

EARTH SCIENCE CURRICULA IN GERMANY

The discussion that Bruce Watson led in his December 2007 editorial is not a new one – still I very much appreciated the editorial. We have been discussing this topic since the late 1970s in Germany, and sometimes with rather hot and almost aggressive connotations. By now the discussion has quieted down, and you might be surprised to hear the results.

Back in the 1960s, the environmental debate started to gain more and more space in public discussion and challenged the Earth sciences in their traditional approach (I became a young Earth science student back then and was often disappointed at the inability of many of the established colleagues to even listen to the students' interests). In Europe, the Earth Sciences were sliding downhill for two reasons: (a) the still noticeable reverberations of WWII and fascism, with the related loss and emigration of outstanding colleagues (e.g. Viktor Moritz Goldschmidt), leaving us with quite a few second-class teachers, and (b) the general decline of mining and Earth science-related activities due to the societal and economic situation. A public debate started – which is only now slowly coming to an end – whether we need Earth sciences at all, in the style and density of the “earlier days”.

Several things have occurred since then:

- Geosciences in Germany have lost many positions at academic institutions.
- Starting with Bayreuth, a new line of studies was introduced that has gained an impressive reputation: “Earth system science” or “Geoecology” (not to be confused with environmental sciences in the North American definition).
- A new generation of academic Earth science teachers is now on duty (often after previous training in North America).
- A diversification can be observed among German academic institutions with different profiles.
- Quality is on the rise again.

With the introduction of Earth system science (geoecology) in the German system, a “valve” was created that attracts those who wish to study more biology and primarily aim at tackling environmental problems – with impressive success at a high level. At the same time, the “traditional” Earth sciences have adapted in the sense of integrating, e.g. GIS in the BSc curricula, without compromising most relevant topics, e.g. microscopic techniques (that are almost neglected in Earth system science). We just equipped our student microscopy labs with an entire suite of state-of-the-art petrographical microscopes. And Germany is not alone here – I hear that in several of the post-Soviet Union countries and in Asian and Latin American countries, improving infrastructures and building top educational facilities are high on the agenda and are being implemented – perhaps faster and more efficiently than in my rich nation.

The bottom line, in my eyes, is that the diversification of our academic Earth science institutions is positive and may help individual universities to maintain high standards. There will certainly be fewer universities (in Germany) that offer Earth sciences, but less can mean more in the end.

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FUNDING CUT IN ITALY

Your Triple point in the April issue of *Elements* is enlightening, and you should NOT apologize for presenting what you fear is a US-biased view. Unfortunately, as we say in Italy “Tutto il mondo è paese” (the whole world is a little town). We just received the news that the funds for basic academic research (the so called PRIN funds) have been curtailed to 90 million Euros, down from an expected 150 million. Of these funds, Earth sciences receive a miserable 3%... We are in no better shape than you are, and the reasons are basically the same...

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ELEMENTS AND AN INDUSTRY PERSPECTIVE

I appreciated Rod Ewing's Triple Point in a recent issue of *Elements*. I think that the “pitch” of *Elements* and the topical themes constitute a fantastic resource, which I hope will continue for years to come. I receive *Elements* as part of my subscription to The Clay Mineral Society, so since I am getting extra for this outlay, I would welcome a price increase. My main reason for responding is to offer an industry perspective.

First, the campaign to raise the profile of minerals, petrology, and geological science in general is an important one, although I am not sure how this can be achieved. I believe that making the subject matter relevant and accessible, as *Elements* does, can help; hopefully the *Elements* network can serve to influence change in a positive way.

Second, I think that regular themes or articles pertaining to economic aspects of mineralogy would be a welcome addition. Related to the previous issue, there is a dearth of mineralogical understanding amongst the many people employed in mineral processing, and career alternatives in mineralogy outside of academic employment should be an option available to students interested in the subject as they decide on which courses to choose. The link between mineralogy and processing is being increasingly recognized and is interesting! So here are some ideas: (1) short articles describing ore deposits related to the general theme of the issue (e.g. Ni laterite or bauxite in the Critical Zone issue; ore deposits associated with the early Earth; industrial uses of Zr); (2) dedicated issues (perhaps one a year) looking at an ore-related theme, such as “super” ore deposits; occurrences of particular elements of economic interest; ore processing, techniques aiding evaluation, and “geometallurgy.”

I hope that these thoughts will serve to begin a dialogue about an industry perspective and its place in the *Elements* scene.

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