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BULLETIN
 OF THE
 NATURAL HISTORY SOCIETY
 OF
 NEW BRUNSWICK.

No. III.

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SAINT JOHN, N. B.
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ARTICLE I.

CONVERSION OF LIGHT INTO HEAT.

BY LEB. BOTSFORD, M. D.

(Read 27th January, 1884).

THERE are but few physical facts more definitely settled and accepted, than that of the conversion of motion into heat. So thoroughly is this understood, that, given the volume of matter, and the velocity of movement, the amount of heat evolved from a sudden stopping of the moving mass can be very accurately ascertained.

The great cold which exists in the upper air sufficiently shows that the rays from the sun do not produce any sensible rise in the temperature of the atmosphere, and that it is chiefly when the rays of light approach the surface of the earth that heat becomes developed, first in the objects against which the light strikes, then indirectly in the air by contact with those substances which have been heated by the sun's rays. Air also may be artificially heated. No doubt can enter the mind but that heat is developed by the action of the direct rays, and man and beast alike seek shelter from its effects in the cooler shades.

Light, we all know, is the result of vibrations in a medium infinitesimal in its tenuity, and passes along with great velocity. If these vibrations should be stopped by any material substance, then they must either cease to exist altogether, or manifest some condition of force which could be stated as their equivalent.

To ascertain what one of the new conditions might be, a few experiments were made, of which I give you the result.

Three glass test tubes were used, each holding about an ounce of fluid. When equally filled, they were first placed in a vessel of water until they all showed the same degree, about 64° F. The air ranged at 65°. The three tubes were then exposed to the direct rays of the sun. One tube was filled with a black solution of India ink. Another with a solution of iodine, the color of brandy; the third with a light yellow fluid.

FIRST EXPERIMENT.

	INDIA INK.	IODINE.	YELLOW.
After the 1st 5m.....	72	69	68
“ 2nd “	73	70	69
“ 3rd “	74	72	72
“ 4th “	76	74	73

SECOND EXPERIMENT.

First tube black, the second blue, from sulph. copper, the third a yellow tinge.

	BLACK.	BLUE.	YELLOW.
5m 1st observation	72	69	68
2nd “	74	72	70

THIRD EXPERIMENT.

	BLACK.	YELLOW TINGE.	WATER.
1st observation	72	70	69
2nd “	75	72	70
25m 3rd “	80	74	72
45 4th “	80	75	74
1.30 5th “	84	76	76

The black tube caused a shadow like any solid substance not transparent, the iodine solution a modified one, and the third still less. In the third experiment, when water was used, the shadow was slight, showing the passage of the light through the tube and water. In the three experiments, the heating of the black liquid was more rapid and decided, and in the third experiment, when one tube contained the ink, the second water, and the third water slightly tinged with the yellow, the black tube showed a decided susceptibility.

The conclusion to be drawn from these experiments would appear to be that the absorption or cessation of the light vibrations was the cause of the increased temperature, or in other words the vibrations of light-motion were changed in proportion as they were stopped into a correlated force, namely, heat.

Another experiment was made to test the rate of cooling of different colored liquids.

The three tubes, one of ink and two of water, were placed in a vessel of water heated to 110° F., and when heated up to that point were placed under equal conditions. After five minutes all three had cooled down uniformly, and at the end of a half hour all stood at 74° F.

From this experiment it was evident that direct vibrations *from* the black fluid and from water did not differ, and that the cooling took place probably from the *contact* of the tubes and their contents with the surrounding air ; that the heat was abstracted chiefly by a medium acting equally upon the tubes ; that dark substances or fluids do not radiate more rapidly than colorless fluids, and that the heat does not pass off in the kind of vibrations which constitute light its correlated force, but follows the law of direct contact.



ARTICLE II.

DISCOVERIES AT A VILLAGE OF THE STONE AGE
AT BOCABEC, N. B.

BY G. F. MATTHEW, M.A., F.R.S.C.

(Read 5th February, 1884.)

A NUMBER of the members of this Society combined to form a Summer Encampment in Charlotte County for the purpose of studying, during a short vacation, the Botany, Zoology and Archæology of a locality in that County. As the work in the last-named branch of study was entrusted to me, it becomes my duty this evening to tell you of the result of our investigation in the kitchen-middens at the place referred to.

First, however, I may mention that our party left St. John by the Grand Southern Railway on 6th August last, and were joined at our destination by other members of the Society from St. Stephen and Queens County.

To the Manager of the Grand Southern Railway we owe our thanks for carrying the party at reduced fare, and for transporting our outfit free of charge; and to George F. Hibbard, Esq., and Mr. Alexander Boyd for much kindness and attention during our stay in St. George and at Bocabec.

DESCRIPTION OF THE VILLAGE SITE AND ITS SURROUNDINGS.

The spot chosen for investigation was a group of kitchen-middens or shell heaps which mark the site of an abandoned village of the Stone Age at a place called Phil's Beach, near the mouth of the Bocabec River. The site was well chosen, for the advantages of the place to a people who depended for existence on hunting and fishing are manifold. A clay flat, flanked on the west by a long protecting hill of felsite rock, running parallel to the course of the Bocabec River, and on the east by a similar ridge which separates this river from Digdeguash Inlet, was the spot chosen for the principal settlement. To the north of this clay flat, where there is now an open field, the standing forest

broke off the keen winds of winter ; and to the south was the sea-beach, where drift wood in abundance was thrown up, and where boats or canoes could be kept, secure from the rising and falling tide.

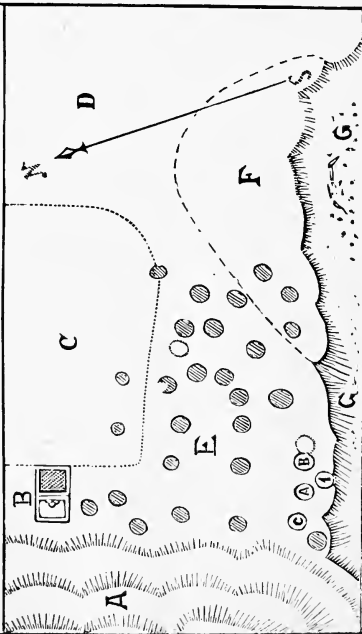
The tide rises from twenty to twenty-five feet at this place ; and as the lower half of the beach is stony, it is probable that the savages who dwelt here obtained their principal supplies of shell-fish at some other point. A sandy beach, and therefore one more suitable for clams, exists on the river about half a mile further up than Phil's Beach ; and extensive sand-flats abounding with these bivalves are found around the shores of Hog Island, off the mouth of Bocabec River. These sands, below the surface, are black with organic matter accumulated by the decay of marine animals (clams, &c.), and would be valuable as a fertilizer of the clay fields found in the valleys along these shores. Sea-fish and marine animals no doubt abounded then, as now, along the whole of this river. Herring and other fish are now taken in great quantities in the weirs at the mouth of the Bocabec.

The position of the aboriginal settlement at Phil's Beach was also very advantageous for hunting. The inhabitants of the village could float up with the tide three miles, to the head of navigation, whence they had a five mile range for hunting beaver and larger game on the branches of the Bocabec River ; or by going out of the River and passing around into Digdeguash Inlet a still more extensive woodland tract was open to them. From the mouth of the Bocabec they could also cross Passamaquoddy Bay in various directions in search of seals and sea-birds.

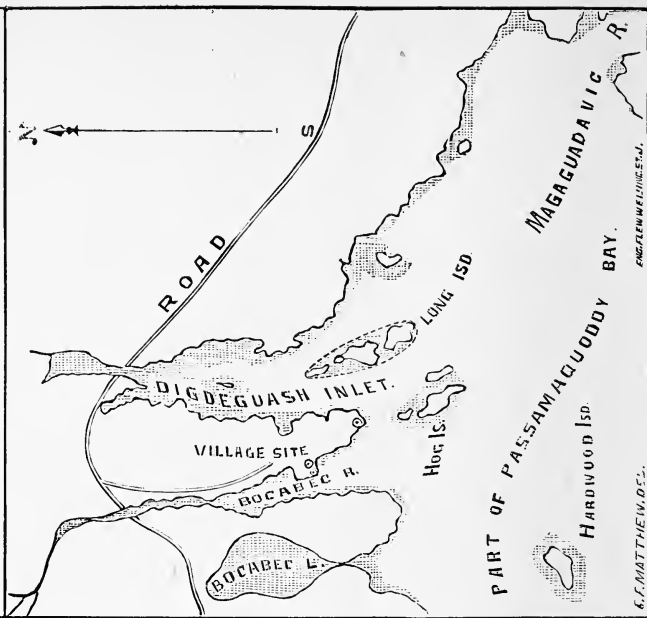
The position of this village was well chosen for defence. Its inhabitants appear to have had an outpost at the point on the eastern side of the entrance to the Bocabec River, whence a view could be had of all canoes approaching from the Digdeguash or Magaguadavic River, or the more open part of Passamaquoddy Bay. Another section of the settlement occupied a small beach on the Bocabec River a little farther up than Phil's Beach, and thus guarded the northern approach to the village.

To the east of Phil's Beach a spring of cool water flows over a low cliff into the sea, and would have given an unfailing supply of this necessary liquid to the inhabitants of the village. In the

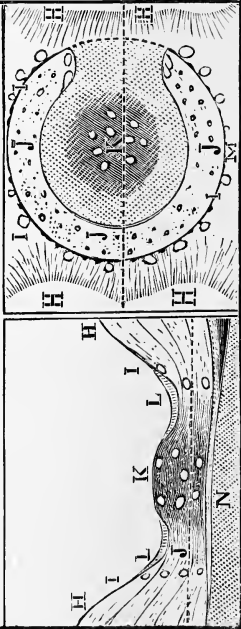
VILLAGE SITE AT BOCABEC.
SCALE 80 FEET TO AN INCH.



VICINITY OF BOCABEC.
SCALE 2 MILES TO AN INCH.



HUT BOTTOM "A"
GROUND PLAN
SECTION.



REFERENCE TO WOOD-CUT.

EXPLANATION OF VILLAGE SITE.

- A**—Rocky ridge on west side of village.
- B**—Ruins of "Phil's" House.
- C**—Area of plowed land,—level—covered by a layer of clam shells about 3-10 inches thick; here the hut bottoms are obliterated.
- D**—Swale—uneven surface, covered with weeds and bushes, and having scattered shell heaps.
- E**—Part of the village undisturbed by the plow. Kitchen-middens deep and hut bottoms distinct.
- F**—Low part of the swale, with irregular hillocks and shell heaps, now liable to be swept by the surf in heavy gales.
- G**—Gravelly sea-beach in front of the village.
The hut bottoms which have letters or numbers are those where the excavations referred to in this article were made.

EXPLANATION OF HUT BOTTOM "A."

- H**—Kitchen-middens before and behind the hut bottom.
- I**—Stones at the outer margin of the hut bottom.
- J**—Layer of beach gravel, used to raise the sleeping bench, outlining the form of hut bottom.
- K**—Fire-place, with charcoal, bones, sherds, etc.
- L**—Layer of surface mould.
- M**—Layer of pottery clay outside of hut.
- N**—Bed of clay (Leda clay) underlying the hut bottoms.

swale to the east of the village site, now cleared, but then probably wooded, a further supply of water was available.

Such was the general relation of the village of Phil's Beach to the surrounding country. A few words may be added as to the arrangement of the dwellings of which it was composed. On first surveying the ground, it was observed that the north side of the village site was comparatively smooth, having been under cultivation since the arrival of the English, and no inequalities remained that would indicate where the dwellings of the ancient inhabitants had been. On this smooth ground we pitched our tents, and found it admirably adapted to our purpose, being well drained by the layers of shells beneath. Fully one half of the site of the village, however, including the part on which the shells of the kitchen-midden were heaped together in the greatest quantities, had never been disturbed by the plow. Here the ground was covered with a growth of the Cow Parsnip (*Heracleum lanatum*) intermingled with other coarse weeds and grasses. This herbage extended to the extreme limits of the village site except on the north, where the land had been brought under the plow. In the western part of the shell-covered area, where the heaps of shells were most conspicuous, the presence of numerous saucer-shaped depressions indicated the positions of the huts of the aboriginal settlement. Over the greater portion of this uneven area no order or arrangement into regular streets could be observed. But near the sea beach, on the southern side of the village site, there was an approach to regularity in the position of the hut bottoms. The front row of huts appears to have been the favourite section for dwellings. Not only were the foundations of the huts more closely set in this row, but the refuse heaps both before and behind them are larger than elsewhere. The huts of this row were very closely set, with alley-ways between, in some cases only four feet wide; but the spaces between the huts further back were greater. Such at least was the arrangement of the huts in the later years during which this community existed. Not only were the huts more scattered in the rear part of the village, but anything like a systematic arrangement in rows entirely disappears after passing the third row from the front of the village.

Of the depressions marking the hut bottoms of the front row, which, as I have said, were more closely placed than those further back, one was much longer and deeper than the rest. This, at first sight, gave the impression of a long communal dwelling, and here we determined to begin our exploration. In digging a trench through a part of this depression we struck an ancient fire-place, which was made the centre of exploration for several feet around. It was found that at this point the deposit in the hut bottom was about two feet deep, but its fire-place rested upon an older kitchen-midden, or refuse-heap beneath.

HUT BOTTOM NO. I.—ITS ANTIQUITY.

The hut bottom of which the first named fire-place is the centre is distinguished on the plan as hut bottom A. The older shell-heap differs in several respects from that of hut bottom A; there was much less charcoal mingled with the shells, and fish-bones were more plentiful. When also we had traced this lower kitchen-midden in different directions beneath and beyond hut-bottom A, we found stone chips or flakes, which had been struck off in the manufacture of weapons, differing in kind from any that were met with at the higher levels. The weapons found in the lower kitchen-midden were also larger, coarser, and of a different form from those exhumed from the hut bottom and waste heaps of A. Fragments of bone harpoons were more plentiful at the lower horizon, the pieces of bone more fragile, and the stone chips more abundantly coated with carbonate of lime than at the higher levels. There were also differences in the patterns of the pottery found in the two deposits. The ornamentation of the fragments of pottery found in this lower kitchen-midden was made with a pointed instrument having a smooth round point, but that of all the pottery obtained from the higher levels was impressed with a tool having a square or angular point,—all seeming to point to a want of continuity in the arts and habits of the men of the older kitchen-midden, and those who made the shell-heaps and occupied the hut bottom of A; and it seems possible that the former belonged to a different tribe or race from the latter.

I am the more confirmed in this impression that there was an older and independent occupation of this camping ground, from the discovery near the edge of the bank, overlooking the sea

beach, in and beneath the oldest kitchen-midden, of an ancient fire-place, so situated that it must have belonged to a hut whose foundation has been partly swept away by the sea; and which was therefore erected and occupied when the bank extended further out than it now does, or when the inhabitants of hut-bottom A lived here. This older fire-place is marked on the plan as hut-bottom No. 1. It was planted on a fresh layer of gravel apparently spread over the original land surface by a storm or by the surf when the land was lower than it is now, as it fills up the inequalities between the stones which are scattered over the clay flat. There was but a film of vegetable mould between this gravel and the clay, from which it may be inferred that hut-bottom No. 1 marks a very early occupation of the site. The clay upon which the layer of gravel was spread, is the Leda or Champlain clay of geologists, and it does not seem likely that any very long time elapsed, after this portion of the land was raised above the sea, before it was occupied by man.

The foot-hold thus obtained at the sea-side by the dwellers of hut-bottom No. 1 seems to have been precarious, and when their successors came they placed their camps further back, and found a permanent site, safe from the encroachments of the sea.

HUT-BOTTOM A — ITS FORM AND THE HABITS OF ITS OCCUPANTS.

As I have already remarked, the site of hut-bottom A and its associated dwellings had on the surface the appearance of a communal dwelling, which was eight feet in breadth by thirty long. As our exploration progressed it was found that this oblong depression did not mark the foundations of a single hut but of several placed close together in a row. The exact form and size of the typical hut was disclosed by a layer of clean beach gravel, which we met with about fifteen (15) inches from the surface. This layer formed a ring around the fire-place, at a distance of from two (2) to three (3) feet from its centre, and was bordered all around by the shells of a kitchen-midden. The ring of gravel was about three (3) inches thick in its deepest part, and was continuous except on the south side where a break about four (4) feet long marks the position of the door. Here the ends of the gravelly layer were upheld or bounded by a few large stones.

This gravelly stratum was found to form the boundary of a hut bottom, less than one-third of the length of the whole depression occupied by the row of hut bottoms, and which had a diameter of eight feet. Around the margin of this foundation there were imbedded stones of various sizes that appear to have been used as supports or wedges for poles of which the frame work of the hut was composed. No remains of these poles or of any wood work was discovered which could be referred to the time when this village site was occupied by an aboriginal people.

There are two peculiarities in the foundation of this hut which would lead to the inference that the hut was conical. The first is the relation of the kitchen-midden to the gravel of the sleeping-bench. In making a trench through this hut-bottom, and others adjoining, sections of several layers of gravel marking such sleeping-benches were passed through at various depths in the deposit; and in all, the outer edge of the gravel of the sleeping-bench was found to be overlapped by the shells of the kitchen-midden as though the shells had fallen in upon the gravel after the decay of the poles which had supported the walls of the hut. A second feature in the appearance of this foundation, which seemed to indicate a conical form to the dwelling, was the width between the ends of the gravelly layer of the sleeping-bench of hut-bottom A. If this space corresponds to the width of the doorway it would be quite out of proportion to the size of such a dwelling, unless the doorway was rapidly narrowed above by the convergence of the poles supporting the sides of the hut.

The slovenly habits of the old Neolithic people who dwelt on the shores of the Bocabec were quite obvious, and certainly were favorable to the spread of disease among them. I have said that they underlaid their sleeping banks with gravel, and in this practice shewed their appreciation of the comfort of a dry bed. This couch they no doubt made softer by covering it with boughs, and warmer by the added luxury of fur-skins. Nevertheless, in some respects they were exceeding slovenly. The ashes and charcoal of their fire-places gradually accumulated to such an extent that to level up the sides of their huts they brought in gravel and threw it on the trampled clam shells and other *debris* of their feasts that were scattered over the floor. They were too careless to clean

out the smaller fragments of bones, etc., and so it happened that in the course of time the stones around their fire-places, which were used to support the firewood and the pots, were gradually buried up, and fresh stones had to be brought in to raise the wood above the embers and to support the cooking vessels. If the occupants of a hut were careless enough to break a pot, it was more than probable that the fragments would be allowed to lie on the floor and be trampled under foot until buried out of sight among the *debris* scattered around the fire-place. The bones left after dinner received much the same treatment. When the flesh was eaten off the leg-bones they were broken up for the marrow they contained, and, with the smaller bones, were left scattered around on the floor, or perhaps the larger fragments would be flung carelessly out of the door and left to fester in the sun. Occasionally a fit of house-cleaning would seize upon the occupants of one of these huts and the *debris* lying within on the floor would be scraped together and shovelled out at the door to mingle with the heap of shells and broken bones without. The evidence of these actions on the part of the inhabitants of hut A is found in the frequently alternating layers of charcoal mingled with broken bones, of pottery clay and other *rejectamenta* from the hut, which are found in the kitchen-midden before the door. These occur with considerable regularity and frequency in alternation with the layers of clam shells which form the bulk of the shell heap. Owing to these occasional house-cleanings, and the vast quantities of clam shells thrown down around these dwellings, the *kjökken-mödding* increased much more rapidly than the deposits within the huts; and although fresh material was frequently brought in to level up the interior of the huts, the boughs and perishable matter within gradually decayed away and the floors sank down, so that now the depth of the deposit within the site of the huts is only about half as great as that of the shell heaps without.

The fire-place of this hut was found to have been kept in the same spot from the time the hut was first built, almost until the settlement was abandoned. Such, however, was not the case with an adjoining hut-bottom (B), which was gradually shifted to the east, so that at the close of the occupancy of this village site it was about two feet from its original position. A similar want of

permanency in the position of the individual hut was found to exist in other hut-bottoms. The huts, therefore, must have been re-built from time to time, and perhaps were deserted for a part of the year.

There seems, however, to have been sufficient permanency to these hut-bottoms to warrant the assumption made in a preceding page, that each saucer-shaped depression in the kitchen-middens of this village marks the site of a hut.

From the present aspect of the surface of the kitchen-middens at this village site, a rough approximation to the population of Bocabec River during this latter part of the Stone Age may be obtained. In that part of the higher portion of the main village site which still remains undisturbed by the plow, there are depressions marking the position of about thirty hut-bottoms. Allowing four individuals to each hut, there would be in this part of the village a population of about 120. But behind this part of the village, which has been ploughed over, there is an area of about equal extent covered by shells; and an additional tract of about the same size, more or less covered by kitchen-middens, lies to the east of the higher part of the village site. A population of 300 may, therefore, at times, on the basis above given, have lived at the main village at Bocabec.

But beside this site, there were the two other small villages, one at the upper beach, and the other on the point to the eastward of the entrance of the river. Including the subsidiary villages, there may, therefore, at times, have been a population of 400 souls on the Bocabec; though it seems more probable that half this number would be a sufficiently large estimate of the people of the Stone Age, permanently located on this river.

It appears to have been the practice of the women who dwelt in hut A, to stow away their needles, pins, and other articles of use or adornment, at the back of the hut, and here they would occasionally slip down and be lost between the couch and the poles and stones of the outer wall. Several of the bone implements taken from this hut bottom were found in such places.

MANUFACTURE OF POTTERY.

One of the occupations of the women living at Bocabec was the manufacture of pottery. On the western side of hut bottom

A was a pottery-yard, or place of deposit, where the occupants of this hut kept a supply of clay for the manufacture of pots and earthen vessels. These people had ready to their hand, in the flat of land which they had chosen as a site for their village, a good tough clay, well suited for making pottery, when mixed with a due proportion of sand. Nevertheless, they do not appear in any case to have used it, but took the mud of the sea-shore, near low-tide mark, for the manufacture of their ware. Such I infer to have been the case, for in the course of our excavations we came across patches of pottery clay in various spots, and at several levels in the hut bottoms A, B and C, and kitchen-middens adjoining them, and in all cases the material thus used was beach-mud, mingled with numerous shells of mussel and clam. In preparing this mud for use, these women of the Stone Age picked out the coarser stones and gravel and many of the shells before moulding and baking their pots. But in consequence of the imperfections of the material used as the basis of their pottery, and the very imperfect firing to which the ware was subjected, it was exceedingly fragile. The coarseness of the clay used in the manufacture, as well as these defects in the material, and the imperfect baking, compelled these potters to make their ware quite thick, in order to obtain the necessary strength. Their vessels were seldom less than three-eighths of an inch thick in any part, except near the rim, and the bottoms were usually about half an inch thick. As I have already remarked, the women appear to have been slovenly in their housekeeping, and as an added instance of this trait I may mention that the charred remains of their pottage still cling to the fragments of their vessels. In the fine charcoal and ashes around the fire-place of hut bottom A were found numbers of parched peas, and of a round seed of the size of those of the radish, as well as grains apparently of some kind of grass. The peas were about the size and appearance of Beach Peas (*Lathyrus maritimus*, Big.), a plant which now grows plentifully at high-water mark on the beach in front of the village site.

But while animadverting upon their carelessness in some respects, it is only just to give them credit for a considerable amount of rude taste in the ornamentation of their pottery. Upon the fragments found at the three hut bottoms we examined there are no less than ten distinct designs or patterns impressed upon

the surface of the ware. Some of them are quite ornamental. A favorite style of ornamentation consisted in continuous parallel lines made with pointed tools; but a more elegant pattern was a chevron, consisting of rows of short diagonal lines impressed in this manner. We did not meet with any of the tools by means of which these patterns were impressed upon the pottery. A small implement with a square point seems to have been in common use, and another is indicated with several teeth by which certain rows of scalloped indentations were made. The lips of several of the vessels were ornamented with diagonal rows of indentations apparently made by an implement having three teeth.

Some of the patterns indicate a different process of manufacture from the last: these show the print of a coarse woven fabric on the outside of the vessel, and sometimes also within. On some fragments this pattern has the appearance of a fine basket work, and may have been used to preserve the form of the vessel, as well as to ornament the surface. On other pieces of the terra cotta the pattern very closely resembles that left on bread by the coarse osnaburgh used by bakers to cover their dough. Fragments of another pot were found which bore the impression of flattened bunches of grass or rushes.

One pattern of the class first referred to, consisting of square, incised dots, is precisely like the marking on some fragments of pottery which I met with about fourteen years ago at Oak Bay, on the western border of Charlotte County. A fragment of pottery found at Bocabec bears the imprint of the leaf of the fir tree (*Abies Americana*) that had been incorporated with the clay of the vessel before baking. It is not probable that this little leaf was in the clay when taken from the mud-flat of the Bocabec River, for being light, such a leaf would have floated on the water and been stranded near high tide mark. We can imagine that it may have fallen from a neighboring tree, or have stuck to the clay when it was thrown down beside the hut. Here we may fancy the crouching potter unconsciously kneading it in as she prepared her clay, and gave form and beauty to her work; little thinking that she thus gave permanency to the outlines of a little leaf which perished ages ago; or that she was adding another line to the history of her people.

Some of the patterns on the fragments of pottery from Bocabec are very like those on the sherds obtained by Dr. L. W. Bailey at the thoroughfare of Maquapet Lake, but the designs are not so elaborate; yet, there appears to have been much in common between the men of the river and those of the sea shore, in this art, as well as others.

In the relative culture of the river Stone-men of Acadia and those of its sea coast, we seem to have a parallel to that observed in Denmark by Prof. Steenstrup between the weapons and implements of the men who erected the tumuli and those who left the Kjökken Mödding in that country, but the differences between the work of the inland people and those of the seashore in Acadia do not appear to have been of so marked a character as that between the corresponding populations in Denmark. We have as yet, however, but small collections to test this point, but I may mention incidentally that some of the skin scrapers from the St. John River exhibit a high finish, and are equal to the most perfect figured by Evans, as found in the barrows of Britain.

IMPLEMENTS AND WEAPONS OF STONE.

Though their pottery was coarse, the people of Bocabec showed a great degree of proficiency in another art, namely, the manufacture of implements of stone.

This industry we may suppose was in the hands of the men, and some of the implements obtained show that it was brought to great perfection.

If Longfellow was right, this work was carried on by the North American Indians outside of the hut. The poet's graphic description of the arrow-maker of the West, sitting by his hut door at the close of the day, is well known. I cite it, as I think it will be seen that his habits did not in all respects agree with those of the arrow-maker of the Stone Age in Acadia.

*" At the doorway of his wigwam
Sat the ancient arrow-maker,
In the land of the Dacotahs,
Making arrow-heads of jasper,
Arrow-heads of chalcedony " . . .*

Truth, however, compels me to declare that the arrow-maker of Bocabec conducted his operations chiefly within doors. Nor do I

suppose that he worked within the hut on account of any special secret in the manufacture, but for other reasons that I will endeavor to explain further on. By far the best work in this line of art at Bocabec was found within hut bottom A, where the chipping of the lance and arrow-heads was performed beside the fire-place on stones or supports placed near the fire. The flakes resulting from the manufacture of these implements were very plentiful in this part of the hut bottom. Very few flakes were found outside the hut, and these mostly beside stones used for wedging the poles of the frame-work that supported the covering of the hut. In the kitchen-midden, flakes are quite rare. It would, therefore, appear that the arrow and lance-heads were fabricated beside the fire-place, and apparently at times with the help of the fire-light, for the flakes were more abundant at the sides and back of the fire-place than in the front. The lance-heads were flat, and of a long oval pattern; a narrower and thicker point, of which one example was found, was probably a javelin-point; and another that was triangular and barbed at the base would be regarded as a spear-point. All the weapons of this type that we met with were made of petrosilex or a highly quartzose felsite, and most of the arrow-heads were fabricated from these materials, but we found a few that were made of quartz and jasper.

The arrow-points were chiefly of three patterns, viz., lozenge shaped, lanceolate-leaf-form and triangular, with lateral notches for securing the point to the shaft. Many of these arrow-points were rudely made, others more highly finished. The workmanship on one of the triangular, notched arrow-points of petrosilex rock could not be surpassed. It was finely serrated on the edges and had a fine tapering point. Another arrow-point of laurel-leaf form made of quartz was also quite symmetrical.

There was a remarkable scarcity of axes and of the larger stone implements at these hut bottoms. Only one well-formed axe was found, and this was in the kitchen-midden under hut bottom B. A very large ovate lance-head of quartzite accompanied this axe. In this lower kitchen-midden, which is connected with the hut bottom No. 1 already referred to, there were many flakes of a dark brown petrosilex of coarser grain than the black petrosilex from which many of the weapon-points of the higher

kitchen-middens and hut bottoms were made. Quartzite rock was more largely used in the manufacture of weapons by the inhabitants of hut No. 1 than by the men who subsequently occupied the place.

Some rougher axes and hammer-stones were found. These larger implements for rough work were chiefly made from diorite rock or quartzite, rocks better suited for standing heavy blows than the more fragile petrosilex and quartz.

Among the objects from Bocabec are a number of skinning-knives. Those which showed the most careful chipping were rectangular in outline, like some agate knives found on the St. John River. Several, however, were lunate or oval. The material used in the manufacture of these knives was either quartz or petrosilex, mostly the former. Numbers of stone flakes, chiefly of petrosilex, which had the form of rude knives, were found. Some of these, in their worn edges, gave evidence of having been used for cutting. These flakes are of various forms, some approaching scrapers in appearance, others are simply sharp flakes which do not appear to have been applied to any use. The skinning-knives were made of quartz and petrosilex, but a large majority of the knife-flakes were formed of the latter rock. Quartzite knife-flakes were comparatively scarce, and came mostly from the shell heap of hut bottom No. 1.

The most curious stone implement found at Phil's Beach was one obtained by Mr. Alexander Boyd, the proprietor of the place. This implement was unearthed from the kitchen-midden behind hut bottom A by Mr. Boyd, when he was removing shells to spread on his land. It consists of petrosilex rock, and in form resembles a short femur of a large reptile; it is smoothed by rubbing at each end, and may have been used as a slick-stone for softening skins.

Other stone implements of a long oval form, which from their appearance are supposed to have been used as slick-stones, were found at hut bottom A. Here also we met with a long cylindrical stone which had probably been used as a pencil, for small facets have been formed on the end of it by rubbing.

Scrapers in great numbers were found in the hut bottoms of this village site, but they were as imperfectly made as they were

numerous, and none were met with that possessed the artistic finish of the agate scrapers found on the shores and tributaries of the St. John River.

Though thus lacking in elegance, the scrapers found at Phil's Beach, Bocabec, present a variety of forms, and were no doubt intended for various uses. Beside the ordinary scraper, which in form may be compared to a gun-flint with rounded corners, and which was used for dressing skins, there were several kinds that were probably used as carpenters' tools. Some of these had chisel-shaped extremities, and, secured in a bone or horn handle, would have made very serviceable little chisels. Other gouge-pointed forms would have been useful implements for scraping the insides of hollow bones, such as are found shaped into needles, bodkins, etc. In others the outline of the scraping edge was concave; these would have been suitable for scraping the wooden shafts of arrows or any other rounded surface of wood or bone. It was in hut bottom C that the greatest variety of these implements was found.

Quartz, being a harder stone than petrosilex or felsite, was the favorite material for scraping tools; but many of the scrapers made of this rock were merely rough flakes, to which a fresh edge was given by flaking minute chips from the margin, and the tool thus restored was used again. This habit of the men of Bocabec reminds us of the manner in which window glass is now used by cabinet makers for similar purposes, a fresh edge being obtained by breaking the glass, when the old one has become dulled by use. As hut bottom A was characterized by the variety and perfection of its stone weapons, so hut bottom C, by the presence of numerous scrapers, gave evidence of the operations of the artificer in wood.

By far the greatest number of scrapers were made of quartz; but beside those made of petrosilex (and these were numerous), there were a few of agate, jasper and chalcedony.

No veins of agate or chalcedony are known to occur near the Bocabec River, but these minerals could have been procured at Grand Manan Island, to the south, or on the St. John River, to the north. Two scrapers made of these varieties of quartz shew a remarkable amount of weathering, as though they had been in use for a long time. The source of supply for the material from

which the greater part of the stone weapons and implements of Bocabec have been fabricated is not far distant from the site of the village. The whole northern and eastern side of Passamaquoddy Bay is bordered by rocks of a peculiar type which, from the fossils found in the slates at the base of the series, are regarded as Upper Silurian. The lower part of this formation with marine fossils, which in the Reports of the Geological Survey of Canada are described as Division One, are absent from the outcrops about Bocabec, which expose at the base of the formation, Division Two. This part of the formation which, in the most southerly outcrops in Charlotte County, consists of hardened silicious shales, with mascerated remains of land plants, etc., is represented at Bocabec by a fine-grained petrosilex, exposed in Digdeguash Basin, and probably also on Bocabec River. This rock splits with a deep conchoidal fracture, and is capable of being worked like flint or chert into stone weapons. It is this material which the men of Bocabec found most advantageous for the fabrication of lance and arrow-heads.

In the Third Division of the Silurian series of rocks, flaggy sandstones are common on the southern margin of Passamaquoddy Bay; but at Bocabec, which is at the head of the same Bay, this number of the series is found to be very compact and fine-grained, coming under the denomination of quartzite. This rock has been used to some extent by the dwellers of Bocabec for their larger weapons and implements.

A third rock, or rather mineral — quartz — was one of which the men of Bocabec availed themselves to a large extent in the manufacture of stone weapons. As this mineral occurs abundantly in the pebbles of the drift and other surface deposits of the region, it is plentiful on the sea beaches, which abound with stones washed out of these surface deposits, and no special source of supply need be looked for.

From the fact that many of the rocks and minerals used by the community of Bocabec for weapons and implements were found so close to their homes, we have good reason to suppose that there was very little occasion for these men of the Stone Age to seek them elsewhere by barter.

IMPLEMENTS OF BONE AND IVORY.

Bone implements of various kinds were found both in the hut bottoms and in the kitchen-middens, but mostly in a fragmentary condition. The most abundant were bodkins of a rough type. These were made in most cases by pointing split pieces of the leg bones of moose, deer or other large animals. An implement like a bodkin in form, but hollow, and having a diagonal slit at the smaller end, was made of the leg bone of a bird. Not knowing the use of this implement, I sent it to Dr. Daniel Wilson, of Toronto, for examination. He thinks "it may be assumed with much probability that it is a modelling-tool, such as the Western Indians still use in the fashioning and ornamenting of their finer pottery."

Several fragments of netting needles, or implements which for their size and form appear to have been available for this use, were found, and one perfect needle of this kind, about eight inches long, was met with. It had one eye about the middle, another broken needle had two perforations. Many fragments of channelled bone implements, which appear to have been pieces of needles and bodkins, were exhumed in the hut bottoms. The harpoons were of the ordinary form, with lanceolate blade, barbed on one side. Only fragments of this kind of implements were obtained.

Among the worked bones which are not, strictly speaking, implements, there was one which was scored on the back, and another that was notched on the edge. Such bones may have been of the nature of tally-sticks; but Dr. J. W. Dawson suggests that objects of this kind, which are also found among the ancient relics in European caverns, may have been used for playing games, small pieces of wood, ivory and bone being carried about by the Indians of British Columbia at the present day, and are used like playing-cards.

Of ivory implements the only ones found were made of the tooth of the beaver. By cutting the point of the incisor of this animal in various ways, chisels, gouges, and other pointed implements were formed. These would be used where the material to be operated upon was not too hard, and such implements were more easily made than the quartz scrapers or tools.

ANIMALS USED FOR FOOD.

In our operations at Bocabec a great many bones and fragments of bones of various animals were unearthed. I have not yet had time or opportunity to have these determined, but it is certain that quite a number of species are represented. The beaver is perhaps the most abundant, for the lower jaw and the femur of this animal were constantly turning up in our excavations. The leg-bones of moose and of deer or cariboo (reindeer) were also of frequent occurrence, but were almost invariably broken to pieces for the marrow. The hare, the fox and the bear were also indicated by teeth, jaws and limb-bones. Bones of birds are frequent, and represent those of wading, aquatic, and arboreal habit. A number of bones, which from their spongy texture are supposed to be those of marine animals, were found. Fishes are represented by remains of the cod, herring, sculpin and shark.

But the remains which form by far the greatest mass in the kitchen-middens at Bocabec are those of *shell-fish*. Among these, pre-eminence must be given to the clam (*Mya arenaria*), which makes up perhaps nine-tenths of the bulk of the molluscan refuse. The horse-mussel (*Mytilus edulis*) and the long-whelk (*Buccinum undatum*) are the most numerous of the other molluscs found in the refuse heaps of this village. After these species may be named the round-whelk (*Lunatia heros*) and the small purple-shell (*Purpura lapillus*). The rock-periwinkle (*Littorina rudis*) is occasionally found, and so also is the bonnet limpet (*Crepidula fornicata*); but the common European periwinkle (*Littorina littorea*), now so common on this coast, is entirely wanting. Beside these, a single valve of the large scallop (*Pecten tenuistriatus*) was found.

The sea urchin is present, but may have been introduced accidentally by crows, and not have been brought intentionally from the beach by the former residents of Bocabec. Other posthumous or accidental additions to the fauna are the land snails, of which several specimens were found at various levels in the shell heaps. Among the species found here, *Helix alternata*, Say, is by far the most abundant. *Helix albolabris*, Say, was not very common. Several specimens of *Helix hortensis*, Müll., were observed, but this species has probably been introduced since the arrival of

the English. A species was found which agrees with Binney's description of *Helix Sayii*, except that the tooth on the parietal partition is nearly obsolete. Among the smaller snails were *Helix monodon*, Rack, *Hyalina arborea*, Say, *Hyalina multidentata*, Binn.

Vanity is a foible quite as prevalent among savage as civilized communities, and we are not surprised to find indications of it among the dwellers at Bocabec. Among the *reliquæ* of their hut bottoms was a fragment of a stone pendant decorated with crossed lines in the form of a lattice, and two kinds of powder, which appear to have been kept in valves of the common clam. One of these powders is made from galena ore, small veins of which occur on the islands of Digdeguash Inlet, near Bocabec. The powder has a glistening appearance. The other powder, which was formed of pulverized shells of the horse mussel, could have been used as a white paint. These powders would appear to have been a part of their toilet requisites. That such has been the use of the glittering galena seems highly probable; and Darwin, in his account of the native Fuegians of South America, who subsisted on a diet similar to that of the Stone men of Bocabec, records their appearance as follows: "These poor wretches were stunted in their growth, their hideous faces *bedaubed with white paint*, their skins filthy and greasy, their hair entangled, their voices discordant, their gestures violent, and without dignity."

PERMANENCY AND ANTIQUITY OF THE VILLAGE.

It has been thought that these kitchen-middens around the shores of Passamaquoddy Bay were made by a people who camped along the shore in summer for fishing and hunting, but retreated inland to the shelter of the woods in winter. There are, however, indications that the occupation of the village sites marked by these shell-heaps was more or less continuous.

Among the indications of occupancy at other seasons than the summer, I may refer to the kind of clay used in their pottery, and the places in the village where deposits of this clay were found. In making sections of the three hut bottoms at Bocabec we passed through several layers of pottery clay of small lateral extent, which had evidently been scattered on the floor of the huts. So also in the kitchen-midden in front of hut bottom A,

irregular layers of the same kind of clay were traversed. These layers were mingled with the charcoal and refuse that had been cast out from the door of the hut in such a way as to show that all had come within the hut. I think, therefore, there can be little doubt that the moulding of the pottery was sometimes carried on within the huts. The practice of chipping their flint implements within the hut, to which I have already referred, would also indicate the use of these dwellings during the colder part of the year.

The very fact of these savages using only the mud of the beach in the manufacture of their pottery, seems to show that the work in terra-cotta was carried on mostly in winter, when other and better kinds of clay (for no other kind has been found in the sherds collected at Bocabec) were inaccessible to them.

The position of the encampment also, situated as it was on the edge of an open beach facing the south, and sheltered from the north-west and north-east winds by protecting ridges-of land, was well adapted for a winter residence.

With our very imperfect knowledge of the shell-heap folk of Passamaquoddy Bay and of the remains they have left, it would be premature to say how long these kitchen-middins have been lying in their present condition, or when the various village sites marked by accumulation of these remains were abandoned. It may, however, be worth while to mention a few points bearing on the question of their age.

Among all the weapons, implements, and other objects found at Bocabec, not one article has been met with which in any way would lead to the supposition that these people were acquainted with the products of European industry. Mr. W. F. Ganong informed me that at a group of kitchen-middens at Chamcook, near St. Andrews, not far from the spot where De Monts wintered with the first colony of Europeans who attempted a settlement in Acadia, an iron-bound copper kettle had been found. I am not aware of the conditions under which the discovery was made. No trace of any object formed of metal or glass was detected at Bocabec. The stone weapons and implements were made of material occurring on the Bocabec River, or in its neighborhood, or at least not farther off than the St. John River. Two of the scrapers, one of

chalcedony and the other of agate, shewed quite a deep weathering and must have been for a long time exposed on the surface of the ground. Nevertheless, the tools of felsite, which are more easily affected by the weather, do not give indications by the condition of their surface of very great antiquity ; and the two scrapers of chalcedony and agate may have been the implements of an earlier people found and used by the later dwellers at Bocabec.

An inference regarding the antiquity of this village site may also be drawn from the covering of vegetable mould which has gathered on the surface of the shell-heaps to a greater or less depth in different parts. In the hollows, and especially over the hut bottoms this mould has attained a considerable depth, in some places as much as a foot or eighteen inches.

But while on the one hand these conditions point to a period anterior to the discovery of America, or at least of the region of Acadia, by the "White Race," as the time when the shores of the Bocabec ceased to be occupied by the people whose remains we have examined ; on the other hand, their sojourn on its banks, when compared with the whole period of the Stone Age, was both recent and short.

In the Old World, as you know, the Stone Age has been divided into two great periods — the Palaeolithic, or the time when mankind used implements and weapons of chipped stone only, and the later Neolithic, when weapons of ground stone were also employed. The time embraced in the earlier of these periods is very great. Since its beginning the river valleys in Western Europe have been very much deepened, and the courses of the rivers in some cases changed. Man, who at first hunted the Siberian elephant, the rhinoceros, the cave bear and other large animals now extinct, used at first large and roughly made axes of chipped stone. Subsequently he found his large game chiefly in the horse and reindeer, and the stone-pointed spear became more prominent as a weapon of offence. In later times, but still while using no stone implements but those made by chipping, he hunted various wild animals more nearly like those which existed in Europe in the times of the ancient Romans. His weapons now were made smaller and lighter. Such in outline was the condition of man in the Palaeolithic Age.

The Neolithic period of Europe, or the time when man in that region used weapons of ground and polished stone, is of a later date than the Palaeolithic times I have glanced at.

No such continuous history of man in America is yet known, for the subject is only now receiving the attention which has been bestowed upon it in Europe for many years, and the landmarks of the older civilization of the Old World seem to be wanting in the New. When the American Indian of this region first became known to Europeans he was still in the Stone Age, but his weapons and his arts were such as to show that he had arrived at a condition of culture equivalent to the Neolithic Age of the rude inhabitants of Europe. Discoveries have, however, lately been made which make it highly probable that there was an older and ruder age in America as well as in Europe. Dr. Abbot, the pioneer in this line of research, has found in the gravel terraces along the Delaware River at Trenton, in New Jersey, rude stone implements which far antedate the occupation of that region by the tribes known there when the continent of America was discovered. Most of the objects found were very rudely chipped and belonged to a people of very primitive habits. Within a year or two a similar discovery, consisting, however, of stone chips only, was made in the terraced deposits of Central Minnesota.

With such *buried* remains of man's occupancy of the earth our Bocabec relics do not compare, as they rest upon the surface, and are unquestionably less ancient. I have already referred to some of the geological evidences of the recent accumulation of these relics, but I may mention other features which stamp these remains as those of a recent Neolithic people. At the very bottom of these shell-heaps stone axes were found which, though rudely formed, were fashioned by grinding; and although the pottery found with these rude implements differed in pattern from that occurring in the higher levels of the shell-heaps, in other respects it showed nearly the same stage of advancement in the ceramic art.

It is somewhat surprising that there should be no evidence of forest growth on the shore of Bocabec River at the site of the village when first it was occupied by these men of the Stone Age, for a mere film of vegetable matter is all that separates the oldest

kitchen-midden from the clay below, while the mould above the shell-heaps is from three inches to one foot in depth. These people, however, may have been driven back by the encroachment of the sea upon land in the rear of their former huts, which they had already cleared of trees and vegetable mould.

ETHNIC RELATIONS OF THE PEOPLE.

Finally, as regards the origin of the people who made these kitchen-middens at Bocabec a few words may be said.

The habits, manners and customs of the people who were known as the aboriginal inhabitants of this country when Champlain discovered the Bay of Fundy have greatly changed through the corrupting influence of contact with the new comers. Enough of their old habits and mode of living remain, when considered in the light of the accounts that have come down to us from the early explorers, to establish the similarity of their habits and mode of living to that of the men of the Stone Age who lived at Bocabec. Furthermore, the indication of a conical form to the huts, which I think is sufficiently shown by the over-lapping of the kitchen-midden upon the sleeping-bench, and by the great width of the base of the doorway of the hut, point strongly to a resemblance between these huts and the well-known wigwam of the Indians.

The choosing of a smooth beach for the village site, the fact that they appear to have had canoes or boats of some sort to transport the vast quantities of clams which formed an important article of their diet, and which could not have been dug with ease or found in sufficient quantities in front of their village, for, as I have said, the principal clam-flats are at some distance from the village; the capture of fish which would not take the hook, but must have been taken by spear, harpoon, weir or net; the dependence of the people on hunting for the more acceptable variety in their food; the character of the rude pottery; the use of coarse woven fabrics, and a variety of other features of their culture and mode of life, are such as we know to have been common to them and the Indian tribes of Acadia.

ARTICLE III.

REPORT OF THE BOTANICAL SECTION.

THE Committee on Botany has to report excellent results from those engaged in the investigation of plants in the Province for the past year. Not only has the range of rare and local plants been extended, but in addition sixty species and varieties, not hitherto known to exist in the Province, have been added to its flora.

The value of the Herbarium has been largely increased by a gift from Mr. G. F. Matthew, who has presented to the Society his entire collection of plants, consisting of over two thousand species, chiefly European. These, with the excellent collection of New Brunswick plants already at our disposal, will make the society's herbarium a valuable one to the student of botany. The publication of a systematic catalogue of Canadian plants has been commenced by Prof. Macoun, of which Part I. — Polypetalae, has appeared. This will prove especially useful to the Canadian botanist, referring him to forms that are unsettled, and which require special attention. Of the 243 genera of the Polypetalae, described in Macoun's List, 128, or a little more than half, occur in New Brunswick; and of the 907 species, 263, or nearly a third, are found in this Province. It is desirable that a revised list of the plants of New Brunswick should be published at the close of the season of 1884. The additions to our flora since the publication of Fowler's List in 1878 (about 150 species of Phanerogams), and the mass of information accumulating since on the distribution of rare and local species, render a new catalogue almost indispensable. The botanists at work in the Province would gratefully extend to Prof. Fowler all the assistance in their power towards publishing a revised and more complete catalogue of New Brunswick plants.

Scarcely a beginning has been made here, as yet, in the study of many important groups of plants — such as the Fungi and their

allies. Our botanists are earnestly recommended to turn their attention to this part of our flora, which has been so long overlooked.

As may be seen by the subjoined list of plants, but few districts, comparatively, have been explored during the past season — small portions of Queens, Victoria, and Carleton, sections of St. John and Charlotte Counties, and portions of Albert and Westmorland. The discovery of so many species new to the Province will, no doubt, stimulate our botanists to turn their attention in the future to districts hitherto unexplored. Among the plants found this year are two which occupy comparatively limited areas in North America. These are *Montia fontana*, and *Potamogeton obtusifolius*, the latter of which is very rare. The former is rare in North and South America. Torrey and Gray's stations for it are Oregon, Sitka, and Labrador; Macoun's stations are Greenland, Alaska, Vancouver Island, Newfoundland, Gaspé, and Halifax.

Of *Ornithopus Scorpioides*, the weed found in a garden at St. Stephen, it may be said that this is probably its first appearance in America. *Mimulus moschatus* has been marked in the subjoined list as introduced, although by some botanists it is described as indigenous to North America.

The following plants, hitherto considered rare, are known to occur more frequently than previous lists would indicate: *Caulophyllum thalictroides*, Michx; *Brasenia peltata*, Pursh; *Nuphar advena*, Ait.; *N. pumilum*, Smith, (*N. luteum*, Sm., var. *pumilum*, Gray,) *Sanguinaria Canadensis*, L.; *Ranunculus Flammula*, L., var. *reptans*, Gray; *Sanicula Marilandica*, L.; *Spiraea tomentosa*, L.; *Penthorum sedoides*, L.; *Ludwigia palustris*, Ell.; *Anemone multifida*, D. C. (only along Upper St. John); *Geum album*, Gmelin; *Lobelia Dortmanna*, L.; *Limnanthemum lacunosum*, Griesb.; *Apocynum cannabinum*, L.; *Solidago bicolor*, L.; *S. thyrsoidea*, E. Meyer; *Asclepias incarnata*, L.; *Asarum Canadense*, L.; *Polygonatum biflorum*, Ell.; *Streptopus amplexifolius*, DC.; *Viola canina*, L., var. *sylvestris*, Regel; *Lonicera caerulea*, L.; *Arethusa bulbosa*, L.; *Stellaria borealis*, Bigelow; *S. longifolia*, Muhl.; *Parnassia Caroliniana*, Michx.; *Habenaria obtusata*, Richardson; *H. blephariglottis*, Hook; *Goodyera re-*

pens, R. Br.; *Cypripedium parviflorum*, Salisb.; *C. pubescens*, Willd.; *Triglochin palustre*, L.; *Eriophorum alpinum*, L., *Rhynchospora alba*, Vahl.; *Oryzopsis asperifolia*, Michx.; *Zizania aquatica*, L.; *Cystopteris bulbifera*, Bernh.; *Woodsia Ilvensis*, R. Br.; *Aspideum cristatum*, Swartz; *Habenaria lacera*, R. Br. (common between Au Lac and Port Elgin); *H. viridis*, R. Br., var. *bracteata*, Reich, Petitcodiac and Havelock — Brittain; *Cuscuta Gronovii*, Willd., Nashwaaksis and St. Stephen, not rare about St. John, also at Lake Utopia. *Papaver dubium*, L., and *Calendula officinalis* have been produced from seeds self sown in gardens at St. Stephen for many years—Vroom; *Calamintha clinopodium*, Benth., *Nitella flexilis*, Agardh, are probably not rare.

G. U. HAY,
J. VROOM,
R. CHALMERS,

Committee on Botany.

ST. JOHN, January, 1884.

ADDITIONAL LIST OF PLANTS—1883.

- 30a. *GLAUCIUM LUTEUM*, Scop. Horn-Poppy. Ballast, St. John, Sep., G. U. Hay.
- 34a. *NASTURTIUM OFFICINALE*, R. Br. True Water-Cress. Hillsborough, Aug., J. Brittain.
42. *SISYMBRIUM OFFICINALE*, Scop. Spreading rapidly at St. Stephen, J. Vroom.
67. *SAPONARIA OFFICINALIS*, L. Along shore Long Reach, Saint John River, Sep., Hay.
- 77a. *Stellaria crassifolia*, Ehrh. Thick-leaved Chick-weed. Shediac, July, Brittain.
79. *S. humifusa*, Rottboell. Shediac, July, Brittain.
82. *Sagina procumbens*, L. The apetalous form (*S. apetala*, L.) occurs at St. Stephen, Vroom.

- 87b. *Claytonia Virginica*, L. Spring Beauty. (A specimen in McGill College herbarium is from Bathurst—Macoun's catalogue.)
- 88b. *Montia fontana*, L. Blinks, or Water Chick-weed. Shediac, July, Brittain. (Not described in Gray's Manual.)
127. *Astragalus alpinus*, L. Petitcodiac, July, Brittain.
- 130a. ORNITHOPUS SCORPIOIDES, L. Scorpion Bird's-Foot. "A native of southern Europe; a curious plant, and worth encouraging."—Prof. Lawson. Occurring in a garden at St. Stephen the past two seasons, Vroom.
- 166a. *Rosa blanda*, Ait. Early Wild Rose. Petitcodiac, July, Brittain.
- 191a. *Proserpinaca palustris*, L. Mermaid-weed. St. Patrick, Charlotte Co. In fruit Oct. 5th, Vroom.
- 209a. BUPLEURUM ROTUNDIFOLIUM, L. Thorough-wax. Ballast, at St. John, Sep., Hay.
213. *Osmorrhiza longistylis*, DC. Pollet River, near Petitcodiac, June, Brittain.
- 231a. *Viburnum Lentago*, L. Sweet Viburnum. Sheep-berry. Chiputneticook Falls, Charlotte Co. In fruit Aug., 1882, Vroom.
- 232a. *V. dentatum*, L. Arrow-wood. Chiputneticook Falls. In fruit Aug., 1882, Vroom.
- 239a. *Cephalanthus occidentalis*, L. Button-bush. St. James, Charlotte Co., Aug., Vroom.
- 241a. *Valeriana sylvatica*, Richardson. Valerian. Richmond, Carleton Co., July, Vroom.
- 248a. *Aster undulatus*, L. Wavy Aster. Petitcodiac, Aug., 1882, Brittain.
- 249a. *A. sagittifolius*, Willd. Arrow-leaved Aster. Petitcodiac, Aug., 1882, Brittain.
- 270a. *Solidago arguta*, Ait. Pungent Golden-rod. Smithtown, K. C., Aug., 1882, Brittain; near St. John, Sep., '82, Hay; St. Stephen, '82; Woodstock, '83, Vroom.
- 277a. *Xanthium strumarium*, L. Common Cocklebur. Cape Bald, July, Brittain.
- 277b. *Heliopsis laevis*, Pers, var. *scabra*, Gray. Ox-eye. Sugar Island, St. John River, 1880, Moser.

- 283a. *ANTHEMIS TINCTORIA*, L. Yellow Chamomile. Ballast, St. John, Sep., Hay.
293. *Gnaphalium decurrens*, Ives. Petitcodiac and Hillsborough, Aug., Brittain.
296. *G. sylvaticum*, L. Hopewell, Albert Co., Aug., Brittain.
312. *LAPPA OFFICINALIS*, Allioni. Var. MAJOR and var. TOMENTOSA occur much too abundantly at Richmond, Carleton Co., Vroom.
- 312a. *LAMPSANA COMMUNIS*, L. Nipple-wort. Ballast, St. John, Aug., Hay.
- 327a. *Lobelia spicata*, Lam. Spiked Lobelia. Moncton, July, Brittain.
- 348a. *Pyrola chlorantha*, Swartz. A specimen of this plant, presented to the Herbarium by I. Allen Jack, Esq., is dated Fredericton, 1844. Petitcodiac, 1881, Brittain; Richmond, Vroom.
- 349a. *Pyrola minor*, L. Smaller Wintergreen. Hopewell, Aug., Brittain.
366. *Utricularia clandestina*, L. Little Rocher, Albert Co., Aug., Brittain.
- 368b. *VERBASCUM BLATTARIA*, L. Moth Mullein. Richmond, Sep., Rev. F. W. Vroom.
- 372a. *MIMULUS MOSCHATUS*, Dougl. Musk Plant. Growing in swampy land near Alma, Albert Co., Aug., Brittain.
- 379a. *VERONICA ARVENSIS*, L. Corn Speedwell. St. Andrews, 1878, Vroom; Chamcook Mt., Aug., Hay; Portage, K. C., and Hillsborough, Aug., Brittain.
382. *Euphrasia officinalis*, L., var. *Tartarica*, Benth. Cape Bald and Little Rocher, Aug., Brittain.
- 387a. *MENTHA VIRIDIS*, L. Spearmint. Baltimore, Albert Co., Aug., Brittain.
- 392a. *SATUREIA HORTENSIS*, L. Summer Savory. Found growing on railway embankment near Hillsborough, Aug., Brittain.
- 430a. *Chenopodium hybridum*, L. Maple-leaved Goose-foot. Petitcodiac, Aug., Brittain.
432. *Atriplex patula*, L., var. *littoralis*, Gray. Near St. John, Aug., Hay.

441. *Polygonum arifolium*, L. Halberd-leaved Tear-Thumb. Hopewell, Aug., Brittain.
452. *Rumex obtusifolius*, L. Germain Brook, K. C., July, 1882, Brittain.
- 454a. *Dirca palustris*, L. Leatherwood. Moosewood. Wicopy. Keswick Ridge, 1881, G. H. Burnett; Hillsborough, Aug., Brittain.
456. *Comandra livida*, Richards. Port Elgin, A. C., July, Brittain.
- 466a. *Urtica dioica*, L. Stinging Nettle. Ballast, at Saint John, Aug., 1882, Hay.
467. *U. urens*, L. St. Andrews, 1879, Vroom; St. John, 1882, Hay.
- 517b. *Lémma trisulca*, L. Duckweed. Duck's-meat. Petitcodiac, July, Brittain.
- 517c. *L. minor*, L. Petitcodiac, July, 1882, Brittain.
- 517d. *L. polyrrhiza*, L. Sussex, Aug., 1882, Brittain.
526. *Potamogeton Spirillus*, Tuckerman, and *P. gramineus*, L., found at Chipman, Q. C., Wetmore.
- 526a. *P. hybridus*, Michx. St. Stephen and St. James, Aug., Vroom.
- 530a. *P. obtusifolius*, Mertens and Koch. Little Rocher, Aug., Brittain. Very rare.
- 531a. *P. pusillus*, L. Little Rocher, Aug., Brittain. Var. major, Fries. St. Stephen, Aug., Vroom.
- 549b. *Spiranthes latifolia*, Torr. Ladies' Tresses. Titusville, Aug., 1881, Brittain; Andover, July, Wetmore.
- 556a. *Microstylis monophyllos*, Lindl. Adder's-mouth. Little Rocher, Aug., Brittain.
579. *Smilacina stellata*, Desf. Petitcodiac, 1881, Brittain; Chipman, Q. C., Wetmore.
- 586a. *Luzula parviflora*, Desv., var. *melanocarpa*, Gray. Wood-rush. Upper Gaspereau, Chipman, Q. C., July, Wetmore.
- 595a. *Juncus pelocarpus*, E. Meyer. Quaco, Aug., 1882, Brittain.
- 595b. *J. articulatus*, L. Hampton, 1882, Baie Verte, 1882, Brittain.
- 599a. *Cyperus diandrus*, Torr. Fredericton, Wm. Massey.
- 600 *C. phymatodes*, Muhl. Fredericton, 1880, Vroom.
616. *Eriophorum russeolum*, Fries. Cape Bald, Hillsborough, and Cape Enrage, July, Brittain. Abundant at Chipman, Q. C., Wetmore.

- 621a. *Carex bromoides*, Schk. Pollet River and Portage, June, Brittain.
- 627a. *Carex rosea*, Schk. Petitcodiac, and Portage, K. C., July, Brittain.
635. *C. adusta*, Boot. Petitcodiac, 1882, Brittain.
637. *C. straminea*, Schk. var. *festucea*, Gray. Digdeguash River, Aug., Hay.
653. *C. gracillima*, Schw. Andover, 1882, Hay.
654. *C. laxiflora*, Lam., var. *hirsuta*, Dewey. Norton, K. C., July, Hay.
- 654a. *C. pedunculata*, Muhl. Nashwaaksis, York Co., 1881, J. Moser; Petitcodiac and Havelock, Brittain.
655. *C. umbellata*, Schk. Rather common at Petitcodiac, Brittain.
656. *C. Novae-Angliae*, Schw. Rather common at Petitcodiac, Brittain.
658. *C. Pennsylvanica*, Lam., and *C. varia*, Muhl., Chipman, Q. C., Wetmore.
661. *C. Arctata*, Boot. Various places in Westmorland, Aug., Brittain.
664. *C. flexilis*, Rudge. Common at Petitcodiac, Brittain.
- 674a. *C. folliculata*, L. St. Martins, 1882, Brittain.
- 679a. *C. vesicaria*, near St. John, 1881, Hay.
- 682a. *C. longirostris*, Torr. Andover, July, 1882, Wetmore.
- 695a. *Calamagrostis arenaria*, Roth. (*Ammophila arundinacea* of Vasey's Catalogue), Courtenay Bay, St. John, Hay.
- 704a. *Glyceria pallida*, Trin. Petitcodiac, Brittain.
- 713a. *Poa debilis*, Torr. Petitcodiac, 1882, Brittain.
- 718a. *LOLIUM PERENNE*, L. St. John, Aug., Hay.
- 718b. *L. TEMULENTUM*, L. St. John, Aug., Hay.
- 732a. *Milium effusum*, L. Richmond, July, Vroom.
- 736a. *Setaria verticillata*, Beauv. On ballast, St. John, Aug., Hay.
- 773a. *Ophioglossum vulgatum*, L. Adder's Tongue, Hopewell and Cape Enrage, July, Brittain.
- 780b. *Isoetes echinospora*, Durieu, var. *Braunii*, Engelm. Charlotte County, Aug., Vroom.

ARTICLE IV.

MAMMALS OF NEW BRUNSWICK.

BY MONTAGUE CHAMBERLAIN.

INTRODUCTION.

SO far as has been ascertained, there have been but two catalogues of the Mammals of this Province previously published; one of these appeared in a work by Abraham Gesner, Esq., issued in 1847, entitled "New Brunswick; with notes for Emigrants, comprehending the early History, &c.;" the other is placed among the appendices to "Field and Forest Rambles," a work on New Brunswick, by Dr. A. Leith-Adams, published in 1873. Neither of these catalogues being correct — when judged by the result of more recent investigations — a new one has been called for, and it is to meet this demand that the present paper is now published.

All of the species mentioned have been identified by the writer, excepting the few otherwise noted in the text; but in deciding upon the relative abundance he has had to depend, to a large degree, upon the opinions of others, and while the best available information has been obtained, it is very probable a difference of opinion may exist regarding the correctness of some of the determinations. A criticism of the catalogue is invited from observers throughout the Province, with a view to having whatever errors it may contain rectified in a future edition.

Want of space prevents his mentioning the names of all the gentlemen who kindly gave the writer the benefit of their observations, and to whom he desires to express his thanks; but he is under especial obligation to Mr. James Vroom, St. Stephen, and to Mr. John Stewart, Woodstock, for valuable notes.

The classification and nomenclature is that of Jordan's "Manual of the Vertebrates," excepting a slight difference in the Bats, copied from Dobson's "Catalogue of the Chiroptera."

CATALOGUE.

1. PANTHER. (*Felis concolor*.)
 Dr. Gesner records this species as "rare" (in 1847). No recent instances of its occurrence are known.
2. CANADA LYNX. "LOUP-CERVIER." "LOOCERVEE." (*Lynx canadensis*.)
 Common.
3. BAY LYNX. "WILD CAT." (*Lynx rufus*.)
 Common.
4. WOLF. (*Canis lupus*.)
 Was common from about 1840 until about 1860; since then, it has entirely disappeared, Dr. Gesner states that Wolves were first seen in New Brunswick in 1818.
5. RED FOX. "SILVER FOX." "BLACK FOX." "PATCH FOX."
 "CROSS FOX." (*Vulpes vulgaris*.)
 Abundant.
6. SABLE. PINE MARTEN. (*Mustela americana*.)
 Common.
7. FISHER. BLACK CAT. (*Mustela pennantii*.)
 Rare.
8. LEAST WEASEL. (*Putorius vulgaris*.)
 Common.
9. COMMON WEASEL. ERMINE. (*Putorius ermineus*.)
 Common.
10. MINK. (*Putorius vison*.)
 Common.
11. WOLVERINE. (*Gulo luscus*.)
 Some thirty years ago it was occasionally met with; but no recent instance of its occurrence is known.
12. SKUNK. (*Mephitis mephitica*.)
 Abundant.
13. OTTER. (*Lutra canadensis*.)
 Rather common in favorable localities.

14. BROWN, BLACK, or CINNAMON BEAR. (*Ursus americanus*.)
Common.
15. RACCOON. (*Procyon lotor*.)
Common along the Bay of Fundy coast; but very rare in the interior.
16. MOOSE. (*Alce americanus*.)
Not uncommon.
17. CARIBOU. (*Rangifer caribou*.)
Common.
18. VIRGINIA DEER. (*Cariacus virginianus*.)
Uncommon, though increasing. This Deer was formerly restricted to the valley of the Magaguadavic; but has lately spread into other portions of Charlotte and York Counties, and a few have been taken in Carleton and Victoria. There is no record of any having been observed east of the St. John River. Dr. Gesner states that this species was first seen in New Brunswick in 1818, the same year in which the Wolf appeared, and that by 1847 it had become plentiful.
19. LITTLE BROWN BAT. (*Vespertilio subulatus*.)
Common.
20. RED BAT. (*Atalapha noveboracensis*.)
Rare.
21. HOARY BAT. (*Atalapha cinerea*.)
Uncommon.
22. COMMON MOLE. (*Scalops aquaticus*.)
Abundant.
23. HAIRY-TAILED MOLE. (*Scapanus breweri*.)
Very rare. I have seen but one specimen, which was taken in Charlotte County.
24. STAR-NOSED MOLE. (*Condylura cristata*.)
Common.
25. COMMON SHREW. (*Sorex platyrhinus*.)
Common.
26. WESTERN SHREW. (*Sorex cooperi*.)
Rare.
27. MOLE SHREW. (*Blarina brevicauda*.)
Common.

28. FLYING SQUIRREL. (*Sciuropterus volucella*.)
Common.
29. GREY SQUIRREL. (*Sciurus carolinensis*.)
A few have been observed in Charlotte and Carleton Counties, near the western border.
30. RED SQUIRREL. (*Sciurus hudsonius*.)
Very abundant.
31. GROUND SQUIRREL. "CHIPMUNK." (*Tamias striatus*.)
Common.
32. WOODCHUCK. GROUND HOG. (*Arctomys monax*.)
Common.
33. BEAVER. (*Castor fiber*.)
Not so numerous as formerly, and now principally restricted to the wilderness portions of the Province, though Mr. Stewart writes to me: "I find the Beaver are coming back to the streams in Carleton and York Counties that have been abandoned by the lumbermen."
34. JUMPING MOUSE. "WOOD MOUSE." (*Zapus hudsonius*.)
Uncommon.
35. BROWN, or NORWAY RAT. (*Mus decumanus*.)
Abundant in the towns near the seaboard, and gradually spreading inland along the rivers. On the St. John River, it has been traced as far inland as Grand Falls.
36. BLACK RAT. (*Mus rattus*.)
Mr. G. A. Boardman reports finding a few examples near St. Stephen.
37. HOUSE MOUSE. (*Mus musculus*.)
Abundant near the seaboard.
38. DEER MOUSE. WHITE-FOOTED MOUSE. (*Hesperomys leucopus*.)
Common in the interior.
39. LONG-EARED MOUSE. (*Evotomys rutilus*.)
Common.
40. MEADOW MOUSE. (*Arvicola riparius*.)
Abundant.
41. MUSKRAT. MUSQUASH. (*Fiber zibethicus*.)
Abundant.

42. PORCUPINE. (*Erethizon dorsatus.*)

Common.

43. RABBIT. NORTHERN HARE. (*Lepus americanus.*)

Very abundant.

MARINE MAMMALS.

HARBOR SEAL. Common.

HARP SEAL. Occasional, in winter.

HOODED SEAL. A few have been observed along the Gulf of St. Lawrence coast.

PORPOISE. Common.

WHALES have been occasionally reported in the Bay of Fundy and off the "North Shore"; but the species are, for the most part, conjectural.



SUMMARY OF MEETINGS.

FEBRUARY 6TH.

THE President, Dr. Botsford, read his annual address, taking for his subject, "The Human Thumb," showing how much through its instrumentality the scope of human knowledge had been extended. Without its aid in manipulating the objects used in the manufacture of implements, and instruments for observation, human knowledge could not have been so extensive and varied as now, and the sciences could hardly have had an existence.

MARCH 6TH.

Mr. J. C. Allison, C. E., read a paper on "Topographical Surveying and Contour," explaining the method by which Contour maps were made, and the practical application of surveying to the laying out and improvement of land.

APRIL 3RD.

On this evening there was a discussion on the subject, "How was America first peopled?" Mr. J. A. Estey introduced the subject, referred to the characteristics of the American civilization, and the possible origin of its aboriginal population. Several members took part in the discussion, and much information was elicited as to the races which had probably contributed to the original population of America.

MAY 1ST.

Mr. M. Chamberlain read a paper on "The work before an Ornithologist in New Brunswick," in which he drew attention to the need of studying the life-history, habits, and migrations of the birds found in this Province. He also described the "Provinces" in North America through which the birds were distributed, in one of which New Brunswick was included.

JUNE 5TH.

Mr. W. S. Carter read an instructive essay on "Heat," describing its relations to electricity, chemical affinity, friction, vital force,

&c. Its application in the construction of philosophical instruments, and especially in the utilization of steam, was spoken of.

JUNE 19TH.

Mr. G. F. Matthew read a paper on the "May-flower of the Loyalists," shewing that the Hawthorne, the Spring Beauty, and the Trailing Arbutus had been successively the May-flower of the Loyalists and their descendants. The Hawthorne (*Crataegus oxyantha*), when they arrived in America; the Spring Beauty (*Claytonia Caroliniana*), to some of the Connecticut Loyalists; and the Trailing Arbutus (*Epigaea repens*), after their arrival in this country. This latter is the plant which is called "May-flower" by their descendants here.

At the same meeting, a paper by Mr. J. E. Wetmore was read, describing the plants found growing on the terraces of the Saint John River, in Carleton County.

JULY 3RD.

A meeting was held this evening to receive reports of members who had attended the field meeting. At Sutton, where the meeting was held, the rock in the ledges along the shore of the Saint John River was found to be a micaceous gneiss, cut by dykes of diorite. Interesting observations were made on the birds of the vicinity. The plants were of a northern or sub-arctic grouping, mingled with the ordinary vegetation of the country. Colombine (*Aquilegia vulgaris*) was found as a "garden 'scape."

SEPTEMBER 4TH.

Mr. W. F. Best delivered an address on "Crystallization," which was illustrated by lantern views, shewing the process of the crystallization of salts from saline solutions.

SEPTEMBER 18TH.

Prof. L. W. Bailey, Ph. D., delivered a very entertaining and instructive lecture on "The American Pre-Historic Man." He referred to the discovery by himself at Indian Point, Grand Lake, of various stone weapons and ornaments, as well as of fragments of pottery, the place having been the site of an Indian encampment. He closed with a brief summary of opinions as to the origin of the Mound Builders of the Mississippi Valley, &c. The lecture

was illustrated by views of objects found in that region, and of local antiquities.

OCTOBER 9TH.

Prof. J. H. Panton, of Winnipeg, Manitoba, delivered an address on "Gleanings from the Geology of the North-West," in which he described the great prairie "steppes" of the North-West Territory of Canada. The geology of this region had an intimate relation to its physical geography. The Professor gave graphic and very entertaining descriptions of various points of interest along the Canada Pacific Railway, which he had visited, and whose geological treasures he had collected.

NOVEMBER 6TH.

Mr. G. F. Matthew gave an account of an Osirid which had recently been found in the museum of the Mechanics' Institute. The inscription on this little figure had been transmitted to Prof. T. O. Paine, of Elmwood, Mass., a well-known oriental scholar, who gave the following as the meaning of the hieroglyphic text:

"Glorified Osiris Paneh the blessed said: 'Behold this image is that of [me] a chief reader and chief burier of the dead. It will do for all people what is to be done in the divine underworld. When the meadows grow green; when the banks are inundated; when the boat is paddled along the sandy shores from east to west, * * *'"

Prof. Paine adds, in explanation, that the meaning is: When the friends left behind on old Nile are enjoying life, he wishes to be spoken to, and to have part in their pleasures, as when he was with them. This Osiris being in the divine image, it was omnipotent against evil in the future world. An Osiris, or, as here named, a *Shebwee*—image of Osiris, and at the same time of Pa-aa-neh—is one who has gone to Osiris. He (Pa-aa-neh) was an *ariash* and an *ariut* priest—one who was a "chief reader" and "chief burier." He led the funeral procession and read the service. The hieroglyphs all belong to the high Pharaonic epoch. But one of the signs is new, or not published by Brugsch or Rougé.

DECEMBER 4TH.

Mr. Alfred Morrissey described the habits and characteristics of the Woodpeckers, in connection with a paper on the "Pileated

Woodpecker" (*Hylotomus pileatus*). These birds are ruthless enemies to insects, and therefore worthy of protection on account of their benefits to the lumberman and horticulturist.

Mr. J. H. Banks read a paper on the habits of the Horned Owl (*Bubo virginianus*) in confinement. Mr. Banks' paper was published in an American magazine.

JANUARY 4TH.

This evening was devoted to papers on botanical subjects. Mr. John Brittain, of Petitcodiac, read a paper on the grasses of New Brunswick, noting the occurrence of rare forms, and speaking of the advantage of introducing orchard grass and other varieties more generally into the mixtures which were sown for meadow and pasture lands.

Mr. J. Vroom, of St. Stephen, referred chiefly to the wild species growing in this Province which were available for cultivation, either for ornamental shrubs or for the flower garden, or on account of their fruit or fibrous stems.

Mr. G. U. Hay, read a paper on "Bacteria," which is among the occasional papers in this number of the BULLETIN.

N. B.—Dr. Botsford's paper on "Conversion of Light into Heat," read at the conversazione, 25th January, and Mr. G. F. Matthew's paper on "Discoveries at a Village of the Stone Age at Bocabec," read 5th February, will also be found in this number of the BULLETIN.



REPORT OF THE COUNCIL.

THE Council of the Natural History Society of New Brunswick present the following report of the work of the Society for the year just closed :

The roll of membership is as follows: 1 Honorary Member; 6 Life Members; 80 Ordinary Members; 47 Corresponding Members, and 35 Associate Members, being an increase for the year of 10 Ordinary, 5 Associate, and 15 Corresponding Members.

During the year just closed, 11 regular meetings of the Society were held, at which the papers mentioned in the preceding summary of meetings were read.

On 17th April the Society held a *conversazione*, which was well attended, and was very successful.

A field meeting of the Society was held at Grand Bay, June 25th, 1883, in conjunction with the Eclectic Reading Club. This, too, was well patronized. A more permanent gathering than a field meeting was this year held for the first time. This was the summer camp at Bocabec, Charlotte Co., where various branches of study were pursued by the members assembled. Much that was interesting regarding the botany and marine zoology of the locality was observed; and some important discoveries relative to the people of the Stone Age, who once lived there, was the subject of a paper at the February meeting.

During later winter and the spring months, a course of four free elementary Lectures on Science were delivered in the Society's Rooms, as follows: W. F. Best, "Glaciers of the Alps;" W. F. Coleman, M. D., "Respiration;" M. Chamberlain, "Means of Flight in Birds;" G. U. Hay, "Morphology of Plants."

The Treasurer reports that the total income for the year is \$287.47, and the expenditure \$248.50, leaving a balance on hand of \$38.97. The balance of \$120, due last year on the cases for birds, has been paid.

The Committee on Geology report a number of additions to the Museum, and especially a collection of fossil plants from Spring Hill Mine, N. S.

The Committee on Botany report that about sixty (60) species of plants, not hitherto reported as existing in the Province, have been found during the past year. They recommend that a new catalogue of New Brunswick plants be prepared at the end of the season of 1884, A. D.

The Committee on Ornithology report that during the year they have continued to study the species of birds occurring in the immediate vicinity of Saint John, and have collected a large amount of information which, though not of such a character as can be readily given in a report, will prove most useful when a revision of the catalogue of the birds of New Brunswick is undertaken. A number of specimens of birds, and bird's nest and eggs have been added to the Museum.

The Committee on Entomology report that in the past year, through the indefatigable exertions of Mr. Herbert E. Goold, a large collection of the insects occurring in the vicinity of St. John has been added to the Museum. These specimens Mr. Goold has mounted with very creditable care and skill. The Society having provided cases in which to preserve them, they will form a most interesting part of the Museum.

Another valuable addition to the Museum in the past year is the collection of native food fishes; prepared, mounted, and presented to the Society by Mr. Peter Campbell.

During the year there have been added to the Library sixty-three books and pamphlets.

The Council here desire to acknowledge their obligation to the daily press, for publishing preliminary notices of the meetings of the Society.

Respectfully submitted,

W. J. WILSON,
Sec. to Council.

DONATIONS TO THE MUSEUM,

DURING THE YEAR ENDED JAN. 15TH, 1884.

1883.	DONORS' NAMES.	DONATIONS.
Feb.	A. C. SMITH, M. D., Newcastle, Miramichi,	Fossil trees (<i>Lepidodendra</i>), Clifton.
	G. F. MATTHEW,	Chalcedony from Indian camping ground on Washademoak.
	LEB. BOTSFORD, M. D.,	Corn Stalk, with aerial roots.
	Master ARTHUR HAMILTON,	Fossil Shell (<i>Spirifer</i>), and teeth of whale and moose.
	RICHARD ROE,	Lapland Longspur.
March.	F. W. DANIEL,	Russian Sable and Common Er- mine, mounted.
April.	J. C. ALLISON, C. E.,	Wall Card, framed, title of the Society, etc.
May.	J. W. WILLIAMS, Toronto,	Skulls of five species of Native Birds, prepared.
	M. CHAMBERLAIN,	8 species of Native Birds, mounted.
	F. W. DANIEL,	Marine plant from Bermuda.
June.	WM. JACK, Esq.,	Stormy Petrel.
	M. CHAMBERLAIN,	Creeping Warbler.
	Messrs. HAY, VROOM, BRIT- TAIN, and WETMORE,	40 species of plants of New Bruns- wick, not previously in the Herbarium of the Society.
July.	REV. JAS. FOWLER, Kingston, Ont.,	Rocks from Roberts' Mine, Kings- ton, Ont., 7 kinds. Ores from Roberts' Mine, Kings- ton, Ont., 4 kinds. Rock specimens from Ontario, 3 kinds. Minerals from Ontario, 6 kinds.

DONATIONS TO THE MUSEUM—(Continued).

1883.	DONORS' NAMES.	DONATIONS.
	W. G. KIDD, Esq., Kingston, Ont.,	Minerals from Ontario, 4 kinds.
	REV. DR. SMITH,	Apatite (Ontario) Fossil Wood (Rocky Mts.), Pink Coral (Ceylon).
	G. WILLIAMSON, Greenwich,	Amber Snails (<i>Succinea</i>).
	JAS. CHRISTIE, M. D.,	Sphinx Moth.
Sept.	C. DEV. SCOFIELD,	Trilobite from Portland, N. B. (<i>Conocoryphe</i>).
Nov.	THOS. WALKER, M. D.,	Shark's Tooth, Eocene of North Carolina.
	MARSHALL REED, Restigouche,	A Newt from Eel R., Restigouche. Diamond from South Africa.
	PETER CAMPBELL,	Food Fishes of N. B., prepared and mounted, 18 species. Harp Seal, young of, prepared and mounted.
Dec.	WM. HALL, Spring Hill, N. S.,	Fossils from Spring Hill Mine, N. S., 10 species. Iron Pyrites from same mine.
	HERBERT E. GOOLD,	3 boxes Butterflies and Moths (<i>Lepidoptera</i>), 223 specimens. 1 box Beetles (<i>Coleoptera</i>), 375 specimens. 1 box Dragonflies (<i>Orthoptera</i>), 138 specimens. Bees, &c., (<i>Hymenoptera</i>), 138 specimens. Flies, &c., (<i>Diptera</i>), 138 specimens 1 box Larval forms of Insects, in alcohol, 97 phials.
	W. C. Drury, Esq.,	Canada Grouse (<i>Tetrao Canadensis</i>).
	JAMES KING,	Grebes (<i>Podiceps</i>).
	E. O. DAMON, Mass.,	Hooded Merganser (<i>Mergus cucullatus</i>).

DONATIONS TO THE MUSEUM — (*Continued*).

1883.	DONORS' NAMES.	DONATIONS.
	F. W. DANIEL,	Grebe, Ruby Crowned Kinglet, mounted.
	A. MORRISEY,	Pileated Woodpecker, 2 Sparrows, 2 Cedar Birds, all mounted.
	M. CHAMBERLAIN,	Peregrine Falcon, Bonaparte Gull, mounted. Young of Ruffed Grouse and of Canada Lynx, mounted.
	R. P. STARR, Esq.,	Ruby-throated Humming Bird, mounted.
	A. DANIEL,	Kittiwake Gull, mounted.
	J. M. WADE, Boston,	California Jays, mounted.
	A. P. CHADBOURNE, Boston,	Hudson Bay Tit, Nest and Eggs of
	G. WILLIAMSON, Greenwich,	4 Nests and Eggs of Birds.
	D. McL. SMITH,	Number of Tern's Eggs. Puffin's Eggs.
	J. W. BANKS,	Night Hawk, Eggs of
	HON. A. HARRISON,	Shrike, Nest of
1884. Jan.	MISS V. VROOM, St. Stephen,	Stone Celt, Oak Bay, Charlotte Co.
	J. VROOM, St. Stephen,	Section of Young Cherry Tree.
	MRS. J. WARREN MOORE, St. Stephen,	Bird's Nest.
	I. ALLEN JACK,	Dried Plants of New Brunswick, mounted, 40 species.
	G. F. MATTHEW,	Dried Plants, European and other foreign, 2,000 species and vars. Dried Plants, Cuban, about 200 species. Dried Hungarian Mosses, collection of.

DONATIONS TO THE LIBRARY.

1883.	DONORS.	DONATION.
Feb.	OTTAWA FIELD NATURAL- IST CLUB, CANADIAN INSTITUTE, DR. J. W. DAWSON,	Transactions. Proceedings, Vol. 1, Fasc. 3, 4 & 5. Erect trees, with animal remains.
April.	DEPARTMENT OF INTERIOR, UNITED STATES, WAR DEPARTMENT OF U.S. EDWARD GILPIN, C. E.	Bulletins of Geological Survey of the Territories (II). Reports and Pamphlets. Quarterly Journal of Geological Society of London, Vol. 37, No. 147, No. 149; Vol. 39, Nos. 1, 2, 3 and 4.
	ENTOMOLOGICAL SOCIETY OF CANADA,	Annual Report.
May.	CLIFFORD RICHARDSON, Washington, BOSTON SOCIETY OF NAT- URAL HISTORY, NATURAL HISTORY SO- CIETY, MONTREAL, BOSTON ZOOLOGICAL SO- CIETY, LINNÆAN SOCIETY, NEW YORK.	Report of United States Depart- ment of Agriculture, 1881-2. Proceedings, Vol. 21, Part IV. V. Canadian Naturalist, Vol. X., No. 7, No. 8. Quarterly Journal, Vol. 2, No. 3, No. 4. Transactions, Vol. 1.
June.	OHIO MECHANICS' INSTI- TUTE, Cincinnati, SOCIETE MALOCOLOGIQUE de BELGIQUE, Brussels,	Scientific Proceedings, Vol. 1, No. 4. Proceedings, April, July, 1882.
July.	HIST. AND GEOL. SOCIETY, Wyoming,	Palaeozoic Fossil Insects, List of.
Sept.	ACADIAN SCIENCE CLUB.	Acadian Scientist.
Nov.	E. A. SMALL, Hagarstown, Md.	Report of Commissioners of Fish- eries of Maryland.
Dec.	BELFAST NATURALIST'S FIELD CLUB, ACADEMY NATURAL SCI- ENCE, Philadelphia, SMITHSONIAN INSTITUTION, UNITED STATES FISH COM- MISSION, PROF. JOHN MACOUN.	Annual Report, 1881-2. Proceedings, 1883. Part 1. Report for 1881. Bulletin, Vol. 2.—1882.
Jan.	ESSEX INSTITUTE, Salem,	Catalogue, Canadian Plants, Part 1. Bulletin, Vol. 14, Nos. 7 to 12.

OFFICERS OF THE SOCIETY

FOR 1884.

Patron :

His Honor the Lieutenant Governor.

President :

LeB. Botsford, M. D.

Vice-Presidents :

M. Chamberlain. W. F. Coleman, M. D.

Treasurer :

James A. Estey.

Corresponding Secretary :

Geo. U. Hay.

Recording Secretary :

W. J. Wilson.

Librarian :

S. W. Kain.

Curators :

G. F. Matthew. F. W. Daniel. W. F. Best.

Members of Council :

R. P. Starr. W. S. Harding, M. D. Edwin Fisher.

STANDING COMMITTEES FOR 1884.

Physics and Chemistry :

W. F. Coleman, M. D. W. F. Best. G. U. Hay.

Meteorology :

Gilbert Murdock. William Murdock.

Mineralogy :

G. F. Matthew. W. F. Best. R. P. Starr.

Geology :

G. F. Matthew. R. Chalmers. W. J. Wilson.

Botany :

G. U. Hay. J. Vroom. J. Brittain.

Entomology :

M. Chamberlain. G. Williamson. H. E. Goold.

Invertebrates :

L. C. Allison, M. D. P. R. Inches, M. D. W. F. Ganong.

Vertebrates :

LeB. Botsford, M. D. W. F. Coleman, M. D. M. Chamberlain.

Ornithology :

M. Chamberlain. J. W. Banks. A. Morrisey.

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S. W. Kain. W. J. Wilson. G. E. Keator.

Essays :

G. F. Matthew. G. U. Hay. C. H. Masters.

Publication :

M. Chamberlain. G. F. Matthew. G. U. Hay.

Hall :

W. J. Wilson. S. W. Kain. G. F. Matthew.

Finance :

J. A. Estey. W. J. Wilson. G. F. Matthew.

Delegate to the Royal Society of Canada :

M. Chamberlain.

NEW MEMBERS ELECTED,

DURING THE YEAR ENDED 15TH JANUARY, 1884.

ORDINARY MEMBERS.

1883.

February.

R. J. Ritchie, Barrister.
 Herbert E. Goold, . . Student.
 Wm. M. McVicar, . . Professor.
 Rt. Rev. Bishop Kingdon, . .

March.

Alfred Mills, Merchant.
 S. W. Kain, Clerk.
 C. H. Masters, Barrister.
 Alfred Markham, Agent.
 Rev. R. Mather, . . Clergyman.

April.

T. F. Fotheringham, Clergyman.

May.

G. A. Hetherington, Physician.

June.

W. A. Holbrook, . Clergyman.
 J. H. Leonard, . . . Merchant.
 Wm. Kerr, Merchant.
 A. H. DeMill, Barrister.
 Ed. Sears, Jr., . . . Gentleman.

July.

F. H. Hayes, School Inspector.
 M. Lindsay, Merchant.

September.

C. A. Prichard, . . . Merchant.

October.

T. M. Pengilly, . . . Druggist.
 Geo. Keator, Clerk.
 W. F. Baird, Lt.-Col.

November.

John Robertson, Clerk.

CORRESPONDING MEMBERS.

1883.

February.

J. Baxter, M. D., . . . *Chatham.*
J. L. Stewart, *Chatham.*
Wallace Broad, *Ottawa, P. Q.;*
St. Stephen, N. B.

March.

John Mosher, *Stanley, (York).*
John Brittain, *Petitcodiac.*
Edgar March, M. D., *Hampton.*

June.

J. M. LeMoins, Esq., *Que., P. Q.*

September.

W. F. Ganong, . . . *St. Stephen.*

October.

J. H. Panton, *Winnipeg, Man.*
W. T. L. Reed, . . . *Fredericton.*
Marshall Reed, Jr.,
Eel River, Restigouche.

November.

Jno. H. Garnier, M. D.,
Lucknow, (Ont.)

December.

Wm. Hall, . . . *Springhill, N. S.*
Rev. C. H. Paisley, . . *Sackville.*

January, 1884.

G. E. Croscup, . . . *Fredericton.*

ASSOCIATE MEMBERS.

Mrs. C. H. Masters,
Miss Hattie Gregg,
Mrs. Charles Holden,

Miss Evelyn Peters,
" E. J. C. Macrae,
" Scilla I. Macrae.

