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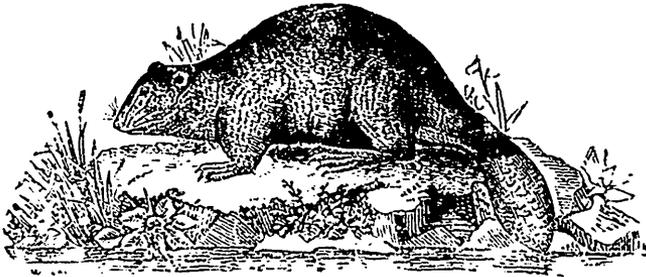
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December, 1893.

THE
* OTTAWA NATURALIST *

VOLUME VII. No. 9.



THE BEAVER (*Castor Canadensis*, Kuhl).

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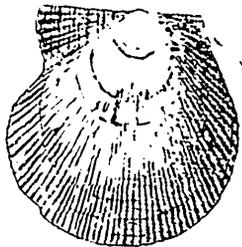
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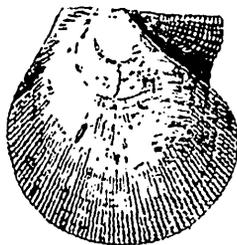
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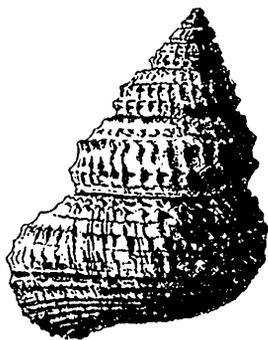
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1



1 a.



2



2 a.

NOTES ON SOME MARINE INVERTEBRATA FROM THE
COAST OF BRITISH COLUMBIA. I

By J. F. WHITELEVES.

ECHINODERMATA.

STRONGYLOCENTROTUS FRANCISCANUS, A. Agassiz.

This littoral species was recorded by the writer as having been collected by Mr. James Richardson in 1874 at Sooke, in the Strait of De Fuca. Dr. G. M. Dawson found it to be the common sea urchin of the Queen Charlotte and Vancouver islands, and especially abundant in localities exposed to the open sea, although its name was inadvertently omitted in the published lists of Echinoidea in his 1878 and 1885 collections. Specimens of it were obtained at Qualicum, V. I., by Professor Macoun in 1889.

MOLLUSCA.

PELECYPODA.

PECTEN (PSEUDAMUSIUM) VANCOUVERENSIS. (Sp. nov.)

Plate 1, figs. 1 and 1 a

Shell small, equivalved, compressed lenticular, both valves being equally convex, ovately subcircular in outline apart from the ears and rather oblique: valves extremely thin and fragile, translucent and almost transparent, pale horn colour with a slightly yellowish hue. Beaks placed a little behind the midlength; hinge line straight and very long; ears unequal in size, the posterior pair, which are much smaller than the anterior, alike, indistinctly defined and merging gradually and imperceptibly into the general convexity and marginal contour of that side of each valve; anterior ears large, subtriangular, prolonged laterally and longer than high, distinctly defined, that of the left valve somewhat convex in outline above and concave below, that of the right valve with a deep and acutely angular byssal sinus at its base.

1. Communicated by permission of the Director of the Geological Survey Department.

Surface marked by densely crowded and exceedingly minute, irregular and rarely continuous, but on the whole radiating, simple or bifurcating raised lines, also by comparatively large, regularly disposed and distant squamose radii. In the centre of each valve the minute and non-squamose raised lines are essentially parallel to the larger squamose radii, but on the sides the former are disposed obliquely to the latter. The surface of the anterior ear of each valve is minutely cancellated with extremely minute raised lines, which are almost parallel to the hinge line, in addition to the coarser cross lines. The whole sculpture of the exterior of the test is far too minute to be clearly seen without the aid of a microscope or powerful simple lens, but under either of these a few faint concentric lines of growth are also visible.

Dimensions of the only specimen that the writer has seen: height, from beaks to base, 7.50 mm.; maximum length, 7.75 mm.; greatest thickness through the closed valves, 2.25 mm.

Forward Inlet, Quatsino Sound, Vancouver Island, in ten to twenty fathoms mud, Dr. G. M. Dawson, 1885: one living specimen.

In the list of specimens collected by Dr. Dawson in that year, the little shell upon which the foregoing description is based, was erroneously identified with the *Pecten Alaskensis* of Dall. A subsequent study of its characters, has led to the conclusion that it is much more nearly related to *Pecten vitreus*, Chemnitz, and *P. abyssorum*, Loven, from both of which it can be readily recognized by its very peculiar sculpture. *P. Alaskensis* has opaque and much thicker valves and different surface markings. Its posterior auricles are distinctly defined and its anterior auricles very much smaller in proportion to the size of the shell, than those of *P. Vancouverensis*. The credit of first distinguishing between the species last named and *P. Alaskensis* is due to the Rev. G. W. Taylor, of Victoria, V.I., who informs the writer that he has two specimens in his collection dredged in about ten fathoms sand, Departure Bay, near Nanaimo, in 1888.

CARDIUM (FULVIA) MODESTUM, Adams and Reeve.

The shell for which the name *Cardium Richardsoni* was proposed in the Canadian Naturalist for December, 1878, was described as a new

species almost entirely upon the authority of the late Dr. P. P. Carpenter. Dr. W. H. Dall, however, regards both the *Cardium* var. *centiflosum*, Carpenter, and *C. Richardsoni* as synonyms of *C. modestum*.

CUMINGIA CALIFORNICA, Conrad.

Barclay Sound, on the south west coast of Vancouver Island, Professor Macoun, 1887 : one perfect specimen.

MACOMA YOLDIFORMIS, Carpenter.

Forward Inlet, Quatsino Sound, in ten to twenty fathoms mud, Dr. G. M. Dawson, 1885 : one fresh and perfect right valve.

PSAMMOBIA RUBRORADIATA, Nuttall.

Barclay Sound, Vancouver Island, Professor Macoun, 1887 : four fresh valves. One dead shell of this species had previously been collected by Dr. Dawson in 1878 at the mouth of Cumshewa Harbour, Q.C.I.

GASTEROPODA.

EMARGINULA CRASSA, J. Sowerby.

An adult shell of this species, with the animal, was found in a jar containing large specimens of *Solaster Stimpsoni*, *S. Dawsoni*, *Cribrella læviuscula* and other starfishes characteristic of the British Columbia marine fauna, preserved in alcohol, the contents of which, except the alcohol, were stated by Dr. Dawson to have been dredged by him at the Queen Charlotte Islands in 1878.

PACHYPOMA INEQUALE, Martyn.

This shell, which is very common in the Vancouver region, was identified by Dr. P. P. Carpenter with *P. gibberosum*, Chemnitz (sp.), but Dr. Dall says that "Martyn's name is four years older," and therefore should be retained for it.

TURCICULA CIDARIS, A. Adams. (Sp.)

Plate I, figs. 2 and 2 a.

Margarita Cidaris (A. Ad.) Carpenter. 1864. Ann. and Mag. Nat. Hist., 3rd series, vol. xiv, p. 426.

Solariella (Turcicula?) cidaris, Pilsbry. 1889. Cont. of Tryon's Man. Conch., vol. xi, p. 331.

Solariella cidaris, Williamson. 1892. Proc. U. S. Nat. Mus., vol. xv, p. 202, pl. xxii, fig. 4.

The only figure of this beautiful shell that has yet been published represents an enlarged ventral view of an apparently immature Californian specimen, twenty-eight millimetres in height, which is stated by Mrs. M. Burton Williamson (op. cit.) to have been dredged in deep water off the islands in San Pedro Bay by the U. S. Fish Commission. The Canadian specimen, of which two views are given on Plate 1, is the only adult shell that the writer has seen, and measures forty-six millimetres in height (or length) by about thirty-two in maximum breadth. It was dredged by Dr. Dawson, in 1885, in thirty fathoms, sand, gravel and dead shells, off False Head, Queen Charlotte Sound, where several smaller specimens were obtained, as already recorded on page 128 (Section 4) of the fourth volume of Transactions of the Royal Society of Canada. In the adult shell the outer lip is somewhat thickened and its nacreous interior is margined by a narrow white porcellanous rim.

BELA SCULPTURATA, Dall.

Bela sculpturata, Dall. 1886. Proc. U. S. Nat. Mus., p. 299, pl. iv, fig. 7.

"Queen Charlotte Islands and Vancouver district," Dall.

ODOSTOMIA SITKENSIS, Dall.

Dolomite Narrows, Queen Charlotte Islands, Dr. G. M. Dawson, and since collected by Dr. Dawson in 1885 at False Bay, Lasqueti Island, as recorded in the fourth volume of Transactions of the Royal Society of Canada.

TRITON (PRIENE) OREGONENSIS, Redfield.

The radula of a Vancouver specimen of this species is essentially similar to that of *Triton* as figured by Wilton in Woodward's Manual of the Mollusca, and Fischer's Manuel de Conchyliologie, its dental formula being 6. 9. 6.

BUCCINUM POLARE, var. PERCRASSUM.

Near Victoria, V. I., J. Richardson, 1875, two dead specimens. Off False Head, Queen Charlotte Sound, in thirty fathoms, Dr. G. M. Dawson, 1885; one specimen. These three shells were named *Buccinum polare*, var. *compactum* by the writer, on the authority of Dr. Dall. The writer, however, has recently been informed by Dr. C. F. Newcombe, of Victoria, that, in a letter received by him on the second of November last, Dr. Dall writes that the word *compactum* is probably a *lapsus* for *percrassum*, and that his *B. polare*, var. *percrassum* was "figured and described in the new edition of Martini and Chemnitz's Conch. Cabinet, Suppl., p. 189, pl. 91, fig. 5." In the official report on the expedition to Point Barrow, Alaska, published at Washington in 1885, Dr. Dall contributes a chapter (vi) on the mollusca obtained. On page 180 of that volume, under the head *Buccinum polare*, Gray, Dr. Dall makes the following remarks. "I have seen two specimens of a singularly thick and short variety *percrassum* from the Arctic north of Bering Strait. It must be exceedingly rare: the upper whorls are smaller, less inflated and less turreted than in the normal form. The operculum is also proportionally larger and more oval. It may prove distinct from *polare*." But in the explanation of the plate of Point Barrow Mollusca, in that volume, fig. 9 is said to represent "*Buccinum plectrum*, Stm., *forma percrassa, minor*."

ONCHIFRULA BOREALIS, Dall.

North side of Queen Charlotte Sound, between tides, Dr. G. M. Dawson, 1885; several specimens.

EXPLANATION OF THE PLATE.

PLATE I.

PECTEN (PSEUDAMUSIUM) VANCOUVERENSIS.

Fig. 1. Side view of the type specimen, four times the natural size, and showing the left valve.

" 1 a. Another view of the same specimen, to show the right valve.

TURRICULA CIDARIS.

Fig. 2. Dorsal view of an adult shell of this species. Natural size

" 2 a. Ventral view of the same, showing the aperture and operculum.

NOTES ON THE GEOLOGY AND PALÆONTOLOGY OF
THE ROCKLAND QUARRIES AND VICINITY. IN
THE COUNTY OF RUSSELL, ONTARIO, CANADA.

BY HENRY M. AMI, M.A., D. Sc.

On the 24th of June last, the OTTAWA FIELD NATURALISTS' CLUB held a very successful excursion to the new Rockland quarries. These are situated about two miles to the south-east of the village of Rockland, in the Township of Clarence, in the County of Russell, Ontario, and were opened with a view of obtaining the stone required for the construction of the Soulanges canal. This locality proved to be very interesting to the geologist, from the fact that six distinct Palæozoic formations were met and examined. Mr. Archibald Stewart, government contractor and proprietor of the new Rockland quarries, and Mr. W. C. Edwards, M. P. for Russell, had extended to the Ottawa naturalists a hearty invitation, and made them welcome. Everything went off well and the day was thoroughly enjoyed by all. Refreshments and conveyances were freely supplied by these two gentlemen, and the excursionists duly appreciating their kindness, unanimously thanked them for their hospitality.

GEOLOGICAL FEATURES OF ROCKLAND.

The following are the different geological formations met with at Rockland, between the mills on the Ottawa River front, and the new quarries, some two miles distant, in descending order. These formations succeed each other in regular order, as seen in the table, with only two unconformities, the first below the glacial drift, and the second below the Potsdam formation. They occupy that zone of country lying between the escarpment at the quarries and the Ottawa River. This escarpment is similar in origin and aspect, to the bluffs and escarpments at Ottawa, and formed at one time the southern shore or cliff-margin of the Pre-glacial stream which flowed from the west in almost precisely the same channel as does the Ottawa River at present.

The Calciferous and Chazy formations form the widest belts, whilst the Trenton, Black River and Chazy formations, are the most fossiliferous in the district.

GEOLOGICAL FORMATIONS AT ROCKLAND, CO. RUSSELL, ONTARIO.

System.	Formations.	Thickness in Feet.	Fossil Remains.
I. Post-Tertiary....	1. Fluvatile.....	Various.....	None observed.
	2. Leda clay.....	Rep. to 25 feet.....	
	3. Glacial clay, etc.	Various.....	
HERE AN UNCONFORMITY OCCURS.			
II. Ordovician.....	4. Trenton.....	About 50 ft.....	Abundant.
	5. Black River.....	" 75 ft.....	Not rare.
	6. Chazy.....	" 60 ft.....	Abundant.
	7. Calciferous.....	" 50 ft.....	None observed.
	8. Potsdam.....	" 75 ft.....	ScolithusCanadensis.
HERE THE SECOND UNCONFORMITY OCCURS.			
III. Archean.	9. Laurentian.....	Several thousand ft.	None observed.

THE LAURENTIAN OUTCROP.

The basal beds of the Potsdam formation are seen to lie unconformably over the denuded and rounded, or irregular surface of the Archæan or Laurentian rocks. These consist of rather coarsely crystalline gneisses and mica schists, along with hornblendic rocks, whose petrographical relations and characters deserve special study. They furnished the material which helped in the building up of the subsequent formations, the quartz of the Potsdam sandstones having been derived from the granitoid gneisses of this vicinity.

THE POTSDAM.

The Potsdam formation at Rockland Mills forms a more or less irregular zone of heavy bedded, light greyish blue or white colored sandstones, which at times become glassy in appearance and give the formation a truly quartzite character. Nevertheless, the grains of quartz may be easily detected, and are cemented together for the most part by silica.

Some of the bands carry iron pyrites, and weather rusty-coloured. The clear and white, or light coloured bands appear to be fit for glass making. The outcrop of this formation near the Ottawa River front, at the Rockland Mills, belongs to the lower portion of the Potsdam. The higher beds of the formation in the Ottawa Valley are finer grained, and have the grains of quartz in the sandstone less coherent, and the beds themselves are less massive and reduced in thickness, often presenting the well known tracks of *Protichnites* as at Montebello, Papineauville and above that again,* eight miles below the mouth of the South Indian River.

THE CALCIFEROUS AND CHAZY.

These two formations occupy their regular and respective positions, one below the other, both as regards their geological and geographical relations at Rockland. The zone of farming or pasture land, between the escarpment at the quarries and the town, is occupied by these two formations, whilst the soil is made up to a great extent of the debris of the Chazy, which is the softest and most easily denuded and disintegrated formation in the district.

None of the characteristic fossils of the Calciferous formation were found on this occasion, but at the turn of the road on the hillside about $1\frac{1}{2}$ miles south of Rockland the typical shales of the Chazy formation crop out and are fossiliferous. These overlie the fine-grained and compact limestones, on which Mr. Edwards' celebrated stock and breeding stables are built.

These limestones are characterized by the presence of concretions or inclusions of irregular masses of pink calcite varying in size and intensity of colour. There are two or three bands of these limestones, which, both in Nepean and elsewhere, have been utilized or described as "cement-rock." This is the same band of limestone which crops out at the Hull cement quarries, Skead's mill, Ont., also at Hog's Back, and again on a lot the property of Mr. T. M. Clark, of New Edinburgh close to Hemlock Lake.

The following species of fossils have been recognized by the writer in the dark and chocolate coloured and purple, calcareo-argillaceous

*Geology of Canada, 1863, p. 94.

shales of the Chazy and in the accompanying calcareous bands :

Fossils from the Chazy Beds.

1. *Orthis imperator*, Billings.
2. " *borealis*, Billings.
3. " *platys*, Billings.
4. *Rhynchonella plena*, Hall.
5. *Raphistoma staminea*, Conrad.
6. *Modiolopsis parviuscula*, Billings.
7. *Orthoceras antenor?* Billings.

But little time was spent collecting here, which accounts for scarcity of forms.

BLACK RIVER AND TRENTON FORMATIONS.

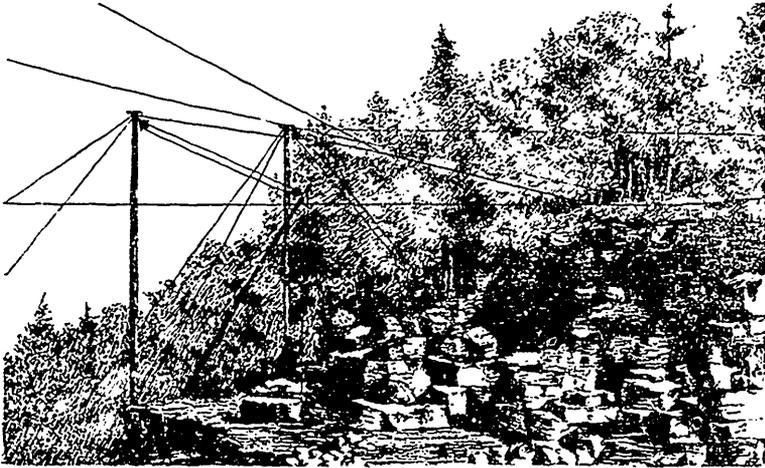
Following the measures in an ascending order the escarpment is met with next. This escarpment, which faces the north and presents its bold front to the Ottawa Valley at the quarries, belongs to the Black River and Trenton formations, or to the Trenton group as it is sometimes called.

The two formations pass imperceptibly from one into the other, only an arbitrary line can be drawn to separate them. The lower part of the escarpment at the quarries belongs to the Black River formation, whilst the upper portion is distinctly Trenton in *facies*. It was in the lower half at the level of the tramway and track, some 15 feet higher than the swamp facing the quarry, that the proprietor, Mr. Archie Stewart found a large coral mass, which he brought to the museum of the Geological Survey for identification. It proved to be the typical coral, *Columnaria Halli*, Nicholson. At a higher elevation, some fifty feet above the *Columnaria* horizon, masses of *Tetradium fibratum*, Safford, were found, which are considered characteristic Black River forms also, yet these were immediately followed by large colonies of *Prasopora Selwyni*, Nicholson, associated with orthoceratites and brachiopoda, of typical Trenton aspect.

The beds throughout the section proved to be highly fossiliferous, but especially so were those in the highest and thin-bedded portions of the escarpment. The beds were seen to vary in thickness, but

the heavier beds and more compact ones occupied the lower portion of the outcrop.

The following view of the quarry reproduced from a pen and ink sketch by Miss A. M. Living, of our club, gives a good general idea of the upper portion of the quarry, with some of the large blocks of quarried limestone to be taken down to their destination, the Soulanges Canal.



Along the western extremity of the quarry, large blocks of quarried and dressed limestone had been piled up and were examined, showing the character of the limestone, thickness of the beds and mode of occurrence. It was evident that a quarry similar to those of central Ontario, from which the material was obtained for the construction of the Trent Valley Canal, had been opened at Rockland, and that the rock was of superior quality. Some of the upper beds of the quarry were apparently more easily shattered, but the hard compact and heavy bedded strata of the lower two-thirds will no doubt afford excellent blocks for the canal.

Through the kindness and courtesy of Mr. Stewart, the writer has been furnished with information on the character of the limestones of the new Rockland quarries. The result of examinations and tests

made of the rock are herewith given, and refer to the chemical composition, to the crushing strength of the stone, and to the microscopical characters of the same, besides a note on the absorption of moisture by the same limestone.

1 and 2.—*Chemical composition and ratio of absorption*, determined by Dr. B. J. Harrington, of McGill College, Montreal.

CERTIFICATE OF DR. B. J. HARRINGTON.

“The specific gravity of the stone was found to be 2.704, and the weight of a cubic foot deduced from these figures 168.5 lbs. (1 cubic foot of water being taken at 62.321 lbs). The analysis shows the stone to consist almost entirely of calcium carbonate, with a little insoluble matter and small quantities of the carbonates of magnesium and of iron. The exact figures are as follows :

Insoluble (including a little organic matter)	2.75
Calcium carbonate	94.70
Magnesium “	2.37
Ferrous	0.18
	100.00 ”

As to the ratio of absorption of water by the limestone from Rockland, the following is an extract from a letter by Dr. Harrington dated 28th April, 1893 :

“The absorption of your specimen of limestone was almost *nil*. The exact figures were 0.03 of a part of water absorbed by 100 parts by weight of the stone. That is an absorption ratio of $\frac{1}{33.33}$.”

(Signed.) B. J. HARRINGTON.

McGill College, 31st March, 1893.

3. *Macroscopic and Microscopic Examination of the Rockland limestone*, by Prof. A. P. Coleman, of the School of Practical Science, Toronto.

The following is the text of a report by Dr. Coleman, of Toronto, entitled : “Examination of Building Stone for Mr. Archibald Stewart, Ottawa. The specimen sent for examination is a cube of dark grey bituminous limestone from a quarry at Rockland, Ontario. Microscopically the stone is compact in texture with included crystals of

calcite and a few fossils, chiefly fragments of brachiopods. A thin section examined with the microscope shows a compact ground mass of calcite with enclosed crystals of the same mineral, some obscure fossil forms (bryozoa, brachiopod shells or crinoids), and some brown lines of bituminous matter.

Judged as a building material the specimen has all the characteristics of a durable stone. "The dark-grey color will probably bleach to a lighter grey on exposure to the weather."

(Signed.) A. P. COLEMAN, PH. D.,
Prof. Metall. and Assaying.

School of Practical Science, Toronto, March 27th, 1893.

4. *Crushing strength per square inch determined by Prof. H. T. Bovey, M. A., LL.D., of the Physical Laboratories, McGill College.*

The following is an extract from a letter by Prof. Henry T. Bovey on two specimens of limestone from the Rockland quarries:—

Specimen A. Dimensions 2" x 2.02" x 2.01".

Tested on bed.

Total crushing strength 92,000 lbs.

Crushing strength per square inch 22,772 "

Specimen B. Dimensions 2.01" x 2.025" x 2.01".

Tested on edge.

Total crushing strength 60,000 lbs.

Crushing strength per square inch 14,741 "

Weight of stone as per sample A = 168.11 pounds per cubic foot.

(Signed.) HENRY T. BOVEY.

McGill College, Montreal, March 22nd, 1893.

It will thus appear from the combined results of the tests made both at the Toronto and Montreal laboratories, that the stone from the Rockland quarries is of a superior quality. When compared with the results obtained from similar severe tests of limestones of Canada and the United States—those of the Rockland limestone stand high. For the record of such tests, the reports published by the State Surveys of New York, Pennsylvania and Minnesota—besides many other valuable contributions contain the most extensive and comprehensive remarks.

FOSSIL REMAINS.

As it was remarked, before, the rocks of the quarry were very fossiliferous. On the occasion of the excursion of the O. F. N. C. quite a number of interesting forms were collected and the following succession of zones was noticed in the rocks forming the escarpment of the quarry in descending order.

- (1) Zone of *Leptaena sericea*, Sowerby.
- (2) Zone of *Streptelasma corniculum*, Hall.
- (3) Zone of *Prasopora Selwyni*, Nicholson.
- (4) Zone of *Endoceras proteiforme*, Hall.
- (5) Zone of *Tetradium fibratum*, Safford.
- (6) Zone of *Columnaria Halli*, Nicholson.

No less than sixteen species of fossils were collected at the quarries as follows :—

1. Crinoidal fragments.
2. *Tetradium fibratum*, Safford.
3. *Columnaria Halli*, Nicholson.
4. *Streptelasma corniculum*, Hall.
5. *Prasopora Selwyni*, Nicholson.
6. ?*Homotrypa similis*, Foord.
7. *Stictopora acuta*, Hall.
8. *Serpulites dissolutus*, Billings.
9. *Rafinesquina alternata*, Conrad.
10. *Orthis testudinaria*, Dalman.
11. “ *tricenaria*, Conrad.
12. *Ctenodonta* sp. indt. cf. *C. abrupta*, B.
13. *Orthoceras* sp.
14. *Asaphus platycephalus*, Stokes.
15. *Endoceras proteiforme*, Hall.
16. *Calymene senaria*, Conrad.

Most of these were collected by the writer, determined by himself; they represent a part of the fauna entombed in the rocks which occupy the face of the quarry. The horizon here is precisely the same as that at Wright's new quarries, Hull, near the C. P. R. station of that town.

Just previous to leaving the field, Dr. R. W. Ells, ex-president of our club, visited Rockland and the quarries adjoining. When at Clarence Creek, one and a half miles below Rockland, Ont., he made quite an extensive collection of fossils which the writer has examined only cursorily and the following forms are included in it :--

Fossils Collected by Dr. R. W. Ells at Clarence Creek, near Rockland, Ont., Sept., 1893.

1. Crinoidal fragments.
2. Stictopora acuta, Hall.
3. Prasopora Selwyni, Nicholson.
4. ? Monotrypella sp.
5. Discina or Trematis sp.
6. Crania sp. cf. C. sp.
7. Lingula quadrata, Eichwald.
8. Leptæna sericea, Sowerby.
9. Rafinesquina alternata, Conrad.
10. Streptorhynchus filitextum, Hall.
11. Orthis testudinaria, Dalman.
12. " pectinella, Conrad.
13. " sp. (? N. sp.)
14. " vel Anazyga sp.
15. Platystrophia biforata, v. lynx, Eich.
16. Bellerophon sulcatus, Emmons.
17. Rhynchonella increbescens, Hall.
18. Calymene senaria, Conrad.
19. Cheirurus pleurexanthemus, Green.
20. Dalmanites callicephalus, Green.
21. Ilænus sp. (cf. I. Milleri or Trentonensis.)
22. Asaphus platycephalus, Stokes.
23. " megistos, Locke.
24. Trinucleus concentricus, Eaton.

Of these Nos. 5, 6, 7, 16, and 24 are of more than ordinary interest, especially the last form *Trinucleus concentricus*, Eaton, a small trilobite which is very common in the Trenton of Montreal and Montmorency,

but which has not, as far as I am aware, been recorded from the Ottawa district as yet.

From the foregoing remarks it is hoped that such general characters of the rock formations of Rockland can be gathered as will be of service to those interested in the quarry as well as others. The beds of the Lower Trenton—and those of the Black River formation almost everywhere in Eastern Canada—have been used as building material, whether for piers, bridges or canals, and proved highly satisfactory.

The Trent Valley Canal locks, as above stated, the piers for the Victoria Tubular bridge, the locks and improvements on the Lièvre River, and the locks on the Rideau Canal at Ottawa, have all been constructed with stone from the Trenton and Black River formations.

In the case of the Rideau Canal at Ottawa, the limestones constituting the upper half of the Trenton formation here are too nodular and concretionary for canal purposes, and if only blocks from the lower half had been used it would have saved the department thousands of dollars that were subsequently spent in repairs.

In conclusion, the writer begs to thank Mr. Archibald Stewart for this opportunity of examining the geological features at the quarry under such favorable auspices, also for the information as to tests and reports of results made by the gentleman above quoted.

BOOK NOTICES.

The Butterflies of North America. Third series, Part xiv, by W. H. Edwards.

The last part of Mr. Edward's magnificent work has been received. It is a most interesting number and will be read with interest by all Canadian Lepidopterists. The three plates are particularly fine. No. 1 shows *Neominois Ridingsii* in all its styles. This is a Coloradan species flying at high elevations. No 2 illustrates *Chionobas Aeno* and its variation var. *Assimilis* in which the band on the underside of the secondaries is wanting or scarcely showing. Both the type and the variety fly together in Labrador and on the highest summits of the mountains of Colorado.

Plate 3 is of special interest to the members of our Club as it shows the fine species, *Ch. Macounii*, discovered by our indefatigable

member, Prof. John Macoun, and named after him by Mr. Edwards. The first specimens were caught at Nepigon on 28th June, 1884. It is a rare and short-lived insect and few specimens are known in collections. The only other known locality where specimens have been taken is Morley, at the eastern base of the Rocky Mountains, and here again strangely enough Prof. Macoun was the lucky captor. He took but 3 specimens, 2 males and a female, and no other collector has since found it there.

The number of collectors who have been to Nepigon to get *Chionobas Macounii* have given it a local celebrity, and the possibility of an entomologist being a rational and sane being is there allowed. The butterfly is there known as the "One-eyed Butterfly" from the fact that when at rest one of the large ocelli or eye-like spots beneath the upper wings is very conspicuous. This name, however, has given rise to most remarkable tales amongst the residents, and Indians. Most of these take the shape of descriptions of a wonderful insect with one large eye in front of its head. As few collectors, however, have obtained the butterfly, it is locally reported to be of fabulous value, "\$100 a specimen," being a convenient sum to mention, that is the usual figure quoted as its value. Guided by the local descriptions of the "One-eyed Butterfly," I fear that would-be speculators would be a long time making their fortunes.

The letterpress of this part of Mr. Edward's work is very full and interesting, and on the whole it will probably be considered one of the best that has appeared.—J. F.

Catalogue of the Lepidopterous Super-family Noctuidæ found in Boreal America. John B. Smith, D. Sc., pp. 224, 8 vo., Washington, 1893. (Bulletin 44 U. S. National Museum.)

Under the above modest title a most valuable work has lately been issued. It is not simply a list of species, but a complete bibliographical and synonymical catalogue, prepared by Dr. Smith with great labour during many years of special study.

A full preface explains the origin and purpose of the work, as well as some of the difficulties which it was necessary to overcome in its execution. There is a list of the authors and works cited, and an excellent index.

The author, date and original place of publication are given for every genus and species. Great care has been taken by the writer to examine, where possible, the types, and indication is given where these may be found. Published references are cited separately under the name of the species and the synonyms. Under the head of Habitat, Dr. Smith gives the distribution as far as known to him. Most references, however, to the 3,456,542 square miles of territory which are officially recognized as the Dominion of Canada (exclusive of Labrador and Newfoundland) are covered by the one word "Canada." This shows that few of our Canadian collectors have availed themselves of the generous offer made by Dr. Smith as advertised in all the Entomological Magazines, namely, that "he will name and return all material of this family sent to him, for the privilege of retaining such specimens as may be needed for description or for completing the collection of the United States National Museum."

As the author of the Catalogue has in preparation a Monograph of the whole of this family of moths, it is to be hoped that Canadian Entomologists will do all they can to assist him by sending him liberal supplies of material. The tendency of some to lock up in private collections rare and interesting specimens is much to be regretted. It is far better to send them to a specialist for study and subsequent deposition in a public museum where they will be not only of scientific value, but also available for study by others, and will have much greater chance of being preserved. The personal possession of rare or even unique specimens is after all a very small pleasure compared with that of knowing that they are in a place where they can be of use to many, and where the best care will be taken of them.

The large number of species included in the Noctuidæ, the close similarity between many of these, and on the other hand the wide variations which sometimes occur in the different specimens even of the same brood, make the study of this family very difficult. For this reason Dr. Smith's Catalogue will be gladly welcomed by Lepidopterists. It is a wonderful book and throws a flood of light on what was a hopeless chaos of impenetrable disorder.—J. F.

PROGRAMME.

1893—OTTAWA FIELD-NATURALISTS' CLUB—1894.

LECTURES AT 8 P.M. IN NORMAL SCHOOL, OTTAWA.

Dec. 12th.—Inaugural Address: The extinct Northern Sea-cow and
early Russian Explorations in the North Pacific.

Dr. G. M. Dawson, C.M.G., F.R.S.

Jan. 9th. Following a Planet. (*With lantern illustrations*)

A. McGill, B.A., B.Sc.

Jan. 23rd.—Biological Water Analysis. (*With lantern illustrations.*)

Dr. Wyatt Johnston, Montreal.

Feb. 6th.—How Rocks are Studied.

Frank Adams, Ph.D., (McGill College, Montreal.)

Feb. 26th. The Transmutations of Nitrogen. (*With chemical ex-*
periments.). Thos. Macfarlane, F.R.S.C.

Mch. 6th.—Ottawa Butterflies. James Fletcher, F.R.S.C.

Notes on the Natural History of the Islands of Behring
Sea. James H. Macoun.

Mch. 20th. Annual Meeting at 4 p.m.



SUMMARY

— OF —

Canadian Mining Regulations.

NOTICE.

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

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

A location for mining, except for *Iron*, shall not be more than 1500 feet in length, nor more than 600 feet in breadth. A location for mining *Iron*, shall not exceed 180 acres in area.

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

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

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

A. M. BURGESS,

Deputy of the Minister of the Interior.

1555

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