

JOURNAL AND PROCEEDINGS

OF THE

Hamilton Association

FOR SESSION 1892-93.

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ABSTRACT OF MINUTES

OF THE PROCEEDINGS OF THE

Hamilton Association

DURING THE

SESSION OF 1892-93.

THURSDAY, OCTOBER 13th, 1892.

SPECIAL MEETING.

The President, Mr. A. Alexander, in taking the chair, stated that it was not his intention to deliver an inaugural address, but would reserve it for some future occasion.

The custom adopted a year ago of inviting those interested in the work of the Association to attend the first meeting of the session was repeated, and there were present this evening nearly two hundred ladies and gentlemen. Biological, geological, botanical and photographic specimens were on exhibition; experiments in electricity were made; pneumatic and microscopic instruments were operated; and a musical programme was presented through the courtesy of Mr. J. E. P. Aldous, B.A.

During the evening the President explained the aims and work of the Association.

Seven applications for membership were received.

THURSDAY, OCTOBER 27th, 1892.

SPECIAL MEETING.

The President in the chair.

The Secretary reported the annual field day held at Grimsby.

W. McD. Logan, B. A., Stuart Livingston, LL. B., W. J. Sykes, B. A., Miss Kate G. Swanzy, C. J. McKinley, Miss F. L. Davis and Geo. Rutherford, were elected ordinary members.

Mr. W. Sanford Evans was then called upon to read the paper of the evening, entitled "The Possibilities of Fiction." The lecturer

urged that the underlying principles of fiction must be understood before a right criticism could be possible, and that the time had come when novels should be treated scientifically. Novels, it was claimed, were for more than mere pleasure, excitement and relaxation—they were a means of instruction through which to learn more of life. The work of fiction true to human nature preached in particular that which had been preached in general. The writings of George Eliot were considered by Mr. Evans to be the nearest approach to the ideal he had formed. A discussion followed.

The President announced that no meeting of the Association would be held on November 10th, that date having been set apart as Thanksgiving Day.

THURSDAY, NOVEMBER 24th, 1892.

SPECIAL MEETING.

The President in the chair.

The Corresponding Secretary announced the receipt of a number of exchanges from learned societies.

The Curator reported donations to the Museum. Two applications for membership were received.

A paper on "The Zone Life of Ferns," contributed by Prof. Wright, Los Angeles, California, was read by the President. A discussion followed.

The Secretary then read the "Biological Notes" of Mr. Wm. Yates, of Hatchley, Ont. A discussion took place afterwards.

THURSDAY, DECEMBER 8th, 1892.

REGULAR MEETING.

The President in the chair.

The addition of a number of specimens to the Museum was announced.

A paper on "Southern California," contributed by the Rev. Wm. Ormiston, D. D., LL. D., Azusa, California, was then read by the Secretary. The paper dealt with the early history of the state, its products and resources. A discussion followed.

A second paper, "A Revised Spelling," was then read by Mr. James Ferres. The essayist dealt with the question of spelling

reform, giving numerous examples of anomalies in English orthography. Charts were exhibited by which it was shown that a revision of our spelling might readily be made. A discussion followed.

THURSDAY, DECEMBER 22nd, 1892.

SPECIAL MEETING.

Mr. A. T. Neill, Vice-President, in the chair.

After the transaction of business, Mr. H. B. Witton was called upon to read his paper on "Ballads, and Ballad Literature." The essayist dealt with the history and composition of the ballad, and gave a number of English and foreign selections. On the conclusion of the paper a discussion took place.

THURSDAY, JANUARY 12th, 1893.

REGULAR MEETING.

The President in the chair.

There being no other business, the President read a paper on "The Flora of the Niagara Peninsula, West of Hamilton," contributed by Prof. John Macoun, M. A., of Ottawa.

The main object of the essay was to direct the attention of botanists to the desirability of thoroughly exploring the locality in which they reside, so that the gaps at present existing in our botanical knowledge might be filled in. A discussion followed.

THURSDAY, JANUARY 26th, 1893.

SPECIAL MEETING.

The President in the chair.

The Curator announced an addition to the Museum.

After the transaction of business, Mr. S. B. Sinclair, B. A., was called upon to read his paper, entitled "The Golden Mean in Wealth." After stating the views of Aristotle, that virtue is a means between two extremes of error, the essayist went on to show how the people of England had by legislation curtailed and finally overcome the tyranny of an absolute monarchy.

It was then pointed out that the accumulation of enormous wealth by individuals led to absolutism in the financial world. It was held that there should be a curtailment of this absolutism through legislation. A general discussion followed.

THURSDAY, FEBRUARY 9th, 1893.**REGULAR MEETING.**

The President in the chair.

Two applications for membership were received.

The Photographic Section then gave a lime-light entertainment.

The majority of the views shown were photographed, and prepared for the lantern, by the members of the section.

THURSDAY, FEBRUARY 23rd, 1893.**SPECIAL MEETING.**

The President in the chair.

Mrs. M. Davidson and Mr. John Pottenger were elected ordinary members of the Association.

Mr. R. T. Lancefield then read a paper entitled "Studies in Sociology." A general discussion followed.

THURSDAY, MARCH 9th, 1893.**GENERAL MEETING.**

The President in the chair.

The Curator announced a contribution to the Museum.

Mr. L. Woolverton, M. A., of Grimsby, was called upon to read a paper entitled "Fungi Affecting Fruit." The essayist pointed out that science is aiding in no slight degree the cause of agriculture, and that of late scientists had given its practical side more attention than ever before. A number of the insect enemies of fruit were exhibited, drawings were shown, and formulæ given to destroy pomological pests. On the conclusion of his paper the lecturer answered a number of questions.

Mr. H. B. Witton moved, and Mr. M. Leggat seconded a resolution of condolence with the widow and family of the late Richard Bull, Esq., for a period of fifteen years Treasurer of the Association. The meeting was then adjourned as a mark of respect to the memory of Mr. Bull.

THURSDAY, APRIL 13th, 1893.**REGULAR MEETING.**

The President in the Chair.

It was announced that the Annual Field-day of the Association would be held at the Albion Mills, on Saturday, June 24th.

The President reported that the Council had appointed Mr. H. B. Small, Corresponding Member of the Association, representative at the forthcoming meeting of the Royal Society of Canada, to be held in the City of Ottawa.

The Curator announced the receipt of a donation to the Museum.

Dr. T. W. Reynolds then read a paper entitled "Fads." In it the reader recommended the collecting and arranging of scientific and other curiosities. A discussion followed.

THURSDAY, MAY 11th, 1898.

REGULAR MEETING.

The President in the chair.

The application for membership of Mr. Arthur E. Mason was received. On motion, the rule requiring that applications for membership be voted on at the following regular meeting, was suspended. Mr. Mason was elected an ordinary member of the Association.

The annual meeting was then held. The following reports were read:

Report of the Council, by the Secretary.

- " " Treasurer, by C. R. McCullough.
- " " Biological Section, by H. S. Moore.
- " " Philological Section, by W. H. Elliott, Ph. B.
- " " Geological Section, by A. T. Neill.
- " " Philosophical Section, by S. A. Morgan, B. A.
- " " Photographic Section, by Wm. White.
- " " Corresponding Secretary, by Thos. Morris, Jr.

The following office-bearers for the ensuing year were elected:

President, - - - - A. Alexander, F. S. Sc. (Lon.)

First Vice-President, - A. T. Neill.

Second Vice-President, - T. W. Reynolds, M. D.

Corresponding Secretary, - W. McG. Logan, B. A.

Recording Secretary, - C. R. McCullough.

Treasurer, - - - - Thos. Morris, Jr.

Curator, - - - - Alex. Gaviller.

Asst. Secretary and Curator, Walter Chapman.

Council: James Ferres, A. E. Walker, P. L. Scriven, William White, W. H. Elliott, Ph. B.

THE POSSIBILITIES OF FICTION.

Read before the Hamilton Association, October 27th, 1892.

BY W. SANFORD EVANS.

I have chosen "The Possibilities of Fiction" as the title of the paper I have prepared for this evening. My paper consists of a few thoughts on some of the principles underlying fiction. I have not attempted the criticism of particular works, but have attempted rather to present certain general aspects which it seems to me must be understood and decided upon before there can be such a thing as intelligent criticism or appreciation. The study of these general principles and general aspects will make clear to us what is greatest and most beneficial in novel-writing, or, in other words, will make clear the possibilities of fiction: hence my title.

The world to-day has no universally accepted standard by their conformity with which we can finally adjudge the relative greatness of authors or of individual works. There is no reason from the nature of the case why such a standard could not be formed, but it is very evident that this standard must be based on the possibilities of fiction, and that these possibilities can be discovered only after careful and scientific investigation of the principles involved. My desire for personal satisfaction on this subject has led me to devote some study to it. To present even the few results I have already attained, in the short time at my disposal, is not possible, and so my treatment must necessarily be incomplete. My only object will be to offer some general thoughts in the hope that they may prove suggestive.

There came a time in the history of my reading of works of fiction when I paused to ask myself why I read them. I had a preference for certain works and for certain authors, and I paused to ask myself the reason for my preference. There were periods, even of serious enquiry, when, of all the sources I knew, I turned to fiction to seek something to satisfy the undefined questioning that agitated me; and I paused to ask myself if it might not be, if it were not true, that in the novel there can be expressed better than

in any other way some of the truths about life that it is most important for us to know. Since that time the novel, in its potentialities at least, has been something more to me than a means of pastime. The more I have thought upon the subject the more I have been convinced that the novel holds possibilities of power and influence that make it no unworthy medium for the greatest thinkers of an age. The novel is great. The time has gone by when novels as a class are to be forbidden, or even questionable, reading, and the time has come when they should be treated scientifically. The modern novel is not a toy; it is something instinct with modern research and modern thought, it is something that gains a readier and wider access to us men and women and exercises a more subtle and potent influence over us than any other kind of literature. Tell me what kind of novels a man reads and I will tell you how to sway him.

I have thought that the most satisfactory form in which I could put what I have to say would be by proposing and answering some of the questions that naturally arise. These questions are:

- 1st. Why are novels written?
- 2nd. Why are they read?
- 3rd. What place do they fill?
- 4th. What is the greatest and most beneficial kind of novel?

To give full answers to these questions would require many lectures, and so, as I have already said, my treatment must necessarily be rather suggestive than complete.

In the first place, then, Why do we write a novel? What is a novel from the author's standpoint? An answer to this is sometimes given by saying that "the object of the novel is to give pleasure;" that is, the novel is written to give pleasure to the reader, but surely such an answer is altogether superficial. No high art can be explained by it. Can we think for a moment, without its cheapening our estimate of all great artistic work, that George Eliot, while elaborating with such earnestness, sympathy and skill, the development of her characters and plot, was actuated solely by the desire of giving pleasure to others? Can we think it of Thackeray as he gives us the history and fortunes of Becky Sharp? Can we think it of Victor Hugo while under the creative inspiration that has given us the passion and the pathos of *Les Misérables*? Can we think it of Shelley,

as we are spell-bound by his beautiful verse, any more than we can think that the little skylark about which he wrote:

"That from heaven or near it,
Poureth its full heart

In profuse strains of unpremeditated art,"

sang only to please the poet who gazed after it and cried,

"Teach me half the gladness
That thy brain must know,
Such harmonious madness
From my lips would flow

The world should listen then as I am listening now!"

No; I cannot believe that artistic production of any kind can be explained by referring it to a desire to give either pleasure or instruction to our fellowmen. Art is not something done for the sake of its effects on others; it is something natural, we might almost say instinctive; and so we must look deeper for the explanation, we must find it in some fundamental psychological fact. That psychological fact is, that every perfected thought tends to express itself in some concrete form, either in imagination, or outwardly, in matter.

It is in the highest degree necessary, in this connection, that we should have a correct understanding of what imagination really is. It is a mistaken idea that imagination is identical in meaning with the fantastic or the exaggerated. It is true that in popular usage it often has such a meaning, and this is particularly true of the conjugate adjective 'imaginary.' To say that a work is a work of imagination is taken as predicating of that work a certain quality of unreality and unnaturalness; and the word seems nearly always to hold for us more or less of such signification. To confine the word imagination to this meaning is to mistake the true nature of the faculty; it is to define a generic word by a specific example. Imagination is the faculty exercised in Dante's *Inferno*, but it is also the faculty exercised by the scientist when he represents to himself the motions of the atoms and ultimates in a molecule of matter. It is the faculty by which the mechanic sees, before he has shaped a bit of material or has put a line to paper, in fullness of proportion and intricacy of detail, his wonderful invention. It is the faculty that is used every day in the most strictly scientific and in the most prosaic affairs of life, as well as in the wildest flights of the poets. What is imagination? It is image-making power. When we imagine

we make an image. It may be an image of plain fact or it may be an image of fairyland. What determines the kind of image we have is the abstract conception that lies back of it. If I understand all that is known of matter and the laws of its motions, I will have little difficulty in imagining atoms and their modes of motion, though no one has ever seen an atom. If I understand the laws of machinery I will have little difficulty in imagining a practicable machine that may be unlike any other in existence. According as my conceptions are complete so will my image be definite. This transition from conception to image is constantly made. Our conceptions are ever passing into images, and on the other hand the images presented to us are constantly being rationalized into abstract conceptions. These are two of the principal processes of mind; they are not separated in experience, but flow into one another.

I hold, then, that imagination is simply image-making, that we make images of our abstract conceptions; and that the distinctness of the image depends on the completeness of the conception. This image-making is a natural process. In this natural psychological process we find the source of art. Every perfected thought tends to express itself in some concrete form, first in imagination, and then afterwards, at our discretion, in a more permanent form in matter. This expression in matter, provided the conception of which it is the expression be of a certain kind, is a work of art. The ultimate basis of criticism of a work of art is the conception of the principles of the subject in the mind of the artist, and will not be found in anything that may be called imagination. I would like to emphasize this as I shall return to it again.

If the perfected conception in the mind of the artist be a conception of the ideal in the female form, we will have the Venus of Milo as its expression. If that perfected conception be one of French peasants with heads bowed, while, "with sound stupendous, throbbing," there "tolls the great passing bell that calls to prayer for souls departed," we will have "The Angelus" as its expression. If that conception be of the quality we call poetic, it will express itself in poetry. If that perfected conception be one of human life we will have a novel or a drama.

Lord Lytton says "What Nature is to God, Art should be to man." Art is man's creation, it is the materializing of what he knows, in the same way that this universe is the visible and tangible

expression of some universe that God knows. Indeed are we not most god-like when we have reached that point in the fullness of our development where our thoughts are complete enough to take on a material form and stand alone.

If anything further be needed in support of my position that the explanation of artistic production is to be found, not in a wish to please or instruct, but in a fact of our natural constitutions, I will only ask whether the passionate devotedness to their life-work, their absorption and joy in their work as work; of those men and women whom the world has called great artists, does not demand an explanation in something other than their desire to tickle the æsthetic sensibilities of mankind. It is very true that the desire to give pleasure, as well as many other desires, may enter as elements in the production of many works of art, but they in themselves can never account for any of these.

If the opinion of art here outlined be correct, the novelist will be one whose conception of human life finds expression in the portrayal by words of acting and mutually inter-acting men and women. Words are the material of this artist; that with which he wishes to express his conception of human life. From his knowledge of the principles or the customary processes of human nature he constructs in imagination individual men and women, and then presents them to us as naturally as can be done through the medium of words. And he does this because in the inscrutable counsels before the world was made it was decreed that it should be natural for man to try to express every completed conception in some material form. This is what a novel is, and this why we write one.

We have thus far looked at the novel from the author's standpoint, let us now look at it from the reader's, and ask: 2nd, Why do we read one? I shall not give an exhaustive list of reasons, for I suspect that such a list would be almost co-extensive with the lists of temperaments and moods, but I will give the principal reasons that have occurred to me. We read a novel:

1st. For pleasure. The reading of many novels is an unalloyed pleasure and there are many times when we pick out this kind of novel and read it for the mere feeling which it excites. We never attempt to analyze the story or search for any significance—we merely enjoy it.

2nd. We read a novel for excitement. In this case we select sensational works and read them for the sort of intoxication they induce. This motive for reading is very common and is liable to lead to the same kind of intemperance that the desire for stimulants of any other kind may lead to, and to carry this analogy a step farther, these novels may have a proper place as medicine.

3rd. We read novels for relaxation from study or care. This is quite distinct in its motive from the two reasons mentioned above. When the mind is tired and tense from work, we often desire, and it is at times almost necessary, that we should have something to divert us and relieve the strain. We seek and find this something in the novel. The novel-reading of the great majority is explained by the above three reasons, but there is a fourth which is most important of all, namely :

4th. We read a novel to find out more about life, or for instruction. It may be objected that the novel is not read for this purpose, but I reply that from personal experience, as well as from the experience of others, I know that it is so read. In fact, do not a great proportion of modern novels appeal directly to this class of readers, because in them are propounded new religious, social, and philosophical theories? They are written on the supposition that there are those who will read them thoughtfully and critically. It may be objected, nevertheless, that to make a text book of a novel is to put it to a use for which it was never intended. I ask for what use it was intended? I have already dealt with the opinion that the object of the novel is to give pleasure, and shown in contradistinction that the object of a novel is to give expression to a conception of life. And is not a conception of life, or any phase or experience of it, as worthy of study as a conception of nebulae, or material elements, or anything else? Is it not, indeed, more worthy of study, inasmuch as how we live is of more importance than what we know? It seems to me that the reading of a good novel is only begun when we have followed the story; it is completed only when we have discovered the conception the author must have had of the phases or principles of life presented, and when we have stored these thoughts up in a form for practical use. This is true novel-reading. We study many classic dramas in this way, comparing part with part, yet the novel holds greater

possibilities than the drama. This paper is merely a few thoughts upon the novel that is most worthy of such a reading.

The third question is :—

3rd. What place does the novel fill? Philosophy finds its proper expression in a strictly accurate treatise; logic, in the syllogism; geometry, in hypothesis and demonstration; dreams and flights of fancy, in poetry. Is there anything, that finds its most effective presentation in the novel? Is there anything left undone until the novel does it? Is there any work the novel can do better than any other kind of literature? I think there is.

(1). It is the best means of extending our experience and knowledge of life beyond the bounds of our personal lot. No matter how far we may have advanced in self-knowledge, and how skilful we may be in studying the life around us, it must happen, from the necessarily narrow range of an individual, that we will not come in contact with a great many important facts in life, or that we will meet with isolated facts which we cannot rightly understand because we cannot compare them with others of the same kind. A novel can best supply what we lack because it is the best form in which others can put their experience and observation of life.

As growing out of this use of it :

(2). It is a more effective way than any other of extending our sympathy with our fellowmen. The reason for the lack of sympathy that is seen between class and class, between rich and poor, between employer and employed, for example, is found in the fact that we do see people as we see ourselves. We often hear quoted :

"Oh! Wad some power the giftie gie us
To see oursels as ithers see us."

I would like to transpose this and make of it a prayer that would give utterance to an even more deeply-seated need :

"Oh! Wad some power the giftie gie us
To see each other as we see ourselves,
'Twould from mony an evil free us,
And foolish notion."

If the employed could recognize that his master's life is just as full as his own of anxious care, and thought, and hope, and disappointment; if the employer could recognize that his servant has essentially his feelings and needs, there could not but grow up an ever-strengthening bond of sympathy between them. The work of creating this sympathy cannot be done by quoting statistics or by

general statements. We read in our papers every day statistics of disasters, for example, of mining disasters, giving the number killed and an inventory of the loss, and we are comparatively unaffected, if, up to that time, we have had no bereavement in our own experience. But hand that same paper to one who has passed through such a scene as that recorded, and even the barest figures will make him shudder. In order to interpret statistics and general statements we must have a sympathy already in existence founded on our past experience. If we have not this we must have the scene presented to us with such vividness that we will live through it in fictitious experience. So in the case of the rich man and the poor man. It may accomplish little or nothing to present the one class with general statements about the other; what is needed to arouse sympathy and understanding is that a life be presented in the concrete, and it seems to me that this can be done more effectively in a novel than any other way, even than by introducing a living person or by visiting one in his home and surroundings, because then we see only the outward which shows the difference, and do not see the inner life of thought and feeling which shows the brotherhood. In the novel, and in the novel only, can be shown at the same time both the outward and inward life, and this not by abstractions but in the form of a fellowman. We see that he is influenced by the same motives that are powerful with us; we discover our common humanity, and we discover that our humanity is common; and, as one writer says, "more is done toward linking the higher classes with the lower, toward obliterating the vulgarity of exclusiveness, than by hundreds of sermons and philosophical dissertations." In the work, then, of extending an understanding and sympathy between class and class, and between man and man, there is no instrument that can be more effective than the novel.

(3). The novel is incomparably the best means of presenting a great deal that is essential to our development. As preliminary to the discussion of this point I would like to ask the question: What is the greatest in life? What is the *summum bonum*, the ethical end of life? We find this question has been mooted in all ages and that philosophical schools still divide upon it; but the highest and truest philosophy answers the question in one word—*self-realization*. What is the ethical end of life, the *summum bonum*,

the highest good? It is to develop into actuality all the possibilities of our natures. The highest in life means the highest in every thought and action, the purest in every motive and feeling. To attain this three things are necessary:

(a) We must know where we stand now—we must have self-knowledge.

(b) We must know what courses of thought and conduct lead to deterioration so that we can avoid them.

(c) We must know what feelings, thoughts and actions are great, so that we may cultivate them. How are we to attain this knowledge? Any one who is a great student of human nature knows how very rare anything like adequate self-knowledge is; most of us are perhaps more ignorant of self than of anything else within the range of our experience, and no one, at this stage of the world's progress, can lay claim to a full knowledge of himself. We are perpetually congratulating ourselves that our actions and motives are magnanimous when they cannot possibly be anything but shortsightedly selfish. We are continually practicing deception on ourselves and we never suspect it. We do not realize the narrowness of our conceptions of what is highest. We do not try to recognize in their incipency the tendencies and habits that will soon become too firmly set to be altered. Socrates revolutionized philosophy with his "Know Thyself," and I believe that it will have to be recognized that this self-knowledge is as essential to moral progress as it ever was to intellectual. How shall we attain it? You say, Study yourself. Yes; but suppose I should come to you and express a desire to know all about astronomy you would not say to me, Go and study the stars. If I wished to know all about geology you would not say, Study the ground. You would say to me, Put yourself under the best masters and get the best text-books and you will then find out all that the study of ages has established, and you will be in a position to make fresh advances. You would tell me that unaided I could not in a life-time hope to arrive at anything comparable to the fullness of knowledge possessed by a modern school boy. The world advances because one age starts where the last left off. The ancient Norsemen had this idea when they compared life to a tree called Ygdrasil, which is growing age by age. We are among the clouds, not so much on account of what we have done, as because we are supported by, and grow out of, all the life that

went before; and the coming age, the next year's twigs and leaves, will be nearer heaven still because we have lived and grown.

It seems to me that it is as necessary to have text-books and guides in a study of self as in any other study. Works on psychology do not cover the kind of self-knowledge we are considering; but even if such works did they would not supply the want. What is needed is a concrete presentation of the facts and processes of human nature. We may learn a good deal about our bodies from scientific generalizations, but these cannot take the place of a physiological chart, or of actual dissection. To a psychological chart we give the name of novel. In a novel we find not generalizations, but people who act as we do, and we find, besides, what the author, who is a specialist in this study, believes to be the motives that prompted these actions, and we also find what he believes to be the effect of these actions on the actors and on others. We find there what the author has discovered to be the modes of life of the men around him and the ends of life we have practically and virtually before us. He traces and exposes the influences that are abroad in the world by showing their effect on men and women. We find the results that he has arrived at in this science of human nature, and we find them in the form that is most easily understood and most effective. He shows us where we are, which, as we have noticed above, is the first thing we require to know in order to self-realization. And I ask in what other way can this be shown?

Then in his bad characters he shows us the course of life and thought that lead to disaster, or deterioration, or to what is unworthy, and here we find what we have to avoid. In his good characters we find what courses of life and thought are necessary to development, and here we find what we ought to cultivate.

It seems to me that the greatest need of the day is guidance in detail. We have righteousness preached at us, but we want to know what righteousness is when translated into the next act that we have to perform, or into the customary acts of our lives. We want to know what is better and worthier than what we are doing, and if this could once be shown, I have sufficient confidence in human nature to believe that a majority would try to follow it. This guidance can be given in a novel more directly than in any other way, and for this reason it is an essential supplement to treatises or

sermons. A small minority only can be directly influenced in their conduct by an appeal to their reasons with abstract truth. You may persuade a savage that civilization is a good thing, but, unless, in addition to this, you instruct him step by step in the elements of culture, there is every chance of his remaining a savage. You may inculcate in a man the virtue of self-sacrifice, but unless you can tell him, at the same time, how self-sacrifice will show itself in his daily conduct, and in his particular acts, it is more than probable that he will go through life just as selfish as the rest of us. We have made wonderful advances in all the arts except the art of living. We are able to control the forces of nature even to the mystery of electricity, but we, as a race, are making no advance in that which is nearer to us, and should come first, the controlling of ourselves and the conforming of lives to a standard that is ever becoming higher. Lest I should seem to overstate the case I would like to give some testimony in support of what I have said. A writer in *The Nineteenth Century* says: "Crime in England during the last thirty years for which we possess official returns, has not decreased in gravity and has been steadily developing in magnitude." In the United States, where we would expect to find life-problems being worked out under the most favorable conditions, what do we see? Hon. Andrew D. White in a recent address said: "The number of deaths by murder in the United States is more than double the average in the most criminal countries of Europe; and this number is increasing in our country every year and in a ratio far greater than the increase of the population." The statistics of 1890-91 show an increase of less than 25 per cent. in population, but an increase of 59 per cent. in the number of persons charged with murder. President Schurman, of Cornell University, said not long ago in speaking of divorce: "The United States grants more divorces than all the world put together. We grant annually more than 25,000—a hundred a day if you give the judges a Saturday half-holiday." If the present rate of increase should continue "a hundred years from now more than half of all marriages will be terminated by divorce." He says the evil of divorce is not a single isolated factor in our modern life, but only one of many kindred aspects of what we may call the modern spirit, "which is a tendency to selfishness, to impatience, to immorality, to irreligion." Our daily newspapers are little but a catalogue of crimes in all grades of society. The world

has had a great deal of righteousness in general preached at it, but very little righteousness in particular. Now I ask, is there any medium so effective as the novel for the presenting, and so the teaching, of the great desideratum—righteousness in particular. Indeed, is there any other way in which can be shown the courses of thought and action that ultimately lead to fault and vice, and the courses of life that lead to purity and strength?

But now, in view of all these things, what must we decide to be the greatest in novel-writing? What kind of a novel is the highest? I would define the greatest in fiction to be the novel that portrays and describes, with the strictest truth to human nature, as nearly as can be done in written language, human life, not only as it exhibits itself in action but also as the actors are conscious of it, and shows the operations of mind and the conflicts of influences with their subtle effects. This novel makes men and women act before us, it describes the hidden life they lead in other realms than that of sense; it also traces the unrecognized workings that are gradually forming or changing their characters. It is the presentation of a complete human being; we are shown his outward life and his inward life; we know those processes by which he has become what he is and those by which he is developing or narrowing into what he will be. We must bear in mind in connection with this definition the many limitations that the nature of the case will put upon it. The novelist has only four or five hundred pages, say, in which to represent some phase of life. It is impossible in that space to put down everything that would be found in like circumstances in actual life, and it is not an object with him to do so. He aims to give a complete whole in a limited space, and to do so he must carefully select those points that are most prominent and most essential. He must get a proper proportion, a proper perspective, in his work. Out of this fact there arise a great many technical rules of art with which it is not my present purpose to deal. I am treating only of the matter of the novel and am not considering at all the question of the form in which this matter may be best presented; and so, when, in the above definition, I said the greatest novel must be strictly true to human nature, I did not mean that it must present an exhaustive picture of life, but that whatever points it did present must be strictly conformable to the laws that govern men and women.

In the first place, before going on to establish this definition, we will have to meet an alarming array of opposing authority. Taine defines a novelist to be "one who labors to manifest the invisible world of inward inclinations and dispositions by the visible world of outward words and actions;" that is, Taine says that novel is the highest which confines itself to words and actions and has nothing directly to do with the inner life. My definition expressly and emphatically includes the portrayal of this inner life. Taine's definition is endorsed by Mathew Arnold and is accepted, implicitly at least, by many critics. I think this definition is already a little out of date, for modern novels almost universally show the works of the watch as well as the dial. The definition is too narrow, and for this reason: If we have a full, true conception of life we will find that we cannot embody it in this kind of novel which is only an extended form of the drama, because the life you and I live is not, cannot be, represented by our words and actions. What we say and what we do may point to the motives that outweighed all others; but will give no sign of the terrible struggles between conflicting motives that mark the crises of our lives and are more truly, and more vividly, a part of our experience than anything external can be. There may be raging within us a battle whose issue entails more momentous consequences for our lives than did Waterloo for the political future of Napoleon, and yet the only external facts to be noted may be the pale cheek, the strained and anxious brow. Little of our joy and grief is shown in our smiles and sobs. The actual circumstances of the moment form but a small part of our experience at any time; memory and imagination give nearly all the depth and power. There is probably no life without its romance, and yet there are very few lives in which there is any romantic incident. Romance has a solely subjective existence. The highest workings of our natures in intellect and imagination can show themselves only very indirectly and ambiguously in words and actions. Nearly all our wealth of passionate, rich, and exquisite feeling is known only to ourselves and never betrays itself in word or gesture. These secret workings of mind and heart make the real life of each one of us, and we often long for someone who would judge us, not by the conventionalities required of us, but by this truest and best life which is throbbing or soaring within us. All these realities of life may be talked about and described but cannot be made to exhibit themselves. Do not

these considerations, together with many more that might be adduced, clearly show that there is a great deal in our lives that cannot be embodied in a novel that confines itself to the external? There is no room in the novel, as defined by Taine, for the treatment of all that is deepest and most real in human life, therefore I say the definition is narrow and the novel he conceived falls far short of the possibilities of fiction.

But in the second place, from the fact that I have insisted that the greatest novel must be true to human nature, I am met by the re-action that has set in against what is called realism in fiction. In these days to say you are an advocate of realism is taken as almost equivalent to saying you like filth, or, at least, insipidity. Now, in the first place, I protest against such a prostitution of the word realism. It is not real life that most of these books present to us. A writer on this subject says: "Realism during the last thirty years has strangely deviated from its fundamental principles; it has become rhetorical; it has become idealism turned upside down—the idealism of ugliness, vice and crime. * * This illusion is aided by the minute care taken by modern narrators to describe the surroundings, the places and the objects, in which their fantastic personages live and move." There is that in me which makes me believe that ugliness, vice, and crime, truthfully presented, cannot be attractive, for in that presentation we would find misgivings, loss of hope, and all the gentler feelings, atrophy of noble impulses and generous thoughts, gradual narrowing, hardening, and despair. Even granting for the moment that these novels against which the reaction has set in are true to nature, this could not be used as an argument against truth to nature as an essential of the greatest novel; it could only be used as a crushing weight against the taste and common sense of the authors of such works. Beauty, goodness, faithfulness, and honor, are as much truths of life as ugliness, vice, and crime.

Having thus to a certain extent cleared the way, it remains for me to bring forward some considerations that will tend to establish my definition, which is, that the greatest novel is that one which, with whatever phase or circumstances it deals, is true to human nature, and gives us not only the external but also the inner life of thought and feelings, and the formative influences and the tendencies at work. I claim that this is greatest,—

1st. Because it is most beneficial. We have seen that it is one of the possibilities of the novel to be the best means of extending our knowledge of life beyond the bounds of our personal experience. To do this the novel must give us the inner life, because the knowledge of that life is most important, and it must present that life truly or else we will gain no knowledge at all, but will be led aside into error. The novel I have defined is able to supplement our experience and so enable us to have an acquaintance with the principal facts of life, after we get which it is an easy matter for us to infer and deduct until we get rules of conduct, of motive, and of thought. I am not advocating the novel that preaches or has a moral at the end. Any amateur in dialectics can draw conclusions, but it takes a trained scientist to establish the premises, to discover the real facts and laws; and this is nowhere so true as in the science of life.

It is another possibility of the novel to be more effective than any other agency in creating a sympathy and an understanding between man and man, and between class and class. To do this it is very evident that the men and classes must be represented as they are. How much do you think it would aid in bringing about the result if we found in our novels nothing truer to life than the peasants in opera, those "lyric rustics" in their elegant attire? How much do you think it would aid in bringing about this result if we found in our novels nothing truer to life than the peasants in poetry, who are always "jocund as they drive their teams afield," who are always cheerful and smiling in harvest, who sing serenades and make bashful love? How much of the misunderstanding that now exists do you think is due to this poetic falsification, which calls out our sympathy for idyllic shepherds and idyllic plowmen that have no counterparts in nature. And to bring about this sympathy and understanding we must find in the novel more than we can see about us every day. We can see the difference in dress, we can see the difference between a mansion and a cottage, we can see the difference in manners, we can hear the difference in speech. These, as I have before said, are the things that mark the separation. We want to know the things that mark the brotherhood. These are found in the thoughts, the feelings, the aspirations, the resolves, the temptations, the conflicts. We must be shown the force of circumstances and all other shaping forces that have brought about the difference that remains after we have discovered the essential

brotherhood. Then, and only then, can we fully sympathize and understand; and it is very evident that to bring about this result the novel must give us more than words and actions and must be true to nature.

We have seen that it is also one of the possibilities of the novel to be the best means of presenting a great deal that is essential to our development. It is equally plain in this case, as in that we have just been considering, that to accomplish this result the novel must give us more than the external and must be true to human nature.

To benefit us by giving us self-knowledge, a novel must present the courses of life that men actually follow, and must make plain to us the motives and principles that are really predominant. It is not moralizing that the world wants most, it is such an analysis of experience as shall lay bare its elements. It seems to me that after all these centuries the world to-day does not know enough about the universal malady, selfishness, for example, to give a satisfactory diagnosis. There are a great many facts referred in a loose way to selfishness, but where do we find the analysis that shows us the real elements, the psychology, of selfishness. They tell us that it is doing things for our own gratification, but this will not stand, because it makes it deliberate, and we all know that very little of the selfishness in the world is deliberate. We do not act for the purpose of gratifying ourselves at the expense of others, we simply do what seems best at the time. Then we will have to seek the root of selfishness in our knowledge of what is best and highest, or farther back still wherever our analysis may lead us. If we can once discover the true source it will be easy to prescribe a remedy. This one instance may help to illustrate what I mean by the necessity for an analytical and accurate knowledge of the facts of experience before we can form rules of conduct. The novel that truly represents the inner life gives us this knowledge. If, in this novel I am advocating, the character of a bad man is depicted with truth to nature, we will see the steps by which he became bad; he will not seem to us some one outside the pale of our common humanity, where he is virtually placed by too many writers; we will recognize in him a being like ourselves whose course of life has a sequence in it; we will find that he has motives that are to him as strong incentives to action as ours are to us; we will see in him what we might become if we took his first downward step. If the char-

acter delineated in this novel be better than we are, we shall know what life is to him and how we must act to be like him; we will find out what in the conviction of great men and women are the thoughts and actions that are worthier than ours. The greatest care, however, should be exercised by those novelists who attempt to represent the perfect man, that they should make their representatives strictly true to the nature of man. A novelist can lead us no farther than he has gone himself, either in actual experience, or in careful calculations upon human nature. No novel can be wholly beneficial whose characters are not possible to actual men and women in like circumstances. And, besides, if we are capable of indefinite development, as we all believe we are, then only God could describe a perfect man. The only ideal representable by man is an ideal of attitude towards the problems of life, an ideal of disposition, not of attainment. The only ideal characters are sincerely striving men and women; but it would not be difficult to represent men and women who have reached a greater degree of attainment than we have. I think it is very evident, then, that the novel I have defined must be the most beneficial.

We have seen that the novel is read not only for instruction, but also for pleasure, for excitement, and relaxation, and any novel that meets these needs may be a legitimate kind of novel and may have a right to be. I am not advocating one kind of novel to the exclusion of all others. I am attempting to establish that this kind is greater than all others. It cannot be urged as an argument against it that it is not fitted to please, as proved by the fact that a majority are not pleased by it. We do not consider that it is an argument against a Raphael, or a Michael Angelo, that a great many people prefer a chromo. There is such a thing as the development of taste in novel-reading. We are not born with a ready-made appreciation of what is highest in fiction any more than of what is highest in anything else. We may come in time to enjoy only that novel which is worthy of study just as we may come to enjoy Beethoven or Wagner. The novel I have defined may, then, not only be most beneficial but give most real pleasure, and to those who have once learned to appreciate it all others may appear comparatively trivial.

I know that very many people will take a decided stand against so serious a view of the novel as I have presented. Such a novel

and such a reading would not afford any relaxation which is one of the great uses of the novel. They will contend that we get enough of this kind of thing in real life, and that when we pick up a novel we want something quite different from the life we are living. We want to read about hair-breadth escapes, or about lords and ladies with incompatible virtues and vices, and impossible fortunes. I cannot at all agree with this opinion.

It is a very trite comparison, that of life to a voyage, but it is a very true one. We each have some harbor we would like to make. According to our temperaments and circumstances, our ambitions and desires adorn this island for which we set sail with all delights. Those who take this stand with regard to the novel, saying that we get enough of real life in what we are forced to do, and that our chief object should be to get something to occupy our spare moments that would take us off into other realms, seem to me to advise that in entering on this voyage we merely weigh anchor and give sail. When the necessities of sustenance or the urgency of gales forces us to work and think, we are to do so, but when such necessities are not upon us we are to read of seas that we can never sail, of ships that we never made, of islands fancy-formed. We are to lie back and dream of journeys

"Over the seas

With a crew that is neither rude nor rash,
 But a bevy of Erores apple-cheek'd,
 In a shallop of crystal ivory-beak'd,
 With a satin sail of a ruby glow,
 To a sweet little Eden on earth that I know,
 A mountain islet pointed and peak'd ;
 Waves on a diamond shingle dash,
 Cataract brooks to the ocean run,
 Fairly-delicate palaces shine
 Mixt with myrtle and clad with vine,
 And over-stream'd and silvery-streak'd
 With many a rivulet high against the sun
 The facets of the glorious mountain flash
 Above the valleys of palm and pine."

Are there rocks ahead? We do not know. Are we sure that by driving before the wind or with the tide we shall ultimately reach our harbor? Are all the winds and all the tides certain to be favorable? Ought we not to change our course and beat up against the wind? We do not know. Is there really amid all the possibili-

ties of formation such an island as we seek? We do not know. Meanwhile we are sailing and dreaming. Can such a voyage be compared in any respect to that of the man who thoroughly studies his boat until there is not a thing he cannot do, not an emergency for which he is not prepared; then master the principles of navigation; then make himself perfectly familiar with the chart till he can place every rock and every shoal? When the sky threatens he understands it and prepares for storms, and when the squall strikes him he exults because he is ready for it and can weather it. When rocks frown he can escape them because he knows where the deep water lies. Is such a man's voyage all drudgery as compared with that of the man who dreams? Far from it. The sun is glorious at sea, the mist is weird, the stars are eloquent, the moonlight on the water is divine, and even the angry, crested waves are grand. His voyage is all pleasure, because he is safe, and he is safe because he has studied and because he knows.

For this reason I cannot believe in devoting one's time to fiction that is admittedly untrue to life. I am anxious to understand life, and have not yet discovered that the only pleasure is to be found in temporary escapes into other, imaginary, states of being.

But you say, since a novel is not written on account of its possible effect on its readers, so much as on account of a natural desire for expression in the author, we must look for the greatest in fiction in what is greatest from the author's standpoint, and surely that greatest will be found where he gives, as it is called, free scope to his imagination. I admit that before my case can be complete I must establish that what we have already seen to be greatest from the reader's standpoint is greatest also from the author's.

I think that, from this point of view, as well as from the reader's, there will be no discussion about that part of the definition which makes the greatest novel contain more than words and actions, for it is unquestionably greater in the author to exhibit not only the external but also the hidden sources of the external. The contention will settle around the assertion that his presentation must be true to human nature.

We have already seen that imagination is the power of making images of general conceptions. The difference in the images depends on a difference of conception. The difference between the works of Rider Haggard and those of Thackeray, for example, is not

so much difference in power of imagination as in the general conception of life and of what is worthiest of being represented. If this be true, and if we can determine what conceptions of life are greatest and best, then these conceptions adequately imaged will be what is greatest in novel-writing from the author's standpoint. To me it will ever seem that the greatest conception of life will be a conception of life as it really is, of the laws that actually govern it, and of the possibilities it actually contains. This is greatest because it is truest and because it requires incomparably the most knowledge in the author. To follow a possible character through a natural development it is necessary that we know all the circumstances in which the life is placed from its beginning to its close; we must know the bias given by heredity, by early training, by love, by hate, by opposition from others, by every motive, by every resolve, by every imagination; we must recognize the effect of the gradual strengthening or weakening of character, and of the formation of habits. Only if we have all this knowledge, and much more, and work upon it without error, can we produce a character with truth to nature; while only the slightest knowledge of the generalities of human nature is necessary to the production of a work when the only standard is an arbitrary determination in the matter.

The novel I have defined will be greatest, then, not only from the reader's but also from the author's standpoint.

A practical question will here at once present itself, namely, how are we to tell what is true to human nature, and so, greatest? Our judgments must be based mainly, I suppose, on our own experience of what life really is, and so at first will doubtless be very faulty, but this faultiness will gradually disappear with every additional experience. Twelve months from now our standard will be higher and truer than it is to-day. In this case, however, we are not left to verify everything by our own experience. In history and in the thoughts of great and good men and women of all time—that is to mention other sources than the most authoritative, Revelation—we have the solution of many of the problems of life. And it seems to me that in our reading we should have before us a few general principles drawn from these sources to supplement our own experience in forming a basis of judgment. I think we may take it as established, for example, that that novel will not be true to the principles of life which

1st. Represents only that side of vice which makes it attractive. The world has found that vice brings disaster or meets it. Vice is an evidence of decay; growth alone is truly attractive.

2nd. Which excites and feeds passions that we should control, the passions that cause trouble in the world.

3rd. Which weakens our reverence.

4th. Which makes us feel anything other than an appreciation and sympathy for our fellowmen.

5th. Which by its false ideals unfits us for the practical duties of daily life.

6th. Which makes the end of life consist in something petty that takes away any aim worth nobly striving for. In this class I would put that large proportion of modern novels which virtually make the end of life a marriage which society will sanction, and the only aim, particularly for the heroine, to be pretty, so as to win attention from the other sex.

This list of principles might be largely extended. I think that each one should, at least mentally, draw out for himself such a list that he may be able to distinguish between the true and the specious, or the false, to the end that he may get from great novels that compensation for the narrowness of personal lot, that help toward a proper understanding and sympathy with his fellowmen, that guidance in self-knowledge, that warning against the very first step downward, and that call to something higher, which constitute the grandest possibilities of fiction.

My remarks have been all of a general nature. I know of no writer who fulfils all the possibilities of fiction, but, in my judgment, George Eliot, comes nearer to it than any other in the most important respects, though her representations are in a good many points only partial. I will not attempt to show this by a reference to any other works, I merely mention it to give my ideas a certain definiteness by pointing to a limited embodiment of them. To me her works seem most worthy of careful study, and most rich in returns, because she never allowed a striving after effect to interfere with her expression of her conceptions of the true workings of the principles of life, and her rare mental endowments pre-eminently fitted her for the study of these principles. There are many other authors I might mention, but she seems so peculiarly suitable as an illustration of my principles, at least of some of the more important ones, that I will

mention no other, since I have not the time to make such comparisons and distinctions as would be necessary for clearness.

I end where I began by affirming that the novel is great, that it holds depths and breadths and heights, both for author and for reader, which may never be fully compassed. The great demand for works of fiction, far in excess as it is of the demand for any other kind of works, is not necessarily a sign of depravity or of frivolity; it may be based upon the longing for that knowledge and guidance for which we seek in vain in philosophy or science, a knowledge of life as we must live it, and guidance that we may live it aright. We may not all seek for truth in the subtleties of metaphysics, we may not all count the stars and tell them by their names, but we must all live. Science may be for the few; conduct is for all. For this reason the novel must ever be of interest and of value, and the novelist may be one of the greatest of human benefactors. His responsibilities are great in proportion to his power of influence, which extends not only to the men of his own generation, but on from age to age. An old monk said to Wilkie, concerning Titian's "Last Supper:" "I have sat daily in sight of that picture for now nearly three-score years; during that time my companions have dropped off one after another, all who were my seniors, all who were my contemporaries, and many or most of those who were younger than myself; more than one generation has passed away, and there the figures on the picture have remained unchanged; I look at them until I sometimes think that they are the realities, and we but shadows." It has been made possible for us to put what is best in us into such a form that it shall live when we are gone, and by its permanence seem a reality beside which we are but shadows. Truth only will so live, and our truth will live only until the world shall have advanced beyond us into deeper and fuller truth. A great mind's truth about human life may live from generation to generation, and from race to race, entertaining, instructing, confronting, and blessing, and helping to mould the life of all the world. Great are the possibilities of fiction.

NOTES ON BIOLOGICAL SUBJECTS.

Read before the Hamilton Association

BY WM. YATES, HATCHLEY, ONT.

I.

After a somewhat mild winter, springlike days were of frequent occurrence after the 24th of March. Some persons who had sugar bushes, began the work of tapping their maple trees as early as that date; the ice in streams and ponds had disappeared by the 4th of April, and on the 5th the first cranes of the season were noticed in these parts, and the piping of the frogs was heard.

One or two days of bright genial sunshine about the 1st of April, is sure to cause the blossoms of the *hepaticas* to peep forth amid the fallen dry leaves of the forest. These were ornamented with the downy flowerstocks and spreading petals of that welcome spring token in the warm afternoon sunshine of the 5th of April, and before the labors of the sap bush have ended the golden heads of the dandelion begin to adorn the sunny roadside "banks and braes." Although the *hepatica's* flowers are commonly assumed to be the earliest floral production of our Canadian spring, such is not the invariable rule, for on one occasion, now many years past, the blossoms of the *cardamine rotundifolia* appeared in a very sheltered spot of ill-drained woodland on the 19th of March—three or four days in advance of the *hepatica* flower, the same season. The *erigenia bulbosa* has also been known to expand its florets quite as early as those of the traditional *hepatica*, or the *sanguinaria*. On the elevated banks of the Avon stream near Stratford, Ont., specimens of this "harbinger of spring" have been found in flower many days before the remains of the wintry snowdrifts had vanished.

The cool temperature and drenching rains of the last days of May and of the first week in June had the effect of retarding the bloom of many species of early summer plants, such as *houstonias*, *castilleias*, and *polygalas*, *lupins*, etc., yet during the last week in May, and for some time afterward, there grew in damp spots by roadsides in some parts of Brantford and Burford townships patches of the

blue violet that were exceedingly attractive to the eye from the profusion of their flowers, and the density and extent of their masses of color. No gardening skill, perhaps, could exceed the brilliancy and charm afforded to every passer by these natural adornments of the boggy wastes and damp roadside borders. In the course of a summer season, many other common wild flowers evince the same *social* habit, and gratify the æsthetic craving that perpetually exists in the human mind. To give instances we need only mention the Blue Iris groups, so exuberant about the 20th of June; then, next, the Tall Vervain, *verbena hastata*, seen during the latter part of July; then the Cardinal Flower of mid-August; and lastly, the immense multitude of Asterworts (including the yellow golden *solidagos*) of the autumnal months. At the present date the clustered masses of the White Aster never appeared in greater glory and profusion on our roadside ditch banks; and in the ardent noon sunshine hosts of gaudily colored butterflies hover and disport themselves around these vegetable denizens of the wilderness. The species we have just alluded to seem to be (*Aster*) *corymbosus* and (*Aster*) *dumosus*. There is also another very noticeable species whose multitude of congregated blossoms afford a massive expanse of pleasing lilac tints. These are most common in marshy situations. Then the more robust and tall growths of the strikingly beauteous purple New England Aster are to be seen on dry banks near fences, and, occasionally, near ditches. This in altitude and luxuriance of growth, nearly rivals its relatives of the golden-rod genus. As if imbued with a love of contrast, groups of white butterflies fluttered and rested on the purple blooms, whilst the large red and florid tinted lepidoptera mostly haunted the paler hued cymes of (*Aster*) *corymbosus* and one variety that resembled (*Aster*) *memoralis* or (*Aster*) *ptarmicoides*.

On the margin of the woods, if not also in the interior, the serene autumnal tints have now begun to manifest themselves on the foliage of the maples, and a number of the walnut trees are already shedding their leaves. "The touch of autumn" seems capricious—a single branch, perhaps, aglow with yellow, orange and crimson, while on the remainder of the tree, a dull green lingers. The tints of decay show first on the margin of the leaf, then extend to the midrib, and the rich hue proves transient, soon changing to a dull brown; then the leaf shrivels and falls. Some of the ferns, also, in

shady recesses of the forest, exhibit the same sensibility to the lowering temperature of the September nights, and suddenly *bleach* or change to an interesting cream color ere they droop and vanish under the influence of the chill rains and gales of October.

Just now the mimetic tendencies in nature are plainly manifested in the white flowers of the snake-head, which is a common growth in the shaded bogs of this vicinity. There is an idea of mockery or derision conveyed to one's mind on a close scrutiny of this remarkable flower; and the remembrance of the bloom of the *cyrepedium* to an Indian moccasin is perhaps not less suggestive. Again a very slight exercise of the imaginative faculty is required to see in the flowers of the Fringed Orchis of the same bogs, the outlines and expression of a benign human countenance! Only yesterday the same *mocking* trait was very evident on a number of groups of Golden Rods on which those ligneous turbinate excrescences, near the summit of the plant stem, had become *quite red* under the influence of the fervid solar rays of September, and assumed a most fraudulent "fruity" appearance. These semblances made one think of the historical "apples of Sodom." In clusters of these plants by the roadside for a distance of miles, about seven-tenths of the individual growths had been victimized by this supposed parasite. In one, also, if not in both of the two species of baneberry, *actæa spicata*, a similar humor of feigning seems predominant. In the white berried variety, the fruit and its mounting or arrangement, mimics the work of the skilled confectioner, and resembles the sugar-coated investiture on elaborate frost cake. What a ruby-like tint, resemblance, and suggestiveness is seen in the fruit of the Wahoo or *euonymus, var obovatus*, than which scarcely any substance can be more insipid to the taste. The luscious red, too, of the ground cherry, and of the *dulcemara* and perhaps some other members of the Nightshade family, give a promise to the eye which is not carried out, or is even treacherous, to the gustatorial sense. The fruit of the Dog-wood, *rhus venenata*, has a close resemblance to that of the white currant bush, but at the same time is an acrid poison, yet at a certain time is utilized as food by the ruffled grouse, (and with impunity to the ornithic consumer). The coral ruby-like fruit of the arum (*Arisæma triphyllum*) is said to have a seductive look, and has been eaten by children with painful, if not with fatal results.

The tendency to imitation in tree foliage, and in plants also, is very marked, and is perhaps too extensive a subject to be comprehended in the present communication, but one or two instances may not be thought irrelevant: For instance in the Mahonia, *Berberis aquifolium*, there is a likeness to the crisped and spinous leaves of the European holly, also a resemblance in the glow of color in the berries—at first orange-colored and afterwards blue.

In the form of stem and leaves of *Euphorbia polygonifolia* or of *E. maculata* (Knot Grass Spurge), the imitation to *ilicebræa* is so close as sometimes to deceive a superficial observer. The very curious reticulations on the leaves of the Rattlesnake, Plantain, might suggest patterns for an artist in wicker, or basket weaving; and the bronze helmet and vizor of the armoured knight of the mediæval periods, may have been copied from the seed capsule of several species of *scutellaria* of swamp margins. In this last mentioned instance the *imitator* and *imitated* may be thought to have illogically changed positions.

In some of the twining stems of shrubs, there is an exact *fac simile* to the scaly covering of the snake, as well as to the ophidian constrictions and contortions. A particular instance of this feature may be sometimes seen in the Moonseed shrub, *Menispermum canadense*. There is, also, something that may perhaps be termed "fantastical" in instances of "albinism" in the motley designs sometimes *etched in white* on the leaves of the common turnip, on pumpkin leaves, and quite frequently, on ribbon grass, as if the beginning of a whimsical design which had not been fully carried out, but abandoned for more practical and perfect ends. If it might not be thought a rambling from our orbit, one might finish by alluding to analogous traits in animal life, as in the curious etching on the upper side of the webbed feet of the Crested Grebe, as if put there to indicate the proper manner of folding the membraneous expansion between the toes when not in use, as a closed umbrella; also the rake-like appendages (for more efficient scratching among leaves) on the *sides* of the *toes* of the Grouse.

As we have introduced bird life, let us mention having seen crows with several *white* wing-feathers, and with a part of the toe-nail *white*!—and the color of the remainder of the bird, black as ebony!—suggesting that something, if only a modicum of pigment had been suppressed, as if "on second thought."

The tufts of crimson and orange colored fibres that serve as a "nidus" to the larvæ of the gall cynips of the Dog Rose bush, (that, a few years since, grew abundantly on the Hamilton commons, not far from the Insane Asylum,) may be mentioned in this connection.

In the prominent white involucre of several of the Dog woods (natural order *cornaceæ*) and notably in *Cornus Canadensis* the "bluffing" whim seems to come to the surface, and make one think of a flourish about one of the capital letters in nature's penmanship, or "splurge" of paper shirt collar in the attire of a "dude," expressing the sentiment, "Beware of spurious imitations," for "all is not gold that glitters." Then the seemingly superfluous amount of petalism in the Guelder Rose, *Viburnum lantanoides*, and in the Snowball, *V. opulus*, as well as the profuse production of rainbow hues throughout the domains of Flora, and in autumnal foliage tints, leads an observer to surmise that mere utilitarian purposes are not the only ones kept in view by the Omniscient Designer of the universe.

Nov. 24th, 1892.

II.

There are now many indications that the spring season is at hand. Although there was this morning severe frost and a keen, raw northeast air, yet at sunrise the Robins broke out in cheerful song, and the melodious warbling of the Blue-bird seemed continuous. The sights and sounds peculiar to the operations of maple sugar-making are seen and heard on every hand. The past winter was characterized by much snow and cold in its latter half, but I think with less frosty winds than in normal Canadian winters. Decided signs of a relaxation of the cold were manifested during the first week of the present month, and a few Blue-birds appeared near here in the mild sunshine of the 8th, although the snow was at least two feet deep in the woods. Mild cloudy weather continuing, with disposition to fog and rain, Robins made their appearance hereabouts on the morning of the 10th, which is, perhaps, two or three days later than last year's coming of these birds. Although there have been several wintry spells since the middle of the month, the birds have made good their presence in the woods and orchards every day.

The large Meadow-larks were first reported in song on the 17th instant, and have been quite musical almost every day since

that date. Juncos were noticed feeding on the seeds still adhering to the dry culms of the Chenopodium weed on the 13th. Grackles and Kill-deer plovers came on the 13th also, and several large Hawks were observed careering and mewing high above the forest on the 14th. On the 18th the Red-winged Grackle was seen and heard. We have always been accustomed here to liken the sound of the the Red-wing's notes to the pronunciation of the syllables "Pope-ree, pope-ree."

There was a gloomy snow-storm on the 22nd instant, and although three or four inches of snow fell, yet on the weather becoming clement a number of Cranes were seen on the following day. Two parties of Cranes, of four members each, were seen visiting some swamp-ash trees whereon were old nests occupied as breeding-places in past seasons.

The Phoebe Fly-catchers were also reported as having been seen on the same day, but we did not see them until the following morning—the 24th.

A mild wave set in before dawn on the 24th and the thermometer showed 51 degrees at daybreak. At 3 o'clock in the afternoon it reached 60 degrees, and this had an inspiring effect on the birds. The Blue-birds were seen mating, and in search for nesting-places. The Robins were doubly demonstrative in voice and behavior, which subsided somewhat as the atmosphere cooled towards evening, when the wind changed from southwest to northwest. The Song Sparrows have also been contributing their quota almost daily to the bird concert since the 17th.

The Chipmunks were noticed above ground by boys who had their dogs in the sugar bush on the 25th. Ground Hogs' tracks were seen in the snow near their burrows on the 23rd. A reliable observer, however, informs us that he saw a Ground Hog moving about in the snow near its burrow one fine cold day during the last week in February. If this be true it would seem to indicate that this animal, like the bear, awakes from its torpor on Candlemas Day, and if certain meteorological conditions exist, again goes into its retirement for a period of six weeks.

Judging from the promptness of the appearance of the bird-hosts, on the subsidence of the cold weather, it would appear that they travel on the very crest of the warm wave, like a victorious army pursuing and harassing a discomfited and retreating enemy.

Regarding the few Meadow-larks, which winter in these parts, it may be said that a family of these birds has, during the past winter, been located in several hilly-stubble fields and meadows near here. In one of these fields (wheat stubble) there was an immense straw-stack, or rather a slovenly-shaped mound of straw and chaffy seed, covering nearly a quarter of an acre, and in the interstices and cavities of this refuse the birds seemingly found ample food and shelter during the inclement weather of winter, and emerged to give out their well-known notes in the brief intervals and fine days of the cold season. Although these are supposed to be insectivorous birds they have been seen to eat the seeds of some species of grasses, such as timothy and clover, and also, with seeming relish, those of the dandelion and other weeds. The imperfect cultivation of our fields has multiplied the number of weeds, and the annual thistle crop, not to mention numerous other vegetable pests, affords food and nesting material for innumerable birds and small animals.

Since the snow has melted from the fields, great numbers of the neatly-made nests of the Field Mouse are to be seen, especially about the surface of the oat-stubble fields. These nests are like a round ball, and are as large as the two fists of a man. If one takes them to pieces it will be seen that they have been made with much labor and skill. The inner cavity is lined with finely hatched grass and straw-fillers; and when one takes into account that all operations have been performed under the deep cold snow, the materials gathered by means of tunnels made to the distance of a number of feet from the intended winter residence, a store of food provided for the many weeks' tenancy, and the cold from above, below and around carefully provided against, he cannot but admire the industry, skill, and foresight of the little architect and builder.

One of our fur-buyers lately made some remarks about the eccentric markings of the Skunk, and stated that there is a great variety in the memphitic markings. In some of them instead of the white V on a black ground, there is a W, with other modifications. Dame Nature seems at times to indulge in a singularly burlesquing mood, as seen in the face markings of the Raccoon, and in its ringed and banded caudal appendage. The curious black diamond-shaped spot on the *chin* of the Chickadee, the white Havelock hood of the black-plumaged Bob-o-link, the white choker of

the owl, and the droll motley markings on the faces of young lambs remind one of the pantomimic roused, the azure design, and arabesque on the face of the circus clown!

March 28th, 1893.

III.

The pleasant season of spring is now evidently at hand, and we are daily expecting to hear the voice of the plowman with his team in the fertile glebe.

There are still small fragments of the winter's snowdrifts to be seen in northern exposures of shaded fence corners, and people who are at work in the maple sugar bushes assure us that there is yet much frost in the ground, under the fallen leaves of the woods. The Song Sparrows have built their nests in the meadows, as also have some crows. The Phoebe Fly-catchers occasionally fly in at the open door or window of our house in their eager search for a suitable nesting-place. The Hylas were first heard piping on the 24th of March, and now they are quite demonstrative with their chorus in the bog puddles.

The coming of the hardier species of insectivorous birds before the snow of winter has much diminished is a remarkable phenomenon. It is caused, perhaps, by the undue pressure of the bird population in those milder climates to which they resort on the approach of winter. I have been assured by acquaintances, who have wintered in Tennessee and Carolina, that Robins, Grackles, Wood-peckers, Fly-Catchers, and other common species, remained there during the entire year; and it is to be noted here that a few hours of warm sunshine, or a warm south wind setting in at the beginning of March or even late in February, will cause a host of insects to emerge from their winter hiding-places, and these become a source of sustenance to bird life.

So soon as the maples are tapped, and the receiving pails are partly filled with sap, great numbers of dark-colored moths assemble near the oozing fluid, probably attracted by its saccharine effluvium. These and many other two-winged flies, and several species of Hymenoptera, hover constantly about the sap vessels, and are a source of some trouble to the syrup makers. A mere rise of the temperature of the air, say up to 50 degrees of the thermometer, is sufficiently attractive to cause the ornithic wave to flow hither, and thirty or forty hours of warm April sun will bring out the Hepaticas,

which we have occasionally seen expanded, when, on digging about their roots, lumps of frozen earth mould, and even ice, have been found. Last year we saw the first blossoming *Hepatica* on the afternoon of the 5th of April. The prospects now are that the plant will not be much later this year, as the thermometer to-day indicated 60 degrees, with bright sunshine and southwest wind.

To-day we learn that bees are in active flight, and return to the hive loaded with pollen. An acquaintance suggests that the pabulum was obtained from willow blossoms, but this is an error. The bees have evidently found some blossoming "Skunk Cabbage," (*Symplocarpus Fœtidus*) as their flight was in the direction in which that plant is known to grow abundantly. The small cone-like spathes of this "cabbage", come up at the edge of the bog while there is thick ice within a few inches of the spot. The plant mentioned is of the *Arum* family and each flower when magnified shows four stamens. The willows come next, or nearly so, in furnishing a supply of bee food. It is thought here that bees have wintered with much less than the usual percentage of loss.

It makes quite a difference what one sees in a series of objects. The more the mind is trained to observe, the more one sees in objects and their surroundings.

Dr. Holmes well observes: "Nature plays at dominoes with you; you must match her piece, or she will never give it up to you." Mr. Emerson says: "It is so wonderful to our neurologists that a man can see without his eyes, that it does not occur to them that it is just as wonderful that he should see with them; and that is ever the difference between the wise and the unwise: the latter wonders at what is unusual. The wise man wonders at the usual! Shall not the heart which has received so much, trust the Power by which it lives? May it not quit other leadings, and listen to the Soul that has guided it so gently, and taught it so much, secure that the future will be worthy of the past?"

April 4th, 1893.

IV.

Last Monday morning, the 17th, a neighbor found a Wildcat caught by one of its forefeet in a large steel trap that had been set and baited with a dead hen, on the margin of an extensive cedar swamp about two miles from here. I went to look at the strange creature a few hours after its capture, and was informed that the

brute weighed only a little over eighteen pounds. It was a male, and spare in flesh. The body was of a tawny grey color, with very faint shadows of stripes on the sides, and small leopard-like specks of black on a tawny ground on the inside of the legs. The tail appeared to be four or five inches only in length, and near the tip there was a black ring of about an inch wide, and at the extreme end a tuft of white hairs. The teeth seemed as large as those of an ordinary bull-dog, and the animal had gnawed in two, near the roots, the stems of one or two poplar trees as thick as a man's wrist, which grew near the trap. The feline was held for eight or ten hours before its life was ended by a bullet. Tracks of wild-cats have been noticed in the snow in the same swamp occasionally of late years, but no similar capture has been made during the last twenty years. The animal will be stuffed and mounted.

The drumming of the Ruffled Grouse has been frequent about here, and the notes of the Chewink became noticeable about the same date, the 6th April. Several Golden-winged Wood-peckers were seen during Easter Week. A friend reports that he has frequently met with these birds in the bush this year since the 17th of March.

On Monday I saw several groups of Grackles enjoying themselves near the small pools of water in the fields. They come to such spots to capture Caddis worms and other aquatic larvæ. So soon as the party have fished a puddle out, they ascend to the branches of the nearest tree and have a chorus of song, at the conclusion of which they fly to a fresh puddle, and repeat the programme.

When the flock numbers forty or fifty the musical effect is harmonious and pleasing, but when there happen to be ten or a dozen only in the party, the discord of individual notes mars the harmony. These Grackle serenades discontinue when the birds pair and commence nest building, which generally takes place about the 1st of May.

On Monday, the 17th, between 11 and 12 a. m., I heard the whiffle-waffling sounds made in the air by the Snipes. At this time of the spring it is a peculiar, soft, genial sound, and is mostly heard near the margin of bogs about the hour of gloaming, and onward to midnight in the warm, calm evenings of the last of April. Occasionally, however, the music is given forth at mid-day, especially if the weather be calm and cloudy, as on Monday last. I cannot do better than quote from Mr. Bolles' book, "A Stroller in New England," concerning this phenomenon :

"At ten minutes to eight, in the evening, (17th Mar., 1891), the air resounded with the strange music of the flying snipe. My friend, who has heard this sound scores of times, feels confident that it is mechanical in character; 'drumming,' in fact. To my ears, it seems to be vocal in quality. Whichever it may be, its weird sweetness makes it one of the most attractive night or twilight sounds in nature. * * * For the shy recluse of the swamp to betake himself at evening to the heights of the sky, and there, against the stars—invisible to all except the keenest eyes—to produce his witching serenade, is something unique and captivating to the imagination."

Those who have watched and heard them at mid-day tell me that they circle about at an altitude of 250 or 300 feet, and make the sound mentioned at intervals of from one to two minutes. My informants believe the sound to be produced by the bird's wings. On Monday last I could point to the spot whence the sounds proceeded, and the birds moved from sixty to seventy feet between the giving forth of the sounds. Whether I had disturbed the birds or not in their feeding operations I am unable to say, but the sounds continued as long as I remained on the spot—from seven to eight minutes. I believe the sound to be produced by the snipe's voice. These birds rarely remain here more than a week or ten days, which is at the end of April.

The first *Hepatica* flowers were found here on the 8th instant. Dragon Flies were seen on the 13th. Five inches of snow fell on the morning of the 15th. To-day an icy rain is falling.

April 20th, 1893.

V.

This is a somewhat tardy spring. I can find no *Sanguinarias* that have yet opened their flowers in spots where in twelve or fourteen days they will be plentiful. There has been a slight snowfall this morning, but it all melted in an hour or two. A Robin is diligently setting on her nest of eggs in a grape vine in my garden, yet I have neither seen nor heard of the arrival of the Swallows. They were seen in Burford last year for the first time on Easter Sunday, 17th of April.

The leaves of the *Erythronium* are nearly expanded in the forest places. *Scilla Siberica* and the English Primrose flowers have beautified our flower plot for the past two weeks.

On Easter Sunday (and inst.) one of our neighbors' sons found a pair of common garter snakes fulfilling the sexual instinct just out-

side of the entrance of their winter retreat on a sunny knoll. In this amorous procedure the snakes twist around each other like a piece of thick cord. In the present instance the ophidians were killed by the dog which attended the boy. Dogs need very little encouragement to kill common snakes. The first business of all the reptilia on their revival in spring, as well as that of the majority of the warm blooded quadrupeds that hibernate, is *sex association*, for the purpose of continuing their kind, and on the first warm sunny days, even in the last days of March or the first week in April, it is a common incident here to find garter snakes as above indicated, even when large snowdrifts can be seen wasting away near the sheltering hole or log.

In the warm nooks among dry fallen leaves in the woods the Hepatica flowers were by no means scarce previous to the five inches of snow-fall last Saturday, the 15th inst., but they have made very little progress since, as the weather has been chilly and uncongenial ever since, with the exception of, perhaps, one day, Tuesday last, 18th inst.

The little chestnut-headed Sparrow (*Fringilla porcella*), who now have nests in the shrubberies, and also the Juncos, seem in consternation at the way the wind blows and the snow flakes fly this morning, yet the Meadow-larks sing lively in the intermittent glints of sunshine, and some of the Robins are working vigorously at the job of digging out angle worms from the sod or sward in the orchard. Thermometer 41°.

April 21st, 1893.

VI.

At the date of my epistle of the 20th ult., I had not heard of the presence of Swallows, yet two or three were said to have been seen here next day (21st ult.) by an acquaintance, upon whose word I place reliance. A more numerous group of thirteen were noticed on the 25th of April by my son. They were perched close in a row on the railroad telegraph wire, in a shaded place between tall woods, and rested there for some time, seemingly fatigued, as if recent arrivals from a warmer latitude. The same species of birds have gradually become more numerous since that date, and are now hourly to be seen and heard twittering and flying in and out of our barn and outbuildings.

The weather continues rather uncongenial, and the month of April, 1893, will long be remembered as remarkable for its boisterous

winds and paucity of sunny calm days. Vegetation is backward, the forests as yet showing but little change from their wintry bareness and indecisive tints, excepting, perhaps, the swamp maples, which reddened with blossoms two weeks ago.

I noticed a few dandelions in blossom for the first time this year on Wednesday last (26th of April.) They are generally to be seen two weeks earlier. I have seen the same flowers expanded in England by the 15th of April. The temperature went up a little on the 30th of April, and consequently the House Wrens put in their appearance. We heard their rippling chant before 7 a.m., announcing their punctual return to their familiar summer quarters. A pair of them went bustling about the neighborhood the whole day, pouring forth volubly repeated snatches of song.

The birds had probably crossed Lake Erie, from Pennsylvania, the same morning, as an acquaintance who lived for years in the Long Point region, avers that migratory birds are frequently at this time of the year, seen there, at, or before sunrise, that were absent at dusk of the previous day.

The leader in the arrival of the warbler family is almost always the little Red-start (*Setophaga ruticilla*), which appears simultaneously with the house Wren, followed immediately by the Marland Yellow-throat, and the Blue-Eyed Yellow Warbler. The Humming Bird is first seen here as soon as the currant bushes blossom. The Robins, that were ten days ago setting on their nest of eggs in the branches of a grape vine in my garden, have met with misfortune, and the broken egg shells are now lying under the nest, which is deserted. I have no doubt that this havoc has been the work of the Boat-Tailed Grackle, which in parties of two and three daily visit the garden, evidently on evil deeds intent. In future it will be more dangerous for them to appear within gunshot of our house premises. This bereavement of the Robins brings to memory a bit of sentimental writing in the New England Stroller, ("Land of the Lingerin' Snow,") which seems worth quoting, (locality Beaver Brook.) "In this meadow the Marsh Marigolds were abundant (May 9th), but on seeking to gather a bunch, I felt the first sorrow of the year. The flowers were faded, their golden petals were stained and partly fallen, their beauty had departed. So soon! Spring, scarcely sure of its standing as a season, is marked with the first scars of death. Not far away I saw

a dandelion gone to seed. Truly if the winter is tempered by many a suggestion of the renewal of life, the spring is branded with many a reminder of the coming of death. Life and Death, what are they but the swinging of a pendulum,—the one as sure to succeed the other, as the other is certain to give place to the one. Each, while it lasts, contains an ever increasing germ of the other. Neither can be *final* as long as the law exists."

Mr. Bolles is a very graphic writer, and his descriptions abound in poetic similitudes, and striking philosophic analogies.

An hour's walk in the woods on a May morning revealed an interesting page in the year book. The increase of heat does not seem *creative*, for in the animal and vegetative life there is *periodicity*—that takes time by the forelock—anticipates, as it were, time and seasons, which are only *co-ordinate*, for when the Ground Hog's hibernating nap of five months is finished, he arises,* shakes himself, and meets the day.

The Robin in his matin song anticipates the coming of daylight; yesternorn he began his canticle when near objects could only be indistinctly seen by human eyes, and the Wren and Pewit Flycatcher speedily followed suit.

The woodland flowers are belated this year, but they had made every preparation to jump into being, and by the time that the thermometer had risen to 60 degrees at noon of the 1st of May, the *Sanquinarias* and *Claytonias* had opened their blossoms, and the *Dicentras* and *Erythroniums* had shot and extended their flower stems and formed incipient flowers.

In bird life almost every hour announces a new arrival. The Large Flycatcher's (*Myiarchus crinitus*) coarse note resounded through the forest this morning, and not far off, the precipitating notes of the Winter Wren were echoed back, and on moving on into the forest depths, the peculiar notes of the Golden-crowned Thrush met the ear. He sang quite timidly at first, as if fearing to be thought intrusive, like a novice in the art of oratory making his debut, yet not quite sure of a favorable reception. Then immediately afterwards, on coming to the forest margin, the rapid song of the Purple Linnet was heard for the first time since last July. This bird is now a laggard; many times we have heard his song during the first week in April.

*Their orbit is co-relative with the calendar.

There was a Crow's nest on a large tree in a not far distant part of the bush, and sounds were distinct and frequent, as if the old birds were feeding the young *corvinus*, but my son mentions that several years ago, he, on hearing similar sounds under similar conditions, was at the trouble to chop down a large tree, ere he made the discovery that the nest had only contained eggs, and that the sounds of food being greedily swallowed proceeded from the throat of the setting hen crow, who was being indulgently fed by her consort.

The early spring flowers will nearly all blossom together this spring, coming "in a lump," one may almost say. The Cohosh, Violets, Trilliums and Acteas have all to blossom during the next three weeks, or else be eclipsed by the big tree foliage, under whose dense shade they soon dwindle.

This must be the rainy monsoon, and farmers are incommoded by the frequent rains, which have stopped all tillage for the present. Clover fields are now beginning to hold out prospects of pasturage if there should be few recurrences of night frost.

There has been distant thunder to-day, and it may be recorded that violent thunderstorms have been of more frequent occurrence than usual, ever since the middle of the month of February. Thunder squalls in spring are believed to be, by the average farmer, succeeded by abnormally cool weather, and the experience of this season may strengthen the dogma.

April 29th, 1893.

VII.

Last evening, by twilight, a number of Whip-poor-Wills gave us their quaint serenade, with its old time emphasis. Their aversion to the mythical "Will o' the Wisp," judging by the birds' vehement objurgations, is by no means diminished.

The first ornithic sounds that greeted the ear on going forth this morning were the staccato notes of the Bobolink, and the pathetic pleading of the Hermit Thrush.

I heard the sound of flying Snipes in the gloaming of 24th April, at another spot. This is a correct description from Mr. Bolles' book: "Rising to a considerable height above the meadow, they fly with rapid wing beats over it, round and round, making from time to time a series of short notes similar to those produced by a person blowing in a rapidly intermittent way across the mouth of a

small shallow bottle. Whether this noise is vocal or mechanical in character, the bird controls it, and *stops it without stopping its flight.* This evening the birds, as a rule, seemed satisfied with twenty-five or thirty successive notes in a series, about once a minute."

Fringilla Tristes (the Yellow Hemp Bird) put in an appearance on the 1st inst., and I saw the *Carex Plantaginea* in blossom to-day.

May 2nd, 1893.

VIII.

The spring season seems to have earnestly set in at last after many relapses. A New England author, whose treatise I have lately been reading, ("The Stroller in New England" by Frank Bolles) describes the spring season's movements as "Crab-like," yet with many charms, and terms that season of the year "The Maidenhood of Nature."

The bush flowers are ten days to two weeks late this year. I saw the first "Adder Tongues" (*Erythronium Americanum*) in full blossom last Thursday. There was a handsome patch of unusually large ones growing on rich ground among raspberry bushes, which had given them shelter and protection. These flowers, if well cared for, seem capable of much enlargement and improvement.

The Marsh Marigolds began to open yesterday, and will soon be at the height of their beauty and vigor. This year they are about co-temporaneous with the Trilliums which began to expand on Saturday and on Sunday (6th and 7th.)

A large number of the summer birds are now here. The Cat Bird, Thrush, and the Hermit Thrush can be heard every day, in full song, and many of the small warblers, notably the pretty Red Start Flycatcher and others. The Tyrant Flycatchers and the Chimney Swallows have also been noticed for some days, and the serenades of the Whip-Poor-Wills, we hear in a piece of not far-distant woods almost every night. When three or four of these strange birds hold a sort of a seance in the loneliest part of the forest, on bright moonlight nights, the drama is a most fantastic extravaganza. They frequently take up triangular positions, or perhaps roughly, quadrangular. Number one will give his quaint call eighty or ninety times in quick succession; on his ceasing number two begins his recitative of about the same number of syllables; next number three "takes up the wondrous tale," and so on about, with brief intervals of moth-catching, till break of day. Sometimes if number one

monopolises more than his due share of the serenade, number two loses all patience and strikes in hit or miss, and the jumble sounds odd, a sort of bird-Billingsgate, for toward the last of his series of "whip-poor-wills," the party of the first part accelerates his rate, and repeats the triad with almost breathless rapidity, so as to get in his number and make sure of his time ahead of interruption. There is something romantic, and almost dreamy and somnambulistic, so remote from the huckstering world of our day, in these midnight bird-revels, that when we listen to them we are carried in memory to the "Arabian Nights Entertainment," or to some of the episodes in the Decameron of Boccaccio, and "Night is Palace Beautiful Peace Chambered," and at that period of the year when the air is swarming with fire-flies the carnival is at its climax!

The "Renaissance" or true growing-time seems now to have arrived, and summer-sounds like the call of the Oriole and the flute of the Rose-breasted Grosbeak are heard, and man and beast rejoice.

The thermometer stands 69 degrees in the shade. Least Sandpiper's cries are frequent, both by day and in the evening. They have nests in our meadows.

May 9th, 1893.

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BALLADS AND BALLAD LITERATURE.

Read before the Hamilton Association, December 22nd, 1892.

BY H. B. WITTON.

With almost all peoples, ballads and rude poetry furnish the oldest fragments of history. Buckle, the historian, says: "All history is at first ballads." Besides their contributions to history, songs have helped to inspire national bravery, and in a variety of ways have made men happy and useful. The Norsemen had their Skalds; the Latin races their trouveres, troubadours, jouteurs and minstrels; the Germans had their minnesingers and meistersingers; and the Britons and Celts their gleemen and bards. Maistre Wace, who lived in the middle of the XII century, has left an imaginary description of the various poets who took part at the coronation of King Arthur. His is an interesting picture of a medieval minstrel company. His "idle singers of an empty day" he classifies into "jouteurs, singers and rhymers," and adds; "many songs might you hear, rote songs, vocal songs, fiddler's lays and notes, lays for harps, lays for sytols, lyres and corn pipes, symphonies, psalteries, monochords, cymbals. Of performers there were plenty, male and female, and some said tales and fables."

At festivals, public and private, the minstrel was an important personage. In the Gothic hall of the noble his harp and voice were readily with stories oftentimes told, but ever new, of knightly bravery in battle, and devotion in love; while at more public gatherings such as the visitation of a bishop, the installation of an abbot, or above all, at the coronation of a king, national themes became the burden of his song. But the minstrel was as much at home, and was as welcome in the cottage of the peasant as in the hall of the baron. A fragment from "Chevy Chase," some of the exploits of Robin Hood, or a minor ditty of local bravery, love, devotion or suffering, sufficed to make all listeners akin, and assured the minstrel a welcome wherever he went. Chaucer's picture of the minstrel of his time is realistic and evidently from the life:

"Somewhat he lisp'd for his wantonness
 "To make the English sweete upon his tongue;
 "And in his Harping when that he had songe,
 "His Eye twinkled in his Head aright,
 "As don the Sterres in a frosty night."

In the middle ages minstrels were often well rewarded. The Chroniclers record that some of them built churches and founded religious houses. Their attractions sometimes excited the clergy to jealousy; for in the olden time many liked songs better than sermons, and preferred to be pleased than instructed.

Of the pre-Christian, heathen literature of Britain, time has left but little trace. The ordeal of modern criticism has reduced the heathen remains of the Celtic period to a few fragments. "Beowulf," an Anglo-Saxon poem of the VIII century, is, in spirit, more Christian than heathen. The "Traveller's Song," which is assigned to the latter half of the VI century, recites the poet's experiences as a travelling gleeman. Another piece "Deor's Complaint," which is held to be of about the same age, is the lament of a bard whom another had supplanted in his lord's favor. The scholarship of England in Anglo-Saxon times was practically confined to the clergy, and the literature of that period is characteristically religious. Translations and paraphrases of the Gospels and narrative portions of the Scriptures, homilies, pastorals, legends, and annals, and chronicles by monastics, are the chief treasures bequeathed to posterity by writers of the middle ages. An interesting list of the best writings of that time, and a summary of their contents may be found in Ten Brinks History of English Literature.

Ballads were originally dancing songs; but, as now understood, they are lyrical poems, in which some popular story is pointedly told. A ballad may, indeed must, include sentiment or passion, or both; but it is essential for these to be coupled with succinct graphic narration of outward action. Sentiment and passion, unaccompanied by narrative, when poetically expressed, fall under some of the infinite varieties into which songs of war, sentiment, and love, and religious hymns may be subdivided, rather than to ballad poetry.

Many of the older ballads of our collections have been orally handed down, till recent times; and nobody knows their exact age or authorship. There is indeed a growing belief that the vital por-

tions of some of the great ballads, like the essential forms of many popular marchen, fables, and nursery rhymes, have been roving about the world for ages, like the wandering Jew, and are the common inheritance of many peoples. The comparative method of investigation applied to popular stories shows some tales to be veritable cosmopolites, strangers nowhere; and the same method applied to the study of popular ballads, may have much to teach concerning them. But it is not strange that folk-poetry even in countries far apart should have lineaments, and strong points in common. Human hearts throb with like passions under different skies. Good and evil, joy and sorrow, love and hate, temptation and self-abnegation, the unspeakable beauty of the earth below, and the heavens above, these—the ultimate elements of all poetry—are common to all lands and ages.

Although the exact date of the older ballads cannot be determined, some of them are undoubtedly closely related to the *lais*, metrical romances and fabliaux, which came into vogue in England, soon after the Norman conquest. These romances, first in verse, and afterwards in prose, dealt with a variety of subjects, legendary and actual, amongst which were the exploits of Alexander the Great; the fall of Troy; the legends of King Arthur; and those of the Holy Grail. These, and many similar topics, during the eleventh and twelfth centuries, were written in metrical form, and in the thirteenth and fourteenth centuries they were reduced to prose, and re-arranged in many shapes. Some of these romances are veritable art treasures; they were written in monasteries, and years of labor were bestowed on their initial letters, miniatures and decoration. Specimens of these manuscripts are still preserved. They are jealously guarded in the great libraries of the world, not only for their rarity, but for the influence of such romances on the literature of Europe, and on the system of chivalry which dominated what was best in Europe for some centuries. Several of these romances were printed by the early printers. Caxton both translated and printed the "Histories of Troye," and Sir Thomas Malory prepared for Caxton's press a book of the Arthurian legends, which in our own time have been presented to the world anew with such melodious freshness by Tennyson.

At its date of issue, in 1765, and for some time after, the book entitled "Reliques of Ancient English poetry," published by Thos. Percy, was the best collection of ballads known. Percy was a man of literary tastes, who enjoyed the friendship of Garrick, Johnson, Shenstone, and other men of note in his day. For a quarter of a century he was rector at Easton Maundit, a village near Nottingham, and afterwards, by favor of the Duke of Northumberland, he became Bishop of Dromore, the see once held by Jeremy Taylor. That Percy had qualifications for making a good collection of ballad poetry, may be seen from his own song, commencing :

"Oh, Nancy, wilt thou go with me
 "Nor sigh to leave the flaunting town?
 "Can silent glens have charms for thee
 "The lowly cot and russet gown?"

Burns said of that song: "It is perhaps the most beautiful ballad in the English language." The first edition of Percy's book contained 176 pieces, 45 of which were taken from an old written ballad book. That old manuscript, since become famous, was a long, narrow, folio volume, containing 195 songs, ballads, and metrical romances. Percy found it on the floor at a friend's house. He was just in time to save it from destruction, as the servants had begun to use it for lighting the fire. After Percy's death, it passed into the possession of his son-in-law, and in 1868 was bought for the British Museum, where it remains. The handwriting of the old ballad book is held by experts to be of the time of the restoration. Mr. Furnival, the great authority on such questions of English literature, calls it "The foundation document of English balladry." In conjunction with Mr. Hales, Mr. Furnival in 1867-68 printed the manuscript in full. Sir Walter Scott acknowledged his obligation to Percy's Reliques, and their influence on his tastes and pursuits. He says: "The first time I could scrape a few shillings together I bought a copy of these beloved volumes; nor do I believe that I ever read a book half so frequently, or with half the enthusiasm."

Shortly after the Reliques were printed for Percy, Joseph Ritson published his "Ancient Songs and Ballads." Ritson's book, though printed in 1787, and dated 1790, was not published until 1792. It is a collection of ballads, chronologically arranged, from the time of Henry the Second to the Revolution; and is edited with great care. Ritson made no pretension to genius, as that gift is usually explained, but by the

special definition, according to Carlyle, that "genius is the capacity to take infinite pains," he was a genius of good standing, for few men ever took more pains to do accurate work than he did. But like some men of that stamp, he had a perverse temper, and took an almost impish delight in pointing out the petty inaccuracies of other workers in the same field of labor as his own. Scott appreciated Ritson's exact knowledge, and careful work, and rarely disagreed with him, though a story is told, that Ritson, when a visitor at Scott's house, on one occasion became so aggressive that Leyden, despite his fondness for literature, could stand the irritation no longer, and threatened to "thraw Ritson's neck," and pitch him out of the window. Despite imperfections of temper, which in his later life became a grave affliction, Joseph Ritson is entitled to the thanks of all who take pleasure in the antiquities of English literature.

Since Ritson's day, Scott, Motherwell, Aytoun, Lockhart, Jamieson, Chambers, and others, have edited collections of ballads, and numerous British societies have printed for their members, ballads of particular periods. Scott's collection of border ballads was just in time to save many of them from oblivion, as their oral transmission was then confined to a few old people, and the next generation would have known little or nothing of them. The completest collection of old ballads is that edited by Prof. F. J. Child, of Harvard University. The Ballads, in 4 vols., edited some years since by Prof. Child, for the Boston edition of the British poets, made lovers of ballad literature his debtors, and the limited edition in 10 parts, just completed under his care, is a superb work, quite unrivalled of its kind.

If the modern ballads, which have permanently enriched the literature of the nineteenth century, be added to those of earlier date, ballad literature becomes doubled in volume, and not depreciated in quality. The poets of Germany following in the footsteps of their forbears, have turned the genius of their language and predilections of the Teutonic race to account, in producing ballads of unsurpassed beauty, and most of the English poets of later years have added to the value of the hoard.

Many a garland might be strung from the beauties of ballad poetry. The limits of this paper permit only a flower or two to be plucked here and there. As with Sinbad in the valley of diamonds,

the difficulty is to choose from such abundance. In such a case we may forbear to quote in order of time or subject. The bee flits from blossom to blossom, and gathers honey, regardless of the order of his visitations, and our illustrations may be more pleasing from variety than from formal selection.

The Cuckoo song is said to be the oldest song in the English language. Ritson places it third in chronological order in his list, and neither of the two which precede it is in English. The Latin convivial song of Walter Mapes stands first, and the second is the French song by Richard the First, written during his captivity in Germany on his return from the East. The MS. of the Cuckoo Song is in the British Museum, and is referred to the year 1250. Although not within the pale of ballads proper, its beauty and age both claim for it first place in English Lyric poetry.

Summer is y-comen in,
 Loud sing, cuckoo ;
 Groweth seed,
 And bloweth mead
 And spring'th the wood now
 Sing cuckoo !
 Ewe bleateth after lamb,
 Low'th after calf cow,
 Bullock sterteth,*
 Buck verteth,
 Merry sing cuckoo !
 Cuckoo, cuckoo !
 Well sings thou, cuckoo !
 Nor swiket† thou never now.

The best known of the old ballads is that called Chevy Chase. There are several ballads, some English, others Scottish, concerning battles on the border. The only fight in which a Douglas fell when battling with a Percy, was that of August 9th, 1388, at Otterburn, where the Earl of Douglas was slain on the field. In the ballads, victory is claimed for both sides, according to the national predilection of the singer. Froissart, the French chronicler, says the Scots were victorious. Chevy Chase is in an ancient and modern version, both of which are more recent than the Otterburn ballads. The minstrel opens with a hunting foray, which is soon merged in the battle given in the older ballads. But, anachronisms are no rarities in these old songs, and historical accuracy is

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not to be expected. The modern version of Chevy Chase, if less accurate than the older songs, is an admirable ballad. Every incident of the day is fixed in the memory, never to be forgotten. The meeting of the armies, the death of Douglas, and the roll call after the battle, are described with much force. How gruesome is the picture of the scene after the fight :

“ Next day did many widows come,
 Their husbands to bewail ;
 They washed their wounds in brinish tears,
 But all would not prevail.

Their bodies bathed in purple blood
 They bore with them away ;
 They kissed them— dead— a thousand times,
 When they were clad in clay.”

Of modern ballads Lenore by Burger is a masterpiece. Its reputation has long been world-wide ; and Germany prizes it as the ballad of ballads. The birth of the modern ballad in Germany dates from its production. Burger wrote this celebrated piece in 1773, eight years after the publication of Percy's *Reliques*. With a firm hand Burger has pictured the old heathen belief that love is stronger than death, inasmuch as even the rest of the dead may be broken by grief of the living. And with like skill he shows the sinfulness of murmuring or despairing over the dealings of Providence with men. The sources of Burger's ballad, are “ Sweet William's Ghost,” an ancient ballad given by Percy ; an old German *volkslied*, and a tale told him by a peasant girl—of a phantom trooper, who at midnight bore to his grave his disconsolate sweetheart. These suggested Lenore to Burger, as *Bandello's* novel suggested *Romeo and Juliet* to Shakespeare. In both cases outlines of the story were to hand, but they were only the motive stimulating the master's higher art, the crude elements to be transmuted to gold in the alembic of the poet's imagination. Dramatists, musicians and painters, have been attracted by this ballad, and have made their arts minister to illustrating its weird beauty. Sir Walter Scott translated it into English in 1795, and it was published the following year under the name of “ William and Helen.” Scott's attention was drawn to the ballad by the chorus of the midnight ride, by which the flight of the spectral steed is made so realistic that it can be almost heard. Taylor's translation of that stanza was repeated to Scott, who used nearly the same words in his version, informing

his readers that for doing so he "had obtained forgiveness of the gentleman to whom the chorus properly belongs." The original chorus reads:

Und immer weiter, hopp, hopp, hopp !
Ging's fort in sausendum Galopp,
Das Ross und Reiter Schnoben
Und Kies and funken stoben.

The translation Scott heard reads :

Tramp ! tramp ! across the land they speed,
Splash ! splash ! across the sea ;
Hurrah ! the dead can ride apace !
Dost fear to ride with me !

Scott's own translation in full is :

From heavy dreams fair Helen rose,
And eyed the dawning red ;
" Alas, my love, thou tarriest long !
O, art thou false or dead ? "

With gallant Fredrick's princely power
He sought the bold Crusade ;
But not a word from Judah's wars
Told Helen how he sped.

With Paynim and with Saracen
At length a truce was made,
And ev'ry knight return'd to dry
The tears his love had shed.

Our gallant host was homeward bound
With many a song of joy ;
Green waved the laurel in each plume,
The badge of victory.

And old and young, and sire and son
To meet them crowd the way,
With shouts and mirth and melody,
The debt of love to pay.

Full many a maid her true love met,
And sobb'd in his embrace,
And flutt'ring joy in tears and smiles
Array'd full many a face.

Nor joy nor smile for Helen sad ;
She sought the host in vain ;
For none could tell her William's fate,
If faithless, or if slain.

The martial band is past and gone ;
She rends her raven hair,
And in distractions bitter mood
She weeps with wild despair.

" O rise, my child," her mother said,
" Nor sorrow thou in vain ;
A perjured lover's fleeting heart
No tears recall again."

"O, mother, what is gone is gone !
 What's lost forever lorn ;
 Death, death alone can comfort me ;
 O had I ne'er been born !

"O break, my heart, O break at once !
 Drink my life-blood Despair !
 No joy remains on earth for me,
 For me in heaven no share."

"O enter not in judgment, Lord !"
 The pious mother prays ;
 "Impute not guilt to thy frail child !
 She knows not what she says.

"O say thy pater noster child !
 O turn to God and grace !
 His will that turned thy bliss to bale,
 Can change thy bale to bliss."

"O mother, mother, what is bliss ?
 O mother, what is bale ?
 My William's love was heaven on earth,
 Without it earth is hell.

"Why should I pray to ruthless Heaven,
 Since my love, William, 's slain ?
 I only pray'd for William's sake,
 And all my prayers were vain."

"O take the sacrament, my child,
 And check those tears that flow ;
 By resignation's humble prayer,
 O hallow'd be thy woe !"

"No sacrament can quench this fire,
 Or slake this scorching pain,
 No sacrament can bid the dead
 Arise and live again.

"O break, my heart, O break at once !
 Be thou my god, Despair !
 Heaven's heaviest blow has fallen on me,
 And vain each fruitless prayer."

"O enter not in judgment, Lord,
 With thy frail child of clay !
 She knows not what her tongue has spoke
 Impute it not, I pray !

"Forbear, my child, this desperate woe,
 And turn to God and grace ;
 Well can devotion's heavenly glow
 Convert thy bale to bliss."

"O mother, mother, what is bliss ?
 O mother, what is bale ?
 Without my William what were heaven ?
 Or with him what were hell ?"

Wild she arraigns the eternal doom,
 Upbraids each sacred power,
 Till spent, she sought her silent room
 All in the lonely tower.

She beat her breast, she wrung her hands,
 Till sun and day were o'er,
 And through the glimmering lattice shone
 The twinkling of the star.

Then crash ! The heavy drawbridge fell,
 That o'er the moat was hung ;
 And clatter ! clatter ! on its boards
 The hoof of courser rung.

The clank of echoing steel was heard,
 As off the rider bounded ;
 And slowly on the winding stair
 A heavy footstep sounded.

And hark ! and hark ! a knock—tap ! tap !
 A rustling, stifled noise ;
 Door latch and tinkling staples ring ;
 At length a whispering voice.

“ Awake, awake, arise, my love !
 How, Helen, dost thou fare ?
 Wakest thou, or sleep'st ? Laugh'st thou or weep'st ?
 Hast thought on me, my fair ? ”

“ My love ! my love ! so late by night !
 I waked, I wept for thee :
 Much have I borne since dawn of morn ;
 Where, William, could'st thou be ? ”

“ We saddle late—from Hungary
 I rode since darkness fell ;
 And to its bourne we both return
 Before the matin bell.

“ O rest this night within my arms,
 And warm thee in their fold !
 Chill howls through hawthorn bush the wind,
 My love is deadly cold.”

“ Let the wind howl through hawthorn bush !
 This night we must away ;
 The steed is wight, the spur is bright ;
 I cannot stay till day.”

“ Busk, busk and boune ! Thou mount'st behind
 Upon my black barb steed ;
 O'er stock and stile, a hundred miles,
 We haste to bridal bed.”

“ To-night ! to-night a hundred miles ?
 O dearest William, stay !
 The bell strik'st at twelve—dark dismal hour !
 O wait, my love, till day ! ”

" Look here, look here, the moon shines clear,
 Full fast I ween we ride,
 Mount and away ! for 'ere the day
 We reach our bridal bed.

" The black barb snorts, the bridle rings ;
 Haste, busk and boune, and seat thee ;
 The feast is made, the chamber spread,
 The bridal guests await thee."

Strong love prevail'd ; she busks, she bounes,
 She mounts the barb behind,
 And round her darling William's waist
 Her lily arms she twined.

And hurry ! hurry ! off they rode,
 As fast as fast might be,
 Spurned from the courser's thundering heels
 The flashing pebbles flee.

And on the right, and on the left,
 'Ere they could snatch a view,
 Fast, fast each mountain, mead and plain
 And cot and castle flew.

Sit fast, dost fear ? The moon shines clear—
 Fleet goes my barb, keep hold !
 Fearest thou ? " O no," she faintly said ;
 " But why so stern and cold ?

" What yonder rings ? what yonder sings ?
 Why shrieks the owl grey ?"
 'Tis death-bell's clang, 'tis funeral song,
 The body to the clay.

" With song and clang, at morrow's dawn,
 Ye may inter the dead ;
 To-night I ride with my young bride
 To deck our bridal bed.

" Come with thy choir, thou coffin'd guest,
 To swell our nuptial song.
 Come priest to bless our marriage feast,
 Come all, come all along !"

Ceased clang and song, down sunk the bier ;
 The shrouded corpse arose ;
 And hurry ! hurry ! all the train,
 The thundering steed pursues.

And forward ! forward ! on they go ;
 High snorts the straining steed ;
 Thick pants the rider's labouring breath
 As headlong on they speed.

" O William, why this savage haste ?
 And where thy bridal bed ?
 'Tis distant far, low, damp and chill,
 And narrow, trustless maid.

" No room for me ?" " Enough for both ;
Speed ! speed ! my barb, thy course !"
O'er thundering bridge, through boiling surge,
He drove the furious horse.

Tramp ! tramp ! along the land they rode,
Splash ! splash ! along the sea,
The scourge is wight, the spur is bright,
The flashing pebbles flee.

Fled past on right and left how fast
Each forest, grove and bower !
On right and left fled past how fast
Each city, town and tower !

" Dost fear ? Dost fear ? the moon shines clear,
Dost fear to ride with me ?
Hurrah ! hurrah ! the dead can ride !
" O William, let them be !"

" See there ! see here ! What yonder swings
And creaks 'mid whistling rain ?"
" Gibbet and steel, th' accursed wheel ;
A murderer in his chain.

" Hello ! thou felon, follow here ;
To bridal bed we ride ;
And thou shall prance a fetter dance
Before me and my bride."

And hurry ! hurry ! clash, clash, clash !
The wasted form descends,
And fleet as wind through hazel bush,
The wild career attends.

Tramp ! tramp ! along the land they rode,
Splash ! splash ! along the sea ;
The scourge is red, the spur drops blood,
The flashing pebbles flee.

How fled what moonshine faintly shewed !
How fled what darkness hid !
How fled the earth beneath their feet,
The heaven above their head !

" Dost fear ? dost fear ? the moon shines clear,
And well the dead can ride ;
Dost faithful Helen fear for them ?"
" O leave in peace the dead !"

" Barb ! barb ! methinks I hear the cock ;
The sand will soon be run ;
Barb ! barb ! I smell the morning air,
The race is well-nigh done."

Tramp ! tramp ! along the land they rode,
Splash ! splash ! along the sea ;
The scourge is red, the spur drops blood,
The flashing pebbles flee.

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" Hurrah ! hurrah ! well ride the dead ;
 The bride, the bride is come ;
 And soon we reach the bridal bed,
 For Helen, here's my home."

Reluctant on its rusty hinge,
 Revolved an iron door,
 And by the pale moon's setting beam
 Were seen a church and tower.

With many a shriek and cry whiz round,
 The birds of midnight, scared,
 And rustling like autumnal leaves
 Unhallow'd ghosts were heard.

O'er many a tomb and tombstone pale,
 He spurr'd the fiery horse,
 Till sudden at an open grave
 He checked the wondrous course.

The falling gauntlet quits the rein,
 Down drops the casque of steel,
 The cuirass leaves his shrinking side,
 The spur his gory heel.

The eyes desert the naked skull,
 The mould'ring flesh the bone,
 Till Helen's lily arms entwine
 A ghastly skeleton.

The furious barb snorts fire and foam,
 And with a fearful bound,
 Dissolves at once in empty air,
 And leaves her on the ground.

Half seen by fits, by fits half heard,
 Pale spectres flit along,
 Wheel round the maid in dismal dance
 And howl the funeral song.

" E'en when the heart 's with anguish cleft,
 Reverse the doom of heaven ;
 Her soul is from her body rest,
 Her spirit be forgiven !"

A writer of ballads pitched in a different key, but worthy to rank with Lenore in excellence, was Macaulay. It is now half a century since his *Lays of Ancient Rome* first appeared. Their brilliant author was then at his best as essayist, reviewer and orator. His old antagonist, Prof. Wilson, of Edinburgh, gave them in "Blackwood" a hearty greeting. "What!" he says. "Poetry from Macaulay? Ay, and why not? The House hushes itself to hear him even though Stanley is the cry! If he be not the first of critics (spare our blushes) who is? Name the young poet who could have written the *Armada*. The young poets all want fire; Macaulay is

full of fire. The young poets are somewhat weakly ; he is strong. The young poets are rather ignorant ; his knowledge is great. The young poets mumble books ; he devours them. The young poets dally with their subject ; he strikes its heart. The young poets are still their own heroes ; he sees but the chiefs he celebrates. The young poets weave dreams with shadows transitory as clouds without substance ; he builds realities lasting as rocks. The young poets steal from all and sundry, and deny their thefts ; he robs in the face of day. Whom? Homer. Sir Walter would have rejoiced in Horatius as if he had been a doughty Douglas.

' Now by our sire Quirinus
It was a goodly sight
To see the thirty standards
Swept down the tide of flight.'

That is the way of doing business ; a cut and a thrust style, without any flourish. Scott's style when his blood was up, and the first words came like a vanguard impatient for battle." Those were hearty words from an opponent, the amende honorable for prior disparagement. Such praise was high ; but it has been sustained by two generations of readers. Sir G. O. Trevelyan, nephew and biographer of Macaulay, says, in his uncle's life, that to June 1875 upwards of a hundred thousand copies of the ballads had passed into the hands of readers. That indicates the existence of a healthier public taste than moaning pessimists would willingly admit can be found. Many a schoolboy knows by heart the response of Horatius to the Consul's appeal to hold the bridge and save the town, when he spake out :

" To every man upon this earth,
Death cometh soon or late,
And how can man die better
Than facing fearful odds,
For the ashes of his fathers
And the temples of his gods.

And for the tender mother,
Who dandled him to rest,
And for the wife who nurses
His baby at her breast."

* * * * He and two comrades kept the foe in play :

" For Romans in Rome's quarrel
Spared neither land nor gold,
Nor son, nor wife, nor limb nor life,
In the brave days of old.

Then none was for a party ;
 Then all were for the state ;
 Then the great man helped the poor,
 And the poor man loved the great ;
 Then lands were fairly portioned ;
 Then spoils were fairly sold ;
 The Romans were his brothers
 In the brave days of old."

The end of the lay is as well known as its beginning. In stirring verse the exploits of Hæcilius are sung. We are made eye-witnesses of his bravery at the bridge ; his plunge into the Tiber, and escape ; the gratitude of his country, and the statue in his honor :

" And still his name sounds stirring,
 Unto the men of Rome,
 As the trumpet-blast that cries to them
 To charge the Volscian home ;
 And wives still pray to Juno
 For boys with hearts as bold,
 As his who kept the bridge so well
 In the brave days of old."

But it was no marvel that he, who at twenty-four could write the "Battle of Ivry," should at forty-two write the "Lays of Ancient Rome." The Huguenot song of triumph was recognized as a promise of greater things to come, and rightly so, for its opening verse is an outburst of exultation which strikes the heart as does an opening chorus from some great tone master :

" Now glory to the Lord of Hosts from whom all glories are !
 And glory to our Sovereign Liege, King Henry of Navarre !
 Now let there be the merry sound of music and of dance,
 Through thy corn fields green, and sunny vines, oh pleasant land of France !
 And thou Rochelle, our own Rochelle, proud city of the waters,
 Again let rapture light the eyes of all thy mourning daughters.
 As thou wert constant in our ills be joyous in our joys,
 For cold and stiff, and still are they who wrought thy walls annoy,
 Hurrah ! Hurrah ! a single field hath turned the chance of war,
 Hurrah ! Hurrah ! for Ivry and Henry of Navarre."

A plaintive tenderness is the crowning glory of many Scottish ballads : they are as sad as music in a minor key. Of that class, "Waly, Waly," a ballad of about the middle of XVI century, is a good example :

" O Waly, Waly, up the bank,
 O Waly, Waly, down the brae,
 And Waly, Waly, yon burn-side,
 Where I and my love were wont to gae !
 I lean'd my back unto an aik,
 I thoct it was a trustie tree,
 But first it bow'd and syne it brak',—
 Sae my true love did lichtlie me.

O Waly, Waly, but love be bonnie,
 A little time when it is new !
 But when its auld it waxeth cold
 And fadeth awa' like the morning dew.
 O wherefore should I busk my heid,
 And wherefore should I kame my hair ?
 For my true love has me forsook,
 And says he'll never lo'e me mair—

Noo Arthur's seat shall be my bed
 The sheets sall ne'er be press'd by me ;
 Saint Anton's well sall be my drink ;
 Since my true love's forsaken me —
 Martinmas wind, when wilt thou blaw,
 And shake the green leaves off the tree ?
 O gentle death, when wilt thou come ?
 For of my life I am weary.

'Tis not the frost that freezes fell,
 Nor blowing snow's inclemencie,
 'Tis not sic cauld that makes me cry ;
 But my love's heart grown cauld to me.
 When we cam' in by Glasgow toun,
 We were a comely sight to see :
 My love was clad in the black velvet,
 An' I mysel' in cramasie.

But had I wist before I kiss'd
 That love had been so ill to win,
 I'd lock'd my heart in a case o' goud,
 And pinn'd it wi' a siller pin—
 And oh ! if my young babe were born,
 And set upon the nurse's knee ;
 And I mysel' were dead and gane,
 And the green grass growing over me !"

Of the border ballads, one of the best is "Jamie Telfer."
 Along the border in the olden time there was a class of impartial
 folk who :—

"Drove the beeves that made their broth,
 From England, and from Scotland both."

This ballad goes back to one Martinmas night when the Captain
 of the Bewcastle drove off Jamie Telfer's kye. The story runs :

"And when they cam to the fair Dodhead
 Right hastily they climbed the heel ;
 They loosed the kye out, ane and a'
 And ranshackled the house right weel.

Now Jamie Telfer's heart was sair,
 The tear aye rowing in his e'e ;
 He pled wi' the captain to hae his gear,
 Or else revenged he would be.

The captain turned him round and leugh ;
 Said—"Man, there's naething in thy house
 But ae auld sword without a sheath,
 That hardly now wad fell a mouse !"

The poor fellow ran ten miles through the sprinkled snow to Gibby Elliot, the only man who refused him help, saying :

"Gae seek you succor where you paid black-mail,
For, man ! ye ne'er paid money to me."

He next carries the fray to auld Jock Grieve, who is married to his wife's sister ; so he sat Jamie on the back of a weel fed bonny black and sped him on his way to give the fray to William's Wat, who with two sons joined him and took the fray to Branksome Ha'. His chief, bauld Buccleuch, heard the story, and said :

"Alack for wae !" quoth the gude auld lord,
"And ever my heart is wae for thee !
But fye, gar cry on Willie, my son
And see that he comes to me speedilie !

"Gar warn the water, braid and wide,
Gar warn it soon and hastily !
They that winna ride for Telfer's kye,
Let them never look in the face o' me !"

The country side was warned :

"And aye the ower-word o' the thrang
Was : 'Rise for Branksome readilie !'"

The raiders are overtaken with the cattle ; there is a fight, with slaughter, in which the captain was wounded and the cattle rescued. When they were ready to go back, one of the party hinted that it would be poetic justice to take back with them a few of Bewcastle's kye, so :

"When they came back to the fair Dodhead,
They were a welcome sight to see !
For instead of his ain ten milk-kye
Jamie Telfer has gotten thirty and three."

From a border foray, to remembrance of Rob Roy, and the passing stave chanted by Wordsworth at his grave, is an easy transition :

"Heaven gave Rob Roy a dauntless heart,
And wondrous length and strength of arm ;
Nor craved he more to quell his foes,
Or keep his friends from harm.

Yet was Rob Roy as wise as brave ;
Forgive me if the phrase be strong ;
A poet worthy of Rob Roy
Must scorn a timid song.

Say then that he was wise as brave ;
As wise in thought, as bold in deed :
For in the principles of things
He sought his moral creed.

Said generous Rob, 'what need of books?
 Burn all the statutes and their shelves;
 They stir us up against our kind;
 And worse, against ourselves.

We have a passion—make a law.
 Too false to guide us or control!
 And for the law itself we fight,
 In bitterness of soul.

And puzzled, blinded, thus we lose
 Distinctions that are plain and few;
 These find I graven on my heart,
 That tells me what to do.

The creatures see of food and field,
 And those that travel on the wind!
 With them no strife can last; they live
 In peace and peace of mind.

For why? because the good old rule
 Sufficeth them, the simple plan
 That they should take who have the power,
 And they should keep who can.

A lesson that is quickly learned,
 A signal this which all can see;
 Thus nothing here provokes the strong
 To wanton cruelty.

All kinds and creatures stand and fall
 By strength of prowess or of wit:
 'Tis God's appointment who must sway,
 And who is to submit.

Since then the rule of right is plain,
 And longest life is but a day;
 To have my ends, maintain my rights,
 I'll take the shortest way.

And thus among these rocks he lived,
 Through summer heat and winter snow;
 The Eagle, he was lord above;
 And Rob was lord below.

So was it—*would* at least have been
 But through untowardness of fate;
 For polity was then too strong—
 He came an age too late.

And had it been thy lot to live
 With us who now behold the light,
 Thou would'st have nobly stirred thyself
 And battled for the right.

For thou wert still the poor man's stay,
 The poor man's heart, the poor man's hand,
 And all the oppressed, who wanted strength,
 Had thine at their command."

German literature is especially rich in ballads. Goethe, Schiller, and Heine were masters of the art; and to Uhland's fancy we are indebted for ballads of exquisite beauty. The *Erlkœnig* of Goethe was translated by Scott; and the translations, by Lord Lytton, of Schiller's ballads, are well known. Baskerville has translated many of Uhland's ballads. The "*Minstrel*" from the first part of *Wilhelm Meister* written by Goethe, in his youth, is a charming ballad:

"What is it at the gate I hear?
 What on the bridge is sounding?
 Let's have the singing to our ear,
 Along the hall rebounding.
 So spake the King; the page he ran;
 Back came the boy; the King again
 Cried: 'Bring us in the Minstrel.'

'My greeting to ye noble lords!
 Ye gentle ladies greeting!
 Like stars on stars rich heaven affords;
 Names fail at such a meeting.
 In hall, of pomp and splendour full,
 I close my eyes, mine not the role,
 Now, wonderingly to revel.'

With eyelids closed, the minstrel's call,
 Brings perfect tones o'erflowing;
 The brave knights glancing round the hall
 And fair cheeks cower glowing.
 The King enchanted with such art,
 Cried: 'Give him for this wond'rous part,
 A golden chain to pay him.'

'Give not the golden chain to me,
 But to the knights, who ever
 In fight, before their helmets see
 Stern foemen's lances shiver.
 Give it the Chancellor you keep,
 And let him add it to the heap
 Of burdens he must carry.

'I sing but as the warbler sings
 That nestles in the bushes.
 The song that without effort springs
 Rewards itself, and pushes
 All else aside. Still this I pine,
 Let them a glass of generous wine,
 Bring me in golden goblet.'

Before 'twas quaff'd he held it high,
 'Oh nectar sweet, refreshing;
 And threefold happy family,
 Where thou art trivial blessing,
 Heaven's joy be with ye; think on me;
 And thank ye God as fervently,
 As I for this do thank ye."

The extract given from Wordsworth's poem calls to remembrance the "Lost Leader," by Browning. A letter in 1875, from Browning, acknowledges that Wordsworth was the lay figure for the "Lost Leader;" just as Dicken's admitted that Leigh Hunt was the prototype of Skimpole; and his own father of Micawber. Before middle life, Wordsworth lost some of his early ideals, and became out of touch with the aspirations of Browning. In his old age the latter, however, said the "Lost Leader" was not intended to be a full and true portrait of Wordsworth, or he would never have talked of "handfuls of silver and bits of riband," which he is sure never influenced the great poet's change of politics.

I.

"Just for a handful of silver he left us,
 Just for a riband to stick in his coat—
 Found the one gift of which fortune bereft us,
 Lost all the others she lets us devote;
 They with the gold to give doled him out silver,
 So much was theirs who so little allowed;
 How all our coppers had gone for his service!
 Rags—were they purple his heart had been proud!
 We that had loved him so, followed him, honored him,
 Lived in his mild and magnificent eye,
 Learned his great language, caught his clear accents,
 Made him our pattern to live and to die!
 Shakespeare was of us; Milton was for us,
 Burns, Shelley were with us—they watch from their graves;
 He alone breaks from the van and the free men,
 He alone sinks to the rear and the slaves!

II.

We shall march prospering—not through his presence;
 Songs may inspirit us—not from his lyre;
 Deeds will be done—while he boasts his quiescence,
 Still bidding crouch whom the rest bade aspire:
 Blot out his name then, record one lost soul more,
 One task more declined, one more footpath untrod,
 One more devil's triumph and sorrow for angels,
 One wrong more to man, one more insult to God!
 Life's night begins; let him never come back to us!
 There would be doubt, hesitation and pain,
 Forced praise on our part—the glimmer of twilight,
 Never glad confident morning again!
 Best fight on well, for we taught him—strike gallantly,
 Menace our heart ere we master his own,
 Then let him receive the new knowledge and wait us,
 Pardon'd in heaven, the first by the throne."

"Sir Patrick Spens" is one of the best of the old Scottish ballads. It was first published in the Percy collection; but Sir Walter Scott was able, after much search, to give several additional stanzas

to Percy's version. Sir Patrick is commended to the King as "the best sailor that ever sailed the sea," and is sent by the King :

"To Noroway, to Noroway,
To Noroway o'er the faem,
The King's daughter of Noroway,
'Tis thou maun bring her hame."

They reached Norway safely, but when about to return, one of the seamen warned Sir Patrick that he feared a deadly storm, for :

"I saw the new moon late yestreen
Wi' the auld moon in her arm ;
And if we gang to sea master,
I fear we'll come to harm."

They hadna sailed a league, a league,
A league, but barely three,
When the lift grew dark, and the wind blew loud
And gurlly grew the sea.

The ankers brak, and the topmast lap,
It was sic a deadly storm ;
And the waves came o'er the broken ship
Till a' her sides were torn."

Sir Patrick Spens went up the rigging to spy for land, but :

"He hadna gane a step, a step,
A step, but barely ane.
When a boult flew out of our goodly ship
And the salt sea it came in."

The efforts to save the ship were unavailing.

"And lang, lang may the maidens sit,
Wi' their gowd kaims in their hair,
A' waiting for their ain dear loves—
For them they'll see na mair."

The ballad poetry of Ireland deserves special consideration. Due attention to the ballads of John Banim, Gerald Griffin, and Thomas Davis, would alone exceed the limits of this paper, and to curtail them would reprehensibly mar them. I however, quote a short ballad from Lover and one from Moore. That from Lover is founded on the old superstition that when a beautiful child dies it is stolen by the fairies :

"A mother came when the stars were paling,
Weiling round a lonely spring ;
Thus she cried while tears were falling,
Calling on the Fairy King :

'Why with spells my child caressing,
Courting him with fairy joy ;
Why destroy a mother's blessing,
Wherefore steal my baby boy ?

'O'er the mountain, through the wild wood,
Where his childhood loved to play ;
Where the flowers are freshly springing,
There I wander day by day.

' There I wander, growing fonder
Of the child that made my joy ;
On the echoes wildly calling,
'To restore my fairy boy.

' But in vain my plaintive calling,
Tears are falling all in vain ;
He now sports with fairy pleasure,
He's the treasure of their train !

' Fare thee well my child forever,
In this world I've lost my joy,
But in the next we ne'er shall sever,
There I'll find my angel boy.' "

The ballad quoted from Moore is founded on the Mærenchen that a maiden richly apparelled, and bearing a wand, on which she carried a ring of great value, travelled, without escort, unmolested, from one end of Ireland to the other :

" Rich and rare were the gems she wore
And a bright gold ring on her wand she bore ;
But oh ! her beauty was far beyond
Her sparkling gems, or snow-white wand.

' Lady, dost thou not fear to stray,
' So lone and lovely through this bleak way ?
' Are Erin's sons so good or so cold
' As not to be tempted by woman or gold ?

' Sir Knight, I feel not the least alarm,
' No son of Erin will offer me harm ;
' For though they love women and golden store,
' Sir Knight, they love honor and virtue more.'

On she went, and her maiden smile
In safety lighted her round the Green Isle,
And blest forever is she who relied
Upon Erin's honor and Erin's pride."

The Rowley poems, interesting from their intrinsic value, and from the circumstances under which they were written by poor Chatterton, contain ballads of much merit. Chatterton pretended that his poems were written by a Bristol monk, a contemporary and friend of Lydgate, of Bury, and of the time of Master Canynge, Mayor of Bristol, and builder of the Church of St. Mary, Redcliffe, of that town. In the ballad of "The Bristol Tragedy," it is Master Canning who intercedes with King Edward for Sir Charles Bawdin, who was beheaded, and his body, according to the barbarity of the

times, mutilated for treason. The Bristol ballad is one of the best of the Rowley poems. For two centuries some of the Chatterton family were sextons at the Church of St. Mary, Redcliffe, Bristol. During Chatterton's life, his uncle was sexton. The boy poet gave it out that the poems he produced had been found by elder members of his family, in the muniment chest of Redcliffe Church, and were transcribed by him. To sustain his story illuminated documents were produced, as marvellous in their way as the poems, and these, and the boy's extreme youth, aided to keep up for almost a hundred years controversy as to the authenticity of these poems.

It was at Bristol that Joseph Cottle, the bookseller, nearly a hundred years ago, published a little work, called "Lyrical Ballads," of some interest in relation to our subject. That little book was the joint production of William Wordsworth and Samuel Taylor Coleridge, two men who have exercised great influence on English literature. The ballads of their volume were conjointly written by the two poets, when they were at their best, and during the period of their closest intimacy. Like the "Blue Boy" of Gainsborough, the artist, the work of each was done to illustrate a theory. Wordsworth and Coleridge differed in opinion as to the relative poetical value of incidents of common everyday life, and those which border on the supernatural. Each wrote ballads for this volume to prove his own theory. Wordsworth wrote more than a dozen pieces on his side; while, Coleridge wrote only one, the "Ancient Mariner," in proof of his contention. The essence of the controversy between these distinguished poets existed long before their day, and will divide the opinions of men long after them. But, if it did not settle their dispute, their controversy gave to the English language some of its best ballads. Both the "Ancient Mariner" and "Christabel" are too long to quote in their entirety, and to mutilate them would be a wrong:

"Farewell, farewell! but this I tell
To thee thou Wedding Guest!
He prayeth well, who loveth well,
Both man and bird and beast."

The songs of the people command passing reference. Thomas Hood, Ebenezer Elliott, Ernest Jones, and Gerald Massey have written ballads that are bright, humorous and delightful, but some of their songs are veritable voices from the depths, wails of despair that startle the ear, and make the heart ache. Their gloomiest

dirges have been serviceable. Hood's "Song of the Shirt," and Noel's "Pauper's Drive," with its doleful chorus,

" Rattle his bones over the stones ;
He's only a pauper whom nobody owns,"

more effectively forced attention to the miseries of the poor than all the reports and figures compiled by commissioners : "I have had no childhood," said one of these men, "ever since I can remember I have had the aching fear of want throbbing in heart and brow." Who can wonder at the biting irony of his cry :

" Smitten stones will talk with fiery tongue,
And the worm, when trodden, will turn ;
But cowards, ye cringe to the cruellest wrongs,
And answer with never a spurn.

Then torture, oh ! tyrants, the spiritless drove,
Old England's helots will bear ;
There's no hell in their hatred, no God in their love ;
No shame in their death's despair.

For our fathers are praying for pauper pay,
Our mothers with death's kiss are white ;
Our sons are the rich man's serfs by day,
And our daughters his slaves by night."

Of Burns it is needless to speak. His songs are universally known ; and their merit everywhere appreciated. Hogg, the Ettrick shepherd, wrote with a grace beyond the reach of art. His "Kilmeny" and the "Jeanie Morrison," of Motherwell, are faultless. Poor Tannahill piped a reed of sweetest tone. What can surpass his "Braes o' Gleniffer ?"

" Keen blows the wind o'er the Braes o' Gleniffer,
The auld castle's turrets are covered wi' snaw ;
How chang'd frae the time when I met wi' my lover
Among the broom bushes by Stanley green shaw ;
The wild flow'rs o' simmer were spread a' sae bonnie,
The mavis sang sweet frae the green birken tree ;
But far to the camp they hae march'd my dear Johnnie,
And now it is winter wi' nature and me."

Lord Tennyson in his "Idylls of the King," clad the Arthurian legends with all the graces of modern poetry. With what resistless charm he depicts Sir Galahad, the perfect knight, whose purity enabled him to find the holy graal ; and how he makes live again the less perfect knights of Arthur's court, who, subject to human frailties, were sometimes led into temptation, and sometimes failed to accord to others that forgiveness they implored from heaven for themselves. And how beautiful are his ballads. The wine from

his own vintage has the sparkle and delicacy of flavour of the wine he drew from the antique jars of the old legends. For example, read his "Lady Clare :"

It was the time when lilies blow,
And clouds are highest up in air,
Lord Ronald brought a lily white doe
To give his cousin, Lady Clare.

I trow they did not part in scorn,
Lovers long betrothed were they :
They two will wed the morrow morn,
God's blessing on the day.

"He does not love me for my birth,
Nor for my lands so broad and fair ;
He loves me for my own true worth,
And that is well," said Lady Clare.

In there came old Alice, the nurse,
Said, "who was this that went from thee ?"
"It was my cousin," said Lady Clare,
"To-morrow he weds with me."

"O God be thanked," said Alice the nurse,
That all comes round so just and fair ;
Lord Ronald is heir of all your lands,
And you are not the Lady Clare."

"Are ye out of your mind, my nurse, my nurse?"
Said Lady Clare, "that ye speak so wild ?"
"As God's above," said Alice the nurse,
I speak the truth : you are my child.

"The old Earl's daughter died at my breast ;
I speak the truth as I live by bread ;
I buried her like my own sweet child,
And put my child in her stead.

"Falsely, falsely have ye done,
O mother, she said, "if this be true,
To keep the best man under the sun,
So many years from his due."

"Nay, now my child," said Alice the nurse,
"But keep the secret for your life,
And all you have will be Lord Ronald's,
When you are man and wife."

"If I'm a beggar born," she said,
"I will speak out, for I dare not lie ;
Pull off, pull off the brooch of gold,
And fling the diamond necklace by."

"Nay now, my child," said Alice the nurse,
"But keep the secret all ye can."
She said, "not so ; but I will know,
If there be any faith in man."

"Nay now, what faith?" said Alice the nurse,
 The man will cleave unto his right,"
 "And he shall have it," the lady replied,
 "Though I should die to-night."

"Yet give one kiss to your mother dear !
 Alas, my child, I sinned for thee,"
 "O mother, mother, mother," she said,
 "So strange it seems to me."

"Yet here's a kiss for my mother dear,
 My mother dear, if this be so,
 And lay your hand upon my head
 And bless me, mother, ere I go."

She clad herself in a russet gown,
 She was no longer Lady Clare :
 She went by dale, and she went by down,
 With a single rose in her hair.

The lily-white doe Lord Ronald had brought
 Leapt up from where she lay,
 Dropt her head in the maiden's hand,
 And followed her all the way.

Down stept Lord Ronald from his tower ;
 "O Lady Clare, you shame your worth !
 Why come you drest like a village maid,
 That are the flower of the earth ?"

"If I come drest like a village maid,
 I am but as my fortunes are :
 I am a beggar born," she said,
 "And not the Lady Clare."

"Play me no tricks," said Lord Ronald,
 For I am yours in word and deed.
 Play me no tricks, said Lord Ronald,
 "Your riddle is hard to read."

O, and proudly stood she up !
 Her heart within her did not fail ;
 She looked into Lord Ronald's face
 And told him all her nurse's tale.

He laughed a laugh of merry scorn ;
 He turned and kissed her where she stood ;

"If you are not the heiress born,
 And I," said he, "the next in blood—"

"If you are not the heiress born,
 And I," said he, "the lawful heir,
 We two will wed to-morrow morn,
 And you shall still be Lady Clare."

These ballads are but as a drop from the ocean. Lack of space precludes reference to humorous ballads, of the class found in the "Bon Gaultier" book. And there are Irish, Spanish and Norse ballads of wondrous beauty ; songs from France, including those of

Beranger, the prince of song writers ; ballads from Greece, the land where the singer's art sprang at once to perfection ; songs from Italy, where Dante shewed that the vulgar tongue could touch the heart as effectively as the classic speech of the Cæsars ; and the ballads of Poe, Longfellow, Whittier, and Lowell in the new world ; of which no mention can be made. Regretfully one turns from these : for at hazard stanzas by the score might be taken, that have made life brighter, toil pleasanter, and the world better.

The modern ballads by Goethe, Scott, Schiller, Wordsworth, Uhland and Tennyson, need no comment. Gems of song from the treasury of the master singers of the century need no commendation. They are as wine that needs no bush ; and they will delight readers without end in the days to come. The ballads of the olden time, like those by and for whom they were sung, bear a composite character in which good and evil are curiously blended. But their sturdy merit bears scrutiny, and fears no criticism. There is no cause to exaggerate their merits, or screen their defects. In some will be found coarseness of thought and expression ; while others are common-place and abound in puerilities that are wearisome. But in many, may be found a combination of force, sweetness, and pathos unsurpassed, and but rarely equalled in literature. Sir Phillip Sydney could be moved by Chevy Chase, however rudely recited, as by the blast of a trumpet ; and, in this practical age, to thousands the past brings no remembrance of sweeter pleasure than that of the hours of childhood, spent at the knee of some venerated, though perhaps illiterate, member of the early home, who at the cottage hearth, in the evening gloaming, by oft-repeated recital of these old ballads, made the young heart dance with joy never to be forgotten.

NOTES ON THE FLORA OF THE NIAGARA PENINSULA AND SHORES OF LAKE ERIE.

Read before the Hamilton Association, January 12th, 1893.

BY JOHN MACOUN, M. A.

To anyone not acquainted with the flora of Ontario in its eastern and northern parts, a visit to that part lying south and west of Hamilton would present so many points of contrast that the impression made would not be easily forgotten. Such has been the case with myself, and the vivid impressions made on my first visit with Dr. Cowdry in 1877 have been intensified by my subsequent ones.

The grandeur of the forests south of Hamilton and east of the escarpment must have been very impressive to the early settlers, and to the botanist a source of wonder. Perhaps in no part of America on the same number of square miles are there so many species of native trees as are found there to-day. It is too true that some of the more interesting are becoming very scarce and are almost unknown to the younger part of the community, yet their scarcity in the present is no proof of their rarity in the past. Owing to frequent changes in soil the rarer trees are very local and seem to be passing out of the remembrance of the present generation, in nearly all the localities where they have been. While at Niagara-on-the-Lake last summer I was desirous of getting a photograph of a well developed Sassafras, and if possible one of a group of the Cucumber-tree (*Asimina triloba*). I had seen poor specimens of the Sassafras at Grimsby and Jordan Station, but wanted better, so after long hunting and many talks I found a few on the outside near Four Mile Creek and a large one was discovered in a field still further to the north. Of the Cucumber-tree I could get no trace whatever. The preceding year I had looked for it where I found it in 1877, at the foot of Queenston Heights, but the forest was cut away and the memory of its existence had passed from the people. By

good fortune I had made the acquaintance of Mr. Roderick Cameron, foreman at Niagara Park in the summer 1891, and, he being a close observer and a very good local botanist, I asked him to look out for the tree. He found it in flower somewhere between St. David's and the escarpment, where, I am unable to say, as I failed to find it. In company with a Mr. H. N. Topley, our photographer, the roads were traversed in all directions and every man, woman and child we came across interviewed, but without success. When we were about to give up the quest we saw in the distance men at work on the roads and as a last resource we interviewed them with the same results. As I turned away a young man said: "over in that field; there is an old man who knows *everything*, he can tell you if such a tree exists, if anyone can." The old man knew, and rising from his knees—he was trimming turnips—pointed to a dead pine in the forest and said: "beyond that tree on an old road you will find what you are looking for." His directions were so precise that we had no difficulty in finding the clump of Cucumber-tree, and although the day was showery we obtained two fine photographs. When going to the spot we came out on the ridge south of Merriton which seemed to be about a mile to our right.

While at Niagara Falls in 1891 we obtained photographs of nearly forty species of native forest trees, and travelled over many miles of country roads, made many enquiries for Sassafras, but could get no account of any outside the thick woods, yet on our return from the trip just spoken of we came upon a farm completely surrounded by them, and nearly all very fine specimens.

I wish just here to call attention to the fact that our boasted system of education is very much like the missionary work of the churches. In no section of Ontario have I found an intelligent appreciation of their surroundings among the school children and young people generally, and yet ignorance, in another sense, does not exist. The Church, like the children, is well posted regarding foreign heathen, but our own heathen, which are in both city and country, are too local to be of much account, or bring *ends* to any society.

The early settlers of the Niagara Peninsula were wiser than they knew when they left so much half-cleared land and allowed so many single trees to grow up to maturity in their fields and fence corners. To-day the beauty of the country and the enhanced value of the land is largely due to this cause. So many trees scattered

over the land break the bitter blasts of winter, and moisten the scorching breath of the summer breezes, and so in both summer and winter is the land fitted for what it is—the Garden of Canada. There is no use in disguising the fact that the careless habits of the last generation have been the making of the present, and if the country from Hamilton to Niagara-on-the-Lake was so completely de-forested as in the *well-cleared* lands of Ontario, its boasted title of the Garden of Canada would be a misnomer.

Nowhere in the Province have I seen finer specimens of the various species of *crataegus* (white thorn), than on the common at Niagara-on-the-Lake. A botanical student can there distinguish very readily the cock-spur Thorns (*crataegus ems-gathi*) from the various forms of the Scarlet-fruited Thorn (*crataegus coccinea*). All the forms have become beautifully-shaped trees with wide-spreading crowns, and are marvels of beauty when in flower or when laden with mature fruit. Near the upper part of the open ground are some fine specimens of the Sour Gum (*Nyssa Multiflora*) which would be ornaments anywhere and at anytime, but seen when in full flower with its glossy light-green leaves, in the latter part of June, it is a charming object. This is by no means a rare tree, but seems to be very little known, although it is common on Queenston Heights and in many parts of Essex and Elgin Counties.

The oaks in numerous species are found scattered all over the peninsula, but each species has its own particular habitat. The species common to almost all soils are White Oak (*quercus alba*) and two Black Oaks (*Q. rubra* and *coccinea*). On the river banks and scattered through the country are two species, the Mossy Cup Oak, (*Q. macrocarpa*) and the Swamp White-oak (*Q. bicolor*). These species are very often taken the one for the other, but when in fruit they are easily distinguished by the latter having long-peduncled fruit, while the other has the mossy-fringed cup which gives to it its trivial name. On the river bank between the Whirlpool and Foster's Flats are groves of Chestnut Oak (*Q. Prinus, Linn.*) that would be taken for Chestnut (*Castanea vulgaris, var. Americana*) by a common observer, so much are they alike. While the latter tree is in flower, however, about the middle of July, it cannot be mistaken for anything else owing to its great bunches of catkins (barren flowers) near the ends of its branches. A very beautiful and valuable oak is the Swamp Oak or Pin Oak (*Q. palustris*) which delights, as its name indicates,

in all the boggy clay soils of the Peninsula. Its long pendent branches distinguish it from all other species.

No less than five species of Hickory rear their stately forms in close proximity to Niagara Falls. The three edible species are (*Carya alba*, *tomentosa*, and *microcarpa*), while the Broom Hickory (*Carya porcina*) and the Bitter-nut Hickory (*Carya amara*) have fruit that are seldom eaten except by boys when in extremity.

Two flowering trees that are almost peculiar to the district should be mentioned, the Flowering Dog-wood (*Cornus florida*), which may be seen bordering the forest from Niagara to Sarnia, and the Tulip Tree (*Liriodendron Tulipifera*) which carries the mind into the tropics, when one of these trees is seen, in the open fields about the 1st of July, of a pyramidal form and covered with gorgeous flowers. Such trees are not uncommon in the open fields in Elgin and Essex. Many other trees claim attention in the neighborhood of Niagara, but we may only mention the Sycamore or Buttonwood (*Platanus occidentalis*) which, whether we consider its size, its leaves or its deciduous bark, can claim a passing notice. It is unique in our forests and indeed is without a relative in North America, and as Dr. Gray puts it in his manual, as being of uncertain relationship to any of the modern trees. It is therefore, very likely, a remnant from a dead past, and when seen should remind us that our time is but a fragment of the earth's life: that this solitary tree proves that time in covering the earth with beautiful forms was not limited to years, but that one age succeeded another, and as the conditions changed the then-existing forms changed with their environment, retaining their vigor, or died out and gave place to others more in accord with changed conditions.

While collecting plants on the islands in the Niagara River I came upon immense quantities of Mezereum (*Daphne Mezereum*), and as it is a European shrub it is of more than passing interest. Flowering in the early spring with the Hepaticas, Dirca and other early blossoms, one would think that our climate would not suit it, and that in a year or two it would disappear. On the contrary it forms much of the undergrowth on one of the islands, and I question much if any citizen of Hamilton has ever seen it in city gardens. It has also been found in woods close to Ottawa, and on Montreal Mountain, but in neither case has a hint been given how the first specimens originated. The old French occupation may have had something to do with it.

Foster's Flats, between the Whirlpool and the village of Queenston, are full of interesting plants, while the woods on either side of the railway, leading up the face of the escarpment, contain many rare and interesting things. In the Flats the Green Violet (*Solea concolor*) is not uncommon, and hanging from the trees may be seen the Summer Grape (*Vitis aestivalis*) which, indeed, is common in many places along the escarpment. Along the railway, with a multitude of interesting things, may be gathered the Squaw Huckleberry (*Vaccinium Stamineum*), the Great Solomon's Seal (*Polygonatum giganteum*), the American Columbo (*Frasera Carolinensis*) and *Asclepias quadrifolia* hitherto considered a rare plant in Ontario. In the woods near Jordan Station on the Grand Trunk were collected specimens of the Yellow Round-Leaved Violet (*Viola rotundifolia*) and the beautiful and rare Bell-wort (*Uvularia perfoliata*).

Port Colborne and Welland Junction are good collecting grounds, and at the latter place the Turk's Cap Lily (*Lilium superbum*) attains great perfection in the damp woods, while of less conspicuous things the finds were too numerous to mention.

Port Rowan was visited for the purpose of ascertaining whether the flora of Long Point came from the south shore of Lake Erie or from the Canadian side. Nothing was seen on the Point to show that a solitary species had come from the south, but all were represented on the mainland. The Point consists of a series of transverse sand ridges more or less consolidated with, generally, marshes between, and neither rock as boulder, or rock in situ was seen. About a quarter of a mile to the east of the wharf at Port Rowan an important discovery was made; here was noticed from the roadside a large patch of Water-lilies which seemed in the distance to have large round leaves without a sinus. I asked a passing resident what kind of Water-lily that was, and he answered "the common white one." Being still an unbeliever I went to the beach and found a peltate leaf on the shore. I had found the Sacred Bean (*Nelumbo lutea*). How it got there is an open question, but doubtless the seeds were planted by the Indians that must formerly have lived at Long Point. It is reported to be in the Grand River near Dunnville, but if so I have not seen it.

Pelee Island was visited, and the vicinity of Leamington, and numerous rare and interesting plants were collected. The Point is

chiefly sand, but there are nuclei of rocks around which it very likely gathered when the Point was being formed. Amongst the more noteworthy herbaceous plants were *Hibiscus Moscheutos*, the Swamp Rose Mallow, which, besides being quite rare, produces the largest flowers of any native plant. These are from four to six inches in diameter, of a light rose color, inclining to white, and are produced in succession, like the Hollyhocks of the gardens. They may be found, in the marsh about half a mile from Sturgeon Creek Bridge, at the entrance to the Point, and to the left of the road. They were in full bloom July 30th, 1892. Later in the season fine patches of them were seen in the marshes on Pelee Island, and on marshy islands in Detroit River. Another herbaceous plant, with a very limited range in Ontario, is the Wild Potato Vine, or Man-of-the-Earth (*Ipomœa pandurata*). This plant often produces a huge root that frequently weighs ten or twenty pounds. This species was found in sandy fields near the southern extremity of the Point, and it was afterwards found in sand on the southern point of Pelee Island, and is doubtless a drift immigrant from the other side of Lake Erie. Another species found on the sand hills is the Honey Locust, or Three-thorned Acacia (*Gleditschia triacanthos*), which has certainly drifted across, as its great pods would drift for months without breaking up. Many of the trees were of a very fair size, and in some cases were amongst the Red Cedar, showing that they were not new arrivals. The same tree was observed on Pelee Island at the south end, and under the same conditions.

Another rare, and, in some respects, peculiar species, which is found on the Point, is the Shrubby Trefoil, or Hop Tree. This tall and beautiful shrub grows in the drifted sand of the Point, and also on the southern extremity of Pelee Island, and undoubtedly drifted from the south side of Lake Erie, as its fruit grows in great bunches. Each being first surrounded by a wing like an elm seed, but much larger, would be exceedingly buoyant and float any distance.

The soil around Leamington is variable in character, but westward of the road to Pelee Point is rather sandy, and hence supports a series of southern forms not often found in such numbers. Growing in profusion south of the railway, and west of the road leading to the wharf, were gathered *Polygala incarnata*, *Solidago rigida*, *Baptisia tinctoria*, *Lechea major*, *Anychia dichotoma*, *Desmodium ciliare*, *rotundifolium* and *canescens*, and many others. In a swamp

south of the Leamington and Walkerville Railway were gathered *Rhus venenata*, *Habenaria ciliaris*, *Archemora rigida*, *Polygonum Virginianum*, and lovely specimens of more common species. It was a veritable botanist's paradise, and the bright Orange Orchid was hailed with delight, and at once placed at the top of the Fringed Orchids.

All the above species are rare in Ontario, and some of them were altogether, if not almost, unknown to the botanists of our time, though reported from Canada many years ago. Dr. Burgess, one of your own members, found the Orchid, very likely in the same swamp I speak of, some years since.

Pelee Island has many features peculiar to itself, and its flora partakes of these in a large degree. Its surface is composed of marsh, extensive tracts of level ground covered with excellent soil, a few rocky ridges and a southern extension of almost pure sand. Each of these tracts has a flora generally distinct from the other, that of the marshy part being identical with the marsh bordering the mainland. The rocky ground at the north end and in the centre has a few forest trees seldom if ever met with on the mainland. One of these the Blue Ash (*Fraxinus quadrangulata*) can be seen in company with the Red Ash at the "Quarries," and may be distinguished at once by the younger branches being quadrangular or four sided. Growing near it are specimens of the Kentucky Bean-tree (*Gymnocladus Canadensis*), but the finest trees have disappeared since I was there in 1882. In the woods on the centre of the island are numbers of a rare Basswood (*Tilia pubescens*, Ait.), which can be separated from the common Basswood (*Tilia Americana*) on sight, by its smaller, thinner, and less shapely leaf. The round fruit, when compared with the ovoid fruit of the common tree, shows that there is no intergrading and that this is a distinct species. It would be interesting to discover whether this tree reaches the mainland or not. Who will find out?

In conversation with Dr. McCormack, a native of the island, I was informed that a remarkable tree grew on the south end of the island, that many years ago produced an abundance of lovely red flowers in early spring before the leaves came out. I told him that this could be none other than the Red-bud or Judas Tree (*Cercis Canadensis*) and next day I examined the south point and found the tree. It had been undermined by the waves and fallen inland, and

more than half of its limbs were dead, but it still bore leaves and what remained was quite healthy. It will soon disappear, but the record of its existence will remain.

There were numbers of interesting herbaceous plants, but the least known are all I need give. There were Loosestrife (*Lythrum lineare*) and *Conoclea multifida*, the latter not hitherto recorded in Canada. Of shrubs, the climbing Prairie Rose (*Rosa setigera*) deserves particular attention as it is quite common, produces multitudes of flowers, is a climber and should be cultivated. Another climber, the Trumpet Creeper (*Tecoma radicans*), was growing wild on the sand at the southern extremity, and doubtless was an immigrant from further south. I may mention in this connection that this species attains wonderful luxuriance in and around Chatham, and when seen in full flower climbing amongst conifers, and other trees, its orange-scarlet flowers make a series of beautiful pictures that have only to be seen to charm the *mind's eye* ever after.

By a judicious system of ditches or canals much of the marsh-land at Pelee Island has been drained and very soon all will be fit for use, and then, if we get closer trade relations with the country to the south, the dwellers on the Island will supply vegetables at a nominal price to the cities on Lake Erie. Apparently market-gardening has not reached the Island, but it surely will, and then the almost inexhaustible soil will be put to a better purpose than it is at present. The future of the Island is not bound up in the making of wine, but better trade relations will convert the Island into a big vegetable garden and its trade will increase a thousand times.

I wish now to say a few words concerning the rare or peculiar plants found at Amherstburg, Windsor, Sandwich and Chatham, and to remark that in my opinion a summer could be well spent by an experienced botanist along the Detroit River and Lake St. Clair, and that much valuable information could be gathered that would be of use to all classes. Geologically the river and lake are not barriers to the distribution of species, and it is not surprising to find many prairie species, conspicuous for their size, at home on our side of the river. It is a surprise, however, to find the more humble individuals wanting, and a cause should be looked for, if this statement be true.

On the eastern bank of the Thames, in Chatham, just where the Erie and Huron Railway crosses that river, may be seen two ex-

tremely tall and conspicuous prairie plants ; these are the Cup-plant (*Silphium perfoliatum*) to the south of the bridge, and *Actinorneris squarrosa*, Nutt., on the north side. Both these were over six feet high last August, and still growing. In one field near the eastern end of Sandwich were seen the tall Coreopsis (*Coreopsis tripteris*) ; the Cone Flower (*Lepachys pinnata*) ; the Rosin Weed or Prairie Dock (*Silphium terebinthinaceum*) all growing from 6 to 10 feet high. Others not so rare might be enumerated but these will suffice to show that if such plants as the above have been overlooked or scarcely ever recorded how many others there are that might throw light on what I term the eastern extension of the prairie flora.

In a sandy field at the southern end of Sandwich a long lost Canadian species was discovered, I refer to the Orange Grass or Pine-weed (*Hypericum Sarothra*, Michx). Growing with it were two very inconspicuous little things both new to Canada. They were *Hemicarpha subsquarrosa*, Nees., a dwarf annual from one to five inches high and *Fimbristylis Capillaris*, Gray, another minute thing. Crossing a little hollow with a small stream running through it, a garden of rarities was entered and in a few minutes our portfolio was filled with good things. The more interesting were *Liatris spicata*, *Archemora rigida*, *Aletris farinosa*, *Lythrum lineare*, and *Alatum*, *Polygala incarnata*, *Hypoxis erecta*, *Ludwigia alternifolia*, *Veronica Virginica*, and at least a dozen others.

In conclusion allow me to say that in these few notes, hurriedly thrown together, I have attempted to embody a part of the observations made during the past summer for the special purpose of stimulating any youthful botanist that may be in the room, and to show to the older ones that in no department of geographical botany has the study of our plants been exhaustive. The more I know of our flora, the more deficiencies I find in our knowledge and the more desirous I become to have additional observers in the field, so that in time we may fill up the gaps that I know exist. I have carefully kept from speaking of the more commonly noticed plants and trees, because much good work may be done by parties having less opportunities than I have, if we give them an opening and encourage them to enter it.

SOME PROBLEMS IN HORTICULTURE.

2.—INSECTS INJURIOUS TO PLANTS.

Read before the Hamilton Association, March 9th, 1893.

BY L. WOOLVERTON, M. A.

The title of this paper, as I first wrote it down, was misleading. It was "Insects Injurious to the Fruit Grower." A lady seeing it remarked, "Your subject seems to be rather a limited one; with how many insects is the fruit grower affected?"

In a way, surely the fruit grower is affected by all those insects which injure his fruit—his pockets certainly suffer to an immeasurable extent. It has been computed that hundreds of thousands of dollars are annually lost to our fruit growers, through the injuries caused by our insect enemies.

I am well aware that in treating upon insects I am treading upon well-worn ground, and I can scarcely be expected to bring before you any new discoveries. The pathways are well worn by such masters of entomology as Riley, Packard, Saunders, Harris, Ormerod, Pettit, and numerous others. Mr. Packard's work is too general for the use of the fruit grower; Harris' is most interesting, but not arranged well enough, nor is it sufficiently complete to meet the needs of the practical fruit grower; Riley's work for the United States, and Miss Ormerod's for England are invaluable, but it remained for our own Professor Saunders to write a book, under the title of the above heading, exactly suited to the needs of Canadian fruit growers, arranging it for practical purposes under such heads as "insects injurious to the apple," "to the pear," "to the peach," "to the grape," etc., classifying the different insects under each head according to the part which they affect, whether the root, bark, leaves or fruit. This has proved a most convenient arrangement. I would suggest to some of our amateur collectors that they might make for themselves a most interesting collection on this same basis. This would not be so scientific an arrangement from an entomological

point of view, but it would be exactly right in the eyes of the professional horticulturist.

It would obviously be absurd for me to attempt to cover in a paper like this even a general survey of the ground so well gone over by Professor Saunders, I shall only attempt to give you some idea of the more well-known injurious insects which just now are great obstacles in the way of success in making the garden and orchard profitable throughout the fair Province of Ontario.

At the very head of our enemies in the insect-world is the Codling Moth, (*Carpocapsa pomonella*). Like other insects, it is increasing with the increasing supply of apples for it to feed upon, until of late years it has threatened the total destruction of our apple crops. A few years ago, before the practice of spraying with arsenites came into use, the pest became so serious that one-third of the crop had to be thrown out as seconds, purely on account of its ravages. If these insects were content to feed upon the poorest of the fruit we would not grumble, as they would do us a good turn by thinning out our fruit, but, unfortunately, they choose the fairest and best, thus directly robbing us of our hard-earned profits.

Many and very ingenious devices have been tried to keep these insects under control, as, for instance, trapping the moths with bottles of sweetened water; by twisting hay bands about the trunks of the trees, into which the larvæ would crawl to pupate, and then wringing these bands through a wringer to destroy the cocoons; by keeping sheep and pigs in the orchard to eat the infested fruit, worms and all, as it falls to the ground, but every one of these devices has served only to check, not rid us of the evil.

Can the fruit growers be blamed then because, when the use of arsenites sprayed on the trees and fruit was found to be a success, they adopted it almost universally. I speak of this because objection has been made on scientific grounds to the use of arsenites, since by the use of them not only the injurious, but also the useful insects are often destroyed, and, among the latter, many parasites whose friendly office might in the end keep these enemies in check without the expense and trouble of applying poisons. The true principle, they say, is to favor the increase of these parasites and introduce other insect friends and thus cope with our foes in a manner which can be approved of on scientific grounds.

Possibly such a course would be the wiser one in the end, but "a bird in the hand is worth two in the bush," and I fear the fruit growers have no patience to sacrifice a present advantage for an ulterior good.

There are two broods of this moth; the first is on the wing about the time of the opening of the apple blossoms, when each female deposits her tiny eggs singly in the calyx-end of the apple; and, as each moth deposits on an average about fifty eggs, it is easy to see how rapidly the insect may increase. There is a second brood of the moth in the latter part of July, but, if the first brood is destroyed, the second will be, of course, destroyed with it. Hence arsenites, applied once or twice in June, will ensure a fairly sound crop of fruit.

Year by year less poison in dilution is found to be sufficient to accomplish the purpose. One pound of Paris green to 200 gallons of water is the usual prescription, but many experimenters have found that 250 gallons will not form too dilute a mixture.

Formerly it has been necessary to depend upon American inventors for tools for this work, but there are one or two spraying pumps invented in Canada which now answer our purpose well.

How best to cope with the *Curculio* has long been a problem. Not only are the plum, apricot and peach stung and caused to drop by means of its evil doings, but the apple and pear are also subject to its ravages, and, as a result, are much knotted and ill-formed. On this account the apricot is little grown in Southern Ontario where it might, otherwise, succeed well, and many fruit growers are even debarred from engaging in the cultivation of plums.

Until spraying with Paris green was introduced, jarring of the trees was the only method adopted and, where faithfully performed, has been, on the whole, successful; some experimenters claim that it is more effective than the use of Paris green. The operator jars the tree with a sharp tap of a mallet and the "little turks" are gathered up in a sheet and burned. This must be continued every day until the plums are well grown. It is a much simpler plan to give the orchard one or two good sprayings, which will suffice, unless constant rains wash off the poisons, providing always that the first application is made almost as soon as the foliage appears, in order to destroy the parent beetles. The preferable method is scarcely yet settled. Professor Green, of the Ohio Experiment Station, strongly

advocates the spraying method as most effective, while Professor Beal, of the Michigan Station, favors jarring.

The Curculionidæ is a numerous family and nearly all are harmful. Mr. Billups, who read a paper at one of our meetings at Niagara, stated that the members of this family number nearly ten thousand species, many of which are injurious to our fruits.

The Oyster-Shell Bark Louse is one of the worst pests of our Canadian apple orchards because it works almost entirely unseen by ordinary observers on account of its small size. Some of our worst foes are so minute that their presence can only be discerned by the use of a microscope. In its first stages this louse is almost microscopic. The eggs, which lie all winter concealed under the dead body of the parent louse, hatch out into tiny lice which emerge from their covering during the warm days of the early part of June, and in about a week they settle down upon some smooth place on the limbs, often concealed from view by patches of old bark. There they spend the summer sucking the juices of the tree, weakening its vigor, until full grown, when each becomes a scale, covering in its turn three or four score of eggs. When I first discovered it, I found many trees almost dead through its effects. The bark was rough, but I had not previously suspected that these rough places were scales concealing young lice. Lousy trees! What a disgrace! I soon set to work with alkaline solution, such as washing soda and potash, and also with kerosene emulsion, and by their use have succeeded pretty well in destroying them. If neglected, these insects will in time completely cover a tree, even to the outer branches, and it is difficult then to reach them with broom or scrubbing brush. The only plan left is to spray the whole tree with an alkaline solution and kerosene emulsion. Some of the formulas recommended are as follows:

Kerosene Emulsion:—Soft soap, one gallon, or hard soap (whale oil soap preferred), one-quarter of a pound; two gallons of hot water, and one pint of kerosene. Stir until all are permanently mixed, and then dilute with water to one-half or one-third strength. This will be found one of the most effective remedies for the Oyster-Shell Bark Louse. Another more simple remedy and yet, if faithfully applied, quite effective is a soda wash made by dissolving one-half a pound of common washing soda in a pail of water. Alkaline

wash may be made of common lye and water, which, if applied during the first week of June when the young insects are first hatched out and are in their most tender stage, will, in most cases, answer every purpose. If concentrated lye is used a potnd should be diluted in a barrel of water.

Among the newer enemies which the fruit growers have to meet are the Pear Tree Psylla and the Raspberry Gall Fly, and of these we give a brief notice.

Pear Tree Psylla.—The Pear Tree Psylla bids fair to become one of the most troublesome enemies in fruit growing which has yet appeared. As if it were not enough to discourage pear growers that the blight so often destroys their finest trees and the Curculio and Scab ruin their finest fruit, this tiny insect must appear, emigrating from Europe, and completely wreck their bright hopes of success. Only so recently as 1891 was this insect noticed as a formidable enemy, and pear growers in various parts of the Eastern States lost thousands of dollars worth of fruit and many valuable trees through its ravages.

A very excellent bulletin by Professor Slingerland, of the Cornell Experiment Station, devoted to this insect, has been published, from which we gather much of the accompanying information, in advance of its ravages; for there is little doubt that Canadian pear orchards will be visited by it during the coming spring.

Already New York State has suffered severely. Mr. H. Wright's orchard, near Ithaca, N. Y., promised in 1891, 600 bushels of fruit, but less than fifty bushes matured, and but a few trees made any growth. Mr. G. T. Powell, of Ghent, N. Y., a prominent fruit grower, stated that the insects reduced his pear crop that year from an estimated yield of 1,200 barrels to an actual yield of less than 100 barrels of marketable fruit. Besides this the trees in the orchard had a stunted appearance, no doubt owing to the attacks of this pest.

The Pear Tree Psylla was first introduced into this country from Europe in 1832, by Dr. Plumb, of Salisbury, Conn. The year after he first noticed it, and during the next five years, he lost several hundred trees by its ravages. From various reports it appears that the pest has already reached the Mississippi Valley in its progress. The severe outbreak of 1891 proves that in New York State, at least, it has become so numerous that it only requires favorable opportunity to do an exceeding great amount of damage.

Entomologists class the Psylla as belonging to the family Psyllidæ, or Jumping Plant Lice, under the sub-order Homoptera. The general name Psylla is derived from the Greek word meaning a Flea. In Europe there are three species which infest the pear tree, and our species, *Pyricola*, is not the worst. Let us hope, therefore, that its relatives may never reach us.

Among the indications of its presence are the following :

The old trees will be observed to make little new growth ; new shoots droop and wither in May as if from loss of sap. A little later the old trees put on a sickly appearance ; the leaves will turn yellow, and the fruit grow but little, and about midsummer most of the leaves and half formed fruit will fall from the trees. Besides this the insect secretes a large amount of honey dew which covers the twigs, trunks and branches of the trees after the leaves expand, as is found throughout the season. At first this substance is clear like water, but soon assumes a disgusting blackish appearance, owing to the fungus growth within it

Mr. Slingerland visited Mr. Wright's orchard at Ithaca, in the latter part of November, 1891, and states that the whole orchard appears as if a fire had swept quickly through it, scorching trees and blackening trunks, large branches and the smallest twigs. The Bartlett and Duchess varieties suffered the most.

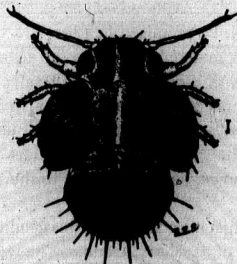


FIG. 1.



FIG. 2.

The insect may be perhaps recognized from the following points of description, together with the accompanying illustrations :

Fig. 1 represents the nymph or immature forms when first hatched. They are translucent yellow in color, and hardly visible to the naked eye, eighty of them placed end to end would scarcely

measure an inch, but they increase in size until about twenty of them would measure an inch. A very conspicuous feature is a broad black wing pad on each side of the body. Fig. 2 shows the adult insect which strikingly resembles the Cicada in miniature; it would take nine or ten of these placed end to end to measure an inch, and the hair line in each case by the side of the insect shows the natural size. The general color is crimson, with broad black bands across the abdomen. The legs have thickened femurs to aid the insect in leaping.

Mr. Slingerland found, when examining Mr. Wright's orchards in winter, hibernating broods of adults. They were hidden in crevices of large trees; a favorite hiding-place on some trees was in the cavity of the bark about the scar of the severed limb. By April, 1892, the larger part of the eggs had been deposited singly. These had been placed in the creases of the bark, or in old leaf scars, about the bases of the terminal buds of the preceding year's growth. The eggs are small and shining, and of a light orange yellow color. A short stalk on the larger end attaches the egg to the bark, and a long, thread-like process projects from the other end. By the 18th of May the most of these eggs are hatched out, and the minute nymph immediately seeks a suitable feeding place, where it sucks the sap with its short beak, a favorite place being in the axils of the leaf petioles and stems of the forming fruit. In about a month they are adults. The adult has strong legs and wings, and thus is able to move readily to distant orchards.

To be forewarned is to be forearmed, and, therefore, the importance of making public at this time the methods of combating this pest, as laid down in Mr. Slingerland's bulletin, is evident.

None of the fluids applied seem to be destructive to the eggs, but the nymphs are found to be easily destroyed by kerosene emulsion. The emulsion was prepared after the following formula:—One-half pound of hard or soft soap, one gallon of water and two gallons of kerosene. This was then diluted with twenty-five parts water, and in every case, the nymphs were destroyed almost immediately after coming into contact with the liquid. The best time to spray for this nymph is early in spring, just after the leaves have expanded, probably, as a general rule, the two weeks succeeding the 15th of May. If this is faithfully done, the pest will be completely checked for the season.

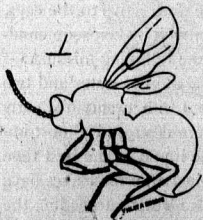
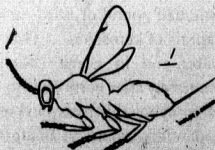
Raspberry Gall Fly.—This is by no means so formidable an enemy as the last, but it is one almost unnoticed in Ontario until last year, when Dr. Brodie, of Toronto, who has been making a speciality of the study of Canadian galls and gall flies, wrote an article for the *Canadian Horticulturist* describing this fly. He tells us that it has been plentiful for the last twenty or thirty years in the county of York, on both cultivated and wild varieties of raspberries. The only reason why this insect does not completely destroy our raspberry plantations is the fact of its being kept in check by parasites, and, in Dr. Brodie's opinion, the encouragement of these is, in almost all cases, the true way of keeping in check the harmful insects.

The illustrations which follow were drawn from life by Miss Violet Brodie, the doctor's daughter. Fig. 3 represents one of the galls as it appears on the raspberry bushes.

They are over two inches long and three-quarters of an inch in diameter, covered with short prickles and of the same color as the bark of the cane. If these are collected the second season and put in a bottle the gall flies will emerge about the middle of May and may be seen walking on the side of the jar next the light. Fig. 4 represents the insect under consideration, which is known to entomologists as *Disastrophus Turgidus*. The doctor describes them as short and chunky, the head and thorax black and the abdomen reddish brown, flattened laterally and rounded.



FIG. 3.

FIG. 4.—THE GALL PRODUCER.
(*Disastrophus Turgidus*.)FIG. 5.
PARASITE OF THE GALL FLY.

The most numerous parasite, he says, is *Torymus*, which is of a coppery, brown-greenish color, with a long ovipositor. Fig. 5.

The next most numerous parasite is the *Ichneumon*, Fig. 6, with head and thorax black, and abdomen reddish, blackish toward the end.

Another parasite is the *Ormyrus*, fig. 7, which is uniform black color, the thorax punctured and rough, and the abdomen smooth, shining and pointed.



FIG. 6.—*ICHNEUMON* FLY,
Parasite of the Gall Fly.



FIG. 7.
A SPECIES OF *ORMYRUS*.

These parasites should be encouraged and by no means destroyed, and by their aid this insect will be probably so kept in check as never to become a formidable enemy to the fruit grower.

In connection with this Raspberry Gall, we may notice another Gall not often described in public print. It is the Pithy Gall of the Blackberry, and the producer is a near relative of the Gall Fly.



FIG. 8.

It is known as *Disastrophus nebulosus*. Fig. 8 shows one of the Galls which it produces on the blackberry canes. If these are cut open transversely, they will be found to contain a number of oblong cells, each about one-eighth of an inch long and containing a single larva. The perfect insect appears in spring and is about half an inch long, black, with transparent

wings, and red feet and antennæ. The parasite insects prey upon this, as well as upon the Raspberry Gall Fly. A sample of this was sent us by a correspondent.

Time and space would certainly fail us were we to enumerate a full list of the fruit grower's insect enemies; the stem and leaf of the grape vine, of the apple tree, and a long list of small fruit plants are all subject to the ravages of numerous destructive insect foes, some of which are easily dealt with, and others so difficult that to overcome them is still a difficult problem in our road to success.

In view of all this, we feel the necessity of appealing to our professional friends, who are students of science, to aid us in solving our problems. Already we practical men are much indebted to scientists for the practical turn which they have given their investigations, and we venture to hope that, in the near future, they will place us under still deeper obligations along the line here indicated.

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GEOLOGICAL NOTES.

Read before the Geological Section of the Hamilton Association.

BY COL. C. C. GRANT.

NOTES ON OUR LOCAL BUILDING STONES.

It was suggested a few months ago that some notes on the rock material used in Hamilton for building purposes might prove acceptable to the public, if not to our own section.

I had some doubts on this point, feeling many various interests were nearly connected with it, however important the matter might be.

One frequently hears the view expressed that our Niagara Escarpment (erroneously called the mountain) furnishes *very indifferent building stone*. The prejudice against it in many instances (so widely entertained) arises chiefly from careless, injudicious selection. Our great drawback here is that the best beds are not easily accessible, and a considerable amount of comparatively useless stuff (chert and shales) must be utilized or got rid of in some way before we reach the more valuable layers underlying the local chert beds, now used for macadamizing purposes. The under portion of the chert resting on the soft shale capping, what the quarrymen here call the "blue building beds," may be, perhaps, used for foundations and underground cellars. It certainly is more suited for such purposes than the rotten material, crumbling shale, which unfortunately is used for their construction too frequently.

Great ignorance prevails regarding the texture and durability of building stones, not alone in Canada but in the States as well. In a lesser degree this may be said of other countries also, but there, take Europe for instance, structures which have existed for ages are available for determining how the material has stood the weathering process, and it can be traced generally to the original place from whence it came. In the Old Country we have learned from experience that *brown sandstones* are not durable *freestones*, even where

no shale seams may be detected. In many consolidated sand beds, the layers become harder on removal. In other instances the opposite takes place, large blocks freshly quarried becoming disintegrated, crumbling away during a night in a mysterious manner. Probably frost could throw a little light on the subject. If the rock is of a loose texture, or shaly, it absorbs a considerable amount of water, and the expansion of this, by freezing may sufficiently account for the circumstance. As far as I can learn, this has never occurred in our Medina freestones, so the texture of the stone is of considerable importance in Canada. The grey band (freestone) caps the blue, red or mottled clay on which Hamilton city is situated, is far and away the most valuable stone we possess. The real workable beds average from five to six feet in thickness (deducting the passage beds into the Clintons.) It is generally free from Iron Pyrites, but at certain places beneath the brow of the escarpment this may be occasionally noticed in small patches. This foreign ingredient is very objectionable, as when it decomposes the sulphuret of iron stains the exterior of the stone, thereby causing an unsightly appearance. Many of the public buildings in New York are built of the brown Medina freestones. No worse material could have been selected for the purpose. Dr. James Hall states: "Although little more than twenty-five years have elapsed since these buildings were erected they already present a most dilapidated appearance." This he attributes partly to clay seams in the New York beds, as well as coloring matter. Others from the same horizon become harder, more durable than when quarried, but less accessible than formerly owing to its position. The cost of removing the overlying shales is increased, the demand too slight, the prices unremunerative and far below the actual value. This quite explains the cause why so few quarrymen are employed here. It is quite possible that in some cases objectionable material may have proved prejudicial also, but it is not always an easy matter to detect injurious foreign substances in rocks freshly quarried. Often the iron stain does not put in an appearance for several days, or the mud and dirt may conceal minute fossils which shine like brass. The base of the Niagaras, known as the *Pentamerus* bed here, usually contains many large shells metalized or impregnated with mineral salts, viz., Iron Pyrites. This is by far the most objectionable layer in the Hamilton quarries used for building purposes. It is injurious, and even when not immediately

destructive disfigures the exterior wall by white or rusty patches. I have traced this rock all over the city, and I may be permitted to suggest that its presence, (together with the indurated Niagara shales—unfortunately also too frequently used) is by no means calculated to impress us with a favorable opinion of our building stones proper, or the dishonest contractors who are ever anxious to substitute the most indifferent material, provided it can be more cheaply obtained. I can never pass one of the churches in Hamilton without regretting that when the original edifice was erected I abstained from calling attention to what led to its collapse and caused the death of a countryman of mine, poor Sullivan, a workman employed there.

The durability of building stone is sometimes tested by submitting $1\frac{1}{2}$ inch cubes to pressure between steel plates. Some rather unexpected results were reached in New York State about eight or nine years ago by experiments of this sort. While grey Gneiss and dark Sienite sustained a pressure of only 22,575 pounds to the square inch, the limestone from the Cobleskill quarries withstood a crush of 27,407 pounds on an average, before breaking. It was also noticed that the same horizon displays considerable difference as regards texture, losing compactness and becoming soft and shaly. In the Upper Clinton green band at "The Jolley Cut" you may notice a thin wedge-shaped layer varying in thickness from perhaps 8 to $2\frac{1}{2}$ inches. At "The Bluff," a little beyond the reservoir, the same bed is three feet or more thick. From the closeness of the grain and its compact texture it may be looked upon as a durable building stone there. Although impressions of *Lingula* are occasionally noticed on the surface they are not, however, injurious. I think it resists absorption of water in a remarkable degree, as likewise very considerable pressure. I hope to return to the subject of this paper on a future occasion.

May 27th, 1892.

NOTES ON OUR LOCAL BUILDING STONES (NO. II).

When the freestone quarries, viz., the capping of the Medina series below the Niagara Escarpment, were worked some thirty or forty years ago, there were less overlying shales and clays to be dumped than now. This is quite true. The difficulty of obtaining access to this fine building material has considerably increased, while its value has not in like proportion. Here we have (assuming

the correctness of the statement as given by a quarryman) something that throws light on our neglected resources. Valuable and durable as the freestones are they scarcely pay the cost of extraction. The proprietors of the quarries complain that the demand for the material is greatly lessened by the preference given by the stonecutters and masons of the city to imported sandstones, softer and more easily worked into the required shape. Admitting that it is more difficult to dress (the fact points to superiority as regards durability), then why should you, I ask, "City Fathers," Hamilton Aldermen, favor the introduction of an inferior article because an influential body possessing votes "for civic honors" may mar the chances of success at election time? Anticipating objections to what I have already stated regarding the stones used for public and private buildings in this city, I have examined as far as I could, without intrusion, a good many edifices within the limits. Of course the examination was restricted to the portion appearing above the ground (except in a few cases.) I found as a general rule the material was carefully selected, and the absence of destructive agents proved that masons must have taken pains to reject objectionable material, such as shaly limestones, for instance. I have every reason to believe, however, that the same care has not been displayed regarding the foundations. Indurated shale or, in plainer words, hardened mud is too frequently substituted for the basement, because it may be purchased at a cheaper rate by some greedy contractor, than a more enduring substance. I need scarcely remark how important it is that the foundation should be firm and unyielding, capable of sustaining the very great pressure of the superincumbent walls, etc. About two or three years ago I met a mechanic (apparently) at the head of the Jolley Cut, who informed me he had invested a little money in the purchase of a house in Hamilton, and the basement was crumbling away. It proved to be indurated shale, and he gradually replaced it by a more durable material.

In the Clinton beds here there are many layers which may be safely used as foundation stones, especially the upper green band. The hard grey sandstone beds are very compact. There may be a little difficulty in dressing it on that account, though probably not much shaping would be necessary. "Experience has everywhere proved," remarks Dr. Jas. Hall, of Albany, "that the brown sand or freestones are not durable; their destructibility is not only due to

the presence of argillaceous matter, but to oxide of iron. The grey or neutral tinted stones of the same composition are much more durable. A mixture of fine sand grains with pebbles does not usually answer; some, however, may be enduring or little affected by weathering, where Silica is the cementing substance." Every stonemason knows that all rocks are more easily trimmed when freshly taken from the quarry than after they have remained exposed to the air for any time. I have noticed of late years the freestones are more frequently removed to the city in the rough state than formerly. I presume there is some reason for it which is quite unknown to me.

Placed as foundation stones, beyond the reach of freezing, thawing and the oxidizing influence of the sun's rays, many of our limestone layers can be safely used, which may be considered objectionable in more prominent positions above ground. I have noticed, for example, in underground kitchens or cellars in Hamilton, limestones still retaining unaltered the brassy appearance and lustre presented by the base bed of the Niagara series. If the information received can be depended on, "that it was quarried a fourth of a century ago" the views generally entertained regarding this very objectionable mineral may be slightly modified. When protected from external influences it may not prove to be quite so subject to disintegration.

Although some of the layers above the Pentamerus bed hold large shells (the *Stricklandinia* of Billings, for instance) they have not been mineralized and present no objectionable features, but the thick limestone bed known to quarrymen as "The Nigger Head," frequently displays pockets filled with Selenite, Baryta, or Earthy Gypsum. Sometimes the mineral matter has been dissolved and disappears altogether, leaving the empty chamber, which adds to the difficulty in shaping the material—even while the cavity is confessedly very slowly enlarged while undergoing the weathering process. I infer from this our Dolomites here are more durable as building stones than the corresponding beds in the States, which have been pronounced more suitable for rough masonry than other building purposes. In the State of New York there are sandstones and limestone of various ages, yet you may perceive from what scientific men admit, that no superiority can be claimed as regards durability except by properly testing. The Amherst freestone so

largely used in New York, Buffalo and the new House of Parliament at Ottawa varies considerably in its character. Dr. Hall states that at different points along the outcrop of the formation our earthy Hæmatite or Clinton Iron band, as we noticed recently, changes at Grimsby into a red and mottled sandstone. Granites, considered the most durable for building purposes and displaying no inherent cause for decay, will show sometimes quite unexpectedly a strange want of cohesion on the quartz, Felspar Mica, a little way off, as in this instance of the specimen now produced, which may easily be crushed in your hand. The decomposition may be due occasionally in this class of building stones to the weathering process, affecting large felspar or homblende crystals. Iron Pyrites, finely disseminated, also occur and are frequently the cause of destruction in the gneissoid and granite rocks. The famous Kaolin clay of China is merely decomposed felspar. No doubt the instructive and exceedingly interesting paper on "Pottery," by Professor Ireland, Principal of the Art School, is still fresh in our memories.

I understand that the limestone of the Barton Niagara rocks at Lime Ridge, behind the Mountain View Hotel, are coming into use for building purposes. It may prove difficult to dress, but it seems well fitted for the heaviest structures, possessing great strength and powers of resistance to pressure. The upper or glaciated layer should only be used in basements of houses. It contains large numbers of organic remains less durable than the enveloping dark material, which slowly but surely would disappear if exposed to weathering.

Since the great fire in Chicago many have become impressed with the idea, that brick resists intense heat better than limestones. It is said the Niagaras used for buildings in that city were saturated with crude petroleum like many of the corniferous limestones of Ontario. Granites which are used for lining kilns will stand any amount of heat. The surface becomes glazed. The pre-historic vitrified forts in Ireland, built without mortar, erected more than 2,000 years ago, seem indestructible. No better material could have been selected than the massive freestone blocks recently used in the construction of the Incline Railway.

The color of a building stone may be of less importance than its durability, yet it is a matter which cannot be well ignored, and perhaps too little attention has been given to our surroundings. Nature has done much for Hamilton. "The suburbs and City of

London give one the idea of a people emerging from barbarism," remarked an English friend of mine, "but I never noticed anywhere such an offensive aspect as the numerous glaring red brick houses presented to one's view here; and you cannot be congratulated on the dull, sombre, cheerless coloring of much of the material used in more pretentious public edifices." It may not be flattering to our taste, yet it is better for us to learn what others say of us.

My friend Mr. Neill (our Vice-President) recently suggested that I may have overlooked the circumstance often noticed that when cold water from the hose is thrown on burning buildings, the hardest freestone is apt to fracture, as he noticed when the McInnes block was gutted by fire some years ago. I do not think any stone, not even igneous Trap would successfully resist the combined action of fire and water under similar circumstances. In pre-historic time the Mound Builders, (or, perhaps, the ancestors of the American red man) discovered that water flung on heated rocks caused them to disintegrate. Dr. Spencer, F. G. S., when employed as a mining engineer at Lake Superior, informs us the Mound Builders sunk pits in the solid rock fifty feet deep, also drove galleries in the mines by heating the stone to a high temperature and throwing cold water on it, which caused it to crack. The original inhabitants of the Malay Peninsula 2,000 years ago, quarried tin in the same manner, and charcoal is frequently found, together with such heavy stone sledges and hammers as at Superior, in ancient Irish mines. Dr. Spencer clearly proves there is no foundation for the assertion so frequently heard that the American red man had no knowledge of the native copper mines when the whites arrived here.

Sept. 30th, 1892.

NOTES ON GRIMSBY EXCURSION, AND THE SILURIAN ROCKS
IN THE VICINITY.

Disappointed at the absence of an old friend and brother geologist at Grimsby, on enquiry from an acquaintance, I was informed the water was so high, owing to the recent heavy rain, that I would find it perhaps impossible to proceed to the first "fall," much less to the last one, if I had any intention of reaching them through the rock bed. Under the circumstances I concluded it would be better to judge for myself. With great difficulty I suc-

ceeded in getting some few hundred yards up stream, when I arrived at a place which was utterly impassable. I had reluctantly to return to the station. Here I ascertained the entire party had gone off a little while before in the direction of the Ravine. I failed to overtake them, and as I had previously ascertained that all the ladies had taken to botanizing or "butterfly-hunting," I naturally concluded I would see very little more of our recreant section on that occasion, so I turned my attention to the Quarries, hoping to intercept a stray member on his return, and induce him to assist in conveying to the railway station some of the best specimens obtainable. Unfortunately the majority of the excursionists passed over to the other side of the stream and returned by another way, and a few, detained to witness the remarkable preservation of some of the Fucoids, could scarcely be expected to volunteer their removal when already in possession of baskets of provisions, ferns and plant cases, with various other things.

A paper on the Silurian Rocks of Grimsby must necessarily be incomplete owing to the difficulty of a proper examination. There is a fair exposure in descending order of the Niagara lower shales, the old Clinton (Niagara limestone), the Clinton upper green and Iron bands, in the quarries. The remainder are concealed measures except in the brook bed. The shales, unlike ours here, are very fossiliferous, and interspersed through the softer clays are thin limestone layers containing many Brachiopods, Coral and Bryozorus. On one of the slabs before us you may notice the beautiful little *Eichwaldia* of the late Professor Billings. It occurs also in our local chert, but rarely; the coarsely ribbed *Spirifera Sulcatus* is also common to both. No collector in the neighborhood of Hamilton has been more successful in obtaining such a varied assortment of organic remains from what we call in the old country the "Wenlock series" than my indefatigable friend of the olden days, Mr. J. Pettitt, but unfortunately few were figured or described at the time of the original discovery. The extensive collection of Cambrian and lower Silurian forms in the Museum of the Canadian Geological Survey Office were almost unknown outside this continent, and I am quite satisfied now that Professor Billings acted wisely in confining his attention chiefly to the study of our oldest organic remains. His training as a lawyer was not time wasted, since it taught him to pursue

his researches in a more systematic manner and much more carefully than is generally done by scientific men. Owing to a well understood rule among geologists that *no organic remains unfigured and undescribed are recognized*, Mr. Pettit lost the credit as the original collector of many fossils subsequently claimed and acquired by others.

Rhynchonella obtained at Grimsby (here submitted for inspection) is probably not represented in the Niagaras near Hamilton. It is usually found in a somewhat crushed condition and this is the only fairly preserved one I succeeded in extracting. On one slab it occurs associated with *orthis hybrida*. Evidently someone must have previously noticed it, for in some places the thin limestone layers around had been collected and placed face downwards to conceal the Corals, Bryozoras and shells on the surface. 'Tis an old trick on the part of collectors to hide from curious eyes specimens which cannot be conveniently removed, but hard, thin beds occurring in shales are usually fossiliferous and never should be passed by without close examination.

Few field geologists would imagine that the upper Red Clinton Iron band in rear of the Reservoir, near Judge Robertson's, is represented at Grimsby by red and mottled sandstones, rather soft and loose as regards texture. Some of the recently erected houses there are built of the material—I would not suppose it a durable building stone. The colored *Lingula* bed, of Hamilton, puts in an appearance in the shape of a liver-colored freestone, the *Brachiopods* were numerous, but in indifferent preservation. The green layers or greyish sandstone below the Niagara limestones there present some fine specimens of the singular furoid *Arthropycus Harlani*. I wish some of my friends, who doubt that it represents a plant at all, had had an opportunity of examining some of the large massive blocks, unfortunately too heavy for removal, from the ravine at Grimsby. The tufts or branches proceeding from the main stem are sufficient to show that Credner is not mistaken regarding the nature of the impression. Other plant remains, not displaying the peculiar marking of *Arthropycus*, may prove to be identical with an undescribed one from the same horizon here. I regret I failed to obtain a portable sample. We have not ascertained, as yet, the limits of our local Chert beds. That they extend as far as Grimsby is rather questionable. I never succeeded in tracing to their original place the

very few pieces of weathered impure flint, formerly found in the bed of the brook. The freshet barred investigation in that direction, and however enjoyable the magnificent scenery and trip may have been, our section can scarcely be congratulated on its success.

LIST OF FOSSILS SEEN OR OBTAINED AT GRIMSBY.

GREY-BAND MEDINA.

A Casteropod (new probably), not unlike a cast of *Strophostyrens Cyclostomus*, but no other marks on shell.

CLINTON.

Fucoids.—*Arthrophyucus Harlavi*.

Fucoids.—Undescribed: *Lingula Oblonga*, *Bucanella Trilobata*, *Liphrentis*—Sp.

NIAGARA.

Plates—*Caryocrinus Ornatus*, *Stephanocrinus Aungalatus*, *Pentamerus Oblongus*.

A Circular Brachiopod (not a phosphatic shell) undescribed. *Orthis Hybrida*, *Orthis Elegantula*.

Athyres Intermedia, *Athyres Naviformis*, *Eichwaldia*, *Cælospira Despiralis*, *Spirifera Sulcatus*, *Spirifera Crispus*.

Rhynchonalla (three species), *Coscintumproavium*, and many Bryozoons, and small corals, including "Sticktopora."

June 11th, 1892.

NOTES ANTIQUARIAN AND GEOLOGICAL—NO. III.

It strikes me as being rather singular that the red men who formerly lived at or near this place (Hamilton) rarely used our local Chert for spear heads, arrow points or other implements. One would imagine that where this material could be so easily procured it would naturally be utilized for war and the chase as well as for domestic purposes. Such, however, was not the case. I have examined several hundreds submitted for inspection, independent of quite a large number personally collected, and I find in nearly every instance the material is foreign to this locality. Indications of their manufacture here are not uncommon. Incomplete specimens as well as lumps of flint are sometimes met with in ploughed fields, the latter

showing plainly where chips have been broken off to form the required implements.

In the Archæological report of the Canadian Institute by D. Boyle it is stated that the township or neighborhood of Bertie was apparently a place where the Indians (the Neuters apparently), manufactured the flint implements they bartered with other tribes. It is not by any means an easy matter to trace this mineral to the original source. I have frequently noticed it in the Post Glacial Drift of Western Ontario, variously colored, while all of it, or nearly all at least, was probably derived from the cherty limestones of the Corniferous (Devonian) series. I have seen some points of jet black hornstone from Mr. Kerr's farm at Barton and others in a fragmentary condition from that locality, bearing a near resemblance to the water-worn rounded flint occasionally found along the southern shore of Ireland, which may have belonged originally to the chalk formation in England. I have not remarked anything like it in the Devonian rocks of Canada. Some years ago a large tree was uprooted on Mr. Heaven's property at Boyne (between Hamilton and Milton.) In the clay underneath several arrow heads were discovered, four of which he kindly gave me; two of them are hard white flint. They may have been brought from a distance, obtained either in war or barter. I ascertained that at a comparatively recent time a small body of Indians were encamped at Lime Ridge when the first white settlers arrived here. There is a never-failing spring near the sloping ground where their tents were pitched. In the bed of the stream, a small one flowing from it, I found abundant evidence it was here they scaled and prepared the fish for cooking they had taken in the lake. The numerous scrapers lying about proved the natives frequently used for the purpose any flint flake, provided it would be suitable for the purpose. Many of the so-called "Palæolithic" implements gave me the impression that they were merely tools manufactured by poor or indifferent workmen for some temporary purpose. Side by side you may often pick up in a freshly-ploughed field, after rain, a highly finished flint scraper or arrow point, together with another so rudely manufactured that if discovered in Europe it would be pronounced undoubtedly *Pre-Neolithic*. Many may be failures thrown away in disgust, yet I sometimes doubt when I observe an isolated flint flake, presumably of human manufacture, that it may have been used

exactly for a similar purpose to those carefully prepared "scrapers" you may perceive in almost every collection of Indian relics in Canada and the United States.

In order to form some independent opinion I recently requested two well-known dealers in New York to furnish me with about a dozen specimens of the arrow points they collected. Strange to say I found the majority were composed of quartz, pure and unadulterated. How such a substance could have been reduced to the shape presented is completely beyond any knowledge I possess. So I must leave it for our university professors to shed some light on the subject. For my part I have always remarked how willing they are to help a lame dog over "the stile."

Both at Lake Medad and the places where small bands of the natives were seemingly encamped—Lime Ridge, and the Kerr property, near the city, for instance—I noticed a considerable number of the shells of the River Mussel (*Anadon*) and kind, very much decayed. No doubt they were frequently used as food, only fragments of the thick portion, the least destructible, were remaining. Indian bone implements, awls, needles, etc., are exceedingly rare. Several, however, have been found in the Medad ossuaries. It is not probable that many articles of this material would survive more than a few year's exposure, unless embedded in clay, or otherwise protected from the weather. The same may be said of such as were formed from the horn of the Wapeti, whose antlers are sometimes turned up by the plough greatly decayed.

Shortly after the Jolley Cut road was opened, a land slide on a small scale occurred below it, revealing the horn of a young deer sticking out of stiff yellow clay, in fine preservation. It appeared to me to be about two feet below the surface soil, but this I could not determine as exactly as I desired. A depression may have existed originally in the ground and have been filled in subsequently.

Gun flints, I noticed are not often seen in collections here. Altogether, I obtained about half a dozen. One, evidently long used, presented the well-known shape of such as were used in the British Army, before the introduction of the percussion cap, when "dear old Brown Bess" was known in the service as the "Queen of Weapons." A few years ago I picked up a very ill-shaped one beside a rude powder horn. Both, however, may have been made by some early white settler. If by a native, at the time the flint was manu-

factured, the Indians seem to have lost their old-time skill in forming flint instruments. I am disposed to believe that several of the least skilfully shaped were produced more recently than is generally supposed. That rudeness in manufacture is no indication of antiquity has, I believe, already been asserted by others, both in Europe and on this continent. I feel inclined to endorse this opinion, while admitting I may have been influenced by a rather limited examination of the places where such things are obtainable. It is some satisfaction to learn that such an accomplished explorer as Dr. Boyle, a man of much experience in unearthing the burial places of the ancient inhabitants of this part of the Dominion, arrived at the same conclusion long since, viz.: That the Mound Builders of North America were not a distinct race, but merely the progenitors of the red men I already mentioned. The same view is entertained by Dr. Head, of Chicago, who, I am informed, possesses a very fine collection of antiquities from burial mounds and graves in the States.

A recent number of the publication of the Canadian Institute, Toronto, contains a valuable contribution to our knowledge of Indian Archæological subjects. I refer to the paper contributed by Dr. Boyle. It is to be hoped it may be published yet in book form with the very accurate illustrations accompanying.

The ornamental designs on many of the vases (baked clay) do not show that marked inferiority noticed in similar ones obtainable from Celtic burrows or burial places in Europe.

The Local Government of Ontario deserve much credit for the liberal annual grant to the Institute. The capital of the Province is entitled to what she receives, and while we willingly accord that and other things that might be urged, I think the Hamilton Association may also prefer a slight claim to some consideration from our Local Government. We cannot but regret that some of the most interesting Indian relics now gracing the cases of the Canadian Institute were transferred from Hamilton to Toronto. Such things latterly have risen considerably in value. Farm hands and boys are not slow to find out that good prices can now be obtained for many things they little valued a few years ago. A certain value is attached to-day to what could have been obtained at a trifling expense formerly. This in a great measure is owing to the Toronto Institute being enabled, through the Government grant, to

offer prices that private individuals cannot afford to make. Much might be accomplished if we had even \$100 a year to expend in the purchase of Indian antiquities, etc., for our Museum cases. Perhaps it would also enable us to procure for comparison some few remains from the Ancient Forts and Mounds of Ohio, Iowa, etc. A few years ago a most important discovery was made in the latter state. Two stone pipes were unearthed close to the same number of skeletons placed in a sitting position, faces towards the East. The figure of the mastodon carved on the elephant pipes proves beyond any reasonable doubt that the owners lived at the same time as the mammalian.

Our collection of Indian relics at present cannot possess many objects of attraction to anyone who takes an interest in antiquarian research. One solitary case (only partly filled) silently appeals to every member to endeavor to make it more worthy the Association. Friends have already contributed some valuable objects: Chief Brant's inkstand (of great historic value to Ontario), the Totem, or Turtle Crest, of the Mohawks, (leaders of the great confederacy or Six Nations) is likewise of much interest, as well as some other things I need scarcely refer to, presented to us, and which I feel are much appreciated by some few of us at least. "These Relics," remarks Sir A. Geikie, "are in a sense more valuable than men's bones would have been. While they afford us certain testimony to his existence, they give us at the same time some indication of his degree of civilization and employment. His handiwork thus comes to possess much geological value, his stone hatchets, flint flaker, bone needles, and other pieces of workmanship are to be regarded as *true fossils* from which much regarding his early history has to be determined." Dr. Jas. Hall and Dr. Selwyn, Director of our Canadian Survey, recognized this fact several years ago and long before it was so emphatically expressed by the distinguished Director of the British Geological Survey.

A flint scraper from the Ohio Mounds, presented by our late Vice-President, Mr. Moffat, is superior to any I have seen, as regards finish.

Oct. 28th, 1892.

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AULOCOPINA—BILLINGS, 1815.

Canadian Naturalist, N. Series, Vol. 7, Page 230.

Mr. Billings describes the genus in an article on some little known fossils from the Silurian and Devonian rocks as follows: "Generic characters: The larger or upper extremity is more or less concave with a small circular space in the centre, which appears to be the mouth of a tubular cavity that penetrates inwards and downwards, along the vertical axis of the sponge. I shall call it the osculum. From its edges numerous small irregular (sometimes branching) ridges radiate outwards in all directions from the surface and descend the sides of the base. Several polished sections through the osculum downward show that the centre at least in the upper half was occupied by a large tubular cone with smaller ones branching from the sides outwards and downwards. This structure is only indicated by the dark-colored material which fills the canals, in contrast with the light grey chert which constitutes the mass of the fossil. The genus somewhat resembles *Aulocopinum* in its structure, and differs in having its whole surface covered with rounded irregular ridges above mentioned."

AULOCOPINA—GRANT.

"1. One of the specimens is sixteen lines in length and twelve in width about the middle. The osculum is a little over two lines in width. There are in general from five to nine striæ or ridges on the surface, in the width of three lines. These radiate from the osculum and sometimes down to the base so that its surface is covered with them.

2. Specimen somewhat compressed.

3. Summit of a large individual.

4. Fragmentary specimen, two inches in diameter, occurs at Hamilton, Ontario. The most perfect is of an elongate oval or pyriform shape. I propose to call it *Aulocopina* and dedicate the only species known to me to Major C. C. Grant."

FROM DR. HEAD'S NOTES.

Mr. Billings made no reference to the microscopic structure of the genus, although he knew that subject was becoming of prime importance in the study of the organism at the time he described it.

The assignment of *Aulocopina* to its proper position in the system of sponges is entirely dependent on its skeletal structure.

The genus is not confined to the single species described by Billings, but is widespread in pattern. Numerous variations within the genus have more recently been found, and in the opinion of Mr. A. E. Walker, who is versed in these fossils, several fragments obtained by him indicate that one or more stalked or branching forms are to be included, which are of *polyzoon* character. All the specimens found are weathered out of the rock, but are partially attached to or covered with a tenacious material peculiar to the sponge beds. The adhering substance consists of fragments of specules and earthy matter, which appears to have mixed in with the sponge-flesh of the organism at the time of its burial, since which time the present adhering material has become a place suitable for the accumulation of considerable sub-oxide of iron, and tenacious matter mixed with particles of silica.

In the Museum of the Hamilton Association there are several different forms assigned to the genus *Aulocopina*, (possibly correctly referred) some of which are extremely similar to *Eospongia Billings* and some very like the erroneously described sponges found in Illinois.

Examples of this species do not invariably have the striæ in ridges on their exterior as referred to; their absence, however, is not to be regarded as of specific importance, nor do all oval examples of the species indicate the *Osculum* as plainly as intimated in the specific description. In some specimens no trace of any true *Osculum* can be found, until a section is made of them, and being globular or ovate the upper cannot be distinguished from the lower part of the fossil. The species proper is "astyloid," evidently sessile, free, and in its lifetime could exist on the sea floor almost as well in one position as in another. This species should not be regarded as the type of the genus, but as the best species that had come to the knowledge of Mr. Billings. His enumeration of its generic character shows plainly the necessity of a better definition. Some of the parietal characters are fairly entitled to separation.

Nov. 25th, 1892.

NOTES ON SOME FEW FOSSIL ORGANISMS. NO. I.

In his Monograph on the Quebec Graptolites, Dr. Jas. Hall, Albany, states: "A large proportion of the organisms which come under our observation, for the purpose of study, are fragmentary. It becomes of importance to know the general character of the form and mode of development of the Cellules, formed by budding from the side of the common body, not unlike many Sertularians." When the foregoing was written it seems to have been a generally accepted belief that this extinct type of the Hydrozoa was confined to muddy or shaly sediments. The extraordinary number discovered at Quebec by the officers of the Canadian Geological Survey confirmed an idea previously entertained. Scattered specimens of the Polypi had been noticed in Europe some years before the organisms were laid bare in the Lower Province, but great difference of opinion prevailed among palæontologists regarding their classification, as a matter of course. This you may perceive from Dr. Hall's allusion to the various ideas published on the matter. In a few instances the slaty shales, Quebec group, revealed the initial point, or radicle, together with the Cellules. Such, I may say, are almost unknown in the softer sediments of our local Niagaras of Hamilton, as well as in the harder limestone beds (known in the States as the old Clinton beds), underlying the thick layer which Dr. Hall and others consider *the base of the formation proper*—that is, if any separation exists between the Niagaras and the Clintons, or Medinas, below. No doubt the distinction is very convenient. If all were merged into one common name, as suggested, would collectors understand what fossils, now obtainable at well-defined horizons, were required by distant European and other correspondents? When we know the foreign equivalents of our own rocks, we see at once what is wanted.

It is only when we come to our local Chert-band that we find additional light thrown on at least some of the forms described and figured in the Canadian Monograph. Dr. Hall regretfully states: "The numerous Graptolites described by myself, and the writers enumerated, were for the most part in a fragmentary condition." The position of the Cellules and the radicle form of the Niagara Inocaulis and Dictyonema were apparently unknown until the discovery of both in limestone at Hamilton plainly revealed one or more species, in the former possessing a

bulbous root, and Cellules over the face, not sides of branches, as was supposed. The other displays in some instances, at least, spreading rootlets, or a funnel-shaped base with the Cellules well marked on the surface also, when the corneous film or test has disappeared (scaled away) in the impure flint macadamizing beds. I have already expressed regret that Dr. Spencer, now Director of the Georgia State Geological Survey, has apparently abandoned his intention of describing the new material obtained since he published his papers on "New Niagara Fossils, Hamilton, Ont.," many years ago. It is to be hoped he may see a way to complete a work of much general interest, if one may be permitted to judge from several enquiries regarding the publication.

I received from an old correspondent of mine, one of the fellows of the Royal Geological Society, London, some time since, the Cambrian Graptolite *Oldhamia Radiata*, found at Bray Head, Ireland, with an intimation that considerable doubt existed regarding its nature; in fact, more than one palæontologist had expressed an opinion that plastic clay, under pressure or through shrinkage, sometimes presents such an appearance as the specimen in the parcel assumed. The branches, mere stains on the matrix, radiated from a well-defined central point. The bituminous *Epiteca*, generally characteristic of the family, was altogether absent; however, this is not very unusual, as I have already mentioned. The conclusion finally arrived at was that the specimen I received was no true Graptolite; it resembled more the spreading rootlets of an Alga, or sea plant, and I thought it decidedly organic. I heard nothing subsequently respecting it. Hugh Miller, in one of his works, alludes to *Oldhamia Antiqua*, I think, as an Alga. Dana in "The Manual of Geology," 3rd edition, page 179, figures under the head "European Cambrians" *Oldhamia Antiqua*, *O. Radiata*, adding on the following page (fig. 276) a species probably vegetable, found with *Oldhamia Radiata*, Bray Head, Wicklow, Ireland.

The Class-Book of Geology, by the Director-General of the United Kingdom Survey (Dr., now Sir Archibald Geikie), was, I think, wisely selected as the text book of the Ladies' College in a branch of science which has few supporters among the churches. On glancing over the work I ascertained that the nature of the *Oldhamia* remained even yet undetermined—the author stating the puzzling organism has been variously referred to the Hydrozoa,

the Sertularia, the Polyzoa, and the Calcareous Alga. If the illustration given at page 321 is reliable, it certainly bears a marked resemblance to one of the Niagara Graptolites described and figured by Dr. Spencer, Acanthograptus. The spiny process is absent; however, that was not likely to be preserved in shale. The scabrous stems of Inocaulis Plumulosa (Hall) are generally quite smooth when found in the same material. "The clearing up of the affinities of a single doubtful fossil is never barren of good results," remarked the late lamented palæontologist, J. W. Salter, "since it may tend to throw light on other forms as little understood." At an early stage it may be noticed the young Graptolite appears to be furnished with Cileæ, like the sponge. The examples given by Hall probably represent a later stage of growth. Admitting that this is an age more for the collection of facts than for their elucidation and explanation, I have always endeavored to let the fossils speak for themselves, rather than put forth views which ultimately may prove to be erroneous, and, when I venture a little beyond, I may honestly say my intention has ever been to attract the attention of others far more competent to judge.

Dec. 22nd, 1892.

RECEPTACULITES.—NOTES IN CONTINUATION. (NO. II).

The Zoological position of this family group is also one in which much difference of opinion exists. Nearly all the leading palæontologists of the age since the time of Goldfuss, Hall, Echwold, Roemer, Salter, Carpenter, Bradley, etc., and other eminent men, have had something to say regarding it, and yet the classification remains undetermined—Formanifera (order) Orbitolitidæ family—Salter and Carpenter say. Bradley claims it as a sponge, and while Billings, who has evidently closely studied the matter, appears to favor this view he does not seem to have quite made up his mind regarding it. Witness his concluding remarks: "When we consider that the full grown and adult individuals of many of the long extinct tribes of animals never attained in their structure a more advanced organization than that exhibited by the embryos of orders living at the present day, it does not seem surprising that we should find in the Palæozoic rocks a sponge which, although often of large size, never became more highly developed than is the recent genus *Spongilla* when it has only advanced to

the sac-like stage described. It is not intended to assert here positively that Receptaculites is a sponge, or to determine the question of its zoological rank one way or the other." "On the whole," remarks Sir Wm. Dawson, "if not Foraminifera they must have been organisms intermediate between these and Sponges." The claim put forth regarding their alliance to the modern purple organ pipe coral (*Tubipora Musica*) scarcely calls for serious refutation. For my own part, I think we may leave such controversial things to the final determination of the specialist. Though we may expect no satisfactory result as likely to be reached even in the next century, this circumstance need not prevent us from placing in their hands every well preserved specimen which may throw additional light on organisms whose nature can alone be determined in the study or cabinet of the palæontologist. But while I accord the higher rank to the man who can both name and classify, (university honor men, generally), I think the explorer or discoverer who brings, for the first time, to light some new species or genera, should obtain a little more credit than he usually receives. Not long since, in discussing the nature of these beautiful fossils with a friend of mine, (you may notice a restored form by Billings in Sir Wm. Dawson's "Dawn of Life"), I mentioned that I had obtained a fragment of the inner surface of an Ectorhin in the Niagara here. He evidently considered I must have been mistaken, as United States palæontologists alleged its range was limited to the Silurian Cambrian deposits. I pointed out that we had in our Museum several specimens presented to us by Professor Bell, from rocks of the North-West, of undoubted Wenlock or Niagara age. They had also been found in the same series in Australia, and from the circumstances of their frequently occurring in the drift beds of Western Ontario, especially between Stratford and St. Mary's, in the shape of the inner surface of an Ectorhin, I would not be at all surprised to find that Receptaculites may yet be found, well up in the Devonians of Ontario. (R. Neptune has already been recognized in this formation in Belgium). I willingly admit erratic boulders, shingle and gravel may be derived from beds of *any age*, but the Glacial Drift is chiefly local. I mean by this term, in "a Corniferous district" For instance, you may remark the moved, rounded debris has been torn from rocks in the immediate neighborhood, so, where mountain limestone prevails, (as in parts of Ireland),

I noticed the superficial accumulation, the loosely aggregated masses of sand and other matter, came from places close by, mountain chains adjacent, while many of the transported boulders of the tile have been traced to lands further north than the Ulster Province. "This boulder clay or tile" remarks Sir Archibald Geikie, in "The Class Book of Geology," (1886), "is always more or less *local* in its origin, but contains a variable proportion of stones which have travelled for a greater or less distance, sometimes several hundreds of miles." The stones or rocks in the detritus, more especially when hard and embedded in a clayey matrix, present smooth striated surfaces, the striæ usually running along the length of the stone, but not infrequently crossing each other. This characteristic striation points unmistakably to the slow, creeping motion of land ice. When the wing of my regiment arrived at London, Ont., a quarter of a century ago, I felt assured I was in a Devonian district, although I had not previously seen a rock of the formation *in situ*, and probably 100 feet of boulder clay was overlying. I reached this conclusion from remarking the numerous Corals (Corniferous) on the surface, and the characteristic Shell (*Spirifera Mucronatus*) Hamilton Shale. The latter (which was in rounded water-worn masses) must have been, as Dr. Chapman, Toronto University, suggested, removed in a frozen state originally, otherwise I cannot see how it possibly could have held together without disintegration. I had no difficulty whatever in breaking it up with a very small hammer, and in obtaining almost any quantity I required. Hamilton shells figured or described are common in the series. This digression may be pardonable in an old collector, for this information may be utilized by younger students of the Geological Section, wherever "drift" is found, from Hagersville to London or Komoka, Ontario.

To return to the subject of my brief address, it is to be regretted that so few of us take much interest in the examination of microscopical objects. The Foramanifera, like the Corals from the earlier ages, have largely contributed to building up our globe, yet very little is known about them. The chalk beds of Europe, with a maximum thickness of 1000 feet, are composed almost entirely of minute shells and sponge spicules. Although other fossils may be abundant, they form but an insignificant portion of the vast aggregated mass. The recent deep sea dredging of the "Challenger" proves a like material is still

accumulating in many places at the bottom of the Atlantic—the same conditions apparently existing as in the Cretaceous age. The Globigerina Mud, submitted to the late Dr. Carpenter for microscopical examination, was found to be composed of the minute remains in enormous numbers. The substance itself is a grayish white, not very unlike chalk, or the Eocene Matrix in which we find the small Taliost Clupea Numiles (*Diplomistis*) embedded. When Carpenter remarked the existence of living Foraminifers that were supposed to have become extinct before the Tertiary period, and sponges, sea urchins, etc., of same age, some one expressed a belief that we are living still in the Cretaceous one. The opinion of Dr. Carpenter respecting Receptaculites, ought to have considerable influence in determining the nature of the fossil. No man devoted more time to the structure of the Rhizopods. He was universally admitted to be unrivalled in his knowledge of the Protozoa. When Salter, the late palæontologist to the Geological Survey of the United Kingdom, placed the fossil in the family group, Orbitolitidæ, no doubt he was considerably influenced by the figures and description of the large species from Australia and the South Seas by Dr. Carpenter. "I was," he remarked, "possessed of the greatest satisfaction on the above view of the affinity, because on explaining the specimens to Dr. Carpenter, I found that he entirely agreed in it. After pointing out several objections that might be made, he showed me that there was in nearly every point a close coincidence in essential structure between Receptaculites and Orbitolites, the difference only being in the size of the cells in this, the most ancient of the Foraminifera." T. R. Jones, another well-known and able naturalist, is also a man whose views must have considerable weight, because he is also looked upon in Europe as a leading expert in minute organic matters. I infer he is quite in accord with Salter respecting the position of the much debated and still unsettled Receptaculites. We may regret the prevailing ignorance in church circles generally regarding geology. It is more difficult to understand why so little is known in the United Kingdom of Great Britain and Ireland, of the important discoveries of late years made on this continent by officers of the United Surveys, and the Dominion Government of Canada. Insular pride and prejudice (as suggested in explanation) may be very dense, but such a charge as this can scarcely be entertained

if applied to such a body as the Royal Geological Society of Great Britain and Ireland.

I may be permitted to call attention to Sir Wm. Dawson's description and figures of Rhizopods in his very interesting work, "Life's Dawn on Earth." Sir William notices the intimate relationship between the Rhizopods and Sponges, however unlike they may appear to us at first sight.

January 27th, 1893.

ANNELID BURROWS, TRAILS, FUCOIDS, ETC. NO. III.

Although I have already alluded to each and all of the above in our local rocks in "Notes on Silurian Plants," still further information is required by correspondents who have had no opportunity of examining any of the original specimens submitted for your inspection. No doubt without seeing the objects, and in the absence of correct figures, it is exceedingly difficult to arrive at any satisfactory conclusion regarding their nature. It may be permitted me to furnish a few additional remarks, even while regretting that circumstances may prevent us from figuring the original specimens themselves.

A well-known fossil botanist in the United States recently requested me to send him copies of some papers on Silurian Plants published by the Hamilton Association, which attracted the notice of a scientific publication in Washington. I was aware considerable difference of opinion existed regarding problematic organisms, so-called, and believing I had in my possession, or transmitted to friends, better preserved ones than are elsewhere obtainable, I was only too pleased to furnish my correspondent with a copy of the first paper on the subject, which appeared in our Proceedings, and subsequently I forwarded a brief description of a few specimens of the late (Mr. Billings' *Licropycus* (species as yet probably undescribed). These were procured (as the Geological Section knows), shortly after a paper was read at a general meeting, and the additional note was only incorporated in the annual issue as a sort of postscript to the former communication.

The absence of bituminous matter appears to be the chief point relied on for rejecting the Silurian Fucoids as plants at all, no matter how well defined the form may be. Several years ago I produced for the inspection of members of the Botanical Section (as well as our own), specimens of well-

known carboniferous ferns from Mazon Creek, Illinois, U. S., in proof that fossilized flora may be recognized and easily determined, even though the plants may not possess a single particle of carbonaceous matter. The vein-like markings of Neuropteris Hirsuta were as well defined in the matrix (colorless), as the black impressions of similar leaves from the same locality. The fern-fronds from the English Iron Stone, frequently present merely a stain, slightly differing from the muddy deposit in which they were originally embedded. While quartered with my regiment in Nova Scotia, I noticed that the carboniferous plants there always presented the blackened appearance only observable, perhaps, in a majority of cases in the coal measures of Europe and Illinois. Called upon for an explanation regarding the absence of carbonaceous matter in fossilized Fucoids or Algæ, may we be permitted to ask in return, why *scientists* avoid such an absolutely hard nut to crack? Alluding to plants of the coal measures in a very interesting paper on the "Preservation of Plants as Fossils," a copy of which the author kindly sent me, I find an important admission to which I would most respectfully call attention, viz: "Very frequently leaves occur in a fossil state with an *impression* merely, the sandstone shows no traces of carbonaceous matter, but the outlines and the venation are as perfect as if the actual leaf were before us." Again in an abstract of a paper on "Problematic Organisms and the Preservation of Algæ as Fossils," the same writer remarks: "The absence of organic or carbonaceous matter is not considered *per se* to militate against the animal or vegetable origin of many of the forms, but when taken in connection with the absence of definite form, the position of the remains in the strata, and other circumstances, etc." This objection in the concluding paragraph can hardly be applicable as regards our Clinton local beds. No better defined fossilized plant remains have ever been figured on or described (as far as I have seen as yet), as the perfect specimens of Dr. James Hall's Buthotrephis, a Silurian Fucoid, presenting an impression which I, in common with many others, supposed to be a sea plant. I have already stated that a Brachiopod occurs also in the same layer (*Lingula oblata*, Hall). This is not the only Mollusc there, and my correspondent, I believe, is mistaken when he states "these problematic organisms are mostly found in strata devoid of other fossils." As regards their appearance,

indicating deposition in shallow water as alleged—this admits of no dispute. If we are in accord with the late Professor E. Forbes, of Edinburgh, respecting the slow subsidence of the mountain limestone rocks in Europe, we need scarcely be surprised at finding here, embedded in Silurian limestones, some few vegetable organisms passing upwards from the underlying Clintons, and accommodating themselves to their altered conditions. These may possibly present appearances in some respects differing from the original parent Alga, as widely as the detached branches or immaturities of the Cambro-Silurian I collected in Anticosti differ from the complete fossilized plant obtained from the local Clinton beds, or even quite as much as the latter seemingly differs from an allied *furoid*, now in the Redpath Museum, Montreal, which Sir William Dawson named and recognized as a true sea plant in a paper recently published in *The Quarterly Journal*, Geological Society, England, for November, 1890.

I must confess I was unable to comprehend how any reasonable doubts could possibly have arisen regarding the nature of some, at least, of our local plant remains. The *Buthotrephis* of the Barton Niagara beds, of Sir Wm. Dawson, is undoubtedly less complete as regards form than the one contained in the Clinton flagstones. There we have the root, (conical), main stem, and lesser branches impressed entire to the topmost one on the layer. I am unable to recall any land plant of the coal measures in a better state of preservation. The confounded thing, however, does not present the blackened appearance it should have presented if it only adhered to "the natural law," which, unfortunately it seems to have utterly rejected. There it displays itself on our museum cases in all its naked simplicity, challenging investigation, and ready to convince the most skeptical regarding its nature. When C. D. Walcott was here some years ago, I split one of the large flags for him, and it revealed the smaller branches alternately proceeding from the main stem. I am not quite so sure that the conical root put in an appearance in the interior of this particular layer on that occasion, but I have preserved a single radix from several given away, and as this portion of the *Furoid* or *Alga* is rarely preserved in the Clinton rocks here, I must request that the Geological Section of the Association will perceive it cannot be well dis-associated from the branches of the *Furoid* or *Alga*, named *Buthotrephis* (Hall), in our cases.

We need not expect to find internal structure in such organisms. Striæ, however, unquestionably in some instances, may be detected even without the aid the ordinary lens affords us. I ask you to pardon the repetition of the description of *Buthotrephis* I gave, as some few opponents have not seen it. Here we have a conical root buried in a dolomitic shale precisely as it grew—a *main stem* and well defined branches alternating, gradually becoming smaller towards the top. How anything presenting such an appearance can be put down as some obscure organism, a worm track or trail, is what I am utterly unable to comprehend. Even a single branch appears to me to be sufficient to convince anyone as regards its nature; the very branching itself seems conclusive on the point in question, independent of other considerations. No Annelid, as far as I can see, could produce a trail that bears any resemblance whatever to one of the poorest preserved fossil branches you may see in our cases. I have already placed before the Section, for examination, three species, all probably new, of the genus *Licrophycus*. All were obtained from the Clinton sub-division, and two of the number since the paper was published on "Silurian Fossil Plants of Hamilton, Ont." One, now in the Redpath Museum, Montreal, presents a tuft or bunch of branches proceeding from a single stalk, (such, however, is usually the case) but in this specimen the main stem is continued through the centre of the tuft, producing another about an inch above it. A far more flexible species (yet in my possession) displays not only a second tuft, but also a third and the base of a fourth one proceeding from the stem. I am unable to comprehend how such an impression as this could represent anything but a plant or fucoid. It may be considered rather questionable taste for an amateur to think famous palæobotanists such as Lasquereux, etc., can be mistaken, more especially with regard to such organisms. A good deal depends on the state of preservation of the specimens examined, as well as their immediate surroundings; the latter appears to be entirely unknown in many instances, and an opinion formed from imperfect specimens submitted for examination. I find I am near the end of my pages, and have only referred to two genera of plants yet, so you may kindly excuse me for returning to this subject on another occasion.

In extenuation of my offence, viz., unfortunately differing from well-known palæobotanists regarding the nature of some

of the organisms, I may be permitted to relate an anecdote I heard related in my younger days. There was a vacancy for a coronership in the Barony of Duhallow, County Cork, and an ambitious auctioneer, finding business slack, came to the conclusion that he might as well prefer a claim to the coveted office as another, so he called on a county magnate in order to secure his influence in the matter. Having stated the cause of his visit, Sir W. B. was rather taken aback at our friend's cool request, but replied, in the courtly way of the old country squire: "I regret, sir, I am unable to promise you my support. I hold that the office of coroner for the county is of very great importance, and I consider it ought to be filled by someone learned in the law or medical profession—a lawyer or doctor, in fact." "A liar or docthur! Sir William," was the unexpected reply, "Arrah! sure I'd know a dead man as soon as either of 'um." Well, gentlemen, you may permit me to say I possibly can recognize an Alga or Furoid quite as readily as any professional, when the latter had not an opportunity of seeing the plant in situ, but merely in the closet or study.

In the appendix to that useful and interesting work, "Geikie's Class Book Geology" (1886), at page 479, under the head "Vegetable Kingdom," I find a statement as follows: "Impressions of some of the larger kind of sea-weeds may be left in soft mud or sand; traces of fungi have been noticed even in rocks of the carboniferous period." The concluding part is calculated to lead one to infer that the indications of sea plants presented themselves for the *first* time in the age of the coal measures. Sir Archibald appears to have forgotten that at page 319 he gives us an illustration of a fine, well-preserved Alga (*Chondrites Versimilis*) from the Upper Silurians. Its position as a plant was, I think, correctly assigned, although it bears a certain resemblance to a Niagara Graptolite of the genus *Acanthograptus* (Spencer).

"From this incompleteness of the record and from the wide differences in the organic grade of the forms actually preserved in the rocks, we may reasonably infer that only a most meagre representation of the life of the time has come down to us in a fossil state."

—*Sir. A. Geikie.*

Feb. 24th, 1893.

ANNELID BURROWS, TRAILS, FUCOIDS, PLANTS. NO. IV.

In a recent paper my remarks were confined chiefly to a few well-marked organisms obtainable here in our Silurian rocks. I endeavored to show some reasons for not accepting the views entertained by several well-known palæobotanists regarding their nature. I have so frequently expressed an opinion that the inferences were formed from mere fragments, poorly preserved, that it seems almost unnecessary to repeat the statement. It certainly would be more satisfactory, to me at least, to furnish specimens from Hamilton in order that my readers may see and judge for themselves. While the best preserved examples may be retained for the Redpath Museum, and the Geological Survey office, Ottawa, yet, no doubt, I can furnish others little inferior from duplicates in the cases of our Museum in exchange for fossils we may require to complete the collection of others foreign to this locality.

Whatever may be the final decision respecting the nature of the above named impressions one thing is certain, it would hardly be accepted as altogether satisfactory if investigation is considered unnecessary with respect to our local fossils. We would rather let them speak for themselves. In a brief notice of "Fossil Botany," by H. Graf Zu Solms Laubach, 1891, it is stated by one of the contributors to *Science*, that the author is non-committal respecting *Buthotrephis* and its affinities, but he admits *Arthropycus* to be a plant. A slight concession is better than none. Credner arrived at the same conclusion many years ago. The members of our Geological Section quite recently had an opportunity of examining for themselves numerous specimens of *Arthropycus* in beautiful preservation at Grimsby, (some members of the Botanical Section of the Association were also present) yet not a single individual was found to question the organic nature of the remains, and more than one or two noticed how several of the stems folded over others below them. On the large blocks of sandstone lying at the foot of the quarries you may recollect how much we regretted our inability to remove some of the larger masses owing to the difficulty of conveying them from the ravine for transportation. Yet despite the obstacles which presented themselves, a fair collection was secured by members to enable them to judge for themselves whether such as were observed could by any possibility be referred to *worm trails* or *crustacean tracks*, to both of which they have been attributed. I am unable to un-

derstand why students in colleges and universities are so moulded by their teachers that they rarely depart from the old groove. They are too ready to accept as gospel truths what such venerable sages record for instruction and guidance. Perhaps pardon may be accorded for the digression.

PALÆOPHYCUS.

Although I have already described and given the dimensions of a Palæophycus, from a large block of Barton Niagara limestone, in a former paper on "Silurian Plant Remains," (the original description of the genus by Hall I cannot find just now), I may be permitted to offer a few remarks on fragments of two species before us from the Medina freestone beds. Taking the smaller and better preserved one first, you may notice how boldly it stands out in relief from the surface of the layer. On measuring the stem across, a little below where it branches, you will find it to be about two inches. It then divides unequally, the spreading branch to the right (wider than the main stalk) is more than double the width of the one to the left. The general appearance indicates what is commonly known as a leathery sea-weed. The branches are not in tufts. Compare it with a Licrophycus from Anticosti, Cambro-Silurians, and the difference is at once apparent, although the latter perhaps may have been very distantly related. It is certain there are distinct species or varieties. Some are so poorly preserved that specific determination is impossible, and little can be done in the way of classification until we arrive at a final settlement regarding these problematic organisms. The second example of the Fucoïd (and I need not say I consider it such), I now display for the first time. It was obtained in a quarry near the city, a few hundred yards from Judge Robertson's residence, but at the same horizon as the other, which was discovered adjacent to the main reservoir, in an abandoned quarry. I attribute the preservation of the plant remains to their having been covered by a thin muddy sediment before decay set in. This shale, rather indurated at places, varies a little in thickness, but averages nor far, perhaps, from six to seven lines, or thereabouts. I do not believe it is ever absent. There is little difficulty in recognizing the position of what I venture to name the Fucoïd bed of the Medina Grey-band. I have hitherto failed to discover the vertical tubes

named *Fucoides Verticales*, in the series by Dr. James Hall. They are not uncommon in the succeeding Clinton rocks, however.

The paired Annelid burrows seem absent likewise. A cord-like Algæ of the Grey-band is new to me, and is exceedingly rare. Only two specimens have been obtained; both came from the same locality, and probably are merely fragments of one plant. They were not found in situ, but in a heap of rubbish where stone-cutters had been working. They present an appearance of smooth cylindrical tubes of an equal thickness, lying on the surface of the flag. A closer examination reveals what I hold to be a fatal objection to their being referred to errant worm burrows—they *bifurcate* and do not display the irregular thickness nor the curved shape of Nicholson's Planolites—(*P. vulgares* has about twice the diameter of this). The gentlemen of the Geological Section may remember that I expressed an opinion that many of the vertical tubes named Scolithus, etc., as also the horizontal ones called casts of errant worms, may ultimately prove to be organic, or in other words, to speak more plainly in order to avoid misconception, plant remains. A conclusion opposed to views very generally, but not universally accepted, requires explanation, and the evidence as yet in support of the assertion may not be deemed altogether satisfactory.

The Scolithus of the Potsdam sandstone (Cambrian) I believe to be a true worm burrow. I noticed in a fragment many years ago the U-shaped base of a paired burrow, such as Professor James describes, both ends opening at the surface, as in the specimens from Madison, Wisconsin. No plant, I conceive, could ever have presented a root-like process as here displayed. Arenicolites didymus, or A. Sparsus (Salter), paired tubes with circular openings, are frequently found in the Clinton rocks of Hamilton, and terminate in a like manner, habitations corresponding with those of the modern lob-worm. There are, however, vertical tubes filled in with a muddy sediment (slightly differing from the matrix in color), whose bases are unlike the ones above mentioned. They end apparently in a sharp conical root-like point. Lingula shells (single valves generally) are not uncommon in the beds here. In a paper by Sir Wm. Dawson I find the remark "that many of the filled-in tubes noticeable may have been produced by these Brachiopods." Perhaps the same idea may have been entertained by Professor Shaler, recently, when he objected to the name

"Scolithus," altogether on the grounds (as he quaintly stated), "since at best, it is only a hole in the rock." I infer the professor has a suspicion that the specific name may convey a very erroneous impression, at least in some instances. I do not think it at all unlikely that the pedicle of a *Lingula* (contractile when alive) was capable of making such holes in the mud and sand. Yet I believe many to represent plants, and I object to the assertion "that no reasonable doubt can possibly be entertained regarding their nature." I spent many weeks last fall in both breaking across and splitting great numbers of the Clinton Iron-band flagstones which were lying about the base of the Niagara Escarpment. In a former paper I stated these layers held several plant remains not true *Fucoids*, but marsh or land ones; that they generally occur in an erect position as if the muddy sediment had formed around them before decay had set in. The edges of a block in some instances revealed rounded branching tubes. Planes of fracture or joints are found in each flag which separate in three subdivisions. You may split a score without discovering anything exposed on the surfaces but vertical tubes more or less closely packed, some a little larger than others and not essentially differing from *Scolithus Verticalis*. I had almost despaired of obtaining a fairly preserved specimen, when I concluded to split a few a little beyond, but from the same horizon; the result was highly satisfactory. Several plants put in an appearance (branching forms chiefly) fossilized in a manner similar to the ones frequently found in the lower Clinton green beds. One is very slender, and so closely allied to a *Psilophyton* (*Lesquereux*) from the Cambro Sil—as figured in Dana's Manual—that it may prove a variety merely. Another, a jointed form, displays the main stem and branches contracting at regular intervals after the fashion of the *Equiseta* (*Calamites cannae formis*, for example); portions of the plants are colored green. This is evidently caused by iron salts, etc., for shells and *Bryozoons* of the band also present the same color frequently. Specimens are submitted for examination. In a paper published in our Proceedings I alluded to a black crushed *Fucoid* of the Clinton green shales found attached to the under surface of the *Pentamerus* limestone, the base of our Niagara. It seems more like a flattened reed or rush. I was surprised lately at finding fragments of this, or a nearly allied form, well up even in the chert beds. The best preserved specimen at base is about four

inches long and one inch wide at top, has a sharp conical root and it is considerably curved, so much so that at first it was mistaken for a black *Cyrtoceras*. It has a roughened wrinkled surface, and in this it differs from the Clinton ones, which are always smooth, as also from the other fragments a little above the blue building beds. Of all the Niagara series I am now collecting examples for Sir Wm. Dawson, who probably may throw a little light on a few of the problematic organisms of our local rocks. The indurated shales of the Barton waterlime beds (Niagaras), display a very large number of vertical tubes of various sizes filled in. These undoubtedly bear a marked resemblance to worm burrows, although one gentleman, a well-known geologist, expressed his opinion that they represented perhaps a *Coral Syringopora*, or a *Monticulipora*. The absence of structure is opposed to this, and it appears now an easy matter to establish the vegetal nature despite occasional appearances. Close to the Barton waterlime beds, a sheet of tufa or carbonate of lime has been deposited on the face of a small cliff to which, in places, modern mosses and lichens, have attached themselves. In some instances I noticed the latter plant had been washed off, decayed and disappeared; not, however, before the vegetable acid had eaten its way into the lime on which it grew. It left a perfect impression of itself on the material it covered.

Professor J. F. James, in a very interesting paper he lately sent me, remarks that the outlines of plants (leaves) may be preserved also by what he calls "a chemical process." Even under unfavorable conditions, which he describes, he was enabled to recognize a variety of leaves he enumerates, fallen ones, which had impressed their outlines on flags. They were more than impressions, he states, for they were not washed away by the rain. They were not mere surface markings. May not a well authenticated fact such as this account at least for some of our faint, doubtful plant remains?

Nearly all the fossilized plants in this neighborhood appear to have conical roots—fibrous ones are rarely seen. Since the discovery of a *Dictyonema* recently with this peculiarity, I feel almost inclined to suppose a mistake may possibly have arisen in at least a few instances where remarked. I had nearly forgotten to mention that I extracted from the ancient lake beach at Burlington Heights, quite recently, a water-worn rounded shingle containing empty tubes of *Scolithus*, which you may compare with a Potsdam

fragment. The matrix may be Medina or perhaps Oriskanny sandstone. I think it might be derived from the latter, as it seems nearer to it.

Dr. Flemming, a Scotch geologist, a good many years ago described a submarine forest extending on each side Flisk Beach, on the shores of the Frith of Tay, as follows: "It rest upon clay, the upper portion of the clay has been penetrated by numerous roots charged with peat. The peat bed itself occurs immediately above the clay. It consists of leaves, remains of stems, roots of common plants, Equisataceæ, etc., mixed with leaves, branches of birch, hazel and alder probably. Empty hazel nuts are of frequent occurrence. All the vegetable remains are much depressed or flattened when they occur in a horizontal position, but when *vertical they retain the original rounded form.*" Now the concluding part exactly describes the appearance of some of our Silurian specimens here. Any way we may learn from the extract that in our present imperfect state of knowledge it would be injudicious to indulge in rash assertion and hasty generalization. When I find men positively stating "all are undoubtedly worm burrows and trails," as far as I am concerned I am opposed to this conclusion. The entire subject of these "problematic organisms" requires revision and more extended investigation. I am quite sure our Association would not object to loan some of the specimens in our cases to any society or individual in Canada or the United States willing to grapple with, or endeavor to solve the problem of their true origin.

I find from an abstract of a paper by Professor Joseph F. James, which he kindly sent me, that Lesquereux concluded that modern sea weeds seldom retain their structure for any length of time. Matthew, however, thought that although they were not preserved in sand, they were in clay. In the Medina grey-band thin sandstone layer or fucoid bed at Hamilton the muddy shale or silt apparently buried them in places or patches before decay, and so preserved the impression of several fucoids in this favored locality of Hamilton.

In conclusion I feel papers must necessarily lose more than half their interest when not illustrated by wood cuts, photographs, etc. No written description can convey the needed accuracy respecting

fossils, and where the reader and student has not the opportunity of examining the original specimens such things can hardly be dispensed with. The pictured record is an absolute necessity.

March 24th, 1893.

DEFICIENCIES OF OUR MUSEUM.

We are all acquainted with the difficulties encountered by our honored predecessors in establishing, on a firm basis, a museum for Hamilton. Under more favorable circumstances their successors have been partly successful in carrying out their intentions. It is always an ungracious task to point out deficiencies, but where the sole object is to improve on what has been already accomplished, this cannot be helped, so you may pardon me for pointing out a few things worthy of consideration.

Conchology.—In this department we possess some interesting specimens kindly presented by Mrs. Charlton, Mrs. Mortimer, and other friends, but on the whole it must be admitted our collection is an exceedingly limited one. This is the more to be regretted, since shell collecting, Professor Gaskom's *la belle science*, is most enthusiastically pursued by many of the inhabitants here, as I well know. When the British Association visited Montreal a few years ago, perhaps nothing attracted more attention (next to Sir Wm. Dawson's organic remains) than the beautiful collection of sea shells, (now in the Redpath Museum), dredged and mounted by the late Dr. P. Carpenter. It was pronounced the most perfectly arranged one ever seen by leading scientists. Here, as elsewhere, I have noticed sea shells have an especial attraction for ladies. I confess, however, some at least displayed a marked preference for such as had the epidermis removed by acid in order to show the Nacreous lustre. Many of the ones imported into Canada are thus injuriously treated. If ignorant dealers had not equally ignorant purchasers, such a state of things could not exist. If the state of our finances permitted the Council to sanction the appropriation of a small amount as the beginning for the purchase of the types of the different family groups and characteristic species of the various sea provinces, it doubtless would meet with general approval. The Museum should be made as interesting as possible to all. The public soon tire of looking repeatedly at the same objects. We must keep on acquiring fresh ones to sustain a living

interest in this museum, and although it may be well to have a trifle in hand to meet any unexpected contingency, no advantage can be gained in letting the dollars remain idle while the cases require additions to their contents. Few are aware that a Hamilton lady (Mrs. Carey), possesses one of the best collections of shells I have seen (land and sea inclusive). I have always impressed on our younger collectors that the mere gathering of these things does not entitle one to be recognized as a conchologist. They must be able to distinguish the family groups and arrange them correctly, and further, have some knowledge of their respective habits, geographical distribution, etc. In the majority of cabinets (private ones chiefly) you may find no attempt at classification, but a sort of arrangement where size, color, and such things are the leading ideas. They look better so, perhaps, to an uneducated eye, but it is a very great mistake all the same.

I lately received a small *Haliotis* or "ear shell" from China. We have heard about painting a lily to improve the appearance, but I never imagined it could have been possible to find any human being who supposed he could improve on nature by plastering this beautiful shell with black varnish, as is the case in the one now before me. Here is a chance for an increase of the revenue, which all naturalists can appreciate. Let the Minister of Finance place a small tax on importations which do not arrive in their *natural condition*, and if some ladies (unlike others in the city) express a preference for a shell when the outer skin or Epidermis is removed, our chemical friends of the drug stores can readily furnish whatever they may require through means of diluted acid. Much as I regret this practice of improving natural productions, if it has to be done let it be done in Canada, not in China or India.

Until recently I devoted but slight attention to the living Mollusca, yet with some little assistance from Professor Whiteaves, of Ottawa, and other friends in Hamilton, I would willingly undertake the arrangement of the sea-shells. I am quite satisfied a collection, classified according to the views of modern conchologists, is an absolute necessity. A great many alterations in family grouping have taken place since Sowerby's famous work was published, new sea provinces have been explored, and great additions have been made to the various species, and unquestionably it must prove of material assistance in the re-arrangement of some of the private cabinets now

located here. As regards the land and fresh water ones of this district, they are unrepresented as yet in our cases. If a beginning were made, the trays (some at least) recently fitted in one of the side cases, may be utilized for their display. I entertain little doubt our young collectors, who are interested in such things, would willingly present us with any they can spare from their own cabinets.

Conchologists can help us by presenting things not required for personal collections. The dead shells frequently cast aside as utterly worthless frequently contain parasites attached (overlooked by conchologists). They are much sought after by others deeply interested in the like organisms of former ages. Parasites unquestionably existed in old Cambro-Silurian seas. I am in possession of a Brachiopod beautifully preserved, with many distinct ones fixed on the exterior of the shells, and Mr. A. E. Walker pointed out to me others which he obtained from the Devonian rocks of Ontario. Organisms thus indicated can scarcely be presented for your acceptance, since they are absolutely necessary to retain, by their possessors for actual and accurate study.

While we possess a very fine cabinet of botanical specimens, it is greatly to be regretted the birds of the district (with a few exceptions) are unrepresented. This should not be. It is necessary to have a considerable amount of skill in taxidermy to select the specimens for this department. You rarely find them mounted in a natural way, and frequently, when too late, you ascertain some improper material was used as a skin preservative. I have had some I bought in the Ionian Isles completely destroyed through such means. It would, therefore, be necessary to obtain any things required in this line from some reliable person. Mr. McIlwraith informs us that mounting birds in cases is going out, they never looked quite natural, and the new plan, viz. ; stuffing, so as to represent the dead ones, has several advantages over the old way.

No remarks are necessary with respect to our Butterflies, Insects, etc.; Mr. Moffatt's name is a sufficient guarantee for their excellence in every respect.

Deficiencies in Fossil Cases.—Visitors from other localities would undoubtedly expect to find a better and more complete collection of organic remains, more especially from our local rocks, than we possess. Previous to opening the Museum many thousand specimens were sent away from Hamilton to Europe, the

United States and various places in Canada. We are not the only collectors. Stray professors occasionally pay us a visit, and carry off many interesting fossils. Numbers of the local organic remains have never been described; a public display of such may be injudicious. No department in scientific research can rest satisfied with what has already been accomplished; so let us have a marked improvement all along the line, if possible. I lately received from the city of Bath, England, an account of the annual meeting of The Royal Literary and Scientific Institute there. The society is supposed to have the best scientific library outside London. All the speakers expressed regret that the institution had, apparently, gradually ceased to be attractive. This was attributed by a few members to keen competition, rival institutions, and other matters that had little, if anything, to do with its failure. "Ladies and gentlemen, you require to popularize the whole concern; it must keep pace with the times—must adopt a progressive policy. Weed out your library: provide useful books for reference. *The porter who dusts them once a year is the only person who ever touches any of the works on these shelves,*" remarked a member to the highly conservative committee. "You cannot afford to stand still." One old general left the room, it is said, wondering what they were coming to, and declaring he had no intention of remaining any longer where such revolutionary doctrines were openly expressed. There exists no necessity for discarding the valuable works bequeathed to us by their honored donors. Such ought to be retained, but instead of loading our shelves with matter never consulted by any chance, would it not be advisable to select a few useful modern works for reference for our respective sections?

Well-intentioned as the invitation was to open the Museum on Saturday afternoon, few have availed themselves of it. Workingmen can scarcely be expected to do so when it means the loss of half a day's pay. It may be worthy of consideration whether it may not be as well to include Dominion Day, and other holidays as well.

I have always held that Dr. Selwyn was quite right in stating "museums are places not of amusement, but instruction," and no valid objection can be urged to the display of the impressions of the footprints of the Creator and work of His hands on Sundays. I feel in Canada the time has not come for this, but the *London Times*, the organ of middle-class respectability, recently furnished its readers

with an account of a meeting held in that city for the purpose of advocating the opening of museums to the public on Sunday. A resolution in its favor, advocated by Lord Rosebery, was carried; sundry bishops of the Established Church of England asserting that *they could see no harm to religion in so doing*. Surely, when such a progressive movement meets the approval of dignitaries high in the church, laymen may be pardoned for seeing nothing reprehensible in the matter. Are not the works of the Creator as worthy of study as translations of Jewish manuscripts, by men whose ignorance of the Hebrew and Greek languages we may suspect, when we are informed by modern scholars that nearly one thousand errors may be detected in the English version of the Bible alone (unrevised edition). No doubt it would be wrong and exceedingly unjust to deprive the usual employees of the *one day of rest* to which they are clearly entitled, but arrangements may be made which would render this objection of little consequence. As I have already mentioned, unfortunately or otherwise, we are not prepared for a move in this direction yet.

ADDITIONAL NOTES.

The recent discoveries of Sir William Dawson in the erect tree stumps of the coal measures, Nova Scotia, may have escaped the notice of the members of the section. The organic remains were submitted to Professor Scudder for examination, who recognized the following, viz.: Amphibians, twelve species; Land Snails, three species; Millepedes, eight species; Scorpions, three species; Insect, one species.

Celts and their Relics. Since the paper on this subject was published, attention has been called to several points not touched upon. The omission regarding the Sythic origin of the race was quite accidental. I was perfectly aware of the fact of what Major Rawlinson, the celebrated cuneiform Assyrian scholar, had stated, with regard to the Khorsabad inscriptions of the introduction of a strong Sythic element at this period into the population of Central and Western Asia. He showed that the Sacæ (Syths) were always named Tsimiri by the Babylonians and Assyrians—that these were to be found in every province of the empire constituting the militia of the kingdom. Major Rawlinson observed that these nomad tribes included Celts, Slavonians, Teutons. The Zimri, of Jeremiah, referred to the same tribe. The ancient Britons even now call

themselves Cymry in Wales. The name Welshman merely signifies foreigner, a term used by our Norman forefathers.

The Upper Green Band Clinton (so rich in plant remains at Grimsby), which you may notice in the debris at the Incline Railway here, below Mountain View Hotel. Embedded at Cayuga Co., U. S., the head shield of the oldest Eurypteris known to me, one discovered by Mr. Townsend, of Durham Point, was figured and described by Whiteaves, and is in good preservation. It is a Guelph one. Fragments of another, which I obtained from the chert here, were pronounced by Mr. Billings to be doubtful and too imperfect for description. Where this crustacean has been since recognized in the capping of the Niagaras (Guelph sub-division), and below in the Clinton sub-series, the intermediate beds must, as I claimed formerly, surely hold specimens also, although unrecognized.

A New Graptolite from the Corporation Quarry, Hamilton.—

Another new form of the above fossil has been discovered here. The greater part of this family group has been described and figured from fragments, and the base is almost unknown. In this one, the Radix (root or initial point), is fortunately preserved, it is fibrous, not bulbous, as in *Inocaulis*. It will come, probably, as regards Genera, under the head Nov. Sp., *Dictyonema* (Hall).

"Supposed New Fossils, Niagara Chert-Sil., Hamilton, Ont.—

The Chairman, Col. Grant, produced for the inspection of the section a remarkably well preserved Graptolite, recently obtained from the Corporation Quarry, expressing his opinion that it belongs to the new Genera of Dr. Spencer, F. G. S., F. G. S. A., *Acanthograptus*, Nov. Species of the family first discovered at Hamilton, Ont. He also showed a very beautiful flint-flake fossil from the glaciated beds, stating it may be either a Cornulites, a shelly sea worm, or a *Pteropod*, not unlike the modern *Theca*. He was unable to find anything figured or described by Dr. Hall or others, like it, so probably it may be new to science. Another flint-flake fossil difficult to determine from the state of fossilization, is a *Ptilodictya* (usually supposed to be a *Chetætes* or *Monticulipora*), the pores of which are displayed in one specimen. The beautiful *Bryazoon*, *Sagenella Elegans* (Hall) was lately found for the first time here by Mr. A. E. Walker."

SOCRATES AND THE SOCRATIC SCHOOLS.

Read before the Philosophical Section, November 19th, 1892.

BY S. A. MORGAN, B. A.

As a preliminary to all scientific exposition two elements must be definitely present in the mind of the investigator. These consist in a clear apprehension of the logical limits of the subject matter, and a general idea of the sources and method of investigation. It may be well, therefore, before entering upon the consideration of an important epoch of the world's philosophical history, to ask ourselves, what are we to understand by the term philosophy? In what does a knowledge of the world's philosophy consist?

The study of philosophy is a study of man's collective intellectual progress. Man's mental unity and individuality does not constitute an isolation. Having received its life and light from the past, the present age in turn transmits these, stamped with its own individuality, to the ages that are yet to come. To trace the progress of this universal intelligence through its various epochs, as expressed in the life and spirit of the time; to investigate the ultimate principles underlying these various phases, is the special work of the student of philosophy.

When then may philosophy be said to exist? When the human mind, not content with the facts of knowledge alone, begins to inquire into their causes and conditions. When, both in mind and in matter, unity and harmony are seen to exist.

That philosophic germ, which obtained its full development at the hands of the great Athenian philosophers, may be said to have had its origin in the Ionic colonies of Asia Minor, at the time when their freedom was being assailed by the arms of Persia. Contact with Oriental dogmatism at once furnished the analytic mind of the Greek colonist with food for speculative inquiry, the result of which was no less original than unique. This may the better be understood by briefly contrasting the natures of the Oriental and the Greek mind.

The Greek mind was objective and critical, the Oriental subjective and emotional. With the Oriental, reason gave way to the despotic

authority of dogmatism. With the Greek, thought itself was speculative and democratic. Thus, while the Orientals had succeeded in building up elaborate systems of divinity and morality, they were necessarily devoid of any real philosophic spirit. The Greeks, on the other hand, had already by their critical spirit laid the foundations of scientific research. What wonder, then, that this spirit, when brought into contact with the splendor and mysteries of the East, should be led to inquire more deeply into the origin and condition of being.

The first stages of this inquiry necessarily were but an attempt to explain the existence of external nature. This involved two questions: 1. What one principle underlies the changing forms of matter? 2. How does matter take its rise?

A full description of the theories of these early philosophers would be beyond the limits of the present paper. Suffice it to observe that they constitute but an attempt to discover some material substance underlying the various forms of matter. This tendency of early philosophy was but a necessary result of that adoration of external nature common to all primitive races, but more particularly to those of the East.

The first attempt to trace back the many forms of matter to some form of unity was made by Thales. This philosopher saw in water the simple uncreated substance underlying nature. Anaximander followed with his *to apeiron*, the everlasting and divine. This substance, however, was not attributed with spirit or intelligence. Anaximenes saw in air, the first cause of all things, and the primary form of matter. "As our soul, which is air, holds us together, so spirit and air animate the universe."

We thus see in the philosophy of Anaximenes the first dawn of a philosophy of consciousness. Thus far, it will be seen, philosophy has been engaged in the futile task of discovering in external nature some ground of unity which in reality exists within the mind itself.

The first to break away from this primitive position was Pythagoras, who saw in number both the form and substance of nature, or rather an identity of the two. The chief advance in this was the abstract turn given to philosophic thought, for, in the language of Plato, "Mathematical attributes belong neither to the world of the senses nor to that of pure ideas." The reason of this advance may be found in the contact of early philosophy with

the western races of Greece. A diminished interest in external nature, consequent upon a diminution in her gifts, necessarily resulted in a new phase of philosophy, in which the mind began first to turn from nature in upon herself.

The Eleatics, advancing a step further, broke away entirely from sensuous experience, and saw in the many forms of matter only a delusion of the senses. What is *is* and must always be. The really existing is eternal and unchanging. Multiplicity and change are but appearances and mere opinion.

Heraclitus, following these, goes to the other extreme, and affirms everything to be in a continual flow. The becoming not the being is the only reality.

Empedocles attempts to explain the nature of things by a union of these two theories. He asserts four primitive elements incapable of change. These represent the pure being of the Eleatics. To account for the world of change, he sets over these two moving powers, love and hate, the uniting and the separating forces, and thus introduces into his system the becoming of Heraclitus.

From this latter there was an easy transition to the theory of the Atomic school. These affirmed nature to be composed of indivisible atoms, between which is empty space preventing their contact and allowing motion, thus giving rise to multiplicity and change. This motion is represented as eternal and the result of necessity.

Whatever advance these latter philosophers may have made, and however they may differ among themselves, one element is yet common to all. This element consists in the objective and materialistic nature of their theories. From the earliest philosophers, who attempted to reduce all matter to a single element, down to the Atomists, we find nothing but matter and properties of matter. Two influences were now at work tending to a radical change in Greek philosophy.

One of these lay in the condition of philosophy itself. If, as claimed by the Atomists, the motion of atoms is regulated by some law of necessity, this motion must transcend the material. How then is it to be explained? How may we account for the regularity and continuity of this law? Here we find a new question which philosophy must attempt to explain.

The other influence was a result of the contact of the early philosophy with Athenian life and thought. Philosophy was in-

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roduced into Athens at a time when that city was at the zenith of her glory. As to the causes which conduced to the greatness and splendor of the age of Pericles, it is not necessary here to enlarge. It was the age when literature and arts were cultivated with the greatest success. From the highest in the state to the humble citizen who attended the theatre at the public cost, intellectual activity was supreme. Could such a people accept a philosophy, the corner stone of which was necessity or blind chance?

The Gordian knot was cut by Anaxagoras, the father of Athenian philosophy. He placed, instead of the blind chance of the atomists, an overruling *nous* or mind. This was considered as a moving force, ordering and uniting the atoms of chaos. But having succeeded in placing reason above matter, Anaxagoras failed to distinguish reason as particular or universal. This question was worked out by future philosophy in a manner that closely associates it with the history of Athenian life.

Through the greatness of her exploits in the Persian wars, Athens, as we have seen, had become the centre of Greek life and culture. But with this position there had also developed in the mind of the individual citizen a high opinion of his own importance. New ideas of private rights and equality were taking the place of old maxims. This necessarily led to a certain form of selfishness, both in politics and speculation. The result was, on the one hand, the party struggles of the Peloponnesian wars; on the other hand, the negative and individual philosophy of the Sophists.

This exultation of self led philosophy, now turning from external nature and directing itself to the study of a spiritual force, to declare man to be the measure of all things, and thus to set up individual opinion as the standard of truth and right. This tendency of Sophistic teaching soon wrought its effect on existing thought. Looking upon knowledge as being relative to the subject, it at once attacked the dogmatism of all previous systems. These systems, having applied themselves directly to nature, were too one-sided to withstand the pruning knife of Sophistic doubt.

But scepticism did not stop here. The old ideas of religion also came under this new inner standard of truth. The result was that here too, all faith in former dogmas was overthrown. In like manner, old customs and laws were one by one allowed to fall into disuse. While, however, the Sophists were overthrowing all that was

old and venerable, they were, by the individual character of their philosophy, unable to formulate any new system of philosophy. Thus philosophy had now arrived at a point where it must either be consumed by its own activity, or search for some new source of light. This want was supplied by the dialectic of Socrates, or the art of forming conceptions.

In placing mind above matter the Sophists had identified truth with individual opinion. But in doing this objective reality was given to sensuous perception, which rendered impossible any uniform system of philosophy. Socrates, on the other hand, distinguished between individual opinion and conceptions which, being purified by the principle of dialectic, are universally true. It was now required that all the properties of an object be taken into account before judgments were formed; and, by a system of examination, to pass from the individual and accidental to what was universal and necessary. Like the Sophists, Socrates was at variance with the dogmatism of earlier systems; but in addition to this he taught that by a system of self-examination the contradictions of experience might be corrected, until man should arrive at that true knowledge which already existed latent in the mind.

This element in the philosophy of Socrates at once marked its character and its method. By looking upon the ordinary notions acquired in experience as untrustworthy, Socrates was led to suppose that conceptions of the real essence of things can be produced from within, that the soul "possesses from its birth the substance of ideas," and that learning is able to bring these to light. His object then was to aid in developing these germs of true knowledge. This led him to war against all appearance of knowledge, and by accepting the opinions of his pupils to entangle them in a maze of contradictions, until their supposed knowledge vanished. They were then ready to proceed to the attainment of that true knowledge already existing confusedly in the mind.

This phase of the Socratic philosophy also led him to identify virtue with true knowledge. For, since conceptions alone constitute true knowledge, they alone have true being, and are thus the only absolute moral authority. With Socrates, then, no man knowingly does wrong, knowledge is the cause of all right action—delusion the cause of all vice.

The following peculiarities at once present themselves in the Socratic philosophy:

1st. The Importance of Dialectic.—This was a necessary result of the Socratic method of arriving at true inward knowledge or conceptions. By question and answer the delusions of the senses had to be overthrown; individual views were to be brought into universal conformity by means of explanation, and fixed definitions established.

2nd. His Independence of the External.—The external world would naturally present but secondary charms to one who possessed within himself the means of true virtue and happiness. Thus we find Socrates at all times ready to undergo all hardships without complaint, and ever treating with contempt the foolish pleasures of sense.

3rd. His Urbanity.—With Socrates the proper study of mankind was man. He little wished "To muse o'er flood or fell." To understand this we need only recollect that with him the highest work of man was to lead his fellow-men to a true knowledge of themselves, and thus to virtue and happiness.

These three phases of the Socratic character produced three varied schools of philosophy among his successors, known as the one-sided Socratics, or partial systems. Another cause leading to the same result was that while Socrates had set down virtue as the highest form of knowledge, he had not laid down any fixed theory concerning the nature of this true knowledge. It was only natural then that various schools should arise to bring out more fully the different aspects of the perfect Socrates.

THE MEGARIANS.

The Megarian school attempted to unite the Socratic idea of the good to the Eleatic doctrine of real being. Socrates had affirmed virtue to be true knowledge. "But," said the Megarians, "since only a knowledge of concepts constitutes true knowledge, and since reality belongs only to the concept or unchanging essence, therefore the good alone is, and evil does not exist." The Megarians forgot, however, that while Socrates affirmed all virtue to be knowledge, he did not affirm all knowledge to be virtue.

The Megarians further reasoned that "since thought is alone able to attain to a knowledge of the real, therefore our senses can recognize only the unreal or false." This at once brought on a war against the testimony of the senses and the theories of other philosophers. To meet this, the Megarians made free use of the Socratic

irony or affected ignorance. But while Socrates had used it for the attainment of true knowledge, these saw in it only a weapon for the overthrow of opposing theories. Thus, as in the case of the Sceptics who followed later, they finally, by a free use of dialectic, denied the possibility of arriving at positive knowledge, and made dialectic an end in itself.

THE CYNICS.

The Cynics, and after them the Stoics, following the Socratic idea of self-mastery and independence, saw in asceticism the path to true virtue and happiness. Like the Megarians, they followed Socrates in placing virtue in knowledge and in making reason cognizant of that highest good. But, whereas the Megarians had opposed only the testimony of the senses, the Cynics considered it necessary to struggle against the pleasures of the senses. This even led them to treat with indifference the various social ties in which they came into direct antagonism with the urbanity of Socrates.

THE CYRENAICS.

The Cyrenaics, and later the Epicureans, looking at the mental serenity and urbanity of Socrates, saw in pleasure the only supreme good. Like Socrates the Cyrenaics occupied themselves in discovering the chief good for man. Like him they also considered this good to be knowledge. Knowledge then must be the end of philosophy. But since our knowledge comes from sensations, which may be productive of either pleasure or pain, the Cyrenaic asked himself, "to which of these classes would true knowledge belong?" By deciding in favor of pleasurable sensations, he identified true knowledge and thus virtue with present pleasure. We cannot fail, however, to notice how far in this they have gone from the position of the Master, who found present pleasure only in the pursuit of philosophy.

While each of these systems had emphasized one side only of the Socratic character, they had done this to the neglect or contradiction of other essential phases of the complete Socrates. It is in Plato that we find the completion and unification of the Socratic philosophy.

PLATO.

Plato, like Socrates, held ideas to be the only reality, and material things to be devoid of real essence. With Plato, however,

this doctrine of ideas was developed into a philosophic system. If ideas are the only realities, the world of particulars must be derived from these, and, from their secondary nature, are devoid of stability. Thus the world of sense can furnish no real knowledge. Experience is but opinion, and reason is the source of all knowledge.

Since, however, the world of sense is moulded after the pattern of the reality, and since there is plurality in the copy, there must also be plurality of ideas. These, however, must lead up to some higher idea—the idea of the good. To discover this chief good is the highest, the only real work of philosophy. Thus the soul by means of dialectic is able to free itself from the doubt and degradation into which it has fallen through contact with the world of sense, and regain a place more near the divine essence.

The prominence thus given to dialectic as the source of all true knowledge, and the secondary position given to observation and the Natural Sciences, is everywhere apparent in the philosophy of Plato and Socrates, and constitutes the real defect in their system. As an illustration of this, we may take the metaphor of the cavern in the seventh book of the Republic. In this it will be seen how the world of sense is looked upon as incapable of furnishing true knowledge, which is alone found by the soul in the sphere of pure ideas.

Again, consider his view of the human soul. According to Plato, the head of man is a little cosmos, possessing a rational and immortal soul. To this head is attached a body possessing two emotional and mortal souls, one the seat of courage and anger, the other of the appetites and desires. While the higher soul was able to some extent to control these lower, it was itself polluted by their contact, which might finally lead to a degeneracy of the species.

From this we may see that the weakness of the present system lay in the fact that it rendered impossible a scientific explanation of the phenomena of the material world. Dialectic was the Royal Science, and experience a source of delusion and degradation. This defect in the Platonic Philosophy it was the peculiar work of Aristotle to correct.

ARISTOTLE.

Aristotle, like Plato, divided the soul of man in a three-fold manner; but instead of making them three distinct and antagonistic

members, he looked upon them as three attributes, which may, and in man do exist together. These he named: 1st, the vegetative; 2nd, the sensitive; 3rd, the intellectual. Like Plato, he gave to this third attribute an indwelling principle as the basis of knowledge, but further saw in these lower forms the necessary means for the development of the higher. Instead, then, of denying any real worth to the world of experience, Aristotle found a positive relation existing between the world of thought and the world of experience.

While, then, Aristotle made use of dialectic, it ceased to be an end in itself. It now served the purpose of investigating the world of ideas as found in experience, where they alone exist. While Plato saw reality only in the idea, Aristotle denied existence to the idea except in the particular. Instead, then, of finding the soul to be degraded by its contact with the world of sense, Aristotle saw in this contact the only possible means of developing the potential excellence which it possesses. The results of this physical turn given to philosophy by Aristotle, in the incorporation of Natural Science with the doctrine of pure ideas, may be summed up as follows:

1. From being, in itself, the royal science, dialectic became but a method for the discovery of the universal in the particular, for passing *from experience to knowledge*. It thus became separated from both Ethics and Natural Science, and was formulated into a science of method.

2. Since knowledge was seen to be really dependent on the activity of the mind in experience, and since nature is an ascending scale of life, the Natural Sciences became both a worthy and a necessary department of research.

3. In Ethics, since virtue is the chief good, and since the chief good is the development of the soul by a life of activity, Aristotle made happiness depend, to a certain degree, upon external circumstances. Virtue, likewise, will depend, not on true knowledge alone, but upon the development of the will by a life of activity. Thus virtue becomes subject to external circumstances and habit. The result was the separation of Ethics from knowledge proper.

Thus we see that the peculiar work of Aristotle lay in his uniting and unifying all previous systems of philosophy, in placing upon a scientific and well-defined basis the various departments of thought as portrayed in the manifold character of Socrates.

THE SCIENCE OF ECONOMICS.

Synopsis of a paper read before the Philosophical Section, March 18th, 1893.

BY JAS. T. BARNARD.

Man, the creature of God, is himself by divine appointment a creator and a king. To him has been given mental capacity to plan, and to acquire skill to perform. His abode, the earth, abounds with material on which he must expend his powers to obtain things necessary for bodily needs and comfort.

Man, endowed with life and entrusted with its maintenance, needs this earth. He is an earth-child. From it he has come and to it he shall return, and from it alone can he draw the means of preserving and sustaining the life given him in trust.

Man's right to life is alone supreme on earth. No other animal shares that supreme right with him. Reason and revelation unite in declaring that man is monarch absolute, and that other beings retain life only during his will and pleasure. Man may fell his ox even as he fells a tree and do no wrong. The life of both must be yielded up to minister to man's needs. Killing an ox is not slaying a man, but every Cain is a murderer.

As man's life is an individual possession, so his right to the use of that which alone can maintain and preserve it is an individual right—his birthright, his possession till death. His right to the use of the earth for life maintenance is unassailable and inalienable. This right never trenches on that of all others. The limit of each man's right to the use of the earth is the equal right of all other men. In the matter of life and the sustaining of life, all men are born free and equal.

Equal rights to the use of the earth mean continuous free opportunity to all men to produce according to their mental capacity, strength and manual skill. They mean also that each man has an equal title with all others to the use of the choicest locations or sites. This equality of right is easily and naturally maintained and practically recognized so long as there is an abundance of choicest

sites, the very best for each individual in pursuing his calling. When increase of population makes it impossible for all to occupy choicest sites, and some are compelled to use those that are inferior, then there arises in the face of equal natural rights, unequal opportunity, and the community finds itself at the "parting of the ways," a worse and a better path.

If the better way has been chosen, all continue in the actual enjoyment of their natural equal right, and therefore all can work without paying for permission to do so. As all can work all must labor, for none have power to exact the earnings of others. Existing wealth is in the hands of producers and accumulations beyond individual powers to acquire are unknown. While excessive wealth in the possession of a single individual may therefore be impossible, the production of wealth through freely exerted effort is enormous and ever increases as civilization advances and subdivision of labor becomes general. Because all are free producers none are compelled to yield up their produce to non-producers and therefore wealth is diffused, none lack but the incapable, and they are provided for because humanity is a brotherhood made in the image of God and having natural affection. Because work is free to all, none have an excuse for being idle nor temptation to being dishonest. Tramp production is stifled for lack of that soil (enforced idleness) in which alone it can flourish.

Supply is natural, continuous and abundant, and therefore its correlative, demand, is always active while insatiate man desires. Over-production (more properly lopsided production) is not feared, for all have free play to exercise their powers in any honest exertion and none are tempted through lack of opportunity or of a means of livelihood to overcrowd any industry. Business stagnation, financial crises and commercial crashes are unknown. The evil factor in these disasters does not exist, for natural opportunities, never held out of use are always accessible to the producer, and therefore the fever of the boom and the languor of reaction are alike unknown. While man's inborn desire to excel perpetuates competition, it is always the healthful, generous competition of those who, sure of plenty, yet desire to achieve the best within their powers. Inequality of wealth there is, for there is always unequal power to create it, but inequitable distribution is impossible, for every man is free to make a just bargain for his honest share of the produce. Last, but not

least, there is everywhere time for a fairly earned leisure to advance in moral, mental education, and to train families to higher and better life.

If, unfortunately, mankind has chosen the worse way, some having possession of the best sites can live without producing, simply by exacting from those who do produce, and therefore need these sites. As civilization advances, as inventions multiply, as division of labor stimulates enormously the production of wealth, these site owners, while relatively becoming fewer in number, increase in wealth in proportion to the industrial development of society.

Side by side with this non-producing class is the great army of industrials, professional, mercantile, artizan and primary. These last, driven from their work ground through the holding of sites out of use or out of their reach, are fain to seek employment elsewhere. They force their way among artizan producers, who, to escape the increased competition, seek relief among the mercantiles. These again, through stress of competition also, enter into and over-people the class of professionals. Throughout all these divisions of the great industrial class there seem to be too many men and too much of things produced. The all-pervading and evil competition makes a livelihood generally a precarious boon. They are happy indeed to whom circumstances have assured a competence or a permanent means of subsistence. But these, too, are conscious of uncertainty—that they hold their happy lot by but a slender thread, and this once broken may never again be so fortunately joined. The place they vacate is promptly filled and they find themselves among the number of those constantly seeking employment, but only occasionally finding it.

This uncertainty of employment and success is productive of over-anxiety and worry. Sanatoriums abound and are crowded with mental and physical wrecks—the wounded in life's bitter and incessant conflict. The need for lunatic asylums increases faster than funds are provided for their erection, and they are filled to overflowing, as soon as built, with the permanently disabled; while mortuary statistics reveal the awful fact that suicides—the killed in the same great battle—are increasing in numbers more rapidly than natural deaths.

Besides this seething mass of struggling humanity, there is another and lower class still, the outlaws of society, the tramps of

the country road and the incurably vicious and criminal of our cities. This class of non-producers, as is meet, jostle the other and more fortunate producers who are rich through the toil of others. On Broadways and Fifth avenues, plutocrat and proletariat meet, the extremes of society—both the sorry product of the same crime. The tramp and the thief are graduates of a school, founded and endowed by erring civilization. Only one lesson is taught there, a short, sharp, bitter lesson only too easily learned, only too easily put into practice. "*It is easier to beg or to steal a dinner than to obtain a chance to earn one.*"

Which of these two descriptions of the industrial world is the nearer a true picture of the civilization that is?

The answer to this question solves another.

At the parting of the ways which path did mankind choose, the worse or the better way?

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HINTS ON HOW TO SEE PICTURES IN NATURE.

Read before the Photographic Section, November 25th, 1892.

BY T. H. WILKINSON.

As this paper is intended to be suggestive rather than exhaustive, I shall entitle it, "Hints on How to See Pictures in Nature." Before entering upon the subject proper, allow me to say that I feel it an honor to have the opportunity of addressing you to-night, especially on a subject which is of the greatest importance to me, and one which I hope will be of interest and profit to us all. I feel I am speaking to those endowed with the power of a full appreciation of the beautiful in nature, to those that are cultivating the mind and eye to see more clearly the wonderful forms that a Master Hand has shaped and set in order for the eye to dwell on and the heart to delight in. I know of nothing that will so completely arrest the senses, awaken the feelings, and expand the heart with love and gratitude, as a quiet contemplation of nature in some of her more pleasing aspects. Man is not only made to love and admire the works of nature, but he is gifted to some extent with the power to reproduce them. So soon as any of us become penetrated, nay overwhelmed, with the sentiment of a single natural beauty, how energetic are our actions and aspirations. We must see that spot once more. We want to feel that charm again. We long to revive the beauty that gave us so much joy and pleasure.

We each take a different path. One expresses what he feels in music, another in a poem, the painter on his canvas, while you show us these beauties in your photographs.

In speaking more directly to photographers to-night, many of my thoughts will be shorn of their full meaning, because I cannot picture my images in color, and must try to confine my paper to your immediate profession. I feel, however, that I am talking to gentlemen who are not engaged in what we might term ordinary photography, but rather to those who love nature, and in their leisure moments take up their camera and go out to the fields, to the stream, or to the mountain side, not only to enjoy its charms, but to bring back some tangible impression of what nature has provided.

Here let me borrow a thought from Shakespeare, which will serve as a text and also show us how deeply he contemplated nature. He says, "That we may find books in the running brooks, sermons in stones, and good in everything;" and to-night I ask you with me to feel that it is our privilege and pleasure to open these books, read these sermons, and to appreciate the full meaning of their beautiful language.

A very necessary thing to do, I may safely say the most important thing for us, is to try to get in a right relationship with the scenes we may observe.

Remember nature herself is ever varying, ever grand, never tiresome, always in the right relation. Sunshine makes shadow; clouds, gloom; wind, the bending tree, the drifting snow, the scudding sail; rain, the dripping roof, the dreary road, the swollen stream. Winter's snow, summer's sun—each mood has its natural sequence. If we can enter into sympathetic relationship with its transitions, our reward will be much greater. Bear in mind beauty in nature keeps closely sealed to the indifferent gaze, but if you will study and reverence her aright, she will reveal beauties that the ordinary mind little dreams of.

Go with me if you please to any of your streams—look at that large square rock. At first 'tis nothing but a stone; its flinty surface uninviting. But see that delicate grey on the sunny side, observe those tufts of velvet moss clinging here and there; out of its niches the most delicate of tiny plants shoot forth their waxy tendrils—a hundred beauties reveal themselves if we linger inquiringly by its side. How many thoughtlessly pass it by ignorant of its beauties. To them it is merely a stone. These thoughts should simplify many things for us. For instance, you are going to take an impression of this stone, or of a group of such stones, partly embedded in the brook; the water silently gliding by, reflecting their forms; the overhanging foliage mirrored in the crystal waters. Would it be wise, think you, to disturb the sweet tranquillity of the scene by permitting one of your company to sit in a conspicuous position, looking out of your picture with a complacent smile? To lovers of nature and truth you would destroy all feelings of serenity and harmony thereby, and make your photograph merely a cartoon.

Again, I would advise those of you who are giving this pursuit your more serious attention, not to make an exposure unless you

find something worth the plate. While I admit that all nature is more or less beautiful, still I do think there are many things that will not bear a close inspection, and at the same time impart a feeling of pleasure or awaken a profound emotion in the heart. This leads us to study, ponder, and investigate, then, after due consideration of our subject, we decide on the desirability of making the sketch or taking the view, and at once know if it will be pleasing and effective.

To illustrate this point: Let us see how many phases of nature we pass through in following a tiny brook in its wanderings. After the spring source we find it merrily rippling over the small white pebbles, singing just a silvery liquid song. Soon it widens and seems to rest while it forms the pool and the pond. See the cattle standing on its brink or in its cooling depths. Then it is off again gathering new strength—no longer can you step from stone to stone to reach the other side. The old bridge spans its banks—now it darts into the woodland—see how it undermines that tall pine; the sturdy oak succumbs to its power, and lo! they both come crashing down, but on it goes increasing in strength, dashing against stones, boiling and seething, leaping in cascades, tumbling in waterfalls, turning the old mill-wheel, floating the logs, and now we behold the peaceful river with life on its placid bosom. First we see the little skiff, then the small white sail, and then the larger craft. Villages here and there dot its banks. Soon cities appear, and now its impure waters move sluggishly down to the sea. No longer does it fill the heart with pleasure or the eye with crystal images. Now, alas! its dark sullen waters are made a convenience for commercial traffic and enterprise, and if we go to its banks we hear only its monotonous swish against the pier, or the angry plunge of its larger waves.

Let us look more closely into this hurried description and see if there are any art lessons we can draw from the different scenes through which we have passed. We will find a few pictures here and there which I think are in keeping, and complete in themselves. Permit me to suggest:

- (1). The small stream, of no particular interest without water-fowl or, perhaps, an urchin picking water-cress.
- (2). The pond. How many interesting subjects may we get here? Cattle drinking, ducks paddling, the old punt half sunken in the water, children bailing with an old lobster can, the weeds and

rushes mirrored at its margin. There are fifty things that are picturesque about an old pond.

(3). The old bridge. To me there is more poetry in an old stone bridge than in any volume that I have ever read. I will not say it is beautiful or grand or lovely, but it is ever quaint, and it pleases my eye and soothes my heart. If you sit by its old grey side and watch the water gently flowing under its shadowed arch, you cannot help feeling a sense of peace and pleasure. The old bridge needs no embellishment.

(4). Now we hear the lazy monotonous hum of the old mill-wheel, and we can just see the mill's gable through the trees. Let us go a little nearer and see the water coming down the race and striking the heavy lopsided wheel. Its buckets are filled and emptied in dreamy succession as it grinds and creaks and groans its jolly old song. The miller too is just as slow, and, I hope, just as happy. When we leave our busy bustling life in the city and gaze on quiet peaceful scenes like these, how they at once fill us with a feeling of restful repose. Our hearts warm to these rural scenes. At every turn we get a picture that will please.

(5). But let us follow on down the old beaten pathway by the stream. The waters seem to flow more rapidly. What noise is this echoing through the woodland? Nearer we come. We find it is necessary to make a descent, and looking back, behold the waterfall, its bridal veil set in variegated green. The overhanging rocks threaten a too near approach, and as the silvery spray envelopes our being, we stand filled with silent admiration. Surely we need no accessories here.

(6). Now we come to the rapids and the beautiful cascades. Here nature herself makes our picture. Water in motion is always picturesque, but especially so when leaping from rock to rock, dashing its spray into the sunlight. How it glistens in all the colors of the rainbow. There is a peculiar fascination about this part of river scenery that is bewildering, and those of you who have enjoyed the privilege of a trip down the St. Lawrence, will fully realize my meaning.

(7). Here we make the portage and, now, another change. Logs are being rolled into the stream. Sturdy men, with their long spiked poles, float on the round slippery timber. What strength and

agility in every movement. Surely we may find an interesting picture here.

(8). Lastly, the smooth peaceful river. How it seems to take a rest after gathering all its tributaries into its bosom, gently bearing them onward to the sounding sea.

I think you will admit that each of these pictures is complete in itself, and I can assure you that if you try to make more out of them or add to them, you are apt to spoil their harmony.

Simplicity and truth touch the heart more surely than man's ingenuity.

You will see from this hasty description, that it is not my intention to enter into any theoretical discourse whatever. No, gentlemen, I am endeavoring to point out, or merely give, a few hints that I hope may awaken a desire in you to investigate the truth in nature under varied conditions. But thus far we have treated of merely every-day subjects, such as you can see in this locality in all their varied loveliness and beauty.

Now we will take another step and look at what we call effects, for they are pictures in themselves, and appeal to you especially, for some of them are so fleeting that it is almost impossible for artists to catch them at their best. With your camera many beautiful things can be secured. Take for instance reflection. When we contemplate it, does it not seem almost phenomenal? Did you ever walk along the banks of a river, on a very still evening, just after sunset, and look into the magic depths? Soon you lose all sense of surface, and, as you note the perfect reproduction of surrounding objects, you feel enchanted. As the light gradually fades, how unreal and mysterious these borrowed forms become. These make excellent subjects for you, and in the quiet woodland pools some beautiful bits can be obtained.

Moonlight effects are also of a most pleasing nature, especially when seen on the water, or if you stand on the beach and watch the moon's mellow path of light stealing out of the far distance, ever widening its quivering silvery sheen as it approaches until it leaves its liquid light of glory at your feet. Such entrancing scenes as these have a moral, pleasing and soothing tendency, and one always feels that nature is full of beauty that not only satisfies the eye, but also reaches our very souls and seems to link us to a better land.

Morning and evening subjects come under this head. You all, no doubt, have observed the solemn, silent, transitions that at this hour take place. How weird the distance becomes in the twilight hour. How gloomy forms, that but an hour ago looked like figures of gold, now stand like dark sentinels, bidding welcome to the darker night. With the coming dawn and its accompanying shafts of splendor, we rejoice to see the gloom disperse, the shadows melt away, and rosy morn shine forth in all her glistening resplendent beauty.

Some wonderful effects are seen among our morning mists in the summer season. No doubt many of you have passed your vacation in Muskoka. Here we get these misty phantoms in all their illusive revels, as if a filmy gauze were lifted, and revealed the uncertain form of some fairy isle. But soon 'tis lost again. Tall pines seem to stretch their blighted arms from out the misty air. Voices can be heard but their forms seem to be enveloped in another world, but as the sun pours forth its stronger rays the mists are rolled away.

Here let me pause and quote a few lines from Scott's "Lady of the Lake." No poet better describes nature in her manifold changes :

" And now to issue from the glen,
 No pathway meets the wanderer's ken,
 Unless he climb with footing nice,
 A far projecting precipice.
 The broom's tough roots his ladder made,
 The hazel saplings lent their aid ;
 And thus an airy point he won,
 Where, gleaming with the setting sun,
 One burnished sheet of luring gold
 Loch-Katrine lay beneath him rolled
 In all her length far winding lay,
 With promontory, creek and bay,
 And island that empurpled bright
 Floated amid the livelier light,
 And mountains that like giants stand,
 To sentinel enchanted land.
 High on the south huge Ben-venue
 Down to the lake in masses threw
 Crags, knolls and mounds confusedly hurled,
 The fragments of an earlier world.
 A wildering forest feathered o'er
 His ruined sides and summit hoar,
 While on the north in middle air,
 Ben-au heaved high his forehead bare."

These lines help us to think, and surely convey to us the unerring conclusion that such men must have made a serious study of nature's handiwork. Truly we are engaged in no mean profession. All great men assure us of the refining power imparted by communion with nature. Still we may go further and see greater wonders, perhaps not so applicable to your craft, but grandeur we all should feel and comprehend.

Did you ever notice how an approaching storm prepares our senses to fully realize its mighty power? Stand upon those naked riven rocks that form the mountain-side. Look over the far reaching landscape, spread out in quiet beauty. Away to the west we observe a low-lying mass of clouds, but all around us seems serene. The gentle breeze that we so much enjoyed has ceased; not a leaf stirs; the heat becomes oppressive. We look to the west again; this sombre cloud is rolling towards us; a feeling of dread takes possession of us; but on it comes, the city's domes and spires, that but a moment before glistened in the summer's sun, now seem wrapped in a funeral pall. Out of the sky's inky blackness a long serpentine cloud, grey and sulphurous, rides before. If we look down into the valley now, we see the tall trees bending to the earth. We hear the distant rumbling thunder; now the clouds are rent. The forked lightning flashes in our very eyes. We feel a hot bellowing wind and hear the hissing rain, while deafening peals of thunder almost shake the very mountain. Earth and sky seem to be at war.

This simple description will serve my purpose, for I merely want to show the connection and to impress you with my idea of feeling just what nature is trying to impart to us.

Take most of the photographs of Niagara. Do you think they convey to us any adequate description of its grandeur? We miss the mighty roar, the vibrating earth, the boiling cauldron, the beautiful rainbow, the might, the majesty, the grandeur, the sublimity of the wonderful cataract itself. We must feel before we can express, and although your instrument is sure, I know you are often in doubt, and though nature tempts you on every hand, like myself you are always more or less undecided. Nevertheless, if you take fewer but better-chosen views, I know it will amply repay you.

I have been speaking in a general way, trying to enforce one truth in particular, that is, let your views be in keeping and harmonious.

In concluding this paper I want to say, endeavor to impart to your pictures a clear and pure sentiment. You can do this in photography. No amount of finish and technical skill will hide the faults of an ill-chosen subject.

If you want any particular picture choose the time and place most favorable to that end.

Never introduce figures unless they are in unity with the surroundings.

Avoid views that have too many repeating lines or right angles.

Never choose a subject that is overcrowded with objects; by so doing you defeat all laws of composition.

If you want good pictures—pictures that will please—go to nature unadorned. The impenetrable forest, the unfurrowed hill, and the unconfined stream, give us subjects that everybody will admire.

You have, perhaps, seen Millet's celebrated picture "The Angelus." If not you have seen prints of it. Why has all the art world almost worshipped this wonderful creation? We say it is merely an evening landscape and two figures. Oh! yes; but look into it a few minutes. You see in the distance the old church spire. The evening glow in the sky tells you 'tis the hour for vespers. You hear the sweet notes of the evening chimes come floating over the hill-side, and with the humble peasants you doff your hat and bow your head. Many artists could paint the picture; few artists could portray the reverential feeling and sentiment with which it abounds.

Let me close with the following beautiful lines from Wordsworth:

* * "Nature never did betray
The heart that loved her; 'tis her privilege,
Through all the years of this our life, to lead
From joy to joy; for she can so inform
The mind that is within us, so impress
With quietness and beauty, and so feed
With lofty thought, that neither evil tongues,
Rash judgments, nor the sneers of selfish men,
Shall e'er prevail against us, or disturb
Our cheerful faith, that all which we behold
Is full of blessings."

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REPORT OF THE COUNCIL.

Read at the Annual Meeting, May 11th, 1893.

The Council has pleasure in submitting a report for the session of the Association for the season 1892-3.

Seven meetings of the Council have been held, reports of which have been regularly made to the Association.

During the year twelve general meetings of the Association have been held, at which the average attendance has been 51.

Following is a list of the titles and authors of the papers read at these meetings :

1892.

Oct. 13th.—“The Aims and Work of the Association,” A. Alexander.

Oct. 27th.—“The Possibilities of Fiction,” W. Sanford Evans.

Nov. 24th.—“Zone Life of Ferns,” Prof. Wright, Los Angeles, Cal.

Nov. 24th.—“Biological Notes,” Wm. Yates, Hatchley, Ont.

Dec. 8th.—“Southern California,” Rev. Wm. Ormiston, Azusa, Cal.

Dec. 8th.—“Revised Spelling,” James Ferres.

Dec. 22nd.—“Ballads, and Ballad Literature,” H. B. Witton.

1893.

Jan. 12th.—“The Flora of the Niagara Peninsula West of Hamilton,” Professor John Macoun, Ottawa.

Jan. 26th.—“The Golden Mean in Wealth,” S. B. Sinclair, B. A.

Feb. 9th.—Lantern Night, Photographic Section.

Feb. 23rd.—“Studies in Sociology,” R. T. Lancefield.

Mar. 9th.—“Insects Injurious to Fruit,” L. Woolverton, M. A., Grimsby.

April 13th.—“Fads,” Dr. T. W. Reynolds.

It is pleasing to report that the Photographic Section, organized a year ago, has been doing excellent work, and has added in no small degree to the profit and pleasure of the Association.

The membership has been increased by eleven ordinary members, two have withdrawn, and one, our esteemed Treasurer, has been removed by death. Mr. Bull was for many years Treasurer of the Association, and it is hardly necessary to say, took an active interest in all that concerned the welfare of the society. His loss is

deplord by every member of the Association, and in him we have lost one who was identified with the society since its inception.

A number of donations have been added to the Museum during the year, and the question will doubtless arise ere long as to space for display purposes. It is not readily realized at the present time the future value to be placed on the contents of this Museum, and the Council would impress on members of the Association the wisdom of adding, as opportunity presents itself, such articles as are necessary to make the collection as complete as possible, and more especially that portion of it which represents this section of the Province.

Attention is directed to the valuable works on scientific and other subjects, in the possession of the Association, and which are accessible to the members.

All of which is respectfully submitted.

A. ALEXANDER,

President.

C. R. McCULLOUGH,

Secretary.

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REPORT OF THE GEOLOGICAL SECTION.

Read at the Annual Meeting of the Association, May 11th, 1893.

The Section, in submitting this report desires first to intimate that the usual interest in the work done during the past year has been maintained.

The Section deemed it necessary, and obtained a small sum of money from the Council of the Association for the purpose of having prepared some sliced and polished sections of our Niagara fossil sponges, so that they would be better appreciated by the general observer, and also enable the expert to more easily determine the species from the revealed skeletal structure. Although the number of prepared specimens is not large, the excellency of the work bestowed upon them gives great satisfaction to the members of the Section. The specific differences are, in many cases, slight, but they can be easily determined by the aid of the polished sections.

Our indefatigable chairman has, from time to time, directed the attention of the members, by his valuable papers, to the subject of identification of some of the fossil plants lately obtained from the rock formation in the vicinity, and respecting which there has been much diversity of opinion expressed by many palæontologists. By these recent discoveries our chairman has been able to produce such convincing evidence as to leave no doubt in the minds of the members of the Section that these hitherto so-called problematical organisms are of undoubted vegetable origin.

A large number of very interesting specimens have been added during the past year to the Geological Department of the Museum of the Hamilton Association.

The Section has held ten meetings during the year, at all of which interesting papers were read by Col. Grant. These papers contain much information of local interest, and are the result of careful investigation. Some of them have reference to economic materials, some refer to the recent discoveries of fossils, and are therefore aids to science, and one offers suggestions as to how we can best make our Museum more attractive to the general public.

Following are the subjects on which papers were read, with their dates :

1892.

May 27th.—“Notes on Our Local Building Stone.”

June 22nd.—“Notes, Geological, on the Field Day of the Hamilton Association at Grimsby.”

(There were no meetings held during the months of July and August.)

Sept. 30th.—“Notes on our Local Building Stone, Part II.”

Oct. 28th.—“Notes, Antiquarian and Geological, No. III.”

Nov. 25th.—“Notes on the Aulocopina of Dr. Billings.”

Dec. 22nd.—“Notes on Some New Fossil Organisms.”

1893.

Jan. 27th.—“Notes on Receptaculites.”

Feb. 24th.—“Annelid Burrows, Trails, Fucoids, etc.”

Mar. 24th.—“Annelid Burrows, Trails, Fucoids, etc., No. IV.”

April 28th.—“The Deficiencies in Our Museum.”

All of which is respectfully submitted.

C. C. GRANT,

Chairman.

A. T. NEILL,

Secretary.

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REPORT OF THE BIOLOGICAL SECTION.

Read at the Annual Meeting of the Association, May 11th, 1893.

During the past year this Section held thirteen meetings. The meetings were kept up during the summer months, but did not prove a great success.

Although only one regular paper was read before the Section, we always had subjects and objects of interest to discuss at our meetings.

We feel greatly indebted to our worthy friend, Mr. Yates, of Hatchley, for his very interesting and instructive series of Biological Notes, read before the Section at several of our meetings.

We specially draw your attention to the note regarding the amount of wild life still to be found in Ontario.

On February 3rd, Mr. J. B. Turner read a paper on the "Ornithorhynchus Paradoxus, or Duck-Billed Platypus of Australia," a specimen of which we have in our Museum.

On March 10th, Mr. A. Alexander favored us with a sketch of his summer trip up the Tyrolese Alps, with especial reference to the Botany of the district.

At the Association field day at Grimsby Ravine on June 11th, this Section was well represented, and several Botanical specimens were collected.

On July 20th, the Section held a field day at Dundas Ravine, which was well attended by the members.

Some of our members possess powerful microscopes, which have added interest to our meetings from time to time.

In Botany considerable individual work has been done during the summer, and for the coming season a systematic visitation of botanical grounds near here has been arranged.

Several additions have been made to our herbarium, of wild plants found in this locality.

J. B. TURNER,

Chairman.

H. S. MOORE,

Secretary.

REPORT OF THE PHILOLOGICAL SECTION.

Read at the Annual Meeting of the Association, May 11th, 1893.

Since its last report to the Association, this Section has held seven meetings, at which papers were read as follows :

1892.

Sept. 16th.—“Graduation in Vowel Sounds,” by W. Connor, B. A.

Dec. 22nd.—“Words,” by J. H. Long, M. A., LL.B.

1893.

Jan. 20th.—“Philological Notes,” by A. W. Stratton, B. A.

Mar. 17th.—“The Origin and Development of our Alphabetical Characters,” by W. McD. Logan, B. A.

The October and November meetings were devoted respectively to a discussion of the previous paper, and to drafting the season's work.

It is expected that two interesting papers will yet be read before the season's work is completed.

The amount of work done in the Section this year has not been up to our expectations. This is owing partly to the fact that the work is not of a nature to popularize itself, and not a little to the loss we sustained in the removal from our district of A. W. Stratton, B. A., and Prof. J. F. McLaughlin, B. A., B. D., two of our most enthusiastic workers.

H. P. BONNEY,

Chairman.

W. H. ELLIOTT,

Secretary.

REPORT OF THE PHILOSOPHICAL SECTION.

Read before the Annual Meeting of the Association, May 11th, 1893.

Since submitting their last report, your Section has held seven meetings, at six of which papers were read as follows :

1892.

May 21st.—“Apperception,” by S. B. Sinclair, B. A.

June 18th.—“Some Thoughts on Liberty and Laws,” by John Holiday, M. A.

October 22nd.—“Hypnotism,” by John King, M. A.

Nov. 19th.—“Socrates and the Socratic Schools,” by S. A. Morgan, B. A.

Dec. 17th.—“Aristotle as an Educator,” by Mrs. Newcombe.
1893.

Mar. 18th.—“The Science of Economics,” by J. T. Barnard.

The meeting of April 15th was devoted to the consideration of certain economical questions arising from the discussion of the previous evening.

While the number of those attending our meetings is not large, we are convinced that good work is being done, and of such a character as could not be attained from general meetings of the Association.

S. B. SINCLAIR,

Chairman.

S. A. MORGAN,

Secretary.

REPORT OF THE PHOTOGRAPHIC SECTION.

Read at the Annual Meeting of the Association, May 11th, 1893.

During the past year a great deal has been done towards making this a permanent Section. A number of outings have been held and much good work has been done and valuable experience gained. We regret that these outings were not better attended, and it is hoped that the members will avail themselves of the outings to be held this coming summer. It is only by attending these excursions and all the meetings that the objects of this Section will be attained. During the month of November, Mr. T. H. Wilkinson, water color artist of Toronto, read a very instructive paper on "How to View Pictures in Nature." A large number of the members and their friends attended and were highly pleased with the very able paper. The pictures set forth and the advice given contained many valuable thoughts, and it is confidently expected that better results will follow in this summer's work as a result of the profitable and timely advice contained in Mr. Wilkinson's paper.

During the month of October, Robt. Moodie read a paper and gave two evenings of practical instruction in the art of lantern slide making, as a result of which the Association has lately had practical proof. A lantern slide exchange has been formed between the Toronto and Montreal Camera Clubs and this Section, and it is through the kindness of Mr. Moodie in extending to this Section his knowledge of slide making, that we have been enabled to send outside clubs sets of views.

To Mr. Moodie is due the thanks of the Association for giving this Section the use of his lantern.

All of which is respectfully submitted.

SAMUEL BRIGGS,

Chairman.

WILLIAM WHITE,

Secretary.

May 11

HAMILTON ASSOCIATION.

*Statement of Receipts and Disbursements for
the Year ending May 11th, 1893.*

INCOME.

Cash Balance from 1892,	\$255 65
Government Grant,	400 00
Sale of Engravings,	5 00
Members' Subscriptions,	188 00
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	\$848 65

EXPENDITURE.

Rent,	\$148 00
Gas,	17 45
Printing, Stationery, Postage,	391 80
Sundry Expenses and Caretaker,	130 83
Balance,	160 57
	<hr/>
	\$848 65

C. R. McCULLOUGH,
Sec.-Treas.

I have examined the vouchers and found them correct.

GEO. BLACK,
Auditor.

May 11th, 1893.

THE
JOURNAL AND PROCEEDINGS
 OF
THE HAMILTON ASSOCIATION.

IS SENT TO THE FOLLOWING :

I.—AMERICA.

(1) CANADA.

Astronomical and Physical Society.....	Toronto.
Canadian Institute	“
Natural History Society of Toronto.....	“
Department of Agriculture.....	“
Library of the University	“
Geological Survey of Canada.....	Ottawa.
Ottawa Field Naturalists' Club.....	“
Ottawa Literary and Scientific Society.....	“
Royal Society of Canada.....	“
Department of Agriculture.....	“
Entomological Society	London.
Kentville Naturalists' Club.....	Kentville, N.S.
Murchison Scientific Society.....	Belleville.
Natural History Society.....	Montreal.
Library of McGill University.....	“
Nova Scotia Institute of Natural Science	Halifax.
Literary and Historical Society of Quebec.....	Quebec.
L'Institut Canadien de Quebec.....	“
Natural History Society of New Brunswick....	St. John.
Manitoba Historical and Scientific Society....	Winnipeg.
Guelph Scientific Association.....	Guelph.

(2) UNITED STATES.

Kansas Academy of Science.....	Topeka, Kan.
Kansas University Quarterly.....	Lawrence, Kan.

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Psyche.....	Cambridge, Mass.
American Academy of Arts and Sciences.....	Boston, Mass.
Library of Oberlin College.....	Oberlin, Ohio.
American Association for Advancement of Science.....	Salem, Mass.
National Academy of Sciences.....	Cambridge, Mass.
Museum of Comparative Zoology.....	" "
American Dialect Society.....	" "
United States Department of Agriculture.....	Washington, D.C.
Biological Society of Washington.....	" "
Philosophical Society of Washington.....	" "
Smithsonian Institution.....	" "
United States Geological Survey.....	" "
American Society of Microscopists.....	Buffalo, N. Y.
Buffalo Society of Natural Sciences.....	" "
California Academy of Sciences.....	San Francisco, Cal.
California State Geological Society.....	" "
Santa Barbara Society of Natural History.....	" "
University of California.....	Berkely, Cal.
Minnesota Academy of Natural Sciences.....	Minneapolis, Minn.
Academy of Natural Sciences.....	Philadelphia, Pa.
Academy of Sciences.....	St. Louis, Mo.
Missouri Botanical Gardens.....	" "
American Chemical Society.....	New York City.
New York Microscopical Society.....	" "
The Linnean Society.....	" "
American Astronomical Society.....	" "
American Geographical Society.....	" "
New York Academy of Sciences.....	" "
Torrey Botanical Club.....	" "
Central Park Menagerie.....	" "
Cornell Natural History Society.....	Ithaca, N. Y.
Johns Hopkins University.....	Baltimore, Md.
Kansas City Scientist.....	Kansas City, Mo.
Wisconsin Academy of Science, Art and Letters.....	Madison, Wis.
Society of Alaskan Natural History and Ethnology.....	Sitka, Alaska.
Agricultural College.....	Lansing, Mich.
Colorado Scientific Society.....	Denver, Col.
Museum of Natural History.....	Albany, N. Y.
Rochester Academy of Sciences.....	Rochester, N. Y.

(3) WEST INDIES.

Institute of Jamaica Kingston, Jamaica.

(4) SOUTH AMERICA.

The Royal Agricultural and Commercial Society
of British Guiana. Georgetown.

II.—EUROPE.

(1) GREAT BRITAIN AND IRELAND.

England.

Bristol Naturalists' Club Bristol.
Literary and Philosophical Society of Leeds Leeds.
Conchological Society "
Royal Society London.
Royal Colonial Institute "
Society of Science, Literature and Art. "
Geological Society "
Manchester Geological Society Manchester.
Mining Association and Institute of Cornwall.

Scotland.

Glasgow Geographical Society Glasgow.
Philosophical Society "

Ireland.

Royal Irish Academy Dublin.
Royal Geological Society of Ireland "
Naturalists' Field Club Belfast.

(2) AUSTRIA-HUNGARY.

Anthropologische Gesellschaft Vienna.
K. K. Geologische Reichsanstalt "

(3) BELGIUM.

Société Géologique de Belgique Liège.

(4) DENMARK.

Société Royal des Antiquaires du Nord Copenhagen.

(5) FRANCE.

Académie Nationale des Sciences, Belles-Lettres
et Arts Bordeaux.

- Académie Nationale des Sciences, Arts et Belles-
Lettres Caen.
Académie Nationale des Sciences, Arts et Belles-
Lettres Dijon.
Société Géologique du Nord Lille.
Société Géologique de France Paris.

(6) GERMANY.

- Naturwissenschaftlicher Verein Bremen.
Naturwissenschaftlicher Verein Carlsruhe.

(7) RUSSIA.

- Comité Géologique St. Petersburg.

III.—ASIA.

(1) INDIA.

- Asiatic Societies of Bombay and Ceylon.
Asiatic Society of Bengal Calcutta.
Geological Survey of India "

(2) STRAITS SETTLEMENT.

- The Straits Branch of the Royal Asiatic Society . . Singapore.

(3) JAPAN.

- Asiatic Society of Japan Tokyo.

IV.—AFRICA.

(1) CAPE COLONY.

- South African Philosophical Society Cape Town.

V.—AUSTRALASIA.

(1) AUSTRALIA.

- The Australian Museum Sydney.
Royal Society of New South Wales "
Linnean Society of New South Wales "
Australian Natural History Museum Melbourne.
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(2) NEW ZEALAND.

- New Zealand Institute Wellington.

(3) TASMANIA.

- Royal Society of Tasmania Hobartown.

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- 1881 Grant, Lt.-Col. C. C., Hamilton.
 1882 Macoun, John, M. A., Ottawa.
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 1885 Fleming, Sanford, C. E., C. M. G., Ottawa.
 1885 Farmer, William, C. E., New York.
 1885 Ormiston, Rev. William, D. D., Gladstone, Los Angeles, Cal.
 1885 Rae, John, M. D., F. R. G. S., LL. D., London, England.
 1886 Small, H. B., Ottawa.
 1886 Charlton, Mrs. B. E., Hamilton.
 1887 Dee, Robert, M. D., New York.
 1887 Keefer, Thomas C., C. E., Ottawa.
 1890 Burgess, T. J. W., M. D., F. R. S. C., Montreal.
 1891 Moffat, J. Alston, London.

CORRESPONDING.

- 1871 Seath, John, M. A., Toronto.
 1881 Clark, Chas. K., M. D., Kingston.
 1881 VanWagner, Lieut.-Col. P. S., Stony Creek.
 1881 Spencer, J. W., B. Sc., Ph. D., F. G. S., Savannah, Ga.
 1882 Lawson, A. C., M. A., California.
 1884 Bull, Rev. Geo. A., M. A., Niagara Falls South.
 1885 Frood, T., Sudbury.
 1889 Yates, Wm., Hatchley.
 1889 Wilkins, D. F. H., B. A., Bac. App. Sci., Beamsville.
 1889 Kennedy, Wm., Austin, Tex.
 1891 Hanham, A. W., Quebec.
 1892 Woolverton, L., M. A., Grimsby.

LIFE.

- 1885 Proudfoot, Hon. Wm., Q. C., Toronto.

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- 1892 Adam, Alex. E.
 1882 Adam, Jas. R.
 1881 Aldous, J. E. P., B. A.
 1872 Alexander, A., F. S. Sc.
 1892 Alexander, Ernest
 1891 Arthur, C. C., M. A.
 1892 Baker, C. O.
 1892 Baker, Alfred H.
 1885 Baker, Hugh C.
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 1892 Bowman, J. W.
 1881 Bowman, Wm.
 1880 Briggs, Samuel.
 1857 Brown, Adam
 1891 Brown, O. J., M. A.
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 1892 Buckley, Miss M. A.
 1892 Burkholder, J. G. Y.
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 LL.D.
 1891 Burns, J. M.
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 1892 Cameron, Chas. E.
 1890 Cape, John
 1891 Carpenter, H., B. A.
 1891 Chapman, J. R.
 1891 Chapman, W.
 1880 Charlton, B. E.
 1891 Cheyne, John P., Com-
 mander R. N.
 1884 Childs, W. A., M. A.
 1890 Clark, D., D. D. S.
 1890 Cloke, J. G.
 1887 Colquhoun, E. A.
 1891 Crawford, J. T., B. A.
 1892 Crisp, Alf. C.
 1880 Cummings, James
 1892 Cuttriss, Geo. H.
 1892 Davidson, Mrs. M.
 1892 Davis, Miss M. L.
 1872 Dickson, George, M. A.
 1880 Dillabough, E. H., M. D.
 1892 Devine, A. L.
 1892 Dow, R. C.
 1891 Eastwood, John M.
 1892 Edgar, Robt. L.
 1890 Elliott, W. H., Ph. B.
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 1891 Evans, W. Sanford
 1881 Fearman, F. W.
 1882 Ferres, James
 1890 Finch, C. S.
 1880 Findlay, W. F.
 1880 Fletcher, Rev. D. H., D. D.
 1880 Forbes, A. F.
 1891 Foster, F. G.
 1880 Foster, W. C.
 1892 Garrett, A. D.
 1880 Gaviller, Alex.
 1882 Gaviller, E. A., M. D.
 1883 Gibson, Hon. J. M., M. A.,
 LL. B.
 1888 Grant, A. R.
 1892 Grant, W. J.
 1887 Greene, Joseph
 1883 Grossman, Julius
 1888 Galbraith, W. S.
 1887 Hancock, Wm.
 1882 Harris, W. J.
 1892 Heming, A. H. H., O.S.A.
 1887 Hobson, Thos.
 1890 Holden, Mrs. J. Rose

- 1892 Holliday, John, M. A.
 1891 Hore, J. C.
 1887 Ireland, S. J.
 1892 King, A., M. A.
 1882 Laidlaw, Rev. R. J., D. D.
 1890 Luncefield, R. T.
 1884 Lee, Lyman, B. A.
 1892 Lees, George
 1890 Lees, Thomas
 1857 Leggat, Matthew
 1890 Leslie, Geo. M.
 1880 Leslie, James, M. D.
 1880 Littlehales, Thomas
 1891 Lothead, L. T., M. A.
 1887 Logie, W. A., B. A., LL.B.
 1880 Lyle, Samuel, Rev., B. D.
 1891 McClemon, Wm. M.
 1891 McCullough, C. R.
 1857 McIlwraith, Thos.
 1890 McInnes, Hon. Donald
 1884 McLaren, Henry Major
 1890 McLaughlin, J. F., B. A.
 1880 Macdonald, J. D., M. D.
 1857 Malloch, A. E., M. D.
 1891 Manning, A. E.
 1890 Marshall, William
 1886 Martin, Edward, Q. C.
 1892 Mathesius, R. A.
 1892 Mills, Edwin
 1887 Mills, Geo. H.
 1886 Milne, Alex.
 1887 Mole, Wm., M. R. C. V. S.
 1892 Moodie, Jas. R.
 1887 Moore, A. H., Lieut. Col.
 1890 Moore, Charles
 1890 Moore, Henry E.
 1892 Morgan, Arthur
 1891 Morgan, S. A., B. A.
 1886 Morgan, W. S.
 1887 Morris, Thomas, Jr.
 1883 Murton, J. W.
 1870 Mullin, John A., M. D.
 1891 Myles, Wm. H.
 1880 Neill, A. T.
 1887 Nelligan, J. B.
 Noyes, Mrs. Ed. F.
 1892 Overell, M. J.
 1885 Plant, John
 1892 Pottenger, John
 1892 Powis, A.
 1891 Rastrick, E. L.
 1891 Rastrick, F. J.
 1881 Reynolds, T. W., M. D.
 1890 Roach, George
 1892 Robertson, R. A.
 1882 Robinson, W. A.
 1892 Ross, Lucien G.
 1892 Rutherford, Geo.
 1887 Sanford, Hon. W. E.
 1892 Sanford, E. Jackson
 1890 Schofield, W. H., B. A.
 1880 Scriven, P. L.
 1891 Sinclair, S. B., M. A.
 1885 Smart, Wm. L.
 1892 Southam, Richard
 1890 Staunton, F. H., Lynch-
 1890 Staunton, George Lynch-
 1892 Stark, Robert
 1890 Stratton, A. W., B. A.
 1892 Swanzie, Miss Kate G.
 1892 Sweet, David
 1892 Sweet, Harry
 1892 Smith, J. H.
 1892 Sykes, W. J., B. A.
 1892 Thompson, R. A., B. A.
 1881 Tuckett, Geo. E.
 1891 Turnbull, A. C.
 1892 Turnbull, J. D.

THE HAMILTON ASSOCIATION.

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| 1892 Turnbull, W. R. | 1888 Williams, C. J. |
| 1880 Turnbull, William | 1881 Williams, J. M. |
| 1891 Turner, J. B., B. A. | 1892 Wilson, Wm. |
| 1892 Turner, W. J. | 1857 Witton, H. B. |
| 1891 Tyrrell, J. W., C. E. | 1885 Witton, H. B., Jr., B. A. |
| 1881 Vernon, Elias, M. D. | 1891 Witton, J. G., B. A. |
| 1887 Walker, A. E. | 1884 Young, Wm. |
| 1892 White, Wm. | |