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NOTICE.—The Treasurer begs to call the attention of members to the advertisements.

## AUTUMN ON THE UPPER OTTAWA.

BY A. O. WHEELER.

*(Read April, 1888.)*

The following is an account of a canoe trip taken by myself and three friends last autumn. And now as to how we came to make this especial trip. Did you ever on a bright warm day go up to the summer-house on Parliament Hill and see the sun glistening on the river away beyond the Chaudiere Falls in a broad band of gold, lighting up the dark green of the cedars and balsams until they became a bright yellow, and giving to the distance a far away and enticing look that makes you wish you were there.

The result of thoughts such as these was a determination to make the trip between Ottawa and Nipissing by canoe, and the fact that some years ago I had been over a large portion of Champlain's route, viz., the Georgian Bay, the French River and Lake Nipissing, as far as South East Bay, only increased the desire and added to the determination to travel this other part of his journey.

In the Canoe Club I happened on a kindred spirit who had had similar longings and come to a similar determination. We soon found two others who were easily inspired with the desire for the delights and experiences of such a trip, and on the evening of the 10th of September last we left Ottawa for North Bay by the night train with two basswood canoes, the best part of three weeks' provisions, ammunition, fishing tackle, and all the rest of a sportsman's paraphernalia. As we had only three weeks' holiday we decided to make the trip down stream and our starting point Lake Nipissing.

We arrived at North Bay the next morning, and on stepping out of the car we stood spell bound for a few minutes and tried to take in the view. A vast sheet of water stretched away before us, all dotted with islands and indented with bays, and shaded blue, brown or slate colour according as the lake was deep or shoal, or as the clouds cast their reflection upon it; while away to the north could be seen the line where sky and water met. Truly Lake Nipissing is a beautiful sheet. It is surrounded at this end by gentle slopes covered in many places with large tracts of hardwood.

But time was precious and we could not stay to enjoy the beauties of Lake Nipissing.

It had been decided that the canoes should be launched at the head of Trout Lake or Turtle Lake as it is sometimes called, and in a short time they were packed on a waggon with the rest of the outfit and *en route* for that point. The usual course taken from Lake Nipissing by voyageurs is by way of the Vase River, but this distance is five miles with three portages—one round a fall of twenty feet—while by the waggon road from North Bay the distance is not much over three miles.

Arrived at the head of Trout Lake, Camp No. 1 was soon pitched and we proceeded to take in the surroundings.

Upper Trout Lake looked a charming little sheet of glass, eight and a half miles long, with an average breadth of about one mile, dotted with heavily timbered islands. It is hidden away among hills covered with semi-hardwood bush, chiefly maple, birch and hemlock, the light and dark shades of which patched here and there with the bright crimson of autumn's paint brush looked very pretty. The lake has three peculiar features—about two miles from its head a narrow peninsula juts out from the north shore and practically divides it into two parts. This peninsula is four miles long, and is so narrow in places that you can see either sheet of water from the other.

The second feature that I allude to, is situated at the lower extremity of the lake near its exit. Here the width is about a quarter of a mile and at regular intervals across this space, with the exception of about forty or fifty yards near the south shore, nature has placed large boulders, whose tops jutting out above the water create the impression that in olden days they were used by giants for the purpose of crossing from one side to the other with, as is generally the case, a big jump at the last, and this appearance has no doubt suggested the name they bear—"The Stepping Stones." The third peculiarity is the exit of the lake, or rather the channel that connects it with Lower Trout Lake. This channel is at the highest water no wider than twenty-five or thirty feet, but at the time we passed through was only three feet in width, and so shallow that it was found necessary to remove some stones to let the canoes pass. To return to camp. The first afternoon

was spent in getting weapons offensive and defensive in order, getting grub into handy and easily got-at packages, and sundry other details. After a while the genius of the place—one Jessup—appeared. He looks after the greenhorns who occasionally frequent Trout Lake; this lake having very undeservedly a great name among nimrods and fishermen; he rows them around and shows them where good sport is *not* to be found. The genius of course began after his kind to spin yarns and tell about the big fish to be found in the lake and the difficulties of hauling them in when hooked, etc., etc., and soon made us regret having left our landing nets and gaffs at home. "But," said he patronizingly, "Of course you have a revolver." "Well! *when* you catch your big fish just fire a shot or two close to his head, and the concussion will stun and enable you to lift him in without trouble." This idea was stored away for future use, and it was not necessary to wait very long for a trial of its value, for that very evening two of our party hooked a twenty pound maskinongé and found that concussion was very useless, but that pistol bullets used in the ordinary manner were very effective, for the first big fish was landed, but not until he had had three shots put into him.

While camped here we received a visit from Mr. Gilbert, an American geologist, who lives in Washington, D.C. Mr. Gilbert said that his object, in this part of the world, was to trace a connection between the waters of Trout Lake and Lake Nipissing, and to find proof that in days gone by the flow of water had not been separated by a height of land as now, but had all passed out towards the south-west through the channel of the French River. He stated that as far as he could judge the waters of Trout Lake are twenty-five feet higher than those of Lake Nipissing, also that he had found an old water line twenty-five feet above the then head of Trout Lake, and another old water line fifty feet above the waters of Lake Nipissing, showing that at one time they were united.

Our next camp ground was in the prettiest spot on the whole lake, viz. : in a grove of pines on "Big Island." I mention this camp ground on account of an incident that occurred, and was recalled to my mind by reading in the December number of the OTTAWA NATURALIST a most interesting paper by W. P. Lett. During the night I was awakened

by one of the most blood curdling screams I ever heard, and as it seemed quite close to the tent I sprang into a sitting posture my hair standing on end and every nerve strained to hear more, but, as no further sound followed I came to the conclusion that our big maskinongé must have been too much for me, and was soon again asleep.

Next morning the scream was brought to my mind by one of the party asking if anyone knew what sort of a noise a panther made, and a little conversation developed the fact that all had heard the hideous yell of the night before. There can be no doubt as to its having been a panther and as we were camped on an island, the brute was probably on the mainland, for I don't think they take kindly to the water, although their smaller brethren, catamounts, swim very well and have been known to cross a river two miles in width. Probably the quiet of night made the sound seem closer than it really was. I had heard this cry once before south of Lake Nipissing and was then told by indians what it was. It is difficult to describe it and I think the nearest approach is the shriek of a locomotive as it enters a tunnel and scares you from your first nap. There was little attraction to remain long on Trout Lake for sport was poor. Our only fishing apparatus was the ordinary trolling line and spoon bait, and for some reason the fish would not take it readily. Old residents along the route said that the water was too cold and that it was too late in the year. I am not much of an authority on matters relating to angling nor am I aware of the thoughts and imaginations of the fish tribe, but have been told that the spoon bait spinning at the end of a trolling line resembles an injured fish of small size making its uncertain way through the water, and hence the voracity with which it is gobbled by members of the pike family, bass and other fish that prey upon their weaker brethren. If this be the case I fail to see why the lateness of the season should affect the appetite, or why the unlucky one should not be just as acceptable to the palate of a hungry gourmand of the finny tribe, in the fall as in the spring.

Major W. Ross King the author of "Campaigning in Kaffirland," says that the spoon bait resembles nothing in nature and is devoid of taste or smell, but appears, for some reason difficult to imagine, to be perfectly irresistible to pike as to many other fish.

On the afternoon of Tuesday, 13th September, it was "Eastward Ho!"

again, and we had just passed the stepping stones when with a familiar whir-r-r a partridge flew across followed by another and another and another to the number of nine. A couple of these birds was secured for supper, and while preparing them for the pan I found in the crop of one, four fresh clover leaves. This, I think, shows why partridge are to be found most plentifully along the roads leading to the shanties of lumbermen, for experience has proved that you can always get a better day's sport by keeping on these roads than by going into the thick bush. The reason is clear as it is only along these roads, over which the hay for the horses of the lumbermen is drawn during the winter, that clover is to be found. Speaking about shanties I would like to know why almost invariably an old shanty is surrounded by a raspberry patch? Why should raspberries grow on these open spots to the exclusion of hazel, dogroses and other und regrowth? To return to the partridge. There are two kinds very common in our woods. The ordinary wood partridge or ruffed grouse and the spruce partridge or Canadian grouse. They are especially noted for two attributes, both truly feminine; their affectionate care of their young and their great curiosity. When a stranger approaches a brood the old ones with discordant cries flutter along through the bush only just out of reach, as though wounded, in order to draw attention from the young ones, and then when you have followed them some distance and they consider their young safe, they throw off the wounded appearance and fly away. A story is told of a brood of little partridge being attacked by a carrion crow and the old birds made such a good fight that they not only beat the crow but held him there until he was taken from them by a spectator. As to their curiosity, if you come upon them in the woods and imitate the barking of a dog, or whistle, they will strut along the log or remain quiet on the branch, moving their heads from side to side until you approach quite close or throw something at them.

On passing through the narrow exit I have before spoken of and entering Lower Trout Lake we found ourselves in quite a different country. All the rounded hills of hardwood with their autumnal tints were gone and in their place the jagged and rocky heights were covered with the light green of second growth poplar and birch, turned in many places to bright yellow, while here and there the tall stems of red and



white pine, rose like so many giants, swaying to and fro and wagging their heads mournfully over the rising generation. This was the country of the rampikes. What are rampikes? Well, I'll tell you. A good many years ago, but well within the present century, tremendous bush fires raged all along the country on both sides of the Ottawa, and thousands and thousands of acres of the best pine country on this continent were totally destroyed, and now the former monarchs of the forest raise their scarred and bleached limbs towards the sky—a mute protest against a cruel and undeserved fate—mute did I say; not altogether so, for on a windy night they may be seen waving their ghostly limbs and heard mourning to each other with many a dismal groan.

Lower Trout Lake is four miles long and very narrow. Its greatest width not being over half a mile. It is surrounded by bold and rocky shores clad with second growth poplar and birch and the ghastly and skeleton rampikes I have just spoken of. While paddling down this stretch we caught another large maskinongé, twenty-five pounds in weight. This one also was despatched by pistol bullets, not concussion. There is a considerable difference among authors as to the correct name for this fish. I have seen no less than eight different methods of spelling it. Among them may be mentioned “Masqu' allongé,” “Maskinonge,” “Muskellunge,” “Muscalinga,” “Masquinongy,” and “Muscanonga,” the most likely one is Masqu' allongé, meaning long face, it is a French translation of the Indian words Masca-nonga, long snout. Masqu' allongé (*Esox estor*) of twenty pounds weight are common and they have been known to attain a weight of seventy pounds with a length of six feet. They prey upon other fish and it is not uncommon to find one of several pounds weight inside them. In fact in the first one we caught was found a brook trout about twelve inches long and  $\frac{3}{4}$  of a pound weight.

Lower Trout Lake makes its exit into Lake Talon by way of the “Lost River” but as this road is four miles long with five rapids in the first two miles, it is easier and shorter to get into Pine Lake by way of the Portage de la Mauvaise Musique and from Pine Lake to Lake Talon by Portage des Pins. Lake Talon (or Tallow, as the natives call it) is 31 feet below Lower Trout Lake, and is an uninteresting lake some seven miles long with an average breadth of a little over half a mile. With the exception of parts of the northern shore where slopes of semi-hardwood are to be found, it is surrounded on all sides by bold rocky shores, covered with second growth poplar and birch and the everlasting rampike. Along the south shore the blueberry grows in the greatest profusion and to a very large size. Champlain in his voyage of 1615 makes mention of this profusion of blueberries. The chief feature of the Lake, however, as far as we were concerned, was the homestead of an English gentleman named Grasswell who has settled on a narrow strip of land about the centre of the north side, and who gave us a kind invitation to visit his establishment.

Mr. Grasswell gave us some kind information about the Mattawa

River, over which he had travelled a couple of times. His information was Job-like and comforting. He said that the Portage du Talon, the first portage we should come to, was the very worst he had ever encountered, and that Le Grand Parresseux, further on was not quite so good.

It had rained in the morning, but about noon the sky cleared, the sun came out and all nature seemed to smile as we glided between the steep banks of the Mattawa River, the outlet of Lake Talon. The scene had changed with a vengeance. We were now slowly moving between high rocky bluffs 150 to 200 feet high. The warm color of the cliffs, the dark green of the pines, the bright green and yellow of the birch and poplar mingled with autumnal tints, formed a picture all light and colour, while the bold jagged rocks and complete silence all around made the scene very grand.

Half a mile brought us to Talon Chute, the largest fall on the river, which drops at this point forty-two feet. Here all was life and activity for a large gang of men was at work building a timber slide—not a small affair like you see by the side of the Gatineau, but one large enough to accommodate whole logs of any size.

With fear and trembling the canoes were unloaded and this terrible portage commenced, but as is usually the case the old proverb "The Devil is not so black as he is painted" held good, for though rough and rocky and up and down hill, an hour saw us safely on the other side. Crossing Pimisee Lake, a sunny expansion, we descended without trouble the Pimisee Rapids, being merely shoals, the water rippling between the stones with no more force than in a brook. That night we camped at the head of the Boileaux Rapids. On the portage here is a grave with a rude cross at its head, carved roughly, with the inscription "Antoine Joli, drowned 1870." We afterwards learned that he was foreman of a gang of river-drivers, and that similar graves might be found on almost all the other portages along the Mattawa River.

To proceed, passing the Boileaux and Petit Parresseux Rapids you arrive at the Grand Parresseux, where, according to Mr. Grasswell, the portage was not quite so good as the worst he had ever met in his life. It was all our friend had described it, but by this time an obstacle could stop us, and soon we were across with all our goods and chattels. Le Grand Parresseux is a very pretty fall of some thirty-four feet, almost perpendicular. The Mille Roches Rapids and mouth of the Amable du Fons River were next passed and the stream began to get wider and the rapids wicked.

In the Rose Rapids we escaped with a few pails of water and the breakage of a paddle, and in the next—the Epines Rapids—sad to relate one of the canoes came to grief entirely. These rapids are shallow and the boulders and rocks in them very close together. In order to get down with loaded canoes it is necessary to get out into the water and pilot your canoe between the boulders. Sometimes you are up to your knees in water, sometimes you are up to your neck; you stub your

toes; you skin your knuckles and almost break your neck as you stumble along—all the while the roar is sounding in your ears and confusing your senses, and the rush of water is doing its best to carry you off your feet, and finally if you do n't look out you are into a hole and then you have to swim for it. This was just what happened, the man in front took a header, the man behind lost control, the water caught the canoe, turned it sideways, poured in and then—chaos. Next morning's sun shone serenely on articles of clothing, tea, fish-hooks, rice, matches, sugar, ammunition, oatmeal, blankets, pepper, books, salt, etc., etc., with which the surrounding rocks and bushes in all directions were covered. Memo. of loss—1 boat, 1 stocking, 1 surveyor's compass, 1 pipe, 1 sponge, 1 paddle, 1 set of maps and 2 letters from Mr. Grasswell to his daughter at Mattawa.

The balance of the river between the the Epines Rapids and its junction with the Ottawa, some seven miles, lies for the most part between high rocky banks and is very pretty, especially in the neighbourhood of Boom Lake, a small expansion a mile long. Well; anyway, one fine afternoon about five o'clock, we ran the rapids beneath the little wooden bridge that spans the Mattawa at its mouth, much to the amusement of a crowd of loafers on the bridge, who had seldom, if ever before, seen such dainty little craft on their waters—for our blue and green Peterboroughs, with their flags gaily flying, showed to considerable advantage over the dull coloured and squat birch-barks of those regions, and almost before we were aware of the fact we were swiftly flying down the Flat and the first dip of the Burritt's Rapids, and had camped on the right bank of the "Grand River" just below the little village of Mattawa.

How changed everything was now, and into what insignificance the little Mattawa had shrunk! Looking ahead the shining water might be seen for a mile or two, lying in a deep valley that ended abruptly in a towering hill, as the river bed turned south, and was lost to sight. Everything was on a grander and more magnificent scale than anything we had yet seen, while about half a mile away a streak of white foam showed where the second dip of the Burritt's Rapids stretched across the river.

Did you ever run a rapid? No? Then you have never experienced the most intense excitement and keenest enjoyment that can be obtained in this ordinary every-day world. To prove my statement, you know what a stolid unmoveable being the North American Indian is; how phlegmatic, how indifferent under the most unusual and trying circumstances. Now in a rapid I have seen Indians' eyes dance with excitement, and heard them shout like very children; and these were men whom no other circumstance could move in the slightest degree. Nor is it to be wondered at, for there is always an uncertainty about it that makes the run exciting. You see ahead the white foam extending in a line across the river, marking the beginning of the fall. If you don't know the rapid and are wise you will go ashore and

take a look at it, picking out a course and impressing it well upon your memory. At the place you have chosen for your entrance the smooth water runs into the broken in the shape of a V, and you point the bow of the canoe for its apex. Very little steering is required; the slightest turn of the paddle in the swiftly rushing water and the canoe answers the demand. All is motionless; not a breath is stirring; you seem to be standing still. But take a glance at the shore. See how the trees and rocks and ground are flying by in one continuous streak.

And now you have reached the apex. One moment all is steady as a rock; the next, wild confusion reigns supreme. Currents here; eddies there; disorder every where. And see! you are rushing right on a boulder—you strike! But no! A quick turn of the paddle, a long drawn breadth, and it flies by—a narrow shave; but in a rapid a miss is as good as a mile. And now you are in the surges near the foot, the water is boiling and bubbling on every side—spray is flying in the air like myriads of diamonds as it glitters in the sunlight; the roar is sounding in your ears, you feel like a hero, ready to do or dare anything, only for one moment, the next you are quietly floating up the eddy below, waiting to see your comrades take the run, and feeling that it is over, but that in the last few moments you have had a lifetime of pleasure.

Passing without difficulty Timmon's Current and the Rocky Farm Rapids, a stretch of ten miles lays between the last mentioned and the Levier Rapids. Certainly at no other season of the year could we have made the trip to such advantage from a picturesque point of view. The banks on either hand were high, rising on the north side to an elevation of between three and four hundred feet. Not a ripple stirred the glassy sheet of water between them. The whole scene represented a most wondrous wealth of colouring. The bright yellow of the poplars, the dark red and green of the scrub oak and tall pine, the bright crimson of the bush maple, the light green of the untouched poplar, the dull brown of the ground, and slaty grey of the rocks, streaked with the white stems of the silver birch—above a blue sky fleeced with white—below an almost identical reflection of it—presented such a brilliant and many-coloured picture as to be almost bewildering, and yet the whole was blended in such perfect harmony that one could not help crying mentally, "Oh, nature, where is the artist who can compare unto thee?"

Often while paddling along I have striven to remember where I had ever seen any resemblance to it, and my mind has gone back to old times in the Wicklow Mountains, where on a bright hazy day almost every shade of blue might be seen, from the darkest slate to the brightest azure, tinged here and there with pink from the thick growth of heather; and yet, though I am truly loyal to my native land, and maintain that Ireland can hold its own with any country in the world for scenery, I am fain to confess that autumn on the Upper Ottawa has been a great blow to my pride in that respect.

The Levier, Trou and Deux Rivières Rapids are all within a short distance of one another but by means of tracking and portaging were safely passed. Tracking in this case means lowering the canoe down along the edge of the rapid by means of a rope

The Trou Rapids, so named because here part of the river rushes with tremendous velocity through a narrow cleft in the rock resembling a trough, gives a splendid idea of the gigantic power of water. You have doubtless seen the Chelsea Rapids at flood tide on the Gatineau. The Deux Rivières Rapids at low water bear a striking resemblance to these. I asked a river driver if they ever ran them in their big buns, "No" he replied "not unless they get into them and can't help it."

At the head and foot of all the Ottawa rapids the waters are perfectly alive with fish—a species of whitefish, I believe. Up there they call them shiners. They rise at flies in all directions but cannot be caught by bait or spoon. You see a faint ripple on the water, a fin and tail appear for an instant and disappear without the slightest noise or splash. They make one think of sharks with their smooth, noiseless movements. A few yards of fine netting and the larder could be stocked in a few minutes.

Between the Deux Rivières Rapids and the Roche Capitaine the most gloriously coloured scenery was passed through—seen in a painting it would be called extravagant, ridiculous, absurd.

It was marvellous. All around was one panorama of red of every conceivable shade, from deep maroon to delicate salmon—yellow, from deep orange to pale chrome, and green from dark myrtle to bright emerald. It was like being in fairy land, and each turn of the river brought it before us more vividly.

The Roche Capitaine is the ugliest rapid between Mattawa and Ottawa and took an entire day to traverse. To quote from Sir William Logan's report: "The river with a strong current above presents in middle distance and lower down, a fierce, violent and crooked rapid which obstructing ledges at the elbow split into several narrow channels, driving the main body round a great cauldron-shaped space where the rocks on the right are swept clean of nearly all loose material." At the elbow spoken of by Sir Wm. Logan is a great rock called the Captain's Rock. Lower down these rapids are known as the Maribou Rapids. There are eight dips in all and the distance covered between three and four miles.

As we advanced the scenery became still more worthy of rapture, and we were fairly struck dumb with admiration and wonder that anything could be so lovely. I cannot begin to describe it. Every bend of the river seemed more beautiful and the colour brighter and more varied than the last, and the view behind still more worthy of ecstasy than the one in front.

Three miles beyond the Village of Rockcliff the Riviere du Moins joins the Ottawa from the north. The entrance looked very grand. On the right hand side is an immense hill, four or five hundred feet high.

The Joachim Rapids passed, chiefly by portaging, we found ourselves in the part of the Ottawa known as the Deep River. While paddling down this stretch an animal of some sort was seen swimming ahead, and at first was taken to be an otter; closer inspection, however, showed it to be a squirrel boldly striking out for the north shore: there was quite choppy water on the river at the time, and what must have been to him great waves. The little chap showed great judgment, for instead of striking directly across, by far the shortest road, he was swimming diagonally with the wind and waves.

The river here is fully a quarter of a mile wide, and the course taken by the squirrel much longer. It was the first time I had seen a squirrel swim, and was much surprised. Some years ago, at Collingwood, on the Georgian Bay of Lake Huron, we had an inundation of squirrels. There is a good deal of lumbering done in that part of the country, and with certain winds the Bay is covered with edgings and pine chips, which are, in the general order of things, thrown on the shore. At the time I allude to, every edging and chip had its occupant and some times two or three. The whole place was overrun with them, and you could not pass a bush or a stump without startling two or three. But though they proved such fearless little voyageurs, I never saw one of them swimming before.

Misfortune again; another boom, and on the wrong side, of course. In this case, however, misfortune was good fortune, for a good natured boom-keeper not only opened a gap to let the canoes through, but also presented us with a couple of fish—a pike and a sturgeon, caught the night before with a jack lantern and spear. The average weight of pike (*Esox lucius*) is from five to ten pounds, but in the big lakes this fish reaches a much larger size. It is not a good fish to eat, as it frequently has an earthy flavor. It is most easily caught with the troll. The pike is noted for its voracity. It will gulp down almost anything it can.

The sturgeons are inhabitants of the ocean, Mediterranean, Red, Black and Caspian seas. The species found in the Canadian Lakes, and in the spring time in the larger rivers flowing into these lakes is *Acipenser rubicundus*. The Mouth is situated beneath the snout, is small, retractile and without teeth. There are several fleshy barbels beneath the snout. The body is defended by hard, bony plates. I have been told by Indians on the Mississaga River, north of Lake Huron, that they have been caught there with the spear as much as five and six feet in length. In the Black and Caspian seas sturgeon attain the length of twenty-five feet, and a weight of over two thousand pounds. The roe constitutes the caviar of commerce. The flesh is strong tasting unless the fish are quite young, when it is very palatable. In former days it was considered a great delicacy at any time.

After a while the deep river opened out into Allumette Lake, and a beautiful sheet of water it is. Near the Upper end is situated the old Hudson Bay Post of Fort William, at the present time a small

collection of white houses, with the deep, old-fashioned Hudson Bay Company roof, showing up in a most striking manner against the dark back-ground of a pine grove.

The largest portion of Allumette Lake is taken up by Allumette Island—the island of the Algonquins, for it was here that in olden days Champlain found several tribes of that nation, who had come there to be safe from their enemies, as here they were protected by the dangers and difficulties of the Calumet rapids further on. This island was the furthest point reached by Champlain in his first voyage up the Ottawa in 1613. He was induced to make the trip by the representations of one Nicholas de Vignan, who had spent the winter of 1611 with the tribes on Allumette Island. At the foot of Allumette Lake are the Allumette Rapids.

The Pauquette Rapids, at the foot of Allumette Island and the entrance to Lake Coulonge, are over a very curious formation. The river here rushes over an immense limestone slab full of deep holes and crevices. The surface of the rock has been worn by erosion to a state very much resembling brain coral, and is very uncomfortable to walk on in bare feet as we found to our cost. I should say that this was a very paradise for fossil hunters, but Messrs. Stewart and Sowter can tell you more about that than I can, as I understand they were in that neighbourhood last summer.

Coulonge Lake, in fact, I may say the remaining distance to Chats Rapids, was made in a thick shroud of fog and wood smoke combined, and the greater part of the way, as far as scenery was concerned, was a blank, progress being made by groping along the shores.

The Chats Rapids, or rather Falls, divide Chats Lake from Lake Deschenes. They are so called on account of the abundance of wild cats that in days gone by frequented the Falls and vicinity.

To my mind, with the exception of the "Big Kettle," the Chats is the grandest fall on the river. The main body of water pours into Deschenes Lake with a drop of some 37 feet, which may be seen from a distance of several miles down the lake like a white wall.

The most interesting part of the fall, however, is the left near the portage. Here the Ottawa River Improvement Company have blasted out a channel sixty feet in width, through which the water rushes with tremendous force. The whole is a seething, boiling, bubbling mass, and woe betide the unlucky one who should ever get into it. It is very grand to look at, and as the surroundings are jagged rocks, capped with cedar and spruce, the whole has a wildly picturesque look that is very fascinating. Looking at this raging torrent one can quite realize how the big logs seen on the quiet river below the Chaudiere come by their bruises.

As the tract between Deschenes Falls and Ottawa lies within the jurisdiction of the Field Naturalist Club, I do not intend to speak of it. Suffice it to say that, having combated rain, wind, and rough weather for two days, we found ourselves at last camped in the Grove at Britannia.

At the conclusion of his most interesting paper, Mr. Wheeler was loudly applauded. As given above, it is much curtailed from the original, many historical references having to be omitted for want of space.

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ON THE SEQUENCE OF THE GEOLOGICAL FORMATIONS  
ABOUT OTTAWA, WITH REFERENCE TO THE  
NATURAL GAS QUESTION.

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BY HENRY M. AMI, M.A., F.G.S.

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(Read February 2nd, 1888.)

In geology, as well as in other branches of physical research, it is often advisable and useful to look back for a moment and sum up the evidence and facts which naturally accumulate in the work of investigation carried on in a particular district.

Much has already been published respecting the leading geological features of Ottawa. As far back as 1851 we find that Mr. Alex. Murray, assistant-geologist to Sir Wm. Logan, at that time carried on his geological explorations in this very district.

The results which were obtained by Mr. Murray, and in subsequent years by Sir William himself, as well as by others on his staff, were embodied in the admirable Report for 1863, entitled "Geology of Canada," and the various geological formations noted were indicated on the "Geological Map of Canada" for 1866. This map gave the geographical distribution of the geological formations of the Ottawa district, with their boundaries, and with such accuracy of detail as the facts at their disposal then allowed.

In the "Canadian Naturalist and Geologist," first published and edited in Ottawa by the famous late Mr. E. Billings, that eminent writer described in classic language the various features which his hammer and mind revealed to the scientific world. His researches in palæontology are eminently well known in every portion of the globe, and are a lasting monument to the progress of science in Canada during that part of this century in which he flourished. The "Decades of the Canadian Geological Survey," and the "Palæozoic Fossils," contain innumerable descriptions of fossil species which Mr. Billings had dis-



covered in this very district and elsewhere, from which an exact idea of the fauna which characterized the old Silurian seas about Ottawa could be had. The researches about Ottawa have, since the demise of that excellent palæontologist, been followed up with marked success by his nephew, Mr. Walter R. Billings, of our Club, and from that time, when the O. F. N. C. was organized, new and interesting results have been obtained regarding the completion of the geologic history of this district, a number of active workers having arisen, in whose hands there is a large store of work to be done as yet.

One of the first contributions to the geology of Ottawa, in the transactions of the Club, was the timely and interesting address delivered by Dr. A. R. C. Selwyn, the able director of the Geological Survey, on the "Geology of the Ottawa Palæozoic Basin" (see Trans. O.F.N.C., Vol. III., page 34, *et seq.*). There is there given a graphic and instructive account of the various formations existing in the basin in question, which were deposited under such favourable circumstances on the shores and in the greater depths of those old palæozoic seas.

During the past nine years, the writer has had many opportunities, both as a member and leader in the geological section of the Club's work, to examine the geological formations of the district and enter into numerous details of structure, more interesting and instructive perhaps, than remunerative, nevertheless of considerable value in working out the geological history of Ottawa. With a view of giving in a concise and practical manner the result already obtained, it has been thought that a table or schedule might better illustrate the same than a detailed description.

The question of natural gas occurring or not occurring in the strata of the Ottawa district has been and is still being freely discussed—a question of considerable import from an economic standpoint and one which has given rise to this paper, written with a view of giving those interested in the matter a general idea of the succession of the rock formations as they are known in this vicinity. There are many problems involved in discussing the likelihood of gas occurring in a certain district. The characters of the strata, its thickness, composition, mode of occurrence and its distribution have everything to do with the occurrence of gas. The result of experiments made in other parts of the world, and especially in the United States, show that gas occurs in rocks of almost any age in the history of the earth, and in comparing the rocks of the Ottawa district with those of similar age

and origin in the States which are known to afford natural gas, even there do we find questions of detail and structure coming in which prevent anyone from making the rash statement that it does or does not occur here. For example, whilst it is well known that the Trenton formation in several places yields natural gas—nevertheless, it does so when the limestones of that rock-formation are dolomitic (Prof. Orton), which character we know does not apply to the Trenton as it is developed about Ottawa. It is also a remarkable fact that, besides the three great faults or dislocations indicated by Sir Wm. Logan (“Geology of Canada, 1863”) which affect the geological structure of the rocks here, there are large numbers of smaller ones which constitute a more or less parallel series of breaks of great importance in working out the geological structure of the country, and which act as so many chimneys or openings whence natural gas may have been escaping for ages past, had the strata ever been impregnated with this substance. Whilst the writer would be pleased to see natural gas occurring in large quantity and easy of access for manufacturing and other purposes, and whilst there are many points occurring in the geology of Ottawa which make it desirable that borings be made to ascertain if gas really does occur in paying quantities; nevertheless, the result of his researches lead him to conclude that there are undeniable evidences which point to the likelihood of gas not occurring in quantity about Ottawa. A bore sunk through the Hudson River, Utica and Trenton formations would soon reveal the fact of its occurrence, yes or no.

Should natural gas be struck however, the formations which would, from their peculiar composition, be most likely to afford that useful material—are the Utica and Trenton formations. These two are highly bituminous. (See table.)

The following table has been prepared with a view of giving at a glance and in chronological order the different rock formations met with. It does not by any means profess to be exactly accurate, still it has been drawn up from the evidence obtained in the field at the excursions and sub-excursions of this Club.

These rock-formations divide themselves into three grand natural divisions as they may be seen in the field, belonging to three different ages or epochs of the earth's history :

- I. Post-Tertiary or Post-Pliocene.
- II. Cambro-Silurian or Ordovician.
- III. Laurentian or Archæan.

The local development of the second division, viz., Cambro-Silurian system include a series of formations which succeed one another in perfect unbroken sequence from the Hudson River formation above to the Potsdam sandstone below. For reasons, palæontological and stratigraphical, which it is not within the province of this paper here to discuss, the writer has placed the Potsdam and Calciferous formations along with the other overlying series into the Cambro-Silurian System, rather than class them along with the Cambrian System.

TABLE SHEWING THE ROCK FORMATIONS ABOUT OTTAWA CITY, IN THEIR NATURAL ORDER.

SYSTEM.	FORMATION.	CHARACTER OF STRATA.	FOSSILS.	THICKNESS.
POST-TERTIARY	Alluvium, shell-marl, fine grey sande, lake and river gravels.	River and lake alluvium, sands and clays, shell-marl (white clays), abundant low beaches, stratified gravels	Recent fresh water shells, plants and other organic forms. Pre-historic remains of Aborigines, along with <i>Castor fiber</i> , <i>Arvicola virginianus</i> , <i>Lamona patula</i> , &c., &c.	Varies from 0 to 50 feet in different places.
	Saxioava Sand(marine)	Marine sand.	<i>Saxocera pupula</i> , <i>L. Vates affinis</i> , <i>Gmel</i> , <i>Leda</i> ( <i>Portlandia</i> ) <i>arctica</i> , <i>Gray</i> , <i>Phoca Greenlandica</i> and <i>Melilotus villosus</i> <i>C. insecis</i> , star-fishes, foraminifers, &c.	Varies from 0 to 6 feet and more.
	Leda clay (marine)	Chiefly stiff blue clay, with occasional nodules, boulders and sandy portions	<i>Leda</i> ( <i>Portlandia</i> ) <i>arctica</i> , <i>Gray</i> , <i>Phoca Greenlandica</i> and <i>Melilotus villosus</i> <i>C. insecis</i> , star-fishes, foraminifers, &c.	Varies from 0 to 120 feet and more.
	Boulder clay	"Till," <i>moraine profonde</i> , glacial deposits.	No fossils discovered.	Varies from 0 to 30 feet.
	Hudson River	Buff-weathering calcareo-arenaceous shales and limestones	<i>Zygospira Heidi</i> , <i>B. Ambouchites radiata</i> , <i>H. Critolica</i> , <i>Orthis</i> , <i>Con. Modiolopsis pholidiformis</i> , <i>H. Ortho</i> , <i>Leptorhynchus fuscoides</i> , <i>H. Ortho</i> , <i>quadrifurcatus</i> , <i>Siphonotrota</i> , <i>Scoletica</i> , <i>Dav. Triarthrus spinosus</i> , <i>B. Asaphus Canadensis</i> <i>C.</i> , &c., &c.	About 20 feet (known), probably thicker.
	Utica	Black and brittle bituminous shales and limestones	<i>Prasopora Selwyni</i> , <i>N. Glyptocrinus ramulosus</i> , <i>B. Pleurocyathites squamatus</i> , <i>B. Anazyga recurvirostra</i> , <i>H. Murchisonia bellioincta</i> , <i>H. Asaphus platycapulus</i> , &c., &c.	From 60 to 75 feet.
	Trenton	Nodular and evenly bedded for the most part light-coloured limestones, with occasional shaly measures, in part bituminous.	<i>Trematidium spiracum</i> , <i>S. Colimmarin</i> , <i>Conocleus anceps</i> , <i>H.</i> ; <i>Bathyurus</i> <i>exaltatus</i> , <i>H.</i>	Between 400 and 500 feet.
	Bird's Eye and Black River.	Hard, compact, impure fossiliferous limestones.	<i>Lepardittia Canadensis</i> , <i>Jones</i> , <i>Cryptozoon</i> (?), <i>Orthoceras</i> sp., <i>Lingula Bellii</i> , <i>B.</i> ; <i>Modiolopsis parviscula</i> , <i>B.</i>	About 200 feet.
	Chazy	Limest nes (cement-rock)	<i>Orthoceras</i> sp., <i>Modiolopsis parviscula</i> , <i>B.</i>	200 feet.
	Calceiferous	Sandstones and sandy shales.	<i>Orthoceras</i> sp., <i>Asaphus Canadensis</i> , <i>B.</i> , <i>Ophileta compacta</i> , <i>S. Murchisonia</i> , <i>Annas</i> , <i>B. Litvites Apollo</i> , <i>B. Orthoceras Lamarcki</i> , <i>B.</i>	250 to 400 feet.
Pots lam.	Passing downwards into arenaceous rock.	<i>Ophileta compacta</i> , <i>S.</i> ; <i>Orthoceras</i> sp., <i>Scolithus Canadensis</i> , <i>B.</i> , <i>Climactichmites</i> , &c., &c.	About 200 feet.	
LAURENTIAN or ARCHÆAN.	Laurentian (Lower) of Logan.	Sandstones and sandstone conglomerates		
	Granitoid gneisses, pegmatite, diorite, crystalline limestones (newer), &c., with apatite, graphite, iron ores, garnet, Jasper, salmon-barytes, gold, &c.	Granitoid gneisses, pegmatite, diorite, crystalline limestones (newer), &c., with apatite, graphite, iron ores, garnet, Jasper, salmon-barytes, gold, &c.	<i>Eozoon Canadense</i> ( <i>Dawson</i> ). (In limestones)	16,700 feet, according to Logan.



## SUMMARY

— OF —

# Canadian Mining Regulations.

## NOTICE.

THE following is a summary of the Regulations with respect to the manner of recording claims for *Mineral Lands*, other than Coal Lands, and the conditions governing the purchase of the same.

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therein, either by surface or subterranean prospecting, for mineral deposits, with a view to obtaining a mining location for the same, but no mining location shall be granted until actual discovery has been made of the vein, lode or deposit of mineral or metal within the limits of the location of claim.

A location for mining, except for *Iron* or *Petroleum*, shall not be more than 1500 feet in length, nor more than 600 feet in breadth. A location for mining *Iron* or *Petroleum* shall not exceed 160 acres in area.

On discovering a mineral deposit any person may obtain a mining location, upon marking out his location on the ground, in accordance with the regulations in that behalf, and filing with the Agent of Dominion Lands for the district, within sixty days from discovery, an affidavit in form prescribed by Mining Regulations, and paying at the same time an office fee of five dollars, which will entitle the person so recording his claim to enter into possession of the location applied for.

At any time before the expiration of five years from the date of recording his claim, the claimant may, upon filing proof with the Local Agent that he has expended \$500.00 in actual mining operations on the claim, by paying to the Local Agent therefor \$5 per acre cash and a further sum of \$50 to cover the cost of survey, obtain a patent for said claim as provided in the said Mining Regulations.

*Copies of the Regulations may be obtained upon application to the Department of the Interior.*

**A. M. BURGESS,**

Deputy of the Minister of the Interior.

NOV 1 3 1886

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