

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

Coloured covers/
Couverture de couleur

Covers damaged/
Couverture endommagée

Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée

Cover title missing/
Le titre de couverture manque

Coloured maps/
Cartes géographiques en couleur

Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)

Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur

Bound with other material/
Relié avec d'autres documents

Tight binding may cause shadows or distortion
along interior margin/
La reliure serrée peut causer de l'ombre ou de la
distorsion le long de la marge intérieure

Blank leaves added during restoration may appear
within the text. Whenever possible, these have
been omitted from filming/
Il se peut que certaines pages blanches ajoutées
lors d'une restauration apparaissent dans le texte,
mais, lorsque cela était possible, ces pages n'ont
pas été filmées.

Additional comments:/
Commentaires supplémentaires:

Coloured pages/
Pages de couleur

Pages damaged/
Pages endommagées

Pages restored and/or laminated/
Pages restaurées et/ou pelliculées

Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées

Pages detached/
Pages détachées

Showthrough/
Transparence

Quality of print varies/
Qualité inégale de l'impression

Continuous pagination/
Pagination continue

Includes index(es)/
Comprend un (des) index

Title on header taken from:/
Le titre de l'en-tête provient:

Title page of issue/
Page de titre de la livraison

Caption of issue/
Titre de départ de la livraison

Masthead/
Générique (périodiques) de la livraison

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

September, 1887.

THE
* OTTAWA NATURALIST *

VOLUME I. NO. VI.

The
* TRANSACTIONS.

Of the
* Ottawa Field-Naturalists' Club *

(Organized March, 1879. Incorporated March, 1884.)

CONTENTS.

	PAGE.
The Great Ice Age and Subsequent Formations at Ottawa, Ontario. H. M. Ami, M.A., F.G.S.	81
Librarian's Record	89
Sub-Excursions.	91
Excursion to Britannia.....	92
Announcements.....	92

OTTAWA, CANADA:

Citizen Printing and Publishing Company, Metcalfe St.

1887.

Published Monthly at \$1.00 per annum.

Patron:

HIS EXCELLENCY THE MARQUIS OF LANSDOWNE,
GOVERNOR GENERAL OF CANADA.

President: R. B. WHYTE.

Vice-Presidents: 1ST, PROF. J. MACOUN | 2ND, PROF. S. WOODS.

Secretary: W. H. HARRINGTON. (Post Office Dept.)

Treasurer: JAMES FLETCHER. (Library of Parliament.)

Librarian: T. J. MACLAUGHLIN. (Dept. Public Works.)

Committee: DR. H. B. SMALL, | H. M. AMI, | DR. GEO. BAPTIE.

Standing Committees of Council:

Publishing—PROF. S. WOODS, W. H. HARRINGTON, JAMES FLETCHER.

Excursions—T. J. MACLAUGHLIN, H. M. AMI, DR. BAPTIE.

Soirées—PROF. J. MACOUN, PROF. S. WOODS, DR. SMALL.

Lenders:

Geology—H. M. AMI, REV. PROF. MARSAN, JOHN STEWART.

Botany—J. FLETCHER, DR. SMALL, DR. BAPTIE.

Conchology—F. R. LATCHFORD, H. B. SMALL.

Entomology—W. H. HARRINGTON, J. FLETCHER, T. J. MACLAUGHLIN.

Ornithology—G. R. WHITE, PROF. MACOUN.

Editor: W. H. HARRINGTON.

The Librarian will furnish the Publications of the Club at the following rates:—

Transactions, Part 1, Not sold singly	}	\$1.00 for Vol. I.
“ 2, 25 Cents.		
“ 3, 25 “		
“ 4, 25 “	}	\$1.00 for Vol. II.
“ 5, 30 “		
“ 9, 40 “		
“ 7, 30 “		

(Less 10% to members.)

The Ottawa Naturalist, \$1.00 per annum.

Extra copy to members, .75 “

Monthly parts, 10 cents each, \$1.00 per doz.

To members, 8 “ .75 “

THE GREAT ICE AGE AND SUBSEQUENT FORMATIONS AT OTTAWA, ONTARIO.

By H. M. Ami, M.A., F.G.S.

Continued from Page 74.

Following this period of great elevation and of extreme cold there came a period of submergence. Nor must it be surmised that the subsidence which took place in this part of the country was necessarily effected in a short time; on the contrary, it must indeed have taken ages for the country to have come down even to the level at which it is at present—a height of between two and three hundred feet above sea level at Ottawa. As the elevated and ice-bound country was gradually subsiding, there came an amelioration in its climatic condition, and more temperate seasons ensued. The glaciers which at one time discharged their materials into valleys and on land—feeders to a regular system of glacial rivers both in the lowlands and in the mountain districts—now discharged these along the coast, and coast-ice and icebergs were soon at work as the sea was encroaching upon the land and depositing over the old beds of the glaciers a series of sedimentary strata, with which there came also the life and organisms common to such habitats, so that the next period or formation with which we have to deal is one of marine origin, deposited in the still depths of an ocean or sea and containing the remains of animals common to that period in the earth's history. Meanwhile, innumerable quantities of icebergs, carrying with them large blocks of rock and detritus—themselves portions of glaciers—were scattering their burden over the bed of this ocean or sea, as the warmer regions were reached, just as is going on at the present day, along the coasts of Labrador, Newfoundland, etc., the icebergs detached from their northern fortresses sweep down towards the centre of the earth—no doubt to a great extent due to that transporting force developed in the rotation of the earth.

There are certain geologists, I believe, who would account for the striations in the hard rock masses below being formed through the agency of coast-ice and icebergs only. Whilst admitting the possibility of

certain local and limited areas as capable of being affected by the agencies above mentioned, there is little doubt that they are together wholly inadequate to explain the phenomena of striated surfaces (see Prestwich's geology) over such vast areas, as it is known that these surfaces extend, in some cases, for hundreds of miles.

But, of the sedimentary strata which, during this period of submergence, were being laid down over the remains of the glacial epoch the lowermost series consists of bluish gray clays of more or less plasticity and varying greatly in thickness in different parts of this region. There are a number of sections both natural and artificial which this district has afforded. Amongst the latter may be mentioned the Rideau Canal, which from the "Basin" to the "Deep Cut" "gives a very good idea of the thickness of these clays there. Then the hundreds of sections which the recent excavations carried on by the City Engineer have exhibited, where in almost every instance, the clays may be seen in their normal position. Then come the brick-yards owned by the Messrs. Odell, Clark, Nicholson, Graham and others. In the first mentioned of these have been found remains of a fossil sponge, the *Tetlea Logani* of Dawson, together with shells and *foraminifera* and a bone sent to Prof. Cope for identification, all of which were presented to the writer through Mr. A. P. Low, of the Geological Survey of Canada. But whilst artificial sections are often more convenient in ascertaining the relative thickness of the different kinds of strata, nevertheless, the natural sections which are met with everywhere, enable us to obtain the geographical distributions, extent and thickness, sometimes with greater facility, as these sections are very numerous indeed. Along the left bank of the Rideau River, *e. g.*, from the Hog's Back to the Falls, down the Ottawa as far as Green's Creek, and farther across the river in Hull Township as far as Ironsides, and above that towards New Chelsea, and in Nepean and Gloucester Townships, there are hosts of natural sections, where the "Leda clay" formation—so-called on account of the prevalence of a small bivalve shell, *Leda (Portlandia) arctica*,—Gray is well exposed.

An interesting point about these clays and accompanying strata is the fact that they occur in many instances in the shape of "terraces" or small plateaus following one another at different levels. By one stand-

ing on Parliament Hill some of the more prominent 'terraces' may be clearly seen to the north forming for a considerable distance an almost unbroken line of level, stretching from east to west in the general trend of the Ottawa River. One of these occurs just above Ironsides, as many members of the Club have had occasion to notice, forming a general plateau of clay covered by a thin stratum of sand. These terraces point indubitably to a period of subsequent elevation which was characterized by oscillatory movements i. e. a period of elevation which is not constant, during which periods of quiescence intervene. Such an elevation predicates the next period with which we are to deal; but before entering upon this latter, there are important results which must be noted with regard to the "*Leda clay*" formation. Imbedded within its measures is found a goodly number of interesting organic remains. Nearly all of them are of marine origin and consist in the remains of shells, insects, animals and even plants which will together, when all examined and determined, make not far from thirty distinct species.

With scarcely a single exception all of these species of shells and animals can be dredged up alive now-a-days either in the Gulf of St. Lawrence or along the Coasts of Labrador or Newfoundland, and even as far as Norway. Their mode of preservation is not an uninteresting fact to record, as it is peculiar even in different portions of the same formation. At Green's Creek, for example, on the Lièvre River, and in other localities likewise, both above and below our city, these places are noted for the peculiar nodules which are found included in the clays. By some such process as concretionary action can the agglomeration of finely divided particles of argillaceous rock be best accounted for, principally around some nucleus whatever it may be—a pebble perhaps as in some instances. Remains of the seal, feathers, numerous remains of the caplin *Mallotus villosus* (Cuvier) occur in this manner, whilst it more often happens that the nucleus is so small as to be almost invisible. These nodules have also yielded two other kinds of fish, the Lump Sucker and a Sculpin found by Mr. Stewart recently, all these still live in the Gulf of St. Lawrence. Sir William Dawson has a beautiful collection of these nodules from Green's Creek, from which he has indentified a large number of species of fossil plants, among which are

twigs and bunches of the white cedar which is met with not unfrequently. Another mode of preservation of these fossils at Green's Creek is through the infiltration of a siliceous solution, so that shells are as thoroughly silicified in this deposit as they are in the Black River formation at Paquette's Rapids, muriatic acid not affecting the shell in the least. Others are preserved with but little change from the character in which they were entombed, whilst others appear as if they were live shells with the epidermis on and nicely preserved.

Of the other fossils which characterize this formation a great deal might be said, but passing over these important discoveries I will mention that during the past season a large number of *feraminiifera* were collected. Dr. G. M. Dawson, whose extensive researches in Post-Tertiary Geology have enabled him to give valuable information regarding the best mode of obtaining these very minute organisms from the clays, and of working out their microscopic character, has very kindly given the writer such hints as have proved of utmost value in this connection, so that by a series of percolations of a solution of clay and water, on sheets of blotting-paper a large number of specimens was obtained. The largest of these, and a common species in nearly all the collections from the Gulf and elsewhere, is *Polystomella crispa*, L., which also occurs in our Ottawa deposits. Besides these forms there remains a great deal of material ready to be worked up and awaiting identification.

It has already been hinted that the "Leda clay" formation, laid down beneath the level of an ocean or sea which extended in this region as far west as the Bonnechère River (*loc. cit.*), was followed by a period of elevation. Whilst these clays were thus being deposited along the bottom of the sea, *i.e.*, at some distance from the shores, the sands and gravels which usually mark the littoral deposits of an ocean were being deposited in this vicinity in regular order. They are arenaceous deposits in which distinct lines of stratification occur overlying the clays in numerous localities, but their thickness varies considerably in different places. This uprising of the continent which exposed to view the former depths of the ocean, once begun has continued on, and there is no index that points out whether this elevation has, up to the present day, ceased. The sands and clays which were laid along the shores and bottom of the old Ottawa Sea, up

as far as the Bonneschère River, are now some 500 feet above the mean tide level at Three Rivers, so that there must have been, at least, an elevation of 500 feet in this part of the American Continent in later Post-Tertiary times. Those sands, to which the term "*Savicava Sand*" has been applied by Sir W. Dawson and others, are very generally distributed over the gravels, clays and older boulder glacial clays in this district. Sandy Hill received its name no doubt on account of the prevalence of this rock about that part of the city, although there is perhaps twenty-five times more clay on Sandy Hill than sand. Near the junction of the sands with the clays below and in places when the gravels are not coarse, there are found several species of fossils, some of which have already been recorded in the Club's transactions. *Macoma calcarea*, Chemnitz, *M. fragilis*, Fabricius, *Natica affinis*, Gmelin, and others occur in these deposits, but as a rule they are nearly always destitute of fossils. As there must certainly have been many at one time, their remains must have been decomposed and become obliterated. A peculiar seam one inch in thickness occurs near the corner of Waller and Rideau streets, and divides the upper sands into two parts. This bed consists for the most part of leaves of poplar and other trees, bits of grasses and sedges held together, but has been observed to be continuous only for a limited area. There is considerable evidence to show that much of the sands of the district were redeposited in lagoons or lakes along river shores in later times. Overlying the sands in New Edinburgh, on the east side of Hemlock Lake, there occurs a deposit of shell-marl teeming with remains of fresh water and land mollusca, evidently a lacustrine deposit. This bed is now at a considerable elevation above the present lake and river levels.

The upper portion of these sands is that with which we have last to deal, and is included in that period which we call here the Human period, for in it do we find for the first time traces of the existence of human beings. The loam or surface soil, cultivated or not, in which implements of stone are found associated with fragments of pottery, bones of deer, bear, beaver and other animals, points clearly to the fact that man of two distinct types has left his mark in these newer overlying beds. Previous to this, however, no records exist which show, that here in Canada, man came in these

times except subsequent to the Glacial Epoch in the newer and present Historical age.

Nor is the economic aspect of the question, in reference to the use to which the materials which compose the Post-Tertiary deposits of this district can be put, one of trifling importance whether in furnishing useful materials for railroad, commercial, agricultural, or other interests. For ballasting, road metal and the like, the Saxicava Sands, gravels and Boulder Clay formations have been extensively used by the Canada Atlantic and Canadian Pacific Railway authorities throughout this district along their roads at Ottawa and its environs, whilst the sands themselves afford splendid material in the manufacture of mortar for building purposes and to such an extent that a good sand quarry is more remunerative than a gold mine. But whilst these substances are of incalculable value to man, the marine clays of the "Leda Clay" formation supply the brick and tile manufacturers with the material wherewith to turn out these useful building and other requisites and likewise afford an inexhaustible supply of the argillaceous substance necessary in the manufacture of Hydraulic cements, of which the Hull cement of this locality, is well-known to be one of the best slow-setting cements.

Mr. Wright, the manufacturer of the Hull Cement, informs me that the marine clays which he uses are almost equal to the mud or clays dug out of the Thames in England, for the manufacture of the "Portland and Roman Cements," so famous everywhere:

There are many good brick-yards in the vicinity which derive their material from the clays in question, and whilst, it is not deemed necessary to signal out any particular one, nevertheless, that of Mr. T. M. Clarke, of New Edinburgh is worthy of note, as from it, that gentleman turned out a large quantity of white brick of superior quality, by carefully introducing a certain percentage of the white earth taken from the marls overlying the saxicava sands at Hemlock Lake, in McKay's Grove, and submitting it to special process. Brick manufacturing is a most remunerative occupation, especially in such a growing place as Ottawa, where the supply can scarcely equal the demand and the materials are ready and at hand.

The plastic nature of certain strata in the lower portion of the

Leda clays afford good substance for modelling purposes and they have already been used to a certain extent in this direction.

There is a large percentage of *alumina* in these clay deposits, and when we think of the vast advantages which the metal *aluminium* presents over such substances as iron, copper, lead and zinc, it may not be amiss to look forward to the time when a process shall be discovered which will enable its being manufactured from clays such as we have at our very doors. Nay, if I am rightly informed, a series of very successful experiments have been carried on by French chemists and others of late by means of which that metal can be produced, but at a cost which, at the present time, is too great so that this aluminium industry cannot compete with that of iron. Those who are familiar with the properties of this metal will clearly see what advantages the community would reap if a aluminium could be manufactured cheaply and from the clays which are so abundantly distributed with us.

And to sum up the results thus obtained in the examination of the Post-Tertiary deposits of Ottawa and vicinity, an ideal vertical section, made to include the various measures which compose them is here given :—It is based on an actual section taken in the excavations along Waller street, not far from Rideau street and is supplemented by data obtained from other quarters. The lowest measures are those which belong to the “Boulder or Glacial Clay” or “till” formation and are seen to rest on the Cambro-Silurian formations of the district unconformably. Their thickness is considerable in numerous places but varies materially, according to the district in which they occur. The “Leda Clay” formation overlies this glacial deposit and contains fossils of various kinds entombed in strata. The thickness of this marine deposit is considerable in some places whilst it has been completely eroded or denuded in others at a remote, but subsequent period to its deposition. The clays often carry erratics with them. Then comes a series of stratified gravels or coarse sands in which many large angular and partially rounded boulders occur overlying the Leda Clays, in most cases apparently conformably, but oftentimes, no doubt, unconformably as the line of contact is very sinuous and points to a good portion of the clay as having been carried away. Overlying these gravels are

found the yellow and darker sands so extensively developed about Ottawa. The shell-marl deposit overlies these sands, and along with them form the newest or topmost deposits of our district. It is in these most recently deposited strata that the Human remains occur—remains which point to the time when this part of Canada was first inhabited by Algonquin tribes who flourished at one time, leaving behind them innumerable traces of the advanced state of civilization to which they had attained whether in hunting or other practices of life common to their race. But these newer and arenaceous strata deposited on the shore or margin of an ocean or sea, point clearly to a period of elevation, which period has been going on ever since, so that this part of the American Continent may safely be said to be rising yet, at least in Eastern Canada, and until we have actual proofs of a submergence going on, a depression along the coast or an encroachment of tidal and other oceanic phenomena on the land, we may rest safely with the happy thought that we are on the upward move.

LIBRARIAN'S RECORD.

The following publications have been received as donations, or in exchange for the transactions of the Club:—

W. D. Dincock, B. A. Truro: Catalogue of Exhibits from New South Wales at Colonial Exhibition; Victoria Year Book, 1884-85; Illustrated Hand Book of Victoria; Hand Book of New Zealand, 1886; Facts and Figures relating to the Bendigo Gold Field, Victoria; The Indigenous Vegetation of Australia, &c.; Observations on New Vegetable Fossils of the Auriferous Drifts, Victoria; Catalogue of Exhibits of the Victorian Court.

W. A. Kellerman, Ph. D.: Journal of Mycology, Vol. III, Nos. 4 to 8.

Montreal Natural History Society: Canadian Record of Science, Vol. II, Nos. 6 and 7.

Johns Hopkins University: Circular, Nos. 57, 58 and 59.

Elisha Mitchell Scientific Society: Journal, 1883-84, 1884-85, 1885-86; Memories of Rev. Elisha Mitchell.

Liverpool Naturalists' Field Club: Proceedings, 1885-86.

Nova Scotia Natural History Society: Proceedings, Vol. VI, Part 9
Rev. Dr. Honeyman, D.C.L.: Giants and Pigmies.

United States Geological Survey: Dinocerata, a Monograph of an Extinct Order of Gigantic Mammalia, by Prof. O. C. Marsh.

Miss E. A. Ormerod: Transactions of the Entomological Society of London, 1887; The Garner and Scientific Recorder's Journal, eight numbers; Manuel of Injurious Insects; The Hessian Fly; Lecture on Injurious Insects; Lecture on the Turnip Fly; Observations on Cæstridae, or "Botflies"; Reports on Injurious Insects for 1877, 1879, 1882-3-4-5-6 and other papers; Guide to the Methods of Insect Life.

Massachusetts Horticultural Society: Annual Report, 1886, Part II.

The Editor: Ornithologist and Oologist, Vol. XII, No. 6.

American Museum of Natural History: Annual Report, 1886-87; Bulletin, Vol. XII, No. 1.

American Ornithologists' Union: The Auk, Vol. IV, No. 3.

Cincinnati Society of Natural History: Journal, Vol. X, No. 2.

- Torrey Botanical Club : Bulletin, Vol. XIV, Nos. 6, 7, 8.
 Essex Field Club : The Essex Naturalist, Nos. 5, 6.
 New Brunswick Natural History Society : Bulletin, No. 4.
 Brooklyn Entomological Society : Entomologica Americana, Vol. III, Nos. 3, 4, 5.
 Ontario Entomological Society : Canadian Entomologist, Vol. XIX, Nos. 6, 7, 8 ; Annual Report, No. 17.
 A. C. Lawson, M. A. : Geology of the Rainy Lake Region.
 Department of Agriculture, Manitoba : Crop Bulletin, Nos. 18-20.
 Queen's University, Kingston : Calendar, 1937-38.
 New York Microscopical Society : Journal, Vol. III, Nos. 1, 2.
 Guelph Scientific Society : Proceedings, 1886-87.
 Illinois State Laboratory : Vol. II, Articles 5, 6 ; Vol. III, Article 1.
-

SUB-EXCURSIONS.

NINTH.—On 30th July this Excursion was to have been to the Beaver Meadow, Hull; but as only five members of the botanical section turned up, and the heat was intense, it was decided to visit a nearer locality, and Stewart's Bush was chosen. The woods, owing to the almost unprecedented drought, were very dry, and it was noticed that the underbrush and even the forest trees were suffering severely from want of water.

TENTH.—On 6th August to Gatineau Point, P.Q. This Excursion was a very successful one. Several ladies attended the meeting and made collections of plants under the guidance of the President, Mr. Whyte, and the botanical leader, Mr. Fletcher. The different character of the soil and woods in the vicinity of Gatineau Point, as compared with more accessible localities on the Ontario side of the river, always renders it an interesting field for our collectors. While the woods and fields were being ransacked by the botanist and entomologist Mr. Latchford, the conchologist, accompanied by one brave and enthusiastic lady follower, took a somewhat dangerous and will-o-the-wisp-like journey over the surface of a dried up creek. Mr. Latchford reported, however, that no finds of special interest had rewarded their efforts. The party assembled in a maple grove, where some of the beauties and wonders of plant and insect life were elucidated by Mr. Fletcher. He spoke of some of the plants which are useful to man; hemp, nettle, milkweed and fireweed (*epilobium*) were referred to as fibre plants. Some of the peculiarities of the *Solanum* were explained and the action of frost upon potatoes and other vegetation was spoken of. The life history of *Limenitis Disippus* was told and some interesting instances of protective mimicry and hibernation amongst insects were related.

ELEVENTH.—On the 27th August a botanical party visited the Beaver Meadow, Hull, and spent a very pleasant afternoon in that interesting locality. The President, Mr. R. B. Whyte, made an instructive address on the more noteworthy species collected, among which may be mentioned the Pickerel weed, the closed Gentian, and the Clematis (*C. Virginiana*, L.) of which the fruit is very interesting.

EXCURSION TO BRITANNIA.

The fourth general Excursion was held on Saturday, the 13th August, to Britannia, where a most agreeable afternoon was spent. There were present some thirty members and their friends, but unfortunately several others arrived at the station a few moments too late, and were deprived of their outing. On arriving at the Britannia station the party separated, some going with Mr. Ami to examine the rock formations, and the remainder accompanying the botanical and entomological leaders. The woods and fields in the neighborhood of the lighthouse, track and gravel pit were carefully explored, and many finds of importance were made. At six o'clock the party re-assembled at the station and listened to addresses from the leaders until the arrival of the train for Ottawa. Mr. Fletcher spoke of the plants and insects observed, and Mr. Ami of the geological formations.

ANNOUNCEMENTS.

EXCURSION.—The Fifth General Excursion of the season will be held on Saturday, the 17th September, to Kirk's Ferry. This point is about four miles above Chelsea, upon the Gatineau River, and is a very picturesque and attractive place, which has not yet been visited by the Club. The trip will be made in vans, and there being a good road all the way, the time taken will be less than that required to visit Kingsmere or Meach's Lake. Tickets can be obtained from any member of the Council at the following rates: Members 40 cents; Non-members 50 cents; Children 25 cents. The vans will start from the corner of Rideau and Chapel streets at 8.45 a.m., and from the corner of Sparks and Bank streets at 9 a.m.

SUB-EXCURSIONS.—Botanical outings will be held each Saturday afternoon (except on date of general excursion), starting as usual from the Post Office at 2 p.m. Visits will be made to Hull, Billings' Bridge and Beechwood.

International Tent and Awning Company,

184 Sparks Street, Ottawa.

Manufacturers of Tents, Camp Furniture, Awnings, Window Shades, Plain and Decorated Curtain Poles, Curtain Chairs, Flags of all Nations, Waterproof Horse and Wagon Covers, &c., &c., on hand and made to order in any size or style on short notice.

NOTICE—Special Discount to Lumbermen, Contractors, and other large Buyers.

Send for Prices. Catalogues Free on Application

Address, **A. G. FORGIE,**
Manager

International Tent & Awning Co.

TELEPHONE CONNECTION.



JUN 13 1866

HENRY WATTERS,

Chemist and Druggist,

Corner of Sparks and Bank Streets,

OTTAWA.

KNABE

Grand, Square and Upright
PIANO-FORTES.

These Instruments have been before the Public for nearly fifty years, and upon their excellence alone have attained an Unpurchased Pre-eminence, which establishes them as UNEQUALLED in

Tone, Touch, Workmanship and Durability. Every Piano Fully Warranted for Five Years.

J. L. ORME & SON,
SOLE AGENTS. OTTAWA, ONT.

C. ROSS & Co. are offering this month a very large assortment of New Saxony Costume Cloths, specially adapted for nice Spring Suits, at the low price of 25c. per yard.

A beautiful selection of Dress Silks is being offered at 75c per yard.

Two large lots of Black Satin Rhadames, at 75c. and \$1.25 respectively, are well worth the attention of buyers; they are very cheap.

Samples will be sent, on application, to those living in the country.

C. ROSS & CO.

BOOK LIST.

- Studies of Plant Life in Canada, by Mrs. C. P. Trull. Illustrated with coloured lithes from drawings by Mrs. Chamberlain \$2.50
- Our Arctic Provinces, Alaska and the Seal Islands, by Henry W. Elliott 5.00
- Myths and Marvels of Astronomy, by R. A. Proctor. 2.40
- Kezauak: the Age of Fire and Gravel, by Ignatius Donnelly 2.40
- Manual Training, the Solution of Social and Educational Problems, by Chas. H. Hall 5.00
- Men of the Reign: a Biographical Dictionary of Eminent Persons of British and Colonial Birth who have died during the Reign of Queen Victoria 6.25
- A Popular History of Astronomy during the Nineteenth century, by Clarke 4.80
- The English Parliament, in its Transformations through a thousand years, by Dr. Rudolf Geisel 4.00
- Methods of Historical Study, by Edward Freeman 3.00
- The Railways of the Republic, by J. F. Hudson 2.40

J. DURIE & SON, SPARKS ST., OTTAWA.

G. W. McCULLOUGH,
ALL RAIL
Anthracite & Bituminous Coal
RUSSELL HOUSE BLOCK.

R. J. DEVLIN,
HATS AND FURS.

THE LARGEST STOCK OF
CHILDREN'S CARRIAGES
IN THE CITY AT
BUTTERWORTH & CO.
110 SPARKS STREET.

A. J. STEPHENS,
FINE SHOES,
102 SPARKS ST.
Boots and Shoes Made to Measure.

M. M. PYKE,
MEN'S OUTFITTER,
99 SPARKS ST.,
OTTAWA, - - - ONTARIO.

OTTAWA LADIES' COLLEGE
For terms apply to the
PRINCIPAL, - SAMUEL WOODS, M.A.