J.H.; 9, Morse, P. L.; 10, Harkness, J. C.; 11, Jull, M. A.; 12, Montgomery, C. G.; 13, Culham, H. A.; 14, Stewart, W. F.; 15, Hosmer, S. A.; 16, Clowes, F. A.; 17, Meek, M. W.; 18, Knight, G. E.; 19, Binnie, T. H.; 20, Broderick, A.D.; 21, Greenshields, J. M.; 22, Hudson, H. F.; 23, Dennis, F.H.; 24, Brownlee, M.C.; 25, Byers, W. E. \*4; 26, Lewes, H. S.; 27, McVicar, G. D.; 28, Clark, C. P.; 29, Raymond, M. K.; 30, McKinley, N.J.; 31, Sanders, G.E. \*3 and 7; 32, Middleton, F.; 33, Jacobs, W.S.; 34, Dias, P.; 35, Miller, H. H.; 36, McBeath, R.J.; 37, McKinnon, G. \*4; 38, Ballantyne, P. M. \*4; 39, Chisholm, T. B.; 40, Fairbairn, J. B.; 41, Baldwin, M.M.; 42, Moyer, E. R. \*5, 9 and 10; 43, Bray, F. R. \*6 and 8; 44, Morse, T. B. \*1; 45, Reeves-Palmer, T. C.; 46, Jordan, H. A. \*4; 47, Porter, E. H. 48, McBride, W.T.; 49, How, L.M. \*9; 50, Miller, W. J.; 51, Fernandez, H. B. \*4; 52, Lough, R. W.; 53, Woods, J. \*2 and 4.

1. English Grammar and Composition.
2. Arithmetic.
3. Book-keeping.
4. Physics.
5. Chemistry.
6. Geology.

7. Agriculture.
8. Apiculture.
9. Veterinary Anatomy.
10. Veterinary Materia Medica.

## SECOND YEAR.



J. Bracken.

1, Bracken, J.; 2, Ballantyne, R.; 3, Tennant, L.; 4, White, G. G.; 5, Smith, H. B.; 6, Hart, F. C.; 7, Lund, T. H.; 8, Nixon, C. C.; 9, Dickson, J. R.; 10, Klink, C. R.; 11, Jones, D. H.; 12, Colwell, H. H.; 13, Tucker, H. S.; 14, Northcott, S. A.; 15, Kitchen, A. F.; 16, Baker, M. R.; 17, Middleton, M. S.; 18, Bailey, C. F.; 19, MacMillan, H. R.; 20, Kennedy, A. B. \*10; 21, Scott, H. W.; 22, Munroe, J. F.; 23, McKay, K. G.; 24, Marshall, C. A.; 25, McKenny, A.; 26, Taylor, H. E.; 27, Breckon, W. D.; 28, Halliday, C. I.; 29, Weylie, D. B.; 30, Elderkin, J. B.; 31, Bean, W.; 32, Evans, W. G.; 33, Sloan, R. R. \*3; 34, Hawtin, A.; 35, Stayner, H. S.; 36, Logsdail, A. J.; 37, Leavens, H.; 38, McKenzie, J. 39, Ramsay, R. L.; 40, Duncan, R.S.; 41, Zubiar, A.; 42, Atkin, J. P. \*11; 43, McVannel, A. P.; 44, McKay, A. J. \*4; 45, Mulloy, G. A.; 46, Manchester, P.; 47, Birley, R. B.; 48, Metcalf, H. M.; 49, Marino, A.; 50, Robertson, A.; 51, McDonald, C. M.; 52, Weir, D. \*8; 53, Sumner, A. L. \*6; 54, Gamble, T.; 55, Murray-Wilson, J. G. \*9; 56, del Carril, A.; 57, McBeth, D.; 58, Reid, W. J. \*4; 59, Monkman, R. K.

\*1 and 4; 60, Smillie, W.\*4; 61, Somerset, H. R.\*5, 6 and 7; 62, Brown, L. A.\*3, 8 and 9; 63, Hutcheson, J. H.\*2 and 6; Knight, T. M.\*4, 5 and 7.

- \* 1. English.
- 2. Thesis.
- 3. Physics.
- 4. Chemistry.
- 5. Botany.
- 6. Bacteriology.
- 7. Entomology.
- 8. Animal Husbandry.
- 9. Judging cattle, sheep, etc.
- 10. Poultry (written).
- 14. Poultry (practical).

THIRD YEAR.



H. G. Bell.

1, Bell, H. G.; 2, Leitch, A.; 3, Bower, J. E.; 4, McKillican, W. C.; 5, Howitt, J. E.; 6, Westover, C. A.; 7, Bustamante, D.; 8, Evans, J.; 9, Wade, R. W.; 10, Esmold, C. W.; 11, Hoodless, J. B.; 12, Mayberry, H.; 13, Brereton, F. E.; 14, Hand, A. J.; 15, Mason, A. W.\*3 and 4; 16, Ledrew, H. H.; 17, Lennox, W. J.; 18, Mortimer, R. E.; 19, McFayden, H.\*4; 20, Panelo, F.; 21, Rudolf, N. N.\*3, 4 and 5; 22, Whyte, G. G.\*1; 23, Deachman, R. J.; 24, Prittie, F. H.\*1; 25, Chisholm, J.; 26, Bartman, R. W.\*3 and 4; 27, Granel, J.\*1; 28, Warner, G. C.\*1 and 2; 29, Barberee, G. L.\*1 and 6; 30, Cooper, H. G.\*3; 31, Logan, F. M.\*4.

- 1. English.
- 2. Meteorology.
- 3. Inorganic Chemistry.
- 4. Organic Chemistry.
- 5. Quantitative and Qualitative Analysis.
- 6. Structural Botany.

**First Class Honor List.**

HONORS IN DEPARTMENTS.

FIRST YEAR.

English (including English Grammar and Composition, Book-keeping and Arithmetic.)

Class I.—1, Kennedy; 2, Winslow; 3, Baker; 4, Higginson; 5, Bunting; 6, Meek; 7, Montgomery; 8, Twigg.

Physical Science (including Physics, Manual Training, Chemistry and Geology).

Class I.—1, Kennedy; 2, Bunting; 3, Winslow; 4, Twigg; 5, Sanders.

Biological Science (including Botany, Zoology and Horticulture.)

Class I.—Winslow.

Agricultural Science (including Agriculture, Apiculture, Dairying and Veterinary Science).

Class I.—Winslow.

FIRST YEAR SCHOLARSHIPS.

English and Mathematics.—J. W. Kennedy.

Physical Science.—T. G. Bunting.

Agricultural Science—R. M. Winslow.

SECOND YEAR.

Biological Science (including Botany, Bacteriology, Entomology, and Horticulture):

Class I.—1, Bracken; 2, Ballantyne; 3, Tennant.

Physical Science (including Physics, Engine, and Chemistry):

Class I.—1, Bracken; 2, Lund; 3, Tennant.

Honors in English (English Economics and Thesis):

Class I.—1, Dickson; 2, Bracken; 3, Ballantyne; 4, Hart; 5, Mac-Millan; 6, Tucker; 7, Smith; 8, Kennedy; 9, Stayner; 10, Tennant; 11, Lund; 12, Kitchen.

## THIRD YEAR.

Botany and Entomology :

Class I.—1, Bustamante; 2, Howitt; 3, Bell; 4, Wade.

Chemistry (Organic, Inorganic, Quantitative and Qualitative Analysis:

Class I.—1, McKillican; 2, Bell; 3, Westover.

Physical Science (Calorimetry, Meteorology, and Cold Storage) :

Class I.—1, McKillican and Westover; 2, Evans; 3, Bell and Leitch; 4, Wade; 5, Howitt; 6, Bustamante.

French and German :

Class I.—1, Leitch; 2, McKillican; 3, Bower; 4, Westover; 5, Bell; 6, Bustamante.

English :

Class I.—1, McKillican; 2, Bell; 3, Esmond.

## SECOND YEAR.

## PRIZES.

First in General Proficiency, First and Second Year work, theory and practice—J. Bracken, Seeley's Bay, Grenville, Ont.

Essay—"Macaulay as an essayist and a writer of English Prose," D. H. Jones, Bedford Park, York, Ont.

## MEDAL.

Governor-General's Silver Medal, First in General Proficiency, 1903-04.

J. Bracken.

## Locals.

To gain time—steal a watch.

Professor H.—as he noted some earth worms—"I intended to bring a bottle with me this afternoon."

Class—"Oh, we wish you had."

Mg. Bell—"What is that black, yellow, blue bird that turns white in summer."

Situation wanted—"Mother's help" amusing children under six a specialty. Address J. B. Elderkin.

She, after a narrow escape in the canoe—"A miss is as good as a mile."

Hammy, tenderly—"Yes, but a Miss is worth a dozen misses.

"One swallow does not make a Summer." Very true, but several swallows of certain drinks frequently make a Fall.

Favorite hymns for Sunday evening as selected by Messrs. Eddy, Esmond, Warner, and Bailey:

Lead me gently home.

Hold thou my hand,

Leave me not, for I am lonely,

Tis midnight and—

Say is your lamp burning?

Prettie, as he looks at the uncorked bottle—"Someone has gone and let all the vacuum out."



D. H. Jones,

Our College artist. The last of a series of illustrious men well-known in College circles.

The cuckoo clock proclaims the knell  
of parting day,  
And "Mother" goes, astute and  
thoughtful, she,  
Then "Father" upstairs plods his  
weary way,  
And leaves the girl to darkness and  
to me."

Why is a Chinaman the greatest  
curiosity in the world?

Because he has a head and tail on  
the same end.

Minister (on Sunday)—"My boy,  
what are you fishing for."

Boy—"Fer fish, of course. What  
yuh think; elephants?"

Judge Baldie—"Some great man  
says that music hath charms to  
soothe even the wildest beast."

She—"Shall I play for you?"

"Evolution is an integration of  
matter and concomitant dissipation  
of motion; during which the matter  
passes from an indefinite, incoherent  
homogeneity to a definite coherent  
heterogeneity; and during which the  
retained motion undergoes a parallel  
transformation."

We always thought that, but Spen-  
cer got ahead of us in expressing it.  
Next!

Prof. Jarvis, to nature students—  
“Now, don't take my word for any-  
thing.”

As Mason stood on College heights,  
His head was in a whirl,  
His mouth and eyes were full of hair,  
And his arms were full of girl.

Veterinary examination paper—  
Name the bones of the donkey's skull.

Hart—“I have them all in my head  
but I can't just think of them.”

President Harper, of Chicago, says:  
“A college professor should be mar-  
ried. The man who is married will do  
three times as much good in his posi-  
tion as one who is single. And if he  
has three or four children, it will be  
still better.” All of the above we re-  
spectfully submit for the consideration  
of the younger members of our staff.

The old maid stood on the  
steamboat,  
Whence all but she had fled,  
And smiled, while o'er her  
Circled a kissing bug.  
The maidens screamed,  
The matrons swooned,  
And the men all prayed for rain ;  
But the game old maid,  
Like a hero stayed,  
And whispered “call again.”

*Trinity University Review* makes  
the following comment on our edible  
prune mash :—“Prunes, we find, may  
now be cooked in an edible fashion.  
Only a few prunes are required, the  
remainder of the feast consisting of  
custard and other ingredients, which  
are guaranteed to remove the taste of  
the prunes. After the whole is baked

in a hot oven—eat the custard.” This  
is a decided improvement on our  
recipe—apologies to the Macdonald  
girls. Did you ever try that tender,  
easily digested structure of archaic  
formation known as beef?

Never were the advantages of ad-  
vertising more clearly demonstrated  
than during the present Nature Study  
course. For some time past the  
Farmers' Binder Twine Co. and the  
Brantford Cordage Co. have been  
running an “ad” in our paper, and  
during the entire course every crow's  
nest examined by us contained sam-  
ples of the well known product of  
these factories. No other twine was  
found in the nests, which demon-  
strates beyond cavil that even crows  
exercise discriminating judgment, and  
that no other make of twine is used by  
farmers of the surrounding country.

#### Deciduous Fruit Season in California.

The California deciduous fruit sea-  
son opened April 30th with the ship-  
ment of a box of Sacramento Valley  
cherries on that date. The first box,  
which was grown near Vacaville,  
Solano County, was closely followed  
by a box of cherries grown near Sac-  
ramento, and others grown in the  
Winters district, in Yolo County, and  
in the Newcastle district, of Placer  
County. Following these, shipments  
were made from various fruit districts  
of the Sacramento Valley.

Notwithstanding the fact that ripe  
California cherries are usually shipped  
earlier in the season, sometimes as  
early as March, the initial shipments  
brought very fancy prices. The first  
box was sold in Chicago for \$25.00,  
\$3.12 a pound. The second sale was

made in New York, and the figure was \$21.00. The third sale, made in the city of Philadelphia, at auction, was a record breaker, eight pounds of cherries bringing the remarkable price of \$70.00.

These shipments marked the beginning of California's fruit season. Carload shipments from Sacramento Valley districts began May 13th, when a carload of cherries was shipped from Vacaville.

The fruit crop of California will probably be slightly below the average in quantity this year. The Sacramento Valley fruit districts, which provide the bulk of California deciduous fruits, report heavy crops of pears, but slight shortage in most other fruits. Apricots will begin ripening within a few days.

#### Horticulture at St. Louis.

The space devoted to pomological exhibits is located in the main room of the Horticultural Building. The floor plan adopted is so arranged that there is no main aisles in the building, but instead it cut up in such a way that the aisles run in different directions, this arrangement making the entire area good exhibit space, because it distributes the visitors evenly over the entire space, and there are no favored locations. This entire area will be covered with fresh fruit on the opening day of the exposition, which is something never attempted before at any world's fair.

The fruit exhibit for the early part of the season will necessarily be largely an apple exhibit, because other

fruits are not so successfully kept in cold storage, and for that reason the fruit exhibit will be of great interest because it will enable the different states and provinces to show the quality of their apples from a commercial standpoint, since the keeping qualities of the fruit, in and out of cold storage, is an interesting point when considered from the commercial side and it will enable exhibitors from widely separated localities to compare the keeping qualities of their fruits with others when placed side by side on the exhibit tables.

In addition to the exhibits made by the different states, the department of Horticulture will maintain a collective fruit exhibit. This exhibit is made for the purpose of getting together in one space, different varieties of fruits grown in widely separated localities. In this collection will be brought together specimens of leading varieties of fruits from all countries and states. This is done in order to afford an opportunity for those interested in studying varieties to compare specimens of the same variety from all sections of the country, and to note its variation as to size, color, shape, texture of flesh and flavor.

At the present time there is a great amount of discussion concerning varieties and it seems fitting that there should be an effort made here to give those interested an opportunity to get the most information in the least possible time concerning this subject, and it is believed that this will be accomplished. In addition to the collective exhibit of the leading varieties a collection of the seedling fruits of recent origin will be shown.

**Does a College Education Pay?**

In the estimable book called "Who's Who in America," are the names of 11,551 persons who have obtained leadership or success in various ways. Of these 5,775 attended some institution of college rank, and 4,810 were graduates, and only 2,000 had no education. Hence it is found that

though there is only one college man for every one hundred of population, three-fourths of those who achieved success had the advantages of a college education. These figures offer a striking proof of the value of an education, and as time advances the keen competition in business makes it almost impossible for a man to succeed unless he is well informed.

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A GENUINE TREAT

By introducing it to a box of our  
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per lb. Half pounds 20c. and 25c.

*The*  
**Kandy Kitchen.**

