European Association of Geochemistry

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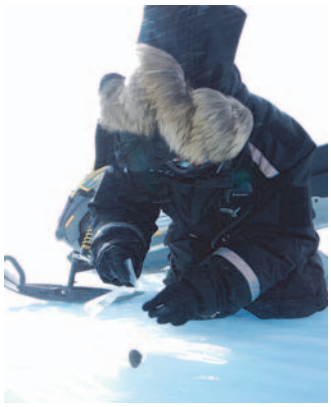
AN ANTARCTIC ADVENTURE

From December 3, 2012, to February 12, 2013, a team of 5 Belgian and 3 Japanese scientists collected meteorites on the Nansen Ice Field of Antarctica. Vinciane Debaille of the Université Libre de Bruxelles, who is also an EAG councilor, led the Belgian team. Here she shares her experiences in an interview with the EAG office.

First of all, why Antarctica? There must be nicer places on Earth. Antarctica is a great provider of meteorites for three reasons. The first is that meteorites are clearly visible on ice fields, and hence easy to collect. Also, meteorites found in Antarctica remain well preserved from terrestrial alteration. Even though they are altered, they are generally the least altered meteorites we can find, except of course when we see a meteorite falling and we can collect it immediately. Finally, and this is certainly the most important reason, the movement of glaciers can concentrate meteorites in places where the ice is stopped by a rocky barrier. There, the moving ice turns upwards and is slowly eroded by the strong katabatic winds—winds that flow down the glaciers. This slowly frees up little meteorites, focusing them in a small zone, even though they initially fell over a much wider area. This type of ice is blue, and we try to identify these blue ice fields first from satellite images. This is painstaking as only human eyes can make a good job of this!

How do you get around in the field? We drive snowmobiles in a V-shaped formation, with 15 to 50 m between each person, depending on the visibility. When we spot a meteorite, we first give it a provisional name, composed of our initials, a date, and a specimen number of the day, and we take pictures of it. We also note the GPS position. We try to avoid touching the meteorites we collect, so we use a plastic bag to scoop them up. Of course all this needs to be accomplished in strong winds, wearing gloves and heavy clothing, so it can be challenging at times.



Getting ready to scoop up a large meteorite

Why go in January? This period of the year corresponds to summer in Antarctica. But as you can probably imagine, temperatures are far from summery: at the Belgian research station (Princess Elisabeth Antarctica research station), located at an altitude of 1400 m, we experienced a range from –10 °C to +1 °C, when the weather was sunny and without wind. However, the Nansen Blue Ice Field, where we conducted our search and established our base camp, is at an altitude of 2900 m, and the temperatures were far less pleasant. We observed absolute temperatures during the day between –14 and –27 °C, without counting the wind chill. With winds up to 20 m/s, the temperature felt closer to –48 °C. January was still the best month for us, as we were able to work every other day. Sometimes we could not go out, due to very strong winds and drifting snow. The visibility was then only a few meters. During these hazardous days, inefficient in terms of meteorite collecting, we had to be patient, watching movies, reading, and playing games.

Leaving base camp to search for meteorites

How was life at the camp? We left the research station for our base camp (150 km away) with a lot of equipment. We slept in insulated containers, where the temperature was rather nice, around 15 °C. We had bed containers, kitchen containers, and logistics containers. Life at the ice field base camp was pleasant by Antarctic standards, but still tough compared to home, with no showers for example. Antarctica is the kingdom of wet wipes! I can tell you that the first shower I had back at the research station was the best of my life.

Was it a physically tough experience? The work on the ice field was relatively easy. We would drive 4 to 6 hours on a snowmobile and just look for black spots on blue ice. But we could not eat, drink, or fulfill personal needs because of the cold and windy conditions and the heavy clothing. Some parts of the field were more challenging because of bumps and crevasses, but fortunately for us, those regions didn't contain any meteorites, so we didn't stay long. The main problem was the altitude; at the poles, the atmosphere is thinner, so an altitude of 2900 m is like 3700 m in terms of oxygen concentration. So your body gets very tired, and it becomes harder to breathe after making even a small effort. Your quality of sleep is also terrible. We received instructions on the symptoms of pulmonary oedema (fluid in the lungs) due to altitude, which would require an emergency evacuation to the base. Fortunately, nobody was affected. The fact that we had 24 hours of daylight was also very disturbing for our sleep. So eventually, we felt really tired from not sleeping well.

How was the food? The good point about Antarctica is that you are living in a huge freezer. So we had plenty of frozen food, hand-made by the cook of the station. We just had to choose the menu of the day and reheat everything in a microwave. Electrical power was no problem thanks to a diesel generator. Because of our schedule (preparing snowmobiles and clothing around 12 pm, leaving for the field at 2 pm, coming back around 4–6 pm), we were eating only twice a day: a hearty breakfast and dinner. But good food—including tons of chocolate (Belgian of course!)—is important for keeping your spirits up.

Was the campaign a success? Yes, even though out of the 40 days we were only able to spend 20 days out on the ice fields, we recovered 425 meteorites, including individual specimens weighing 4, 6, and 18 kg! The latter was the largest find in Antarctica during the last 25 years. We identified a few achondrites—relatively rare meteorites derived from differentiated asteroids or planets—but the fusion crusts were mostly intact, so we now have to wait for lab identification.

Vinciane Debaille
Université Libre de Bruxelles and EAG Councillor

Read more about Vinciane's trip on the EAG Blog at blog.eag.eu.com/general/18kg-meteorite/.

German Mineralogical Society
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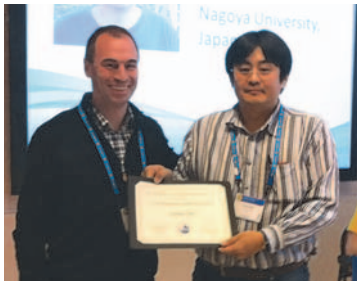
EAG AT THE EGU GENERAL ASSEMBLY 2013

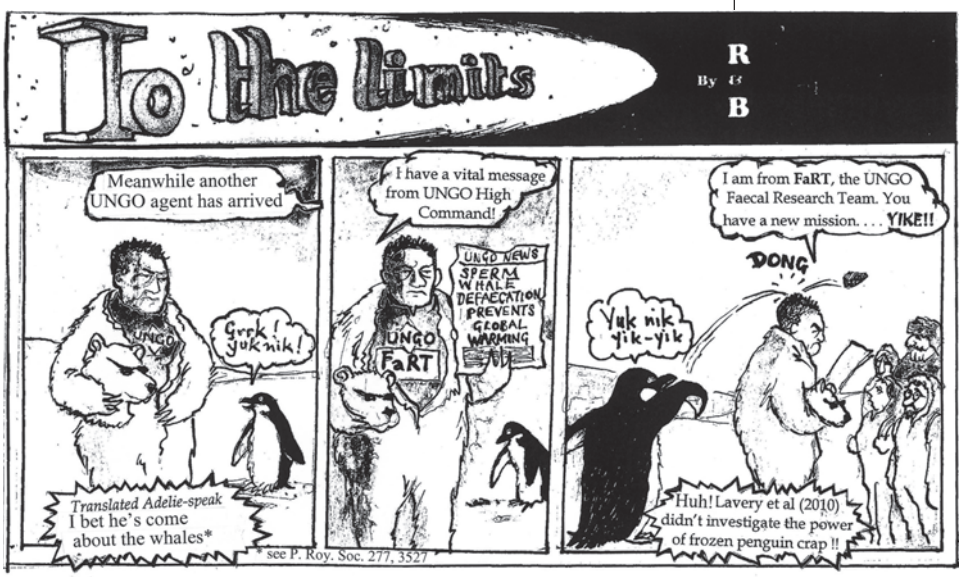
The EAG was once again present at the EGU General Assembly, held in Vienna, Austria, 7–12 April 2013. The EAG proudly co-sponsored 11 sessions in geochemistry and presented Eminent Speakers Awards to Nicolas Mangold (University of Nantes, France) and Osamu Abe (Nagoya University, Japan). This award is usually attributed to one or two prominent, mid-career scientists and comes with a €500 honorarium.

The EAG also had a booth, where delegates could find out more about the activities and membership benefits of the society and browse through *Elements* and *Geochemical Perspectives* publications. We would like to take this opportunity to thank all our visitors and welcome all the new members who joined during the General Assembly.

Nicolas Mangold (LEFT) receives the EAG Eminent Speaker Award at EGU2013 from Anders Meibom, EAG Program Committee co-Chair.



Osamu Abe (RIGHT) receives the EAG Eminent Speaker Award at EGU2013 from Anders Meibom, EAG Program Committee co-Chair.



CALORIMETRY IN THE GEOSCIENCES: THEORY, EXPERIMENT AND APPLICATIONS

Participants in the DMG short course Calorimetry in the Geosciences; missing: J. Majzlan and C. Geiger.

A DMG short course about calorimetric methods in the geosciences was held on 18–20 February 2013 in Jena, Germany. The organizers, Prof. Juraj Majzlan and Dr. Klaus-D. Grevel, had invited up to 20 participants to the Department of Mineralogy in the Institute of Geosciences at the Friedrich Schiller University Jena. Besides several German students, the course attracted international participants from Poland, the Czech Republic, Brazil, and China, as well as the lecturers Prof. Edgar Dachs, Dr. Artur Benisek, and Prof. Charles Geiger from the University of Salzburg, Austria.

The workshop opened with a welcoming address by the organizers and an introductory lecture on the thermodynamic concepts that are important for the understanding of calorimetric methods. This talk was followed by a description of the different calorimetric techniques and the associated equipment, including their operating procedures. Finally, applications for all the calorimetric methods presented were demonstrated.

Short breaks between the well-coordinated lectures made it possible to refresh with a cup of coffee or a snack and chat with colleagues. The course was suited to MSc and PhD students as well as postdoctoral researchers interested in calorimetric methods, but it was also accessible to other people. The only prerequisite was an elementary understanding of thermodynamics.

It should be noted that everyone was able to apply the knowledge gained to solution calorimetry. Each participant prepared a sample for a calorimetric experiment and performed the entire measurement procedure. The participants were shown how to derive the thermodynamic data from the measurements and how to use these data for calculating phase diagrams using the program TWQ.

In conclusion, this perfectly organized, enriching short course allowed all participants to learn more about calculating and interpreting mineralogical phase equilibria.

Steffen Schächinger, Kiel