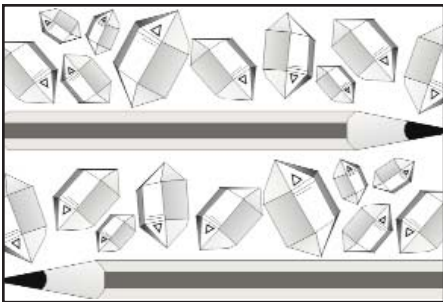


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Geoheritage 4: Raising Public Awareness of Geological Heritage at L'Université du Québec à Chicoutimi

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SUMMARY

Promotion of geological heritage is achieved through programs that increase the public awareness of geological phenomena and to draw attention to the importance of minerals in everyday life. Activities at the Université du Québec à Chicoutimi (UQAC) are divided into two parts: conservation and popularization. At the UQAC Petit musée mineral exhibit, the minerals on display are predominantly from the province of Québec, but samples from elsewhere in Canada and from the rest of the world are also presented to compare with Québec's geoheritage. More than a hundred samples from the Petit musée are described and photographically illustrated in a mineral iden-

tification guide (Bédard et al. 2008). Part of the collection can also be consulted on the web.

The Petit musée is not simply a mineral collection. Elementary and secondary school groups routinely visit the museum in conjunction with science popularization activities. For younger students, a story has been developed to present, in a light-hearted manner, some information about minerals and their uses. This story is centred on a hero who has many adventures in which minerals provide solutions to a series of problems. Older students participate in laboratory experiments that include observation of melting a rock, tasting and measuring salts in water and playing with the concept of density.

New exhibits presently being developed include a 'lead pencil' exhibit where the rich history of this common object is explored; another on mass extinctions presents the rich fossil heritage of Québec.

SOMMAIRE

Une bonne mise en valeur du patrimoine géologique nécessite une conscientisation de la population à la présence de phénomènes géologiques dans l'environnement immédiat et à l'utilité des minéraux dans la vie de tous les jours. Les interventions se divisent en deux grandes volets, soit la conservation et la popularisation. Au Petit musée de l'UQAC, des échantillons minéralogiques provenant principalement du Québec sont conservés. Quelques échantillons d'autres régions du monde sont également exposés en guise de comparaison avec le patrimoine du Québec. Plus d'une centaine de minéraux du Petit musée sont présentés dans un livre grand public (Bédard et al. 2008). De plus, une partie de la col-

lection peut être consultée en ligne.

Le Petit musée n'est cependant pas qu'une simple collection de minéraux. L'UQAC accueille régulièrement des groupes scolaires de niveau primaire et secondaire qui viennent visiter le Petit musée. Les visites d'élèves sont généralement accompagnées d'activités de vulgarisation scientifique. Ainsi, pour les plus jeunes, un conte a été développé pour présenter de façon amusante quelques minéraux et leurs utilisations. Le héros vit de nombreuses aventures dans lesquelles les minéraux offrent des solutions aux problèmes rencontrés. Pour les plus vieux, des activités de laboratoire sont offertes dans lesquelles ils peuvent observer une roche en fusion, mesurer et goûter la salinité de l'eau et expérimenter sur la densité.

Des nouveaux présentoirs sont en développement : une vitrine ayant comme thème le « crayon plomb » nous fera découvrir l'histoire riche de cet objet commun et des dioramas sur les grandes extinctions pour valoriser le patrimoine fossilifère québécois.

INTRODUCTION

Geological features and phenomena are often observed by the general public, but with little understanding beyond the fact that rocks are hard and solid and hurt if they strike you. Very few realize that modern amenities of life, such as television sets, houses, cars, computers and mp3 players would not be possible without minerals and their by-products. Although most of the public are less than happy to see mineral extraction in their backyard, they do not realize that modern consumer items require mining. Therefore, raising public awareness about the role of minerals in everyday life is, for

many reasons, very important. It enables one to better understand environmental issues such as global warming, and serves to elevate the level of general scientific culture. In addition, it can serve to increase student enrollment in geology programs in universities and colleges.

To address these issues, a program was developed at our university to reach out, at different levels, to the general public. Getting pre-teens, teenagers, and adults interested in minerals requires different approaches and techniques. Activities that succeed in getting the younger students interested do not work for the older teenage group, which is the most difficult group to engage. Through experience, we have found that the younger students will listen to a story that features minerals, whereas the older teenage students prefer to assist with popular laboratory experiments. Guided tours of our museum are offered to all ages, and presentations are made upon request.

TYPES OF APPROACH

Most of our various activities start with questions about the importance of minerals in modern life. Are minerals useful? How important are minerals in your life? We then discuss specific questions such as: Why are they important? What is made with minerals? Once they understand the logic, they start naming common products composed of minerals such as concrete, engines and pencils. Often we reverse the question: What is not made of minerals? Most soon realize that the list is limited to little more than wool, cotton, silk, and wood. This exercise allows them to better grasp the importance of the presentation.

Museum Guided Visits

This traditional approach involves guiding visitors through different displays (Fig. 1) that present minerals from different localities from the province of Québec, the rest of Canada and from around the world. This locality-based classification is used to present the mineral samples so that visitors can relate minerals to a location they know or are familiar with (e.g. where a relative lives). However, this method does not work as intended, as



Figure 1. Petit musée displays in university corridor.

we almost never get questions or comments on locality. Although this is not a serious problem, the desired effect is not being achieved, so our classification of minerals will have to be revised in the future. We are seeking to present minerals to visitors using their esthetic values, historical aspects and/or uses.

An effort is being made to link with school programs (geometry, physics, natural history, literature, history, etc). As an example, quartz from 'Cap Diamant' in Québec City is used to explain the (obviously now outdated) expression 'false as a Canadian diamond' by recounting historical anecdotes such as Jacques Cartier's discovery of Québec, at which time he mistook quartz for diamond. Graphite is used to explain how pencils are made and also to explain the origin of the 'lead pencil' name. A large stromatolite sample (Fig. 2) is used to introduce a discussion about blue-green algae, now a Canadian environmental problem. Stromatolites are also used to explain the first production of breathable oxygen and some notions about the origin of life. Moreover, we use stromatolites to discuss the science fiction literature genre, and speculate on the possibility of sending cyanobacteria to another planet to make it habitable.

Most mineral exhibits are presented in a traditional manner, i.e. with labels on individual mineral samples bearing information such as the mineral name, chemical composition, date of discovery, location, and donor's name. We believe we have reached a plateau using this type of presentation, because visitor interest saturates after 45 to 60 minutes of mineral description, history and uses. We also believe that simply showing more minerals will not get the general public more inter-



Figure 2. Stromatolite sample used to discuss blue-green algae.

ested, no matter how spectacular the mineral samples. Therefore, a new type of presentation based on dioramas is now being designed. One display will be devoted to global extinctions, relating fossils and past climates. The other display will present common objects such as the pencil. Hematite in the eraser and clay and graphite in the pencil core will be shown, along with a description of how pencils are made. A section will focus on the history of pencils (use of lead, first graphite holder, etc.; Petroski 2003). A small section will address the differences between the mineral graphite and graphite in sports equipment (hockey sticks, golf clubs, etc.).

Stories

The eight-year-old to early teenage group is introduced to minerals by telling them a story about minerals and their uses; the hero of the story, named 'Petro Graf', is trained by a character named 'G.O. Logue'. The story lasts about an hour and the adventure takes place approximately in the eighteenth century. In the first story, the hero comes from Europe to Canada to meet some *coureurs des bois* and "Indians". In the second story, he goes to Iceland and learns about volcanic rocks. Historical geological knowledge is taken from Agricola's *De Re Metallica* (1556). The heroes get themselves out of trouble by using their knowledge of minerals. As an example, when burglars ask for money, they give them pyrite which the burglars mistake for gold, and when fire is needed, they produce sparks by striking

pyrite and quartz together (this produces a nice and safe pyrotechnical effect in the dark classroom). Petro Graf stories are currently being written as novels.

“Ze big show”

The teenage group is the most difficult group to impress with stories or other presentations. To get them interested, we have developed popular activities such as melting a rock, water tasting and playing with densities. For the first activity, rock powder and flux are melted in a furnace and poured in the dark, behind a window for security purposes. The effect on the group is clear and their attention is very focused. The presentation allows us to explain volcanoes and lava, glass making, pyro-analysis techniques, etc. The other activity involves tasting bottled water from two different sources: Vichy Célestins water, which has a very high salt concentration (3350ppm), is tasted after a soft water such as Dasani (25-35ppm). Then, water conductivity is measured and discussed in relation to taste. During the final activity, the students weigh in their hand a small lead ingot (wrapped in plastic for health reasons) and compare it to a low-density material such as wood. Moreover, because the density of lead is comparable to gold, we discuss movies where robbers carry a large quantity of gold ingots as if they were made of wood or foam. These activities get their attention, so that they become more receptive to further information about the ‘best profession in the world’: geologist!

Talks and Presentations

Many schools and groups will ask for information on subjects such as volcanoes, meteorites, natural catastrophes and the geological professions. Members of our group, who have the best knowledge of the subject requested, will generally make the presentation, which, in most cases, takes the form of a computer-aided slide show.

Mineralogical Club and Shows

The Earth Science Department at UQAC sponsors the local mineralogical club (Club de minéralogie du Saguenay Lac Saint-Jean [[\[cm.html\]\(http://mineraux.uqac.ca/club_mineralo_08/index_cm.html\)\]\) and hosts their activities. Often, geology department personnel will present talks on their field of expertise \(paleontology, volcanology, geochemistry, mineralogy, etc.\). This provides our geology department with volunteers for science popularization activities, and prompts members of the club to bring back samples from unknown localities. In return, we provide help with mineral identification and a room with appropriate samples for learning. Every two years, we present a gem and mineral show at the university. Approximately 3000 visitors come to the show during the weekend, which is good attendance for a city of 150 000. In contrast to similar shows, the UQAC gem and mineral show features special booths where geology, mining and local mineral-related industries are discussed. Typically, the show is planned around a specific theme accompanied by spectacular displays of, for example, gold, diamonds, or meteorites.](http://mineraux.uqac.ca/club_mineralo_08/index_</p>
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Publications

Presently, there are only two sources of information available from the Petit musée: our website and a mineral identification book. Some of the museum samples are presented on the Internet [<http://mineraux.uqac.ca>] along with a list of science-fair projects that can be undertaken by students. The book (Bédard et al. 2008) is a minerals field guide that uses samples displayed in the ‘Petit musée’. Minerals are classified with an identification key. The book is divided into two sections based on mineral lustre. To identify a mineral, the reader must decide whether the mineral is metallic or non-metallic. We decided that it would not be productive to further divide non-metallic lustre into pearly, adamantine, etc. because this would not be practical or easily grasped by the neophyte. Then, within each section, minerals are classified with increasing hardness. From experience, we believe this is the easiest way to teach mineral identification to the neophyte. The book also has a section on meteorites because we get so many questions from members of the public who believe they have found a meteorite. Finally, there is a short section on geology as a profession.

CONCLUSIONS

Through the use of different approaches tailored to different clientele, we have managed to elicit a very strong response. As an example, we have more than doubled the number of inscriptions in our undergraduate program in the past five years. Raising public awareness is very important, if we expect the taxpayer to understand geological heritage and the usefulness of minerals and geologists to society.

ACKNOWLEDGEMENTS

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