

Bulletin of the MPE

May 5, 2019



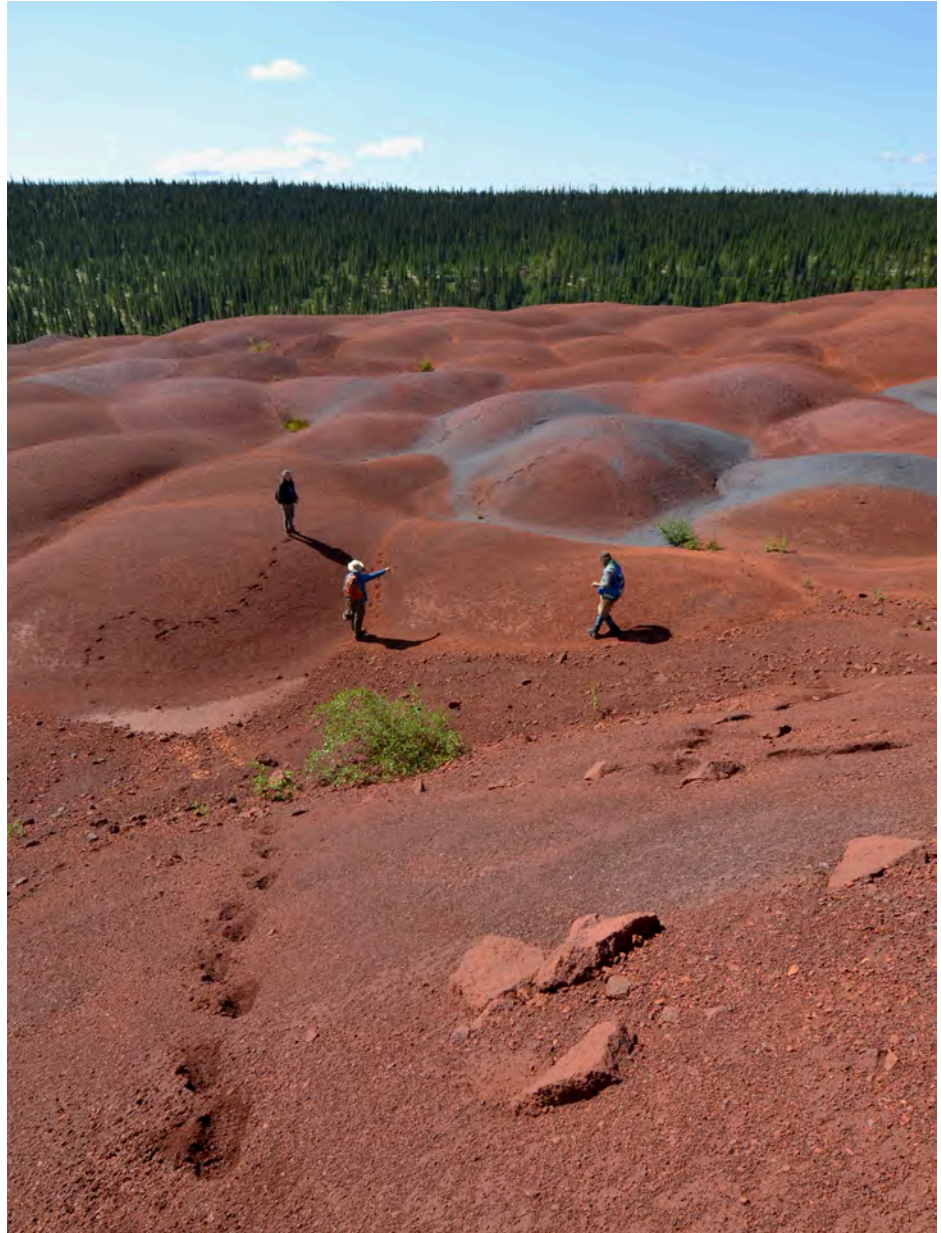


Bulletin of the MPE

Back to Schefferville

In the summer of 2018, a team of members from the MPE and the Redpath Museum returned to Schefferville, Québec, to re-sample the Cretaceous period deposits of the Redmond Formation (approximately 100 million years old). Their hopes of finding other insects and fossil plants in this neglected site were fulfilled: the fossil insects found during the digs number in the hundreds, increasing dramatically the knowledge of this insect fauna, which is unique in North America and the world.

These recent findings followed a request for access to fossils we had collected during our reconnaissance work in Schefferville in August 2013 (MPE Bulletin, September 24 2013), by Alexandre Demers-Potvin, a McGill University biology Masters student. Under the supervision of Hans Larsson, professor of biology at McGill University and director of the Redpath Museum, Alexandre will attempt to identify our fossils and document the paleoecosystem of the Schefferville area in the middle of the Cretaceous. Mario will also be co-supervisor, providing useful help at many levels. In addition, Alexandre has another project in mind, that will increase knowledge of the Schefferville fossils, as we will see later.



Noémie Sheppard (left), Alexandre Demers-Potvin (center) and geologist Ben MacDougal (right) at the Redmond-1 Mine, searching mounds rich in insect and plant fossils.



Back to Schefferville (cont.)

But let's go back: exploration work was organized in August 2013 by Jean-Pierre Guilbault, assisted by Pierre Bédard, Jacques Letendre and Mario Cournoyer. During this trip, the group collected many fossils of insects and plants, in addition to bringing back "mummified" wood samples and Precambrian stromatolites (see the [MPE Bulletin, November 19, 2013](#)). The numerous fossils of plants and insects collected were immediately cataloged and deposited in the cabinets of the Laboratory for Conservation and Research - MPE. Afterwards, Mario Cournoyer, Director of the laboratory, tried to find researchers who would be interested in working on them. He was convinced that among the specimens discovered, new species could be found and that these fossils could also provide more knowledge about the paleoenvironment, the paleoecology and the relative age of these fossils compared to other sites of equivalent age, elsewhere in North America and worldwide.

Research and known publications on fossils from Schefferville are limited to half a dozen articles, published in the late 1950s and 1960s, mostly on insects, but also on plants. The largest work on the Schefferville fossils was done by a Yale University bachelor's student, Timothy B. Armstrong, in 1993. His work consisted of a paleoclimatic interpretation of the site's fossil flora. By the same token, he had identified 39 species or varieties of plants. For at least a decade or more, this work was no longer available at the Yale Library, as the only paper copy was lost! In 2016, Mario attempted to trace Mr. Armstrong through LinkedIn and found him as Managing Director of Roark Capital Group. He had made a career change. Tim confirmed that he was indeed the one who did the work on the Schefferville fossil plants, and that he was going to try to find a copy of his thesis. He finally found it, made a scanned copy, which he immediately sent to Mario, admitting that he was flattered to learn that there were people interested in his work. Mario sent a copy to the Yale University Library and the Yale Peabody Museum. At that time, Mario felt that the project to study the fossils collected in 2013 in Schefferville should be put back on track.



Alexandre Demers-Potvin (left) and Michel Chartier (right) at the Redmond-1 mine, searching one of the mounds rich in insect and plant fossils.

Alexandre Demers-Potvin wanted not only to study our fossils, but to return to the Schefferville site for a longer field trip in order to gather samples more systematically. Late in the fall, he applied for a Research and Exploration Scholarship from the National Geographic Society. The scholarship was granted! This scholarship, along with funding from the Northern Science Training Program (NSTP Govt. of Canada), were used to defray travel, accommodation and other expenses related to the work that was to be done during the summer of 2018. During the fall of 2017 and winter of 2018, Alexandre made many contacts with people who would make our stay in Schefferville easier. As in 2013, we were housed at McGill University's Subarctic Research Station. For our traveling, we were permitted use of the Redpath Museum's Ford F-250 truck, which, once in Sept-Îles, was transported by train to Schefferville.



Back to Schefferville (cont.)

Field work at Schefferville lasted from August 5 to August 30, 2018, including the trip to Sept-Iles by car and the train to Schefferville. Unlike the 2013 visit, when there was more exploration done in the Schefferville area than at the Redmond-1 mine, this time around a lot of time was spent exploring the mounds around the mine which we knew were fossiliferous. In 2013, only two or three sectors, among the areas visited around the mine, had yielded the red argillites, rocks which contain fossils. The 2018 expedition demonstrated that there were many more red argillite "deposits" scattered throughout the western, northern and northeast portions of the mine.



Alexandre Demers-Potvin (in the foreground) and Noémie Sheppard (in the back) looking for fossils in red argillite.

The 2018 field team consisted of Alexandre Demers-Potvin and Noémie Sheppard for the Redpath Museum and Mario Cournoyer and Michel Chartier for the MPE. Michel was there for just the first week, but his contribution in terms of specimens collected was excellent. The first week ended with an abundant harvest from the sites previously visited in 2013! This confirmed that our 2018 trip was justified. Having realized that there were still many pieces of argillite that had not been collected, the next step was to see if there was more elsewhere in other deposits around the mine. We began by visiting the area west of the mine, where the known sites were located, a territory of a few square kilometers. We were disappointed to find very few pieces of argillite: not a very promising result for the upcoming two or three weeks. If we did not find other deposits, our stay would be drastically cut short. In the following days we visited the southern sector of the mine: again, no red argillite was found and our hopes dwindled very quickly.

The next area visited was the eastern part of the mine: nothing on the horizon again! Just thousands of tons of "Rubble Ore" (ore consisting of hematite rubble), piled tens of meters high without any fragments of argillite. It was only when Mario reached the easternmost end of the mine that he found several small piles of reddish/pinkish or bluish clays among which large quantities of fossiliferous red argillite were found. We had finally hit the jackpot!



An insect elytron found on a piece of red argillite.

Some figures on collecting at the Redmond-1 mine:

2018 (MPE + Redpath Museum):	Plants:	262 specimens
	Insects:	399 specimens
	Other:	125 specimens (*)
2013 (MPE):	Plants:	170 specimens
	Insects:	49 specimens
	Other:	2 specimens
1958-1960 (Yale Peabody Museum + Geological Survey of Canada):	Plants:	174 specimens
	Insects:	18 specimens
	Other:	2 specimens

(*) Includes "momified" wood, ichnofossils, and incertae sedis

Now, with our new knowledge of the presence of red argillite associated with clay piles, we could recognize from a distance, by color, the piles that had the potential to contain the fossils we were seeking. This is how Alexandre and Noémie discovered new deposits in the northern part of the mine, an area rich in insect and plant fossils. The rest of the month, we surveyed these areas carefully, resulting in a record crop for the Redmond Formation fossil deposits.

M. C.



The "Montréal under the sea" exhibition has not yet surfaced, but...

We announced at the last Annual General Meeting in April 2018, that the MPE exhibition project "Montreal Under the Sea", due to be presented at the Montréal Biodôme for the closing of the 375th anniversary of Montreal would not take place in 2018, despite the hard work done by the MPE and "Espace pour la vie" teams during 2016-2017.

We had won the first prize in the "Je suis MTL" (I am Montreal) contest, with \$ 5,000 for a promotional video. The videos, [short version](#) and [long version](#), are now online on our YouTube channel. We proudly unveiled them on October 3, 2017, during the opening of the exhibition "Quebec: a Sea of Fossils", produced by the MPE, at the Pointe-aux-Trembles Cultural Center (from September 9, 2017 to January 7, 2018). We hoped to use them during the official online launch of our fundraising campaign that would have been dedicated to the exhibition planned for the Montréal Biodôme in 2018.



The promotional video posted on our Youtube channel.

Various delays due to the renovation of the Biodôme had delayed our project. We were still waiting for news about this when a meeting between the MPE team and that of the Biodôme finally took place in March 2018, at which it became clear that the new plans did not really include us anymore. Initially, during the first planning meetings in 2015, our exhibition space was to be in the basement. After reflection, those responsible at the Biodôme (in 2016), decided to install us on the ground floor of the building. Finally, budget cuts forced officials to review the location of our exhibit and send it back to the basement. The basement of the Biodôme needs to be renovated, but for now, they have no budget to do it. Our exhibition project is therefore pending.

One week before the meeting with "Espace pour la vie", at the beginning of March 2018, we met Mr. Benoît Dorais, President of the Executive Committee of the new administration of the City of Montreal, newly elected during the municipal elections of November 2017. It was very important for us to quickly create links with the administration of the new mayor, Mrs. Valérie Plante, just as we had done at the time of former mayor, Denis Coderre. During this meeting, we asked to meet the Mayor to present the Biodôme exhibition project, and also discussed our desperate need for space: a permanent place as well as conservation areas for our collection. Our requests were heard and passed on to the appropriate persons in charge. To date, we are still waiting for a meeting with Mayor Valérie Plante, and the search for a place is following its course.

Other steps have been taken, including the search for funding from the Government of Quebec. Our requests had been forwarded to Mrs. Dominique Anglade and Ms. Marie Montpetit, respectively Minister of Economy, Science and Innovation and Minister of Culture and Communications. However, in the provincial elections of October 2018 these ministers lost their positions. We must therefore work again to re-establish links with members of the new Government of Quebec.



The “Montréal under the sea” exhibition (cont.)

As you can see, all these lines cast into the water required a lot of energy from the team and resulted in many disappointments. That does not stop us! This is not the first time that we have come up against obstacles and delays. This is the essence of any great project.

We are advancing like ants, but what is important to remember is:

- We have an original exhibition project ready for deployment, supported by the Biodôme;
- Our goal of improving the accessibility of the MPE project has been achieved through the promotional video, which can now travel independently from the exhibition project;
- Our name and museum project reached the offices of the provincial government;
- Following recent municipal and provincial elections, we remain known to the respective new administrations.

In 2019, we will continue our actions vigorously. See for yourself by reading the articles in this newsletter.

H.-L. P.

Follow-up on the UNESCO project for Anticosti Island

Since our last press release in March 2018 about Anticosti, the future interpretation center at Port Menier has progressed slowly due to last fall's provincial election. Since then, the new government has announced its intention to continue the process initiated by Philippe Couillard's Liberal government to include Anticosti Island as a UNESCO World Heritage site.

Therefore, the stars are getting aligned for a nomination to UNESCO in 2021 or 2022 for the Island. The applicant for the nomination is the municipality of Anticosti Island, with support from the provincial and federal governments. A seed fund had been allocated during the summer of 2018 to prepare the application, but the construction of an interpretation center is subject to additional funding. It is worth remembering that the opening of an interpretation center is not an obligation to obtain World Heritage Site status. For the moment, the municipality is approaching all levels of government to obtain grants for the project of an interpretation center. To this end, the municipality has just purchased the village church and in the short-term, plans to make it a visitor center, but the building requires quite significant funding for basic maintenance. The site also has potential for a future interpretation center.

The municipality will focus on three important aspects of its application: i) the justification of the site through a comparative analysis of similar sites in the world, ii) a plan of protection by new laws and regulations, and iii) a sustainable tourism management and development plan. The exploratory meetings with government agencies planned for the next few months will make it possible to make progress on all the application files, including that for a future interpretation center. The latter will have a large space dedicated to paleontology. On the scientific side, more than twenty researchers and their graduate students (Ottawa, Victoria, Berkeley, MIT, Ghent, Brussels...) are actively working on research projects on the geology of Anticosti, which is significant in supporting the candidacy of the Island.

Interview by Jean-Pierre Guilbault with André Desrochers in January 2019.

J.-P. G.



Gamache Bay, Anticosti Island. Photo: André Desrochers



New projects in Pointe-aux-Trembles

Context. Many of you had the opportunity to visit our exhibition on the Ordovician of the St. Lawrence Lowlands, "Québec: a Sea of Fossils", which was presented at the Pointe-aux-Trembles Culture Center, from September 2017 to January 2018. This exhibition was made possible following the unexpected visit in 2013 of Mrs. Chantal Rouleau, then mayor of the Rivière-des-Prairies / Pointe-aux-Trembles (RDP-PAT) Borough, to our laboratory on Congrégation street. Immediately convinced that there would be a lot of interest in our collection and exhibition, she facilitated the rapid establishment of contacts with the borough's Cultural Services, which allowed us to imagine possible projects for Pointe-aux-Trembles. During the period between April 2014 and the fall of 2015, together we explored various possible options. We initially thought of an exhibition about the Champlain Sea which would have demonstrated continuity in the "maritime history" of the St. Lawrence and Montreal area, a concept favored by Cultural Services. However due to time and funding constraints, we have agreed to simply move our already existing exhibition on the Ordovician from Pointe-du-Buisson to the Cultural Center of RDP-PAT. Cultural Services have paid a visit to our laboratory (in Montréal) as well as to the Pointe-du-Buisson exhibit and were delighted with it. As of January 2016, it was decided that the new exhibition would be held in the autumn of 2017 and the contract was signed in December 2016. Compared to Pointe-du-Buisson, the RDP-PAT exhibit contained two important additions: the first was two new modules on the fossils of the Mingan Islands in collaboration with Parks Canada and the second, a module explaining to visitors the difference between the fossils of the Champlain Sea and those of the Ordovician limestones presented at the exhibition.

Current situation. As early as 2014, Madame Rouleau had proposed to "do something" in her borough, the details of which were to be discussed. She added that, whatever the outcome of our project with the Biodôme, she would be interested in having us at RDP-PAT. Following the suspension of the project with the Biodôme (see previous article), Jean-Pierre Guilbault and Sergio Mayor met Mrs. Rouleau. We reminded her of her 2014 proposal and we told her about the need for a 800 to 2,000 square foot exhibition hall for a period of 1 to 5 years. This request was well received. In addition, we asked that the exhibition space be identified as "Museum of Paleontology and Evolution". This was to be considered. In December 2018, we were invited (JPG and SMP) to meet Mrs. Valérie Laforest, new director of culture at RDP-PAT. In the intervening time, there had been a provincial election and Mrs. Rouleau had been newly elected for the CAQ and had become Minister in charge of Greater Montréal. Ms. Laforest offered us two options: if our financial demands are large, it will be necessary to appeal to Montreal City Hall, which would be possible but difficult. We estimate an exhibition on the Champlain Sea might require up to \$ 50,000. This is the figure we quoted to Mrs. Laforest as the maximum to consider and would require a contribution from the Montreal City Hall. If we are willing to



settle for a smaller space and smaller budget, then it could be handled by the Borough of RDP-PAT. An idea suggested by Mrs. Laforest would be to make mini-exhibitions, two or three, in different places at the same time. She talked about sports centers. Could a long-term exhibition actually transform into an MPE after a few years? That subject was not discussed. Other meetings will be necessary before coming to a final plan. The aim of these negotiations is to establish something that in 5 years' time, can become the open MPE we dream of, although we will still have to find a place to house it in the long term. If we can have exhibition space for only one year, it will still give us a new mobile exhibition to present.

J.-P. G.

The exhibition "Québec: a sea of fossils" presented at the Pointe-aux-Trembles Cultural Center, in the fall of 2018.



Visits to the laboratory in 2018: scientists love our fossils

The Laboratory for Conservation and Research - MPE is becoming increasingly popular with researchers working in invertebrate palaeontology. In fact, during the summer of 2018, three paleontologists visited the laboratory to consult our fossils, discuss projects for the publication of scientific articles and borrow certain fossils for study.

On April 10, 2018, Professor William (Bill) Ausich, from Ohio University in Columbus, came to the lab to examine our crinoids from Anticosti Island. These fossils are included in an article submitted in January 2019 to the Journal of Paleontology. Selected crinoids include specimens collected by the following people: Dr. Allen Petryk, Markus Martin, Daniel Saint-Laurent, the late Pierre Groulx, Philip Isotalo, David Clark, Nathalie Daoust and Mario Cournoyer. The article will discuss the following points specifically about Anticosti's crinoids: 1) it will review the stratigraphic distribution of some species; 2) new anatomical features will be described for already known species; 3) the first evidence of ecological associations between crinoids and other organisms will be described; 4) the first samples to present multiple species of crinoid on the same slab will be reported and 5) new species will be described. A collection of crinoids from Anticosti that are curated at the Royal Ontario Museum (ROM) will also be in the study, including new species. This article will be the first major update since the publication of the Anticosti crinoid monograph, published in 2010 ([Ausich & Copper, 2010, The Crinoidea of Anticosti Island, Palaeontographica Canadiana #29](#)). Note that this article was submitted in early 2019 and will likely be released later this year.



Eucalyptocrinites archaios, a specimen that will be featured in the article on crinoids of Anticosti Island. MPEP495.3

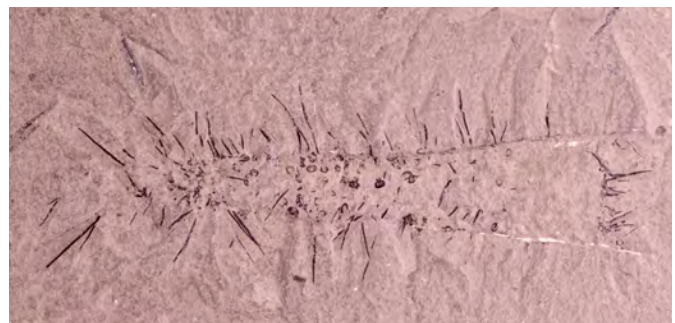


The species *Ceraurus pleurexanthemus* will be reevaluated in an upcoming article. Québec, Québec. MPEP700.71

On June 26, 2018, Lisa Amati, the State paleontologist for New York and a researcher at the New York State Museum in Albany, consulted our Ordovician trilobites from Québec and Ontario, specifically our cheirurid specimens. She is working with colleagues (Gerry Kloc and Curt Kongreve) on an article that will review cheirurids and on another that will focus specifically on the genus *Ceraurus* and other close relatives such as *Borealaspis* and *Bufoceraurus*. These will be important studies given the large number of species in this group. She borrowed our cheirurids for the purpose of studying them, photographing them and in some cases doing extra preparation work.

Finally, on July 14, 2018, Heyo Van Iten, professor at Hanover College, Indiana, and his wife Tatiana, came to the lab to continue the paper on our Ordovician conularids from Ontario. For the occasion, Laurence Gagnon, intern (biology, UdeM) who had collected data on our specimens, which will be featured in this future article, was present. He will continue collecting data on one last specimen from the ROM that will be added to the

study. The final step will be to take the pictures since the manuscript is almost finished. Heyo's visit also focused on another article, this time involving one of our fossils which shows an ecological association between an orthocone cephalopod and *Sphenothallus* (group related to jellyfish). This specimen was found in the Utica Shale of the Québec City area. It shows the anchoring bases of *Sphenothallus* on the shell of a cephalopod, the first occurrence to be so well documented. This article was submitted in January 2019 to the journal *Acta Palaeontologica Polonica*. M. C.



A cephalopod shell with *Sphenothallus* attached to it. Cap Santé, Québec. MPEP1144.1



More about the Schefferville project

The expedition itself is generally considered to be the crucial stage in the success of any field sampling research project. Fortunately, the Redpath Museum-MPE expedition to Schefferville in 2018 was successful: our efforts resulted in a significant increase in the known abundance and diversity of Cretaceous fauna and flora collected around the Redmond-1 mine. Thus, my master's project gained a strong momentum. Anthony Howell, head of the Redpath Museum's zoology and palaeontology collections, confirmed that the fossils I collected with Noémie Sheppard are one of the most important individual contributions in the history of this institution. Now I had all the material at my disposal to bring the project to a successful conclusion. At that time, my knowledge of insect identification was very sketchy and the quantity of specimens was rather large, as large as the vast expanses of iron clay, where we could walk for days without finding any piece of argillite. For me, even after the arduous organization of our field work, the real challenge was just beginning.

The first step of the project that I completed was an assessment of the Quebec/Labrador Cretaceous climate using angiosperm leaves from the Redmond-1 site. I had already started before the field work, because the collection of the Yale Peabody Museum of Natural History assembled by Erling Dorf in 1958, the same collection used by Armstrong for his bachelor's degree, was relatively complete. I had already integrated specimens collected by the MPE in 2013 to produce preliminary results. The 2018 expedition added a few morphological variants of previously undetected leaves, increasing the proportion of the original community represented in the fossil record, increasing the power of our analysis. I carried out this analysis using the Climate Leaf Analysis Multivariate Program (CLAMP): in short, this method relies on correlations established in current flora between various climatic parameters and foliar traits such as shape, surface-to-length ratio and the presence/absence of teeth on the margins. By quantifying the frequency of these characters in fossil flora (which is supposed to react to the environment the same way it does today), it is possible to project them on a regression and thus obtain quantitative results (with uncertainties, of course), for example on the average annual temperature or precipitation during the growing season.



Michel Chartier proudly holds a leaf belonging to a species never identified from the Redmond-1 site before. The insertion position of the petiole within the margin rather than the margin itself would indicate an aquatic plant. This leaf adds some data to support our past climate estimates.



More about the Schefferville project (cont.)

The Cretaceous Schefferville climate manuscript was submitted to the prestigious journal *Palaeontology* in October, and was recommended for publication two months later! At this moment, the revisions are going well and the year 2019 should witness the publication of the first article on the site of Redmond in fifty years! Since the last publications dating back to the 1960s, our knowledge of Cretaceous insect evolution has exploded, and the Redmond site certainly adds a critical chapter to understanding these ecological and evolutionary interactions in a region of the world that is poorly represented for the fossil record of the Mesozoic Era.

The rapid conclusion of this stage of the project gave me valuable time to tackle the monumental task of classifying new kinds of insects, often from unique holotypes. The first person I contacted was Étienne Normandin-Leclerc, coordinator of the Ouellet-Robert entomology collection at the Université de Montréal. His brief orientation to orders or sub-orders put me on tracks that led me to more precise diagnoses. Throughout this process, I kept in mind that many of these insects belonged to families that are extinct or very rare nowadays. As I tried to make my own diagnoses, I started contacting palaeo-entomologists around the world to discuss my ideas and get their advice. To date, I have contacted Professor Michael Engel of Kansas University, Bo Wang of Nanjing Institute of Geology and Paleontology, and Ryan McKellar of the Royal Saskatchewan Museum, for specific specimens. My main contacts, however, remain Olivier Béthoux, of the National Museum of Natural History (MNHN Paris), and David Grimaldi, of the American Museum of Natural History (AMNH New York), because they offer me access to their collections and their respective equipment to speed up descriptions. Visits to these museums this year are funded by a Redpath scholarship, the Class of 66 Award, which funds research trips to other museums.

In January, I spent a week at the AMNH studying remarkable specimens from the Brazil Crato Formation and New Jersey amber to compare them with some of the new Redmond genera. The MNHN's visit will be longer, as the main objective will be to test an imaging technique, Reflectance Transformation Imaging (RTI), on the specimens themselves. The collaboration with Professor Béthoux will be indispensable, because he is a pioneer of the application of this method to the observation of fossils in 2D. Since fossil impressions are never completely 2D, the shadow cast by a single or double light incidence greatly affects the quality of a conventional photo. In theory, the RTI will allow us to choose the combination of light bearings that brings out fine anatomical details in optimal ways. These details are often essential to the definition of a new species.



The super team, the Fossil Fab Four. From left to right: Alexandre Demers-Potvin, Noemie Sheppard, Mario Cournoyer and Michel Chartier in front of the original camp where the idea of founding the Iron Ore Company of Canada (IOC) was born.



More about the Schefferville project (cont.)

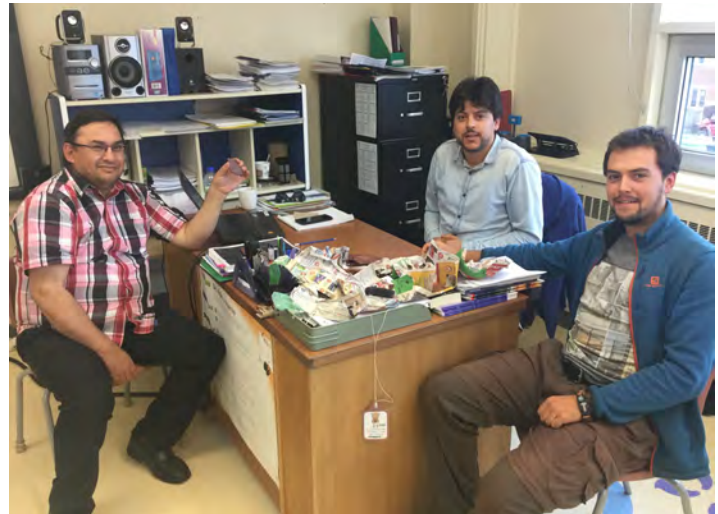
Recently, I cut several of the fossiliferous blocks using a diamond saw, located in the Department of Geology at McGill University. Not only does this operation significantly reduce the weight and volume of my luggage for Paris, but it will eventually allow certain specimens to be inserted into McGill's scanning electron microscope to obtain a different type of image that would be particularly relevant for the observation of precise structures on a wing or elytra.

Since my return, I have had the chance to share many of my results. At McGill itself, I presented two seminars at the Redpath Museum, a poster at McGill North's Third Science Day, and my first insect description at the Department of Biology Day. I also did science outreach in a series called Tea and Science where students from the Redpath Museum explain their research to the public. Not only did I present pictures of my specimens, but visitors could observe and manipulate them with their own hands!

Off campus, I presented posters at the [Troisième journée de la science de l'Institut nordique du Québec \(INQ\)](#) and the [Réunion 2018 de la Société d'entomologie du Québec \(SEQ\)](#), both in Québec City. I also presented an oral presentation at the latest symposium of the Center for Biodiversity Science of Québec (CSBQ) at Concordia University. This spring, my participation in the 87th Acfas Congress at the University of Québec in the Ottawa region is confirmed, and I am also aiming for conferences more specialized in paleontology.

In the long term, I intend to return to Schefferville to present my results to the community that welcomed me this summer. Shortly before Mario took the Tshuetin train, we finally thought of the best way to contribute to the social and cultural life of the municipality of Schefferville and the Innu community of Matimekush-Lac-John. We understood that the best service we could offer as paleontologists and educators would be an exhibition! I suggested this idea to some notables, including Ghislain Lévesque, the administrator of Schefferville, and Donat Jean-Pierre, director of Kanatamat High School, and they were equally enthusiastic. This means that the project has now taken a direction that goes far beyond the mandate of my master's degree, that it will continue well after the submission of my thesis, and that it should be the source of very enriching collaborations for years to come.

A. D.-P.



Left picture: Alexandre Demers-Potvin (right) shares his findings with Schefferville's administrator, Ghislain Lévesque (left)

Right photo: Alexandre Demers-Potvin (right) meets with director Donat Jean-Pierre (left) and a teacher (center) at Kanatamat High School in Matimekush-Lac-John.



Fundraising campaign for the acquisition of fossils

From time to time, the MPE receives beautiful donations of fossil collections. For example, in 2017, Concordia University gave us its pedagogical collection ([MPE bulletin, Octobre 31, 2017](#), p.3) while Pierre Groulx's heirs posthumously donated the latter's collection ([MPE bulletin, Octobre 31, 2017](#), p.5 and 6). At times, the MPE seeks to acquire specimens that are important for science and that are, in addition, a valuable fossil heritage for Québec. In these cases, the MPE must find funds to acquire them. In 2016, we carried out a fundraising campaign to acquire crinoid fossils from Anticosti Island. Thanks to donations from our friends and members, we have been able to acquire these important specimens, some of which will be part of an upcoming paper on Anticosti crinoids (see this newsletter, page 7).



An article describing new species of fossil starfish from the St. Lawrence Lowlands is in preparation. The MPE has two specimens from the Québec City area, which have been identified as new species by David Gladwell, a British researcher expert in starfishes and other fossil echinoderms. We were aware of half a dozen other fossil starfish specimens in private collections, associated with our two specimens. In fact, all these starfishes were discovered during a dig in the 1980s. All of them represent new species, and to acquire them for study would allow us to describe them, publish them and by the same breath have them kept as holotypes by the MPE. If we have holotypes in our custody, the status of the MPE in the scientific community will be improved.

One of the starfishes (not yet identified) from the Québec City area that will be acquired as part of this fundraising campaign

We would like to thank the following people for their generous contributions:

\$ 500 and more

Jean-Bernard Caron, lifetime member of the MPE; Sylvie Pinard, lifetime member of the MPE;
Pierre J.H. Richard, lifetime member of the MPE; Gilles Renaud lifetime member of the MPE;
Jean-Pierre Guilbault, lifetime member and Board member of the MPE;

Less than \$ 500

Julie Talbot, MPE member; Richard Labrie; Ha-Loan Phan, copresident of the MPE;
Alexandre Guertin-Pasquier, copresident of the MPE; Victoria Cournoyer, MPE member;
Audréanne Loiselle, MPE member; Daniel Renaud; Jean Barbeau, MPE member;
Denis Barnabé; Diane et Daniel Beaudriault; Pierre Cournoyer; Stéphane Clermont;
Pierre Cardinal; Gabrielle Zacek, MPE member; Brigitte Beaudoin;
Anne Costisella, MPE member; Ginette Cournoyer, MPE member;
Michel Chartier, MPE member; Réal Daoust; Jacques Lachance, Board member of the MPE;
Jacques Letendre et Carole Agard, MPE members; Jean-Marc Ethier; Édeline Gagnon;
Véronique Poirier; Robert Ascah, MPE member; Suzie Nantel, MPE member.



Fundraising campaign for the acquisition of fossils (cont.)

A silent fundraising campaign was started in June 2018 to acquire these specimens, with a goal of \$ 14,000. The friends and members consulted, saw with a good eye on the acquisition of these specimens and, as of August 2018, we had already raised \$ 5,000 !!! Just before the 2018 holidays, we managed to accumulate \$ 2,500 more. At the beginning of the year 2019, the campaign went public (you have probably received our email solicitation) and many other donations arrived, reaching the sum of \$ 2,000. To date, we still need \$4,500 to reach our goal. For those who have not donated yet, here's the perfect time to help us reach our goal. Remember that the Museum of Paleontology and Evolution is a non-profit organization registered with the Canada Revenue Agency (# 890282445RR0001) and is able to issue receipts for taxes purpose for your donations.

Two ways to donate:

By check: make a check payable to the "**Musée de paléontologie et de l'évolution** " and mail it to the following address: **Musée de paléontologie et de l'évolution** , 541 rue de la Congrégation, Montréal, Québec, H3K 2J1

Or, donate online, via our website: <https://mpe-fossiles.net/donner/>

Once again, thank you for your donations, your precious financial help will ensure that we save these important specimens for Québec.

M. C.

What is a holotype?

If you are not in a hurry, you can identify a living organism by placing it next to a specimen of the opposite sex whose species name is known. If, after a certain time, offsprings appear, it is because they are of the same species; otherwise, they are different species. This is the very definition of biological species. If you have a well-equipped laboratory, you can analyze its DNA, compare it to that of other similar specimens and if their DNA is identical (or almost), it's the same species. Unfortunately, it's a pretty heavy procedure. With a fossil organism, all of the above is impossible. It is therefore necessary to visually compare it with one or more well-identified specimens and to decide, on the basis of one's personal experience, which specimen it identifies with. In practice, one searches books with fossil illustrations. But how could the authors of these books identify their own fossils and conclude that such a shell belonged to (imaginary name) *Allus bixus* Bleau (1933)? In the end, one or other author had to visit a museum where he could see with his own eyes the holotype of *Allus bixus* Bleau. This means that Bleau once excavated and found a fossil he had never seen. On the basis of his knowledge of the paleontological literature, he knew that no form like this had ever been reported. Then, note carefully what follows: 1. He wrote an article in which he described the fossil in question and gave it a name: *Allus bixus*; the article was published in a scientific journal (as the date above indicates, it was in 1933); 2 ° The article contained illustrations of *Allus bixus* and if there were several specimens, a number of them were illustrated; 3. Of the specimens illustrated, Bleau designated one as a holotype. The designated specimen, the holotype, THAT is *Allus bixus*. Once the article is accepted for publication, printed and distributed, you can for example, if you find a fossil which you believe is of the same species as the specimen described by Bleau in 1933, write that you have found an *Allus bixus* Bleau (1933), and your readers will know what you are talking about. There is therefore a type description, a type illustration and a type specimen (a holotype) and even a type collection. Now, how can you check with your own eyes if what Bleau wrote makes sense? By seeing the holotype by yourself! To this end, Bleau had to mention in his article in which place, that is to say in which museum, he had placed his holotype. You will understand that for a museum, it's a major responsibility. To remain available to all researchers in the world, *Allus bixus* must be protected from theft, fire, natural disasters, excessive temperature and humidity, molds, political unrest and the bankruptcy of the museum that houses it, forever. Also, it is necessary that the successive curators have a minimum of order otherwise the poor *Allus bixus* will be foolishly lost in the general mess, if it is not simply borrowed by someone who is irresponsible.

So that's what we're going to commit to when people will entrust us holotypes. Holotypes are not shown in exhibitions. However, when we have many, we can ask for help to protect them. And our visibility in the palaeontological profession then increases considerably.

Visitors follow each other

During 2018, we received a few visitors who did not come as specialized researchers, but who each had the potential to help develop the MPE, if the opportunity arose. In all instances, it is Jean-Pierre Guilbault who received them.

In the spring, we had a visit from Etienne Godin. Etienne is a physical geographer trained at the University of Montréal. Today he is working on a post-doc at the University of Western Ontario. He is looking for opportunities to do scientific mediation. Since part of his geomorphology was done on Mars (on satellite photos, of course), I told him about our exhibition project "Life on Earth / Life on Mars". He was interested and we talked about different possible projects, but without concluding. On the other hand, he is currently working on excavations in Devon Island (Canadian Arctic Archipelago), in a site that was the scene of a meteorite impact and where lake sediments of Miocene age have been found, along with fossil fish. Some of these fish could be welcome additions to our collection. He will remain available for interesting collaborations.

In the fall, we received Frédéric Macé. He had met Ha-Loan Phan two years ago while visiting Montréal. Frédéric helped set up the Paléopolis interpretation center in France near Vichy. Paléopolis was founded in 1993; it's a museum of paleontology a lot like the one we hope to build, with two differences. First, it is located in the countryside and then, it started with the local discovery of a large fossil vertebrate (Miocene rhinoceros) to which a few others were added. Frédéric contributed greatly to its establishment, through his expertise in mediation on the one hand, but also by knowing how to consult and bring together all the persons that had to be involved to create Paleopolis. He has received training in paleontology and is a great facilitator. He came to Québec dreaming of doing the same thing here. It was not hard to convince him of the potential of our project. He is currently traveling between Québec and France and is trying to find a job here, which would make him much more available.

Just before Christmas Nathalie Sauzières, Honorary Attaché to the collections of fossil cephalopods at the Muséum National d'Histoire Naturelle in Paris, visited the MPE. Her title simply means that she is a volunteer; positions like hers, responsible for a collection of invertebrates, are volunteers. Nathalie organizes and participates in excavations for groups at sites rich in fossils, participates in the conservation of sites and, as I write above, deals with the conservation of ammonites. Her knowledge of the subject is indisputable. She could identify and give the place of origin of many of our ammonites without looking at the labels that were hidden under the specimens. I already had the opportunity to use her skills. She donated several specimens from her personal collection. Her interest, in addition to receiving specimens in exchange, would be to organize excavation trips for groups of French amateur paleontologists. J.-P. G.



Portion of the fossil donation of Mrs. Nathalie Sauzières:

Left picture: a collection of fossils from the Falaises-des-Vaches-Noires, Villers-sur-mer, France, of Upper Jurassic age.

Photo on the right: a collection of ammonites mostly from Germany but also from France.



Fiche descriptive de spécimen

Specimen number: MPEP990.1
Genus and species: *Ophiopinna elegans*
Identification: Complet ophiuroid (echinoderm)
Age: Jurassic
Locality: La-Voulte-sur-Rhône (Ardèche, France)

This specimen is one of many *Ophiopinna elegans* that dot the surface of a slab of shaly marl from this classic site, located near the Rhône River, 30 km north of Montélimar. Initially, there was a quarry that produced iron ore until the last decades of the 19th century. In addition to iron, remarkable fossils were extracted and sold, the soft parts of which were preserved. Octopus and squid were particularly beautiful. No scientific study was done on the site at the time so that most of what had been extracted is now in private collections. The first scientific study dates back to 2003, sampling was done between 1983 and 1986. The soft tissue preservation suggests anoxic conditions in the bottom water, which moreover, must have been very calm, as the specimen is not dismembered. The preservation of organic matter could be explained by very early mineralization. This specimen has nothing to do with our work, but it reminds us that we have a considerable backlog of echinoderms to publish and that the first steps in this direction have been taken. An important upcoming article will focus on starfish from the Québec City region. This card is a call to your generosity to help us in the acquisition of some fossil starfish, from Québec, which will be used for this scientific project.



Memberships

Just as at the beginning of every year, we wish to inform you that your membership must be renewed. Attached to this newsletter, you will find a copy of the membership renewal form. Remember that you can also make a donation; the Museum is a charitable organization duly registered with the Canada Revenue Agency (No. 890282445RR0001) and therefore authorized to issue receipts for income tax purposes.

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Ha-Loan Phan (H.-L. P.), Alexandre Demers-Potvin (A. D.-P.)

Sally McQueen (translation)

Photos: A. D.-P. - pages 9, 10 and 11
M. C. - all other photos

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