European Association of Geochemistry

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ANNOUNCING THE WINNERS OF THE EAG PHOTO CONTEST, "WONDERS OF GEOCHEMISTRY"

We are pleased to announce the three winners of the 2017 Photo Contest, "Wonders of Geochemistry". We asked the photographers to tell us more about their winning pictures, so read on to find out the stories behind these images, which capture beautifully some of the "Wonders of Geochemistry".

"Encrusting the Mantle", by Marco Brenna (Lecturer at University of Otago, New Zealand)

In January 2017, I joined a field expedition to Red Mountain, Mount Aspiring National Park in New Zealand. Red Mountain is the exposed portion of the Dun Mountain ophiolite belt, the place of origin of the rock name "dunite", which consists mostly of olivine. My colleague at the University of Otago, Dr James Scott, is leading several projects dealing with the properties of and processes that occurred in the lithospheric mantle beneath New Zealand. I went along with him and one of his PhD students, Stephanie Junior, to sample portions of the mantle exposed high up in the Southern Alps. The landscape is rocky and, due to its chemical make-up (mostly Mg, Fe and Si), no vegetation covers the ground – this resulting in a Martian-like red landscape. Because of its contrast, my eyes were drawn to a patch of white ground. With the thought in mind that New Zealand was once famed for its pink and white terraces, and hoping to discover something analogous, we explored the white patch, which however turned out to be "just" a carbonate spring. After this first one, we found a few more of these springs, which occur along an alignment and are, therefore, likely controlled by some local fault that forms a pathway for fluid flow. Looking down on the ground, I saw a colourful combination of peridotite fragments encrusted with white carbonate, and snapped. The question remains, however: Why should a carbonate spring occur within an ultramafic crustal domain?

Calcite precipitates on colorful dunite and serpentinite pebbles at a spring within the Dun Mountain ophiolite, Red Mountain, Southern Alps (New Zealand).

"The Color Palette of Dallol", by Electra Kotopoulou (PhD student at CSIC-UGR, Spain)

The Danakil depression lies 120 m below mean sea level in NE Ethiopia. This vast, salty plain, composed of a thick evaporitic sequence, was created by several transgressions of the Red Sea. Danakil is situated at the extension of the Main Ethiopian Rift, one of the three branches of the Afar triple junction system (the other two being the Red Sea and the Gulf of Aden) that is tearing apart the continental crust, resulting in incipient seafloor spreading. In this dry, remote, and harsh area of Ethiopia, where daily temperatures in the winter can exceed 50 °C (the name "Ethiopia" derives from the Greek words "αἴθω + ὄψ" and means "sunburnt"), mantle plume activity related to the continental rifting has created a unique hydrothermal system within the evaporitic sequence, known as the Dallol dome.

The Fe aqueous species and saline minerals give the most spectacular colours in Dallol's acidic terraces.

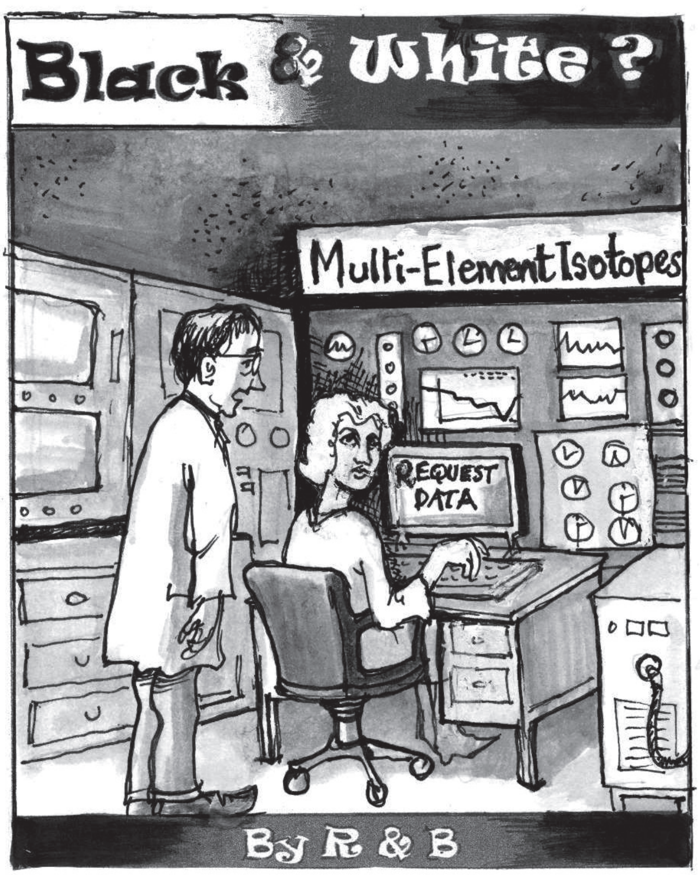
Hydrothermal activity in Dallol is expressed by numerous springs, miniature geysers, fumarolic fields, and phreatic eruptions. The pristine spring water is hyper-acidic, hyper-saline and oxygen-free; it is discharging at a temperature around 107 °C; and it has more than 25 g/L of Fe. The solid phases that are precipitating are composed mainly of halite and Fe nanophases and these form chimneys, pillars, terraces, and many other structures. As oxygen diffuses slowly in this hyper-saline system, both the Fe aqueous species and the Fe mineral precipitates are oxidized to produce this impressive palette of colours, ranging from transparent, to white, veraman (a type of blue-green), lime, green, yellow, gold, orange, red, chestnut, caramel, and ochre!

"Hardness Removal by Crystal Sticks", by David Benavente (Associate Professor at University of Alicante, Spain)

My colleagues from the applied electrochemistry group at my university suggested that I should study precipitates on stainless steel because they (my colleagues) were investigating electrochemical softening methods to remove hardness from natural waters. This attempt seemed amazing and new to me because I had been studying salts in monuments and stalactites for a long time. I thought, "Easy task. A bit ugly, though". I did not know what the scaling was like or what the precipitate that spoils my kettle or washing machine was like.

We characterised the precipitate using scanning electron microscopy with energy dispersive X-ray spectroscopy and X-ray diffraction. Simple is beautiful. Calcium and magnesium ions were eliminated from the water to form different mineral phases. Calcium is removed from water as calcite and aragonite, whereas magnesium is precipitated as brucite. The calcite presented trigonal-shaped crystals, the aragonite had needle forms, whereas the brucite precipitated as spherulites. It was amazing how hardness could transform itself. All the crystal shapes seemed to be in perfect balance, coexisting in harmony.

The electrochemical softening method precipitates calcite, aragonite, and brucite crystals on a stainless-steel wool cathode.



I 've lost the sample details, but if you analyse it for everything we're bound to find something new.

2018 EAG AWARDS – SEND IN YOUR NOMINATIONS

Recognizing deserving scientists from all generations is crucial. It can really make a difference to one's career (see blog post "What does it change to receive an award" at blog.eag.eu.com). Yet it can't be done without nominations. So, make a difference and send a nomination for one of the EAG awards.

	The **Urey Award** recognizes outstanding contributions that have advanced geochemistry over the span of a career.
	The **Science Innovation Award** differs by subject area every year according to a five-year cycle. In 2018, the award is in honour of Nicholas Shackleton for his work in climatology and recognizes important and innovative breakthroughs by scientists within 30 years from the start of their PhD (which must have been completed). Hence, candidates for the 2018 award should have started their PhD in 1987 at the earliest.
	The **Houtermans Award** recognizes a single exceptional contribution to geochemistry, published as a single paper or as a series of papers on a single topic. This award is bestowed to scientists within 12 years from the start of PhD (which must have been completed). Hence, candidates for the 2018 award should have started their PhD in 2005 at the earliest.

The **GS/EAG Geochemical Fellows Award** is bestowed upon outstanding scientists who have made major contributions to the field of geochemistry.

geochemical society

Nomination deadlines: **31 October** for the GS/EAG Geochemical Fellows and **15 November** for all other awards. All details are available at www.eag.eu.com/awards/nomination.