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ON THE LOCAL GEOLOGY OF ELORA.

Read by Mr. David Boyle,

PRINCIPAL OF THE PUBLIC SCHOOL,

At the First Regular Meeting of the ELORA Natural History Society, on the 2nd of Nov., 1874.

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It would probably be impossible to find a better introduction to this paper, than a sentence or two incidentally employed by a recent writer on Natural History. He says: "There is nothing that the study of geology teaches us that is more certain or more impressive than the extreme instability of the earth's surface. Everywhere beneath our feet we find proofs that what is land has been sea, and that where oceans now spread out has once been land; and that this change from sea to land, and from land to sea, has taken place, not once or twice only, but again and again, during countless ages of past time."

The introductory use of these remarks will be sufficient to indicate that a certain amount of elementary knowledge regarding the science is supposed to be already in your possession. Should this not be the case, you can scarcely do better than read one or more of the many geological works in the village library by Lyell, Page, Ansted, Sedgwick and others.

In the study of this, as of the other natural sciences, nothing so discourages the beginner as the formidable appearance of the terms used to distinguish orders, genera, species or individuals. Frequent employment of the ugly-looking names will surmount the difficulties of pronunciation, and a slight knowledge of the classical languages will go a long way towards destroying their forbidding appearance, and even make them beautiful in our eyes. A consideration of this kind alone should prompt all who may have an opportunity to the study of both Greek and Latin.

Now, before plunging into the special department which has been chosen as the subject of this paper, it will be well, I think, to say a word or two concerning geological "formations" and "systems." One of the first principles laid down by Dr. Smith, "the father of Modern Geology," was, that no matter how much the mineral character of rocks might differ, a *stratum* could always be identified by its fossils. According to this principle, although of late years it has been somewhat modified, one, two, or more *strata* containing fossils of a like kind are known by the name of "formation," one or more of which may compose a "system." And just here we encounter another of the difficulties to beginners. In Scotland, it may be, we read of the Laurentian cropping out in the Northern Highlands, whilst in Canada, on the shores of Lake Erie and other places, we are informed that the Devonian system exists. How can a system in Britain take its name from our St. Lawrence, or one in Ontario from the County of Devon in England? In this way. Geologists have adopted, in many instances, the practice of naming a formation from that portion of the world in which the formation is most perfectly developed, or where a certain series of strata has been first studied and recognized as peculiar.

My only apology for saying anything in reference to this point is just for the sake of making it quite clear why the rocks in our neighborhood are known as "Silurian."

Sir Roderick Murchison first studied the system of which the Elora rocks form a part, and upon the principle already alluded to, called it "Silurian," from that portion of South Wales where his

investigations were made, and which was anciently inhabited by a tribe of Britons to whom the Romans gave the name Silures.

Now, when Professor Nicholson was in our neighborhood last summer, he volunteered to our President and myself a little bit of information, which so far as known to me has not yet appeared in books. It was somewhat to this effect: Professor Sedgwick, whom he pronounced a superior authority to Sir Roderick, denied the propriety of the name "Silurian," contending that the rocks so called were only a continuation in all their main fossil characteristics, of the Cambrian, which lies immediately underneath, and that therefore they should be named not *Silurian* but *Upper Cambrian*, or at most *Cambro-Silurian*. Murchison having described and named them, naturally looked upon them with a jealous eye, and insisted on the retention of the name given by him. Both Murchison and Sedgwick are now dead, and what impartial judges will do in the matter remains to be seen.

The Silurian rocks as developed in Canada are classified into sub-formations, made for the most part, as I have already explained, many of the names too taking their rise from places in New York, where they were first described, such for instance as "Utica," "Hudson River," "Onondaga." In portions of this and adjoining counties the strata take the name of "Guelph," simply because no equivalent appears to exist in New York State, and could not, as a matter of course, have been described by the American geologists.

According to Sir William Logan, late Provincial Geologist, the Guelph formation is very nearly the highest in the Silurian system, only other two overlying it, whilst not less than ten are underneath.

At Elora, again, we are, I think, considerably higher than at Guelph itself, and since the higher we go among the leaves of the rocky volume, the more likely we are to find fossils of an advanced type, it will be easy to see the peculiar advantages enjoyed by an enthusiastic geological student in our locality.

On the banks of the rivers, the Grand and Irvine, we have just such an exposure as a student requires: an exposure which, had Nature not performed the work, it would have taken millions of dollars to accomplish; an exposure, in fact, which if it did not exist, we should *wish* that it did.

One of the first questions that occur to the mind of a stranger upon gazing over our precipices is, "How was this gorge formed? By water or how?" The "or how?" in such a problem is exceedingly handy, as the querist apparently asks two questions, whereas he only asks one, the "or how?" being equivalent to "well, water is out of the question altogether. I give it up." My own opinion is that the chasms were produced (for all I know, ten million years ago) by a sudden convulsion of Nature—an earthquake—that if the streams had been flowing previous to that time, the infiltration of the water through the porous rock (for all limestone formations are remarkable for their porosity) so weakened it by keeping it perpetually in a moist condition, that when the shock did occur, the weaker threadlike portions marking the streams' courses first yielded to the enormous pressure from within; or, that the separation having taken place before there were streams, the water when it began to flow naturally took the lowest level, and thus the chasms became utilized as river-beds. However it may have been with regard to the streams themselves, I have no doubt at all as to the eruptive origin of the gullies, and if we accept this theory we are then driven to the conclusion that the rent portion must have been weaker than surrounding portions, whatever the cause of that weakness may have been. The name Dolomite has been given to this class of rocks to which those of our formation belong, in honor of a French geologist.

A very slight inspection of the Silurian

formation, in almost any one of its many strata, is quite sufficient to determine its aqueous origin. Corals, shells, and crustaceous animals, the latter distantly related to recent lobsters and crabs, are found in great abundance. Concerning these crustaceans—the trilobites—it may be remarked here that plentiful as they are in the Trenton, Utica, Hudson and Medina groups, all underlying our own, they appear to die out in the Clinton and Niagara rocks upon which, particularly the latter, our formation rests. No trilobites have, to my knowledge, ever been found in this locality, that is to say in our limestone rock.* Otherwise they have, but of that afterwards. Corals in considerable variety may be picked up almost anywhere, and singular as it may appear, even a sponge. Most of the former are of the genus *Favosites*, so called from their honey-comb appearance. Another somewhat plentiful coral takes its name from the similarity which a cross-section of it presents to a chain—*Halysites Catenulatus*. Specimens of this fossil are chiefly found near the surface; at least I have never met with any at a greater depth than four or five feet. Excellent illustrative specimens are often seen in field-stones, in which cases the interstices are eroded by the action of the weather, and the chain-like walls stand out prominently. As specimens of this and other fossils referred to may be examined on the table during recess, it will be quite unnecessary to describe them at length. The sponge alluded to (*Stromatopora concentrica*) is more commonly met with than many other local fossils. On the rocky road-bed leading to the Gilkinson bridge on both sides, very large ones may be seen, and some capital weathered specimens may be picked up about Aboyne. Down the Grand River also, below Tribe's, any number of them may be seen in the side of the cliff. Formerly *Stromatopora concentrica* was regarded as a coral, but from a remarkably fine one submitted to Professor Nicholson's inspection by our President, the evidence in favour of its being a sponge was considered as pretty conclusive. A new species was discovered by Mr. John Wilkie, of Guelph, two years ago, and described by Nicholson, who named it *Stromatopora Ostiolata*. In company with Mr. Wilkie I visited the quarry in which he had first met with *ostiolata*, and succeeded in procuring a fair specimen after some search. It may be seen here with the rest of the objects. Returning to Elora, somewhat deeper than the region of the Favosites, concerning which nothing more need be said at present, and measuring from the highest part of the formation, we occasionally come across a very pretty species of what is commonly known as Lamp Shell, from its resemblance to an old-fashioned oil-lamp. It has been named *Pentamerus Occidentalis*, and when found with the lines sharply defined is one of the finest fossils our rocks contain. At a depth of from forty to sixty feet, other two species are met with having the same general appearance, of course, but differing somewhat in size and proportion. One of those exists in considerable numbers in a small cavern on the left band of the Irvine River, almost below Modeland's Foundry. In the same place may be found as well, a great many beautiful specimens, some of which are probably unnamed, including species of *Pleurotomaria*, *Murchisonia*, and *Orthoceras*. I can conceive of no more profitable and pleasing way for a boy to spend a few hours, than in such a place, where almost every few minutes the hammer exposes a gracefully formed shell, which has been entombed probably a greater number of years than Adam could have counted had he been busy counting day and night to this the second day of

*A beautiful folded specimen, Phacops *rana*, is in the museum. It was found by Mr. R. Tribe, but is doubtlessly "drift." A fragmentary specimen of very doubtful character has recently been picked up by Mr. Clarke.

November, 1874.* In this cavern too, but found usually a little higher, the student will possibly meet with that species of Pleurotomaria, named by Billings *Elora*. Another shell I have mentioned as being procurable in our neighborhood is the *Orthoceras*, or straight shell. Some five hundred distinct species of *Orthoceras* have been named and described in various parts of the world, and half-a-dozen at least have been brought to light about Elora. Who shall say that as many more or thrice as many more may not reward the diligent explorer? In life these shells must have been remarkably beautiful—of all sizes from two or three inches to six feet in length, tapering gently, and richly colored.

With the exception of Pentamerus, all the shells noticed so far are univalves. Of bivalves we have also quite a variety. Almost all children in the village upwards of five or six years of age, can distinguish *Megalomus Canadensis*, quite as readily as they can an Early Rose potato or a Swedish turnip. It is the commonest and most characteristic bivalve in the Guelph formation. It is found of all sizes from two to six or seven inches in length, either in casts of the fleshy parts, which are the more common, or in casts representing the form of the perfect animal. *Megalomus* would seem to have reigned a king among bivalves on the shores of the Silurian seas. The immense numbers of them to be found at present is attributable, doubtless, in some measure, to the great thickness and consequent strength of the shell—from a quarter to five-eighths of an inch. Common as they are in this formation they are hsghly prized for European collections, as they are utterly wanting in the Silurian system of the Old World. It would be almost needless to mention where the *Megalomus* may be found in this locality, but to assist those who intend to make a beginning, the quarries at Mrs. Inglis' farm, the left bank of the river any where between the carpet factory and Aboyne, a surface exposure near the residence of Highland John, and the rocks at Tribe's, yield specimens more or less perfect.

Before closing this part of my paper, I shall mention only one bivalve more—one which has carried the name and fame of Elora across the Atlantic, and caused our beloved little town to be spoken of by the most eminent palaeontologists in England, as "a very interesting locality." This shell is only found in a very circumscribed area, and, so far as I know, not being met with anywhere else than within a short distance above the Gilkinson bridge, on the right bank of the Grand River.* Strictly speaking the shell itself is not found at all—only an interior cast, or cast of the fleshy part, and this alone is certainly a remarkable object. No cast of the exterior has yet been discovered—leading us to conclude that the shell must be exceedingly thin and fragile. The name of this fossil is *Trimerella grandis*, and I should be glad to hear of some of you devoting your spare time and energies towards the unearthing of even better specimens than our museum now possesses.

But however much invites the geological student in the rocks of the Guelph formation, his attention need not necessarily be confined to them alone. Thanks to the cold period which succeeded the hot one of the coral ages, other materials have been supplied, and some of them from great distances.

The glaciers, whose mighty masses ploughed their way slowly but irresistibly towards the south, carried with them in their icy embrace, millions of frag-

*The rigidity of the old conceptions has been relaxed, the public mind being rendered gradually tolerant of the idea that not for six thousand, nor for sixty thousand, nor for six thousand thousand, but for æons embracing untold millions of years, the earth has been the theatre of life and death. TYNDALL.

*Besides Elora, it has only been noticed in two or three other places in the Province.

ments of rocks belonging to the regions where from climatic changes intense frost had supplanted torrid heat. Those fragments, becoming unlocked as the masses penetrated comparatively warmer regions, dropped, eventually became water-worn, were washed into hollows, and at last elevated so as to form dry land. Deposits of this kind are known to us as gravel-beds. The heavier fragments, not so easily affected by waves or tides, imbedded themselves in the ooze, heavy end always down—these we see at, or near the surface, to-day, and call them "boulders."

It is quite possible, therefore, to learn just as much from a careful examination of a boulder or a bed of gravel, as if some friend fifty, or a hundred, or two hundred miles off had sent us the same quantity of material by express, for our own special inspection. Beautiful crinoidal or mountain limestone is often procurable on the fields in the shape of boulders. I have here upon the table a perfectly defined cast of beautiful shells picked up in a field in Pilkington by my friend Mr. Sanderson. Our collection contains a boulder which has been carried from the North West perhaps more than five hundred miles. Close by Salem is a gravel-bed in which the boys of the village procured some very fine specimens of *Strophomena*, *Ambonychia radiata*, *Avicula demissa* and trilobites, not to be found in the solid formation nearer than Owen Sound. Only last Wednesday my own little girl, who plays at Geology on the gravel walk, picked up a handsome little specimen of a trilobite's tail, in a bit of Hudson River shale. In fact the amount of interest and information derivable from an hour spent in a gravel pit, is, to one who does so for the first time, perfectly astonishing. Several pits exist even within the limits of the corporation; try them, and at some future meeting display your collections jointly or separately, and I feel confident that those who look will be equally astonished with those who gathered. Although hammer and chisel are not quite so indespensable in pits as among the solid rocks, you will yet find them of great value. Many slaty-looking stones will be found which split easily, and frequently they contain the greatest treasures.

I have already hinted at the *coloring* of the ancient shells. Now, although it is quite true that none are ever met with about Elora, and seldom any where else, to indicate the possession of peculiar beauty in this respect, a moment's consideration will show the reasonableness of the supposition that the fossil mollusca were at least as variously and as prettily tinted as the average recent shell. The total absence of color in limestone specimens, can only be accounted for from the complete mineralization which has been effected by a process which may be described at some other time.

Omitting altogether the notice of many points that have doubtlessly suggested themselves to some of you, I will close this paper by an attempt to answer the irrepressible "*What good?*"

In most cases when this expression is taken out of its interrogative form and made assertive, it simply means "You can't make anything by it." Go to Fergus, or Eden, or a hundred places in this Province besides, and they will tell you that they have *lost* from geological ignorance. Only some ten or twelve years ago a farmer near Bowmanville ruined himself by boring for coal. Sir Wm. Logan at the time declared how utterly unreasonable the search was, and still there are to-day thousands in Ontario who believe that coal remains to be discovered within our borders. In the Island of Timor a company was formed in 1861 for the mining of copper. I quote, "So confident were they of the existence of copper, that they thought it would be waste of time and money to explore! and accordingly sent to England for a mining engineer, with tools, machinery, laboratory, utensils, mechanics, and stores of all kinds for two

years." When the engineer, who was of course a practical geologist, arrived on the spot, the first glance assured him that not a particle of copper existed there. A few months since a poor fellow out west married a widow with a large family, because he thought she owned a little hill composed largely of gold. The mineral that deceived him has deceived many more, it was simply bi-sulphuret or iron pyrites. The early French explorers of America carried home with them bushels of worthless crystals from Quebec, supposing them to be diamonds. But is there no profit other than that of dollars and cents? Why do we enjoy a walk—a fine view—a flower garden—a beautiful picture, or an exquisitely executed piece of machinety? Just, I take it, because we meet with an appeal to the imagination either in one form or another. And I contend that no more forcible appeal can possibly be made, than the study of this science affords us upon every hand Now and again a discovery is made of a few Indian relics, and on reading the account it is impossible to avoid contrasting the Canada of to-day with Canada of, say two hundred years ago. Certainly in such a case there is room for wonder and admiration, but what is even that compared with the Canada of ten thousand years ago? What is that compared with the time when the spot, now occupied by Elora, first appeared above the surface of a mighty surrounding ocean, an ocean whose bottom was a mass of corals and sponges, the only vegetation being a few simple forms of sea-weed? * When the molluscous animals we now find fossilized were gifted with life and motion, and when the lily or other encrinite with extended arms, waved gracefully to the fluctuations of the water in particular localities. Surely such considerations as these, apart from a purely scientific point of view, are sufficient to endow the study with the deepest interest, and to assist in making us what we all ought to be—happier, better, and more thoughtful men and women; enlarging our views concerning the majesty of creation, and, as a consequence, giving us a more reasonable, yet elevated conception of the Great First Cause.

Nature in every aspect affords food for the profoundest thought, and he who passes through life in total ignorance, or regardlessness of the thousand and one wonderful objects with which he is surrounded, can never be said to enjoy his existence to the full, or be considered, in point of intelligence, as but a few removes from the beasts that perish.

May our Society do at least a little towards bringing about a better state of feeling among both young and old, in Elora and its vicinity!

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*If star-fish existed in those seas, no remains of them have yet been found here, and the boy who first discovers one will be as famous in our annals as he who finds a trilobite. Fish had not appeared to populate the deep, and of the multitudes of gelatinous creatures with which the seas undoubtedly teemed, it is impossible to detect a trace.

NOTE.—Since the above was written I have learnt that the *Phacops rana* referred to was brought from Bosanquet.

OUR LOCAL FLORA.

Read before the Elora Natural History Society by Miss JANE CLARKE, 11th January, 1875.

Although at this season of the year it is difficult to procure natural objects f r the study of that pleasing science, Botany, still very much may be accomplished by reading, by studying charts and printed representations of plants, and by examining pressed and dried specimens. Some time during the present year, the members of this Society will probably make botanizing excursions in the woods about Elora, and will wander along the banks of the Grand and Irvine Rivers in search of hare-bells and lobelias, or will climb the grand old rocks which guard the streams, in quest of delicate ferns or velvety mosses. We may enjoy these rambles in anticipation, and it would not be unwise, therefore, to make some slight acquaintance beforehand with some few of the treasures we hope to secure.

If, in the beginning of May, we were to take a walk in the Cascade Woods we should find in abundance spring's earliest blossom, which is common to the greater part of Canada, and is botanically styled *Claytonia Virginica*, after the Virginian botanist, Clayton. The more familiar name, which is pretty and expressive, is *Spring-beauty*, and the Indians call it "Miskodeed." It is found rising from hillocks, covered with the bright, green grass of spring, under the shade of moss-grown logs, or from beds of brown, dead leaves collected in masses by the autumnal winds of the former year, and which, as the summer advances, decompose and supply nourishment to flourishing vegetation. Such is the economy of Nature.

Let us glance at the structure of the *Spring-beauty*. Its root is a tuber, like those of many of our early blooming plants, and its stalk bears only two leaves, which are thick and well stored with nutriment, and, although few in number, are enough for the frail flower-stalk to support. The flowers are on what is called a raceme, that is, a cluster of blossoms arranged along the main flower-stalk. They are of a pale pink, striped with dark rose-color, and consist of two sepals and five petals. This plant is of the same order as the obnoxious garden weed purslane, and its ornamental relation the portulacca, and, like them, stores its seed in a one-celled pod. The Claytonia is not a showy blossom, but should be heartily welcomed as the first of our floral forest beauties able to brave the cool days of early spring. As we reach the more shaded part of the woods, we may make an addition to our bouquet of spring-beauties in the shape of Hepaticas, which bloom where the snow first melts, in a sunny and well-protected situation, such as at the root of some tree which has withstood the storms and gales of years, and offers a strong shield against boisterous winds which would rudely shake the pale tinted Liverleaf. Both the botanical and ordinary names of this plant are derived from some fancied resemblance in the leaf to the form of the liver, and to its having been used, in olden times, as a remedy for diseases of that organ. Another Canadian name is the Snow-flower. This plant has no real petals, but colored sepals, from five to twelve in number, either of a pure white, blush-pink, or blue shading to a pale purple. When the leaves first rise from their winter's sleep, they spring from a bed of white silken down, but as they stretch themselves out, their soft covering leaves them, and they ultimately become smooth and green. They are of the order *Ranunculaceæ* or crow-foot family, to which a great number of our wild flowers belong. Another member of this extensive order is the wood-anemone, *Anemone nemorosa*—

Wind-flower. These various poetic names derive their origin from an old belief that the beautiful flowers bloomed only when soft breezes were blowing, but, alas! the idea exists in imagination alone, as sunshine and showers, as well as the gentle breathings of Æolus combine to expand the lovely petals. Thomas Miller, the basket-maker poet, thus tells the story of the Wood-anemone:

Some Grecian poet,—
Where it grew,
Lay dreaming, while
The Sweet South blew
Its white-streaked petals
To and fro;
And through his eyes
Half shut, he saw
A God-like shape,
Formed of the wind,
And thus a name
Did for it find
For seeing all
Its bells in motion,
He thought this young god
Of the ocean,
Had left fair Thetis'
Pearly side,
Upon its drooping
Bells to ride,
And ever since
That dreamy hour,
It has been called
The Wind-flower.

The most distinguishable characteristic in the Wind-flower is that the leaves are compound, being of three parts, very much serrated or notched at the edges. Like the Hepatica it is petaloid, having sepals of a very pure white, much veined, and the under side faintly tinged with purple, making an extremely beautiful bud before the flower is in full bloom. But if we look at another of these star-shaped waxen-white flowers, we find that it has no purple blush creeping over its buds like the anemone, while it is even more spotlessly pure than the hepatica. The flower, too, is much larger than either, and the leaves quite different, being broad and divided into several lobes. If we gather a blossom, we find our hands stained with an orange-red juice exuding from the stem, and if we examine the plant more minutely we find it literally gorged with the liquid. This indicates that it belongs to the Poppy family, the whole of which have colored or milky-white juices stored up for the nourishment of the young leaves and flowers. Judging from the color of the fluid, our variety must be the blood-root or *Sanguinaria Canadensis*, which supplies an extract used in medicine. Another peculiarity of this plant is, that it affords a specimen of the root-stock, that is, an underground stem, bearing a scale or two at each joint and buds in each scale. Each scale, too, has its tuft of fibrous roots which absorb nourishment from the ground. If separated from the parent plant, each of these little tufts will exist independently. More beautiful than any of the before mentioned "children of spring," is the fragrant wild Hyacinth, the *Dicentra Canadensis*, one of the Fumitory family. We may often find in a flowery dell a whole, tiny, fairy forest of their feathery fronds. The slender stems droop gracefully with their weight of pellucid white blossoms. This wild, and tender beauty always seeks protecting shade and rich soil, wherein to bloom. Its fragile leaves are very compound, being divided and sub-divided into feathery sprays. The cream-colored variety *Cucullaria* resembles a fly in form, and has a sweet perfume. The tubers of the plant have a similar appearance to grains of Indian corn, and, from this fact the name "squirrel corn" has arisen, although it is probable that Mr. Nutcracker, Mrs. Nutcracker & Co. never have the slightest idea of feeding on the Dicentra at all.

Any one who has had the pleasure of rambling through the woods in spring, can scarcely have failed to notice numbers of oily, brown-spotted leaves, rising from the ground in every direction. They are the leaves of the Adder's Tongue, Dog-toothed Violet, Yellow Lily, or, to name it botanically, *Erythonium Americanum*. Although there is but a single pair of leaves, they contain nourishment, and are succulent enough to support a greater number of them if they were present. From this foliage, dotted and beautifully clouded with purplish brown, rises a single stem, bearing a solitary flower, evidently belonging to the lily family. It has the general liliaceous characteristics, three sepals and three petals, which in this case are alike colored yellow. Its stamens are six, as many as the perianth, that is, sepals and petals taken together, and the leaves are parallel-veined. This flower, looking like a golden crown hanging on a slender stem may be found early in May in any of the woods about our village.

Two sister flowers may be seen blooming under the shade of some decaying log, once a fine old maple tree, which in days gone by, long before the water of the Grand River Falls was employed as a motive power, saw the red man steal-

thily creeping his way along, hunting in the forest, and was vigorous and youthful when the perilous Indian bridge was used for crossing the Grand River. Now the glory of the maple has faded, and it bears no bright green foliage in spring, nor golden nor crimson in autumn, but if it cannot send forth its leaves as of old, it can offer a shelter to timid plants which gladly hide themselves beneath its protecting side, and the kindly moss will clothe it lovingly with a soft covering that it may be outwardly beautiful to the end. But we must return to the sisters. What a contrast in complexion! This is a dark gipsy with cheeks of dusky red; that a pale complexioned beauty, pale enough for Death. It is the Death-flower, White Lily or *Trillium Grandiflora*, and the dark red blossom is the *Trillium Erecta*, Smiling-Wake-Robin, or Red Lily. How symmetrical is the arrangement of all the various parts! Three, or its multiple, is the predominant number; three broad leaves, three green sepals, three white or colored petals placed alternately with the sepals, six, or twice three stamens, and a three-celled pistil with three or six lobes or ridges. Every thing is perfect enough to excite the admiration of the most exacting mathematician. In the White variety, the golden yellow pollen offers a strong contrast to the pure petals, which, when old, are tinged with rosy purple. The organs of reproduction are wonderfully protected and developed in this and all wild flowers, obviously for the preservation and sure propagation of the species by seed. In the cultivation of flowers, these organs degenerate while the more showy parts increase in size, and thus double flowers are produced, superabundant in petals but nearly destitute of seed, and so Art acting on Nature improves and cultivates one part for the purpose of rendering it more attractive to the eye, while the vigorous vitality of the whole plant is materially lessened.

Later on in the season, say in the middle of June, if we take a walk on the south bank of the Grand River to the Ravine or "Cove," the name by which it is more familiarly known, in search of wild flowers, we shall be rewarded bountifully when we reach the water's edge. And as we are treading carefully, (we must tread very carefully), down the precipitous, rocky pathway, we may cast a passing glance at the ferns and mosses, the tiny, wild geraniums, and the trickling stream of water falling in silver threads over the dark green, moss-covered stones. But we are anxious to find the Wild Columbine or *Aquilegia Canadensis* and cannot stop to examine minutely the minor beauties of the way-side. There are the Columbines, swaying and bending with every breath of wind! They have grown for years on this rock on the left hand side of the entrance to the cave, and long may they remain undisturbed, to listen to the music of the water, made merry with its leap and dash over the falls! The bright cap of bells is composed of five brilliant scarlet sepals, and five petals of the same color without but golden within. The spurs of the horn-shaped petals are a striking characteristic of the Crow-foots, and Aquilegia belongs to them. There is a pretty conceit in connection with the Columbine, which is worth repeating. It is thought, and it does not require much stretch of the imagination to see that the flower resembles a group of doves in the act of drinking. The knob-like nectaries form the heads, the petals the bodies, and the sepals the wings of the bird, and hence the name *Columba*, signifying a dove. There is a large number of garden varieties, but none so beautiful as our rock-clinging, crevice-loving Aquilegia Canadensis. It is worthy of observance that although the flower droops its head, the seed-pod is stiffly erect when the sepals and petals fall away. Another fragile, graceful ornament of our river-rocks is the blue Hare-bell, *Campanula Rotundifolia*, which may be found in abundance on the banks near the Gilkinson Bridge. The corolla has five clefts, the stamens number five, and the stigmas, and cells of the pod are three or five. Here again we see the similarity of number in the component parts, and it is worthy of note that the odd numbers three, five, seven, &c., occur so frequently in the various parts of flowers. There is also a white hare-bell, but it is much more rare than the blue. I have found one specimen only myself, and that was some years ago, growing on a point of rock near the present carpet factory. The hare-bells also nod their blue heads further down the river on the rocks opposite the Cascade,—the rocks that witness all the year's changes on the waterfall, see the rush of water in the spring-time, white with fury in its hurry to reach the river, that hear the soft trickling and dripping on hot summer days, that listen to the gentle autumn ripple, but hope in vain for any song in winter, when the Frost King hushes all with his ice-cold grasp.

A singular flower which grows in our neighborhood, and is common to all On-

tario, is the Indian turnip—*Arum Triphyllum*, or, to use the suggestive and droll name the children give it, "Jack-in-the-Pulpit." The flower consists of what is botanically termed a spadix and spathe. The beautifully striped spathe, or hood, forms the so-called pulpit, while the club-shaped spadix, bearing its tiny blossoms quite hidden under its dark claret-colored covering, is Jack himself. The leaves are compound, being composed of three leaflets. The root of the Indian turnip is a fleshy bulb, the juices of which are hot and bitter, and of a poisonous nature. However, the poisonous juices may be evaporated by the action of heat, and the tubers used for food; in fact, a starchy powder is made from them called Portland Sago, which very closely resembles Arrow Root. The Indian medicine men use the root extensively in their healing art.

But of all our local flora the most peculiar and least understood is the Pitcher Plant, *Sarracenia Purpurea*, known also as the Side-Saddle Flower and Pigeon's Drinking Cup. These wonderful plants, native only to the New World, are found growing in masses, in boggy or swampy soil. Before the railway was built to the village, they were to be found, and probably are yet, in the swamp through which the trains pass daily, behind Mr. Reynolds' farm. The leaves are tubes, quite small at the base, but gradually enlarged, and terminating in a lip like that of a pitcher. They are thick, of a pale green, much veined with a reddish purple, and on the inner side there is a broad wing or flap. In an address delivered at Belfast, a short time since, by Dr. Hooker, he says that the Sarracenias are now regarded as being nearly allied to the water-lilies, that Linnæus himself, although he had no opportunity of making any real investigations, seems to have supposed that they were originally aquatic in their habits, that they had Nymphæa-like leaves, and that when they took to terrestrial life they became hollowed out to contain the water in which they could not float. In fact, as the lecturer says, the great botanist showed himself to be an evolutionist of the true Darwinian type. These leafy cups are always found to be filled with water, even in the driest seasons, and as the lids or lips are not closed in the purpurea variety, the rain enters them. In some of the other species, the lid covers the cups so closely, that the rain cannot readily find admittance, and the liquid found is supposed to be a secretion, which has the function of digesting insects. However, our pitcher plant does not seem to have this secretion, although there are quantities of insects in the leaves. When once a small fly enters the lid it finds the interior formed of smooth cells, which are conical in shape and lap one over the other, making a slippery surface for the entrapped victim. Then the lips and upper part of the tube are bristling with silvery hairs, inclining downwards, and which effectually detain the struggling insect. The name "Pigeon's Drinking Cup" doubtless arose from the idea that birds drank the water contained in the cups. A more rational supposition is that they sought for the insects which had been lured into the trumpet shaped leaves. Comparatively little is known of the habits and true formation of the Sarracenia purpurea, and as the plant is foreign to Europe, American botanists, by study and observation, are the persons who ought to remove the doubts surrounding the singular vegetable phenomenon. The flower of the Sarracenia is as peculiar as the leaves, one blossom only appearing on a stem. There are five sepals with three little bracts or small leaves behind them, five petals of a delicate rose color, yellowish green, or purplish red, differently shaded probably at various stages after the expansion of the flower, and the style rises from the centre in the form of an umbrella-like hood of five divisions. It is said that an infusion made from the root of this wonderful plant, is of great medicinal value in cases of small-pox, but this statement may be incorrect and has recently been much discredited. The Sarracenias would make a fine subject for a botanizing excursion, and this Society might distinguish itself by eliciting new facts in regard to this obscurely understood family, for after all the Natural Sciences are only in their infancy, and new facts, revelations and wonders are being daily discovered. Why should not we add something to knowledge, when there are such abundant opportunities for studying these sciences, right at our hands?

The violets, phloxes, lobelias, and many others of our Local Flora have been omitted, but I am afraid that the length of this paper has already proved wearisome. I hope, however, that some person, more competent and better acquainted with the wild flowers which bloom near our pretty village, will continue the subject at some future time.