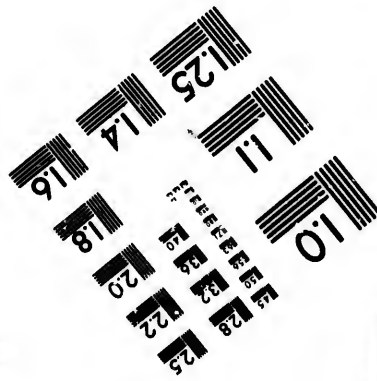
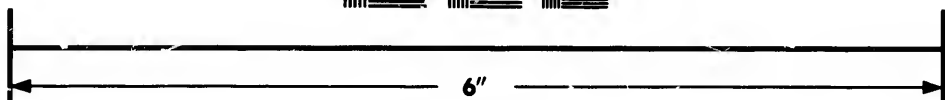
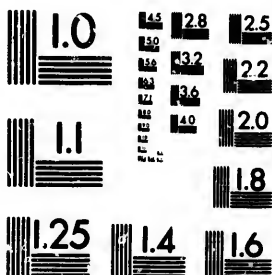


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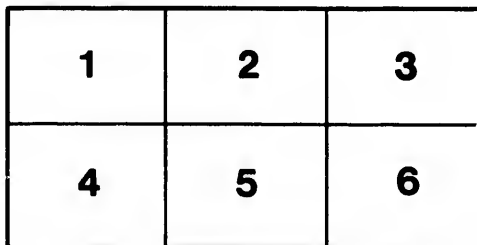
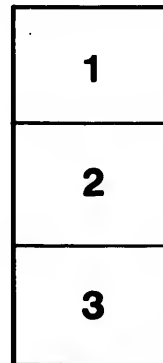
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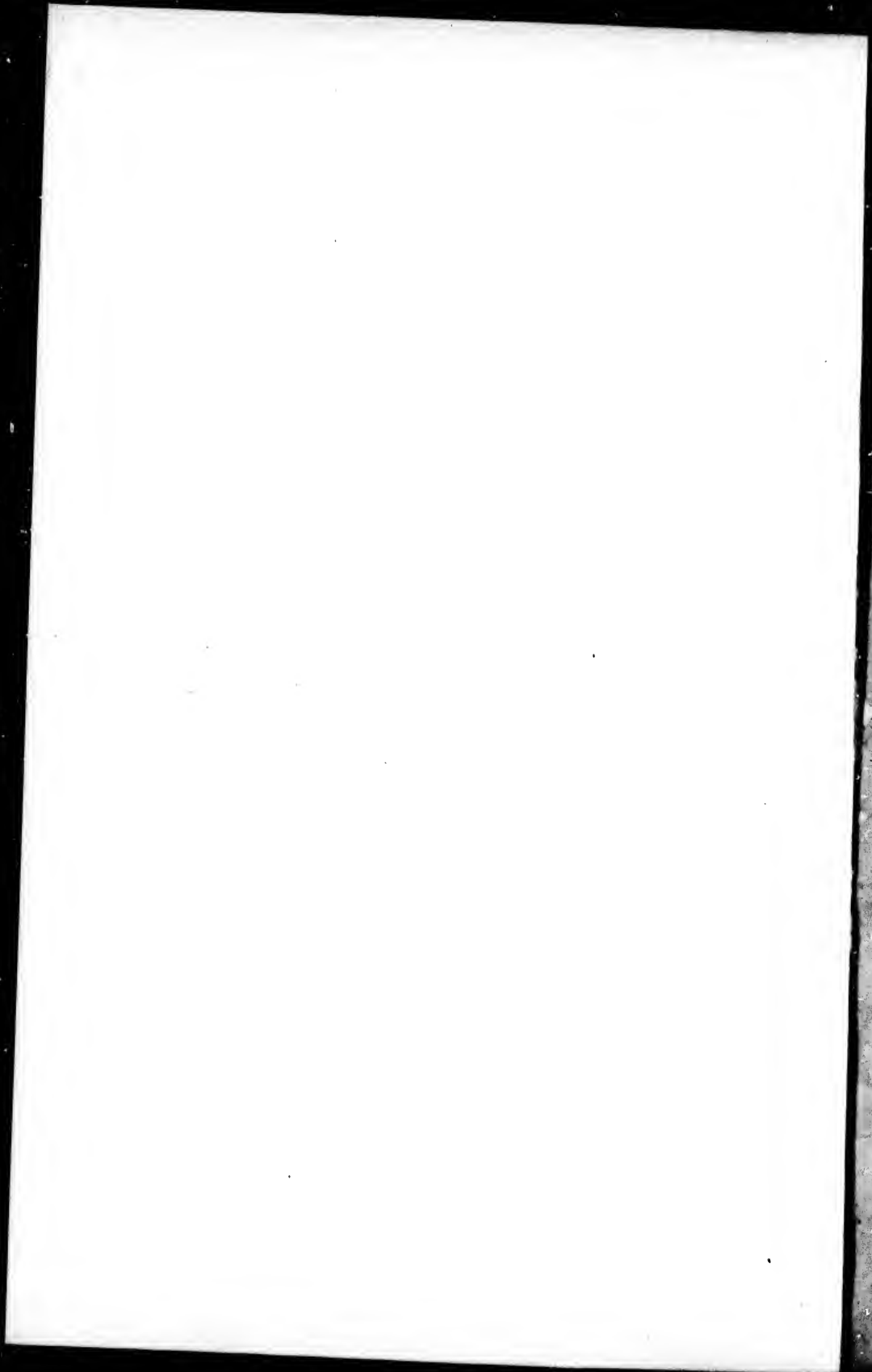
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*C. Webb Esq
Montreal*

LETTER

ADDRESSED TO

MR. JOACHIM BARRANDE,

ON THE

ROCKS OF THE QUÈBEC GROUP

AT

POINT LEVIS.

BY SIR W. E. LOGAN.

Montreal:

PRINTED BY JOHN LOVELL, ST. NICHOLAS STREET.

1863.

LETTER

ADDRESS

MR. JOACHIM BARANDE

ON THE

BOOKS OF THE QUERE GROUP

POINT DE VUE

BY SIR W. E. LOGAN

Illustrated

PRINTED BY JOHN LEITCH, 21, NICHOLAS STREET

1865

LETTER

ADDRESSED TO

MR. JOACHIM BARRANDE,

ON THE

ROCKS OF THE QUEBEC GROUP

AT

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Montreal:

PRINTED BY JOHN LOVELL, ST. NICHOLAS STREET.

1863.

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1811

ON
THE ROCKS OF THE QUEBEC GROUP
AT
POINT LEVIS.

MONTREAL, 15th MARCH, 1863.

MY DEAR MR. BARRANDE,—Mr. Jules Marcou has addressed to you a letter dated the 2nd August last, on the Taconic rocks of Vermont and Canada, in which he says, on page 10, "I was able this year to follow out and trace every bed and layer on the whole contour of Point Lévis, from the Grand Trunk Terminus to Indian Cove; and as Point Lévis is a point of land surrounded by high cliffs, I feel satisfied that there is no repetition of beds, and no synclinal axis; and that the few foldings of the strata at Ferry's cliff are mere accident, confined to a distance of a few feet, and are without any effect upon the whole mass of strata, but are what we call in French *structure ployée* (contorted strata)." On page 14 he says: "Fearing that my first unsuccessful attempt last year to understand the explanation of Messrs. Logan and Billings might be my own fault, I tried very hard this year again, when at Point Lévis, but with no better success, and I left the Point fully convinced that the fossils described by Mr. Billings, and the so-called outcrops, A², A³, A⁴, &c., of Mr. Logan, were collected and observed in a very careless way, without regard to stratigraphy, by irresponsible collectors, or by unskilful practical geologists."

I have neither time nor inclination for controversial geology. I have never criticised any of Mr. Marcou's remarks on rocks in Canada, or out of it, nor have I suggested any such criticisms to others; but a charge of carelessness on the part of public officers in the discharge of their duties appears to me, on the present occasion, to require a few words of reply, lest you and others might suppose the accusation to have some foundation. It is due to Mr. Marcou to give him credit for the very great care he claims, as I am persuaded he would not have ventured so unreserved and con-

demnatory a contradiction of what has been stated on the part of the Survey, without having exhausted all his skill on his own investigation. The only critical remark therefore left for me to make, is that this distinguished stratigraphist has been very unfortunate; and that having missed the main feature of the conspicuously marked structure he so carefully searched for, it is not surprising that he should find a difficulty in understanding a statement connected with it.

In 1854 and 1856, a considerable time was expended by Mr. Richardson, one of my assistants, and myself, in ascertaining by measurement the position and extent of all the exposures of the limestone conglomerates which characterize Point Lévis. The result of this work was exhibited by me to Mr. Marcou, at the office of the Survey, in 1861, on an unpublished manuscript map, on a scale of six inches to one mile, showing nearly all the known exposures of rocks of the Quebec group for about twenty miles below, twenty miles above, and nearly twenty miles to the south-eastward of Quebec. This map represents an area of 800 square miles, on which all the exposures are laid down by admeasurements, comprising the work of one member of the Survey for two seasons, and of another for one season. The measurements at Point Lévis I have recently re-protracted on the same scale, with a view of completely separating what is exposed to view, from what is inferred; and a plan reduced from this to one half, by photography, accompanies the present communication. The topographical as well as the geological features are delineated from the measurements of the Survey.

On this plan, the heavy black bands represent the known exposures of the limestone conglomerates; the dotted lines between different exposures represent their supposed connection. Some of the geographical undulations are shown by what I have designated the Coast Ridge, and the North, Middle and South Ridges. The main feature of the Coast Ridge is a thick band of limestone conglomerate extending in a hill and precipice, which overlook the beach from Patton's wharf to the neighborhood of the Lower Ferry; beyond which it gives place to the cliff immediately behind the houses near the Lower, Middle and Upper Ferries. The North Ridge is a hill which rises up from and runs parallel with the road passing in front of the Temperance Monument or Cross; and attains its greatest height in a band of limestone conglomerate about 300 yards southeastward. The part of this ridge nearest the road probably constitutes Mr. Marcou's Cross Hill. The

Middle Ridge is, I presume, Mr. Marcou's Parochial Hill. It includes Guay's quarry, or the Redoute, and crossing the St. Joseph Church road (Route de l'Eglise), extends for about a mile to the southwestward, with a somewhat broad depression southward from the Burying-ground. Where Mr. Marcou's Middle Hill may be situated, I am not quite sure, but suppose it to be the upper part of my North Ridge, as the extension of this seems to be the only hill between the Temperance Monument and Guay's quarry. The South Ridge crosses the St. Joseph Church road about half a mile to the southeastward of the Middle Ridge.

The limestone conglomerates, as you are probably aware, consist of beds of yellow-weathering magnesian limestone, in which, as a base, are imbedded masses of pure compact limestone, of colors varying from yellowish-white, through gray and brownish, to nearly black. These masses are generally of a sub-spherical or sub-elliptical form, looking like boulders, and many of them may probably be such; but beds of a limestone almost precisely similar to them in character appear occasionally to run in an irregular manner in the conglomerate bands, presenting the aspect of original sediments. The yellow-weathering matrix is often arenaceous, the white silicious grains sometimes attaining a quarter of an inch in diameter. The bands of conglomerate are separated from one another by greenish and blackish slates, which in many places, are interstratified with strong yellow-weathering gray and black calcareo-magnesian slates, and occasionally with yellow-weathering sandstones. In a few places red slates are intermingled with the others.

Southeastward from the St. Lawrence, the limestone conglomerates of Point Lévis are distributed over a breadth of more than two miles. In the North Ridge there are four bands, numbered 1, 2, 3, 4, on the map; on which is represented, in addition, a long lenticular bed (4^a) subordinate to 4, but separated from it by slate. The lenticular bed is composed of brown-weathering magnesian limestone, but appears to contain few or no enclosed masses of the pure limestone. The bands 3 and 4 are, respectively, A² and A³ of a former description. You will perceive that northeastwardly they converge a little; and at the time of that description, it was not determined whether they were to be considered two distinct beds, or one a repetition of the other. They are now taken to be two distinct beds. Followed northeastwardly, they appear to be dislocated by a fault near the St. Joseph Church road; but beyond this they are easily traceable around the extrem-

ty of a trough, with a deep channel worn between them in the slate. After passing the axis of the synclinal, the band 4 comes to the limestone of Guay's quarry, which is nothing more than a large lenticular mass of pure limestone, subordinate to the band. Southwestward of the quarry, both bands are seen again crossing the St. Joseph Church road, and again coming against the transverse fault. This fault appears to show an upthrow on its southwest side; since on that side the opposite outcrops of the trough are thrown towards the centre.

Continuing to trace the outcrops on the southern side of the trough, that of band 4 gradually thins, and disappears at P, in less than a furlong; while that of the band 3 becomes more conspicuous, and shows a great development as it folds over an anticlinal axis just eastward of the eastern boundary of the fief St. Anne. From this it returns towards the Church road, but becomes concealed about fifty yards before reaching it, after again shewing the effect of the fault, in a much smaller horizontal displacement than before. On the northeast side of the anticlinal axis, on both sides of the fault, the dip is to the southeastward, and is therefore overturned; but from the character of the displacement it is evident that beneath the surface, on the northeast side of the fault, the inversion must be compensated for by a change to the northwest in the slope.

A little above the outcrop of band 4, at P, there occurs a layer of sandstone, which is traceable on the fief Ste. Aune over the anticlinal axis; and a sandstone approaches the outcrop of band 3 at A'. In the description of 1860, this was supposed to show that possibly the stratigraphical place of the band 4 might gradually approach the band 3, and finally merge into it; but finding farther on, along the outcrops, an exposure of conglomerate at z, which will answer for band 4, it is now conceived that there may be two layers of sandstone, one above, and the other below the stratigraphical place of band 4; and though this band thins to nothing at P, it may commence again in its relative place farther on.

From the neighborhood of the Temperance Monument the outcrop of band 2 is traceable northeastward, running not quite parallel with 3, to the fault, and thence across the St. Joseph Church road to the main road. It traverses this obliquely, a little beyond the church, and its turn upon the synclinal axis is seen on the north side of the road, about 400 yards beyond. In the limestone of Guay's quarry there is a small notch-like turn, which serves to augment somewhat its apparent volume; a corresponding twist

is more conspicuous in the outcrop of band 3, and in band 2 it assumes a still further prominence at *y*. These successive forms indicate a plait in the stratification, commencing at the quarry, and rapidly augmenting northeastwardly in the space of 350 yards. The importance of its effect on the distribution of the strata would, at this rate of increase, soon become considerable, and it serves to show some of the complications of the neighborhood.

Without going into detail, it is evident from the map that the Middle Ridge is an anticlinal form, and that the South Ridge is another. On this, the exposures of the bands 2 and 3 conspicuously mark the turn on the axis, as they do in the synclinal between the ridges. It will be perceived that between the synclinal and anticlinal axes, the outcrop of band 2 is represented as showing a very sharp twist. The evidence of this is not quite satisfactory, and the apparent arrangement may possibly be due only to a swelling in the volume of the band, with parts obscured by drift.

The Temperance Monument stands on band 1, with which are associated some layers of sandstone. This band is easily traced to the northeastward, across the field Ste. Anne; but between that and the fault, it becomes broken down and obscured, and it will require farther investigation. Nothing like it, nor indeed any conglomerate band has been yet observed following, in its relative place, the sinuosities of band 2, where the strata are affected by the synclinals and anticlinals that have been described. Eastward of the fault, and northward of band 2, there is an exposure of conglomerate close upon the southeast side of the main road, the bearing of which would carry it under the church of St. Joseph; and two years ago it was observed in an excavation for the foundation of a house on the northwest side of the road, close by the church. In the strike of these exposures, about 400 yards beyond the church, there is a band of conglomerate, which continues in the same strike for about a hundred yards. This strike would carry the band away from those of the North Ridge, and gradually bring it towards those of the Coast Ridge; and it appears probable that the bands of the Coast Ridge may be only a repetition of some of those of the North Ridge. The main band of the Coast Ridge is associated with several beds of sandstone; and from its great breadth it may possibly be capable of division into more than one mass of conglomerate. To the southwestward of the extreme point to which this band has been traced, there occurs in the cliff, to the southeast of the Lower Ferry, the band A; one of those referred to in the description of

1860. Its exact relation to the other bands has not yet been satisfactorily determined.

Southward of A³ you will remark A⁴, and you will perceive that these two bands somewhat converge to the southwest, in which direction they are not traceable for over a quarter of a mile. At the time of the previous description, it was left undecided whether these were to be considered distinct bands, or a repetition of one another. They are now assumed to be distinct. On the Middle Ridge, the band 4, at P, is followed by B¹; which is a band of slate with nodules of limestone. On the North Ridge its place would be between A³ and A⁴. It would therefore be band 5, and A⁴ would be band 6. The bands 7, 8, and 9 succeed on the north side of the Middle Ridge, the band 9 being B² of the former description; like B¹, it is composed of slate studded with nodules of limestone. This band appears to have a considerable development southwestwardly, in a long shallow trough-like form, extending to the Grande Côte road. From this, its outcrop returns on the south side of the Middle Ridge anticlinal, and points to B³; which however differs from it in character, having a base of magnesian limestone instead of slate. What is seen of the band B³ is broken into three portions by transverse faults. It is evidently on the south side of the Middle Ridge anticlinal, and may correspond with band 8, but this has not yet been satisfactorily made out; nor has it yet been found possible to arrange the complicated exposures to the southeast of it, on the South Ridge.

On the southwest boundary of the fief Ste. Anne, near the quarry there indicated, the beds appear to be dislocated on the north side of the Middle Ridge anticlinal, by faults, which do not affect the outcrops on the south side. These faults may be small breaks accompanying twists in the strata, the connecting parts of which may be concealed by drift; but it would require additional facts to make their arrangements certain. Though the number of bands is assumed to be nine, some of them may be repetitions through the effect of plaits suddenly starting up, like that at y, or through undetected faults running with the stratification. The distribution of the outcrops in the southwest part of the South Ridge shows the very complicated character of the disturbances, and is a warning against over-confidence in respect to minute details. In regard to the main features of the structure however, there appears to be no doubt; namely that the Middle and South Ridges are two well marked anticlinals, and that a synclinal, not

less so, runs between the Middle and North Ridges, repeating the whole mass of strata.

From the foregoing explanation you will be able to understand how the fossils enumerated in the description of 1860 are related to the conglomerate bands, as represented on the map. The whole of these fossils were collected by the officers of the Survey, who are all perfectly aware of the importance of observing the exact stratigraphical place of the organic remains, and always most carefully do so. The collectors were Messrs. Billings, Richardson, Bell, and myself; and from the statements made to me by my colleagues and assistants, I am quite prepared to assert that the specimens referred to B³, B², B¹, A, A¹, and A², are from the bands marked on the map by those letters. With the exception of a single specimen of the pygidium of *Bathyurus Saffordi*, obtained by Mr. Sterry Hunt from the band 4 (A²), where it crosses the more northern synclinal axis near the Redoute; the band A² afforded to my late regretted and talented young scientific friend, Mr. John Head, and myself, the first collection of fossils obtained by the Survey at Point Lévis. These were taken from the whitish limestone masses associated with the bed, where it crosses the *ief* Ste. Anne and the opinion in regard to them expressed by Mr. Billings, induced me to instruct Mr. Bell to make a farther collection on the same band. In addition to the fossils collected by Mr. Head and myself from the band, there are some by Mr. Richardson, and others by Mr. Bell, all from the fixed rock; but in Mr. Bell's collection there are, in addition, those from the limestones designated by Mr. Billings as Nos. 1 and 3. These limestones were not, like the rest, firmly attached to the band, and as they have been by Mr. Marcou designated as two loose boulders, lying on the superficial soil, while he carries them away from their true site, and approximates their position to the lime-kiln of the Redoute, in order to affiliate them to that mass, it will be necessary for me to describe their mode of occurrence.

On the *ief* Ste. Anne, the band 3 (A²) dips to the southeast at a high angle. It is from about twenty to twenty-five feet thick, and in its calcareo-magnesian base it holds a great many masses of yellowish-white limestone, in which fossils are apparent, and somewhat abundant. It is underlaid by slates; and in some parts a sudden step to the underlying slates occurs at its northern edge. At the foot of this step, Mr. Bell observed in one place a mass of gray-weathering yellowish-white limestone protruding for a few inches through the soil. This mass, when exca-

vated from its position, proved to be about a foot in diameter, and very fossiliferous. Persuaded that it had fallen from the conglomerate band, he tried farther on in the strike, and found another; and finally, in the distance of about fifty feet along the strike, he obtained five masses, each as heavy as would require a strong man to lift; and twelve smaller masses, each of about twenty pounds weight and upwards. They were all rich in fossils. Some of these gave to Mr. Billings his limestone No. 1, and others that of No. 3. All of these masses, some of which were sharply angular, rested on the slate, just at the base of the conglomerate band; and with the exception of the small portion of the first one, were wholly covered by the soil, one of them to a thickness of a foot; requiring, before it could be extracted by aid of pick, shovel, and crow-bar, a hole to be made of two feet deep. It appears to me much more probable that these masses should have fallen from the conglomerate band which they touched, than that they should have been transported nearly half a mile from the Redoute, and all laid at the foot of the conglomerate band A², in a row in its strike. It is by no means supposed that the stock of these masses was exhausted by Mr. Bell; more may probably be obtained in the strike, and I am persuaded, that if the adjacent parts of the conglomerate band were laid bare, similar masses would be found imbedded in it.

Mr. Marcou states that the limestones Nos. 1 and 3, without doubt come from the Redoute; and that in respect to No. 1, so rich in trilobites, he could almost point out the exact spot from which it came. Soon after the first discovery of fossils at Point Lévis, I spent a good deal of time in endeavouring to obtain specimens from Guay's quarry, but with very indifferent success. Fragments of trilobites were observed, but the only recognizable species obtained was *Menocephalus globosus*. Perceiving that Mr. Marcou had been so fortunate as to meet with upwards of nine species of trilobites in the locality, I last season renewed my attempt; and with Mr. Billings, made a diligent search of the rock, but with no better luck than had attended my previous researches; *Menocephalus globosus* being again the only species procured. Mr. Marcou states that the stratification is indistinct, and that in consequence of the hardness of the stone, it is difficult to obtain specimens. This perfectly accords with what we observed; but not with the characters of the limestones Nos. 1 and 3; which are not very hard, and in which the fossils occur in layers, marking well the stratification. The limestones split with moderate facility in the direction of those layers, and give considerable planes of surface,

with fossils starting prominently up from them. I presume therefore that the beds at the Redoute, with which Mr. Marcou compares the limestones No. 1 and 3, are some which he has not yet described, and with which we can make no comparison, as we have not been so fortunate as to find them.

Since 1860, Mr. Devine and Mr. Cayley, both of the Crown Lands Department, have obtained several species at Point Lévis. The latter gentleman discovered *Amphion Cayleyi*, (Billings) in band 3, (A²) on the North Ridge; and Mr. Devine, on the same ridge, has procured *Bathyrurus Saffordi* from band 2, *Menocephalus globosus*, and *Cheirurus Eryx* from band 3 (A²); and from band 4 (A²) *Bathyrurus Saffordi*, *B. Cordai*, and *B. bituberculatus*. But from this band he has made a very important addition to the fauna of Point Lévis, in a perfect specimen of what Mr. Billings agrees with him in considering an *Olenus*, or a closely allied genus. This was obtained on the North Ridge, just east of the fief St. Anne, in a mass of drab-colored limestone; which Mr. Devine thinks is a part of the solid band, although he has not yet tested the matter sufficiently to be positive. The same part of this band here holds *Obolella*, *Orthis Evadne*, *Camerella calcifera*, *Pleurotomaria*, *Ecculiomphalus Canadensis*, *Orthoceras*, *Agnostus Americanus*, *A. Canadensis*, *A. Orion*, *Arionellus subclavatus*, *Bathyrurus capax*, *B. quadratus*, *B. Saffordi*, *Cheirurus Eryx*, *C. Apollo*, *Dikelocephalus magnificus*, *D. megalops*, *D. planifrons*, *D. Oweni*, *Menocephalus Sedgwickii*, and *M. Salteri*. In this collection, the species of *Pleurotomaria*, *Ecculiomphalus*, and *Cheirurus* do not occur in the same hand-specimens of rock with the others. *Bathyrurus Saffordi* is in the same specimen with *Menocephalus Salteri*. On the Middle Ridge he has obtained *Menocephalus globosus* from band 4, at the Redoute. Mr. Billings has obtained in band 2, on the North Ridge, *Bathyrurus quadratus*; on the Middle Ridge, in band 6, on the north side of the anticlinal, *Leptaena decipiens*; and the same species in band 7, on the same side of the anticlinal; while band 7, on the south side of the anticlinal, has yielded him a *Pleurotomaria*, allied to *P. Laurentina*, *Orthoceras*, n. s., *Illænus*——, and *Asaphus*——. In a band of conglomerate forming two successive mounds at the water's edge, northwest of the Coast Ridge, and running parallel with it, he has met at D, with a new species of *Dikelocephalus*

To make the distribution of the fossils, which we in Canada (including Mr. Devine and Mr. Cayley) have obtained at Point Lévis,

more clearly understood, a catalogue of them has been prepared, with the specific names of those which have been described, and a separate column for each of the bands, and made a part of the present communication. In this catalogue no certain stratigraphical place is assigned to the bands D, G, and A, in relation to the others; which, from 1 to 9, are supposed to be in ascending order. With the exception of those otherwise marked, all the determined species have been described by Mr. Billings.

Mr. Marcou, it appears to me, has gone somewhat out of his way to insinuate a discourtesy towards you on the part of the Canadian Survey, in that we have, as he says, distributed fossils of the Quebec group, in England, to more favoured geologists than yourself. Mr. Marcou could not have stated this from his own knowledge, as it is not consistent with fact. The truth of the matter is precisely the reverse of this. We long ago did ourselves the pleasure of transmitting to you a small collection of the principal species; while we have presented none to any other of our geological friends in Europe. On this side of the Atlantic we have exchanged a few specimens with Col. Jewett, of the New York State Museum, for New York species, of which we stood greatly in want; and we are just now about to make a small exchange with Mr. A. H. Worthen, State geologist of Illinois, for species from several of the Western States, of which we have long been anxious to possess authentic specimens. Mr. Marcou seems especially aggrieved that he did not obtain a pygidium of *Dikelocephalus magnificus*, asked for, as he states, in your name. This was during my absence in England, at the International Exhibition. Mr. Billings cannot call to his recollection that the application was made in your name. Such an application would have afforded him the opportunity of informing Mr. Marcou, that you were probably already supplied, in the collection sent; but it would not have altered the propriety of what, in conformity with his duty, he found himself under the necessity of replying; namely that he was not authorized to distribute the specimens of the Provincial Collection.

I am, my dear Mr. Barrande,

Yours very truly,

W. E. LOGAN.

MR. JOACHIM BARRANDE,

Rue Mezière No. 6, Paris,

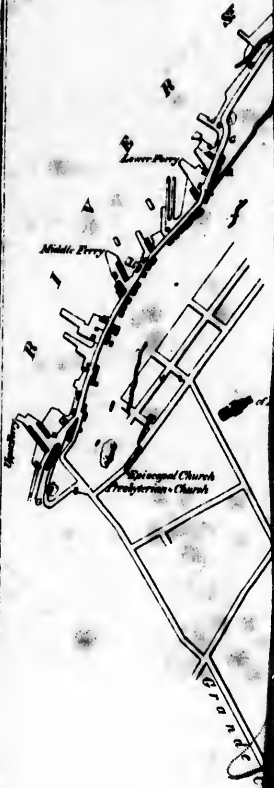
CATALOGUE OF FOSSILS FROM THE QUEBEC GROUP,
COLLECTED AT POINT LÉVIS.

	D	G	A	1	2	3	4	5	6	7	8	9
Tetradium?.....	*											
Graptolithus, several sub-genera (Hall).....	*						*					
Lingula Mantelli.....						*	*					
" Irene.....	*											
" Quebecensis.....			*									
Obolella Ida.....						*	*					
" desiderata.....			*									
Acrotreta n. s.....						*						
Leptæna decipiens.....								*	*	*	*	*
" sordida.....								*	*	*	*	*
" undescribed 1.....								*	*	*	*	*
" " 2.....						*						
" " 3.....							*					
Strophomena, undescribed.....			*									
Orthis gemmicula.....								*	*	*	*	*
" Tritonia.....								*	*	*	*	*
" orthambonites (Pander).....								*	*	*	*	*
" Euryone.....								*	*	*	*	*
" Electra.....								*	*	*	*	*
" Hippolyte.....								*	*	*	*	*
" Evadne.....								*	*	*	*	*
" Mycale.....								*	*	*	*	*
" Eudocia.....								*	*	*	*	*
" Quebecensis.....			*					*	*	*	*	*
" undescribed 1.....						*						
" " 2.....							*					
" " 3.....							*					
" " 4.....								*				*
Camerella calcifera.....						*	*					*
Stricklandia? Arachne.....								*	*	*	*	*
" Arethusa.....								*	*	*	*	*
Cyrtodonta? undescribed.....								*	*	*	*	*
Ecculiomphalus Canadensis.....								*	*	*	*	*
" intortus.....								*	*	*	*	*
Pleurotomaria vagrans.....								*	*	*	*	*
" Postumia.....								*	*	*	*	*
" Quebecensis.....								*	*	*	*	*
" undescribed 1.....								*	*	*	*	*
" " 2.....								*	*	*	*	*
" " 3.....								*	*	*	*	*
" " 4.....								*	*	*	*	*
Murchisonia, undescribed, 1.....								*	*	*	*	*
" " 2.....								*	*	*	*	*
" " 3.....								*	*	*	*	*
" " 4.....								*	*	*	*	*
Helicotoma perstriata.....								*	*	*	*	*
Ophileta uniangulata (Hall).....								*	*	*	*	*
" undescribed, 1.....								*	*	*	*	*
" " 2.....								*	*	*	*	*
Maclurea Atlantica.....								*	*	*	*	*
Holopea dilucula (Hall).....								*	*	*	*	*
" undescribed.....								*	*	*	*	*
Metoptoma Melissa.....								*	*	*	*	*
" Hyrie.....								*	*	*	*	*
" Orphne.....								*	*	*	*	*
" Venillia.....						*	*	*	*	*	*	*
" anomala.....						*	*	*	*	*	*	*

	D	G	A	1	2	3	4	5	6	7	8	9
Metopoma Augusta							•					
" superba							•					
Orthoceras Autolytus							•					
" undescribed 1							•					
" " 2							•					
" " 3							•					
" " 4							•					
" " 5							•					
" " 6							•					
Cyrtoceras Metellus							•					•
" Dietyx							•					
" Althes							•					
" Mercurius							•					•
" Syphax							•					
" undescribed							•					
Nautilus							•					
Agnostus Americanus							•	•				
" Orion							•	•				
Agnostus Canadensis							•	•				
Amphion Cayleyi							•	•				
Ampyx, undescribed							•					
Arlonellus cylindricus							•					
" subelavatus							•					
Asaphus Illænoides							•					
" goniurus							•					
Bathyrurus capax							•					
" dubius							•					
" bituberculatus							•					
" armatus							•					
" Saffordi							•	•				
" oblongus							•					
" Cordai							•					
" quadratus							•					
Cheirurus Apollo							•					
" Eryx							•					
Conocephalites Zenkeri							•					
Dikelocephalus magnificus							•					
" planifrons							•					
" Oweni							•					
" Belli							•					
" megalops							•					
" cristatus							•					
" undescribed							•					
" (Olenus) Logani (Devine) ...							•					
Endymion Meeki							•					•
Holometopus Angellii							•					•
Illænus, undescribed							•					•
Leperditia							•					•
Menocephalus globosus							•	•				
" Sedgwicki							•	•				
" Salteri (Devine)							•	•				
Nileus, undescribed							•					•
Shumardia granulosa							•					



THE
MANS
OF THE
FIRST PART



GEOLOGICAL SURVEY OF CANADA
 R. W. Logan F.R.S. Director.

PLAN

Showing the distribution.

OF
LIMESTONE CONGLOMERATE

IN THE

QUEBEC GROUP

AT

POINT LEVIS

1882.
 Scale



