Elements
An International Magazine of Mineralogy, Geochemistry, and Petrology



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Printer: ALLEN PRESS



**elementsmagazine.org**



# POPPING THE GEOSCIENCES' BUBBLE OF LIMITED DIVERSITY

DOI: 10.2138/gselements.16.4.223


John M. Eiler

One of the pleasures of serving as a principal editor of *Elements* is working with people from across the whole Earth science community, many from places, subjects and institutions who I wouldn't encounter in the rest of my professorial life. This issue is a good example: its contributing authors and editors include men and women from four continents and seven countries, studying everything from isotope geochemistry to mining to advanced batteries to medical biochemistry, while working in universities, national labs, technology and mining companies, consulting agencies, and a medical center. This breadth reflects the efforts *Elements* makes to assure that the words in our pages capture the full range of insights and experiences of the diverse minds that are engaged in the Earth sciences. We are proud that many issues of *Elements* have authors and editors that *almost* represent a cross section of the world.

But there is a sticking point in that 'almost': roughly 1/5$^{th}$ of the world's population is Black or Indigenous, but if I've ever worked with such a person in my role as an *Elements* editor, I didn't realize it. This is typical of my experiences as an Earth scientist; in the universities, national labs, businesses and other research institutions where most of us work, you might easily spend a decades-long career without ever having a Black or Indigenous colleague in the office next to you. In this respect, Earth scientists are among the most racially segregated communities in the developed world. The Survey of Earned Doctorates by the US National Science Foundation (NSF) (https://ncses.nsf.gov/pubs/nsf20301/data-tables/) documents that, in 2018, some 760 PhDs in the Earth sciences were awarded by US institutions to US citizens, but only 14 of them were awarded to Black or Indigenous people. That year, not a single Black or Indigenous American received a PhD from any US institution in geochemistry, paleontology, stratigraphy, oceanography, or marine biology.

It is not unreasonable to blame this problem on centuries of systemic racism in the developed world. I was the first person in my family to receive a PhD and become a professor at a research university, but that life was made possible by the fact that my parents, a doctor and a teacher, had property and advanced educations, and were themselves enabled by their parents' lives as educated, property-owning professionals. Their savings helped carry me through a decade of graduate school and fellowships and provided the down payment for my house. How can we expect to see our field benefit from the work and insights of Black and Indigenous colleagues if society around us hasn't spent generations steering young people to the colleges and universities that launched our careers?

But that isn't the whole truth. We also have to take personal responsibility for the fact that the Earth sciences are more segregated than nearly any other academic field. The NSF's survey also tells us that most STEM (science, technology, engineering, mathematics) fields award PhDs to Black and Indigenous peoples at rates several times higher than in the geosciences. The racial barriers set up by society-wide systemic racism are eroding in the biosciences, and in chemistry, mathematics, and other subjects. But walking into a geoscience department or reading a geoscience journal seems to suggest that little has changed. In a recent piece in *Nature Geosciences* (volume 13, 2020), Kuheli Dutt offers a compelling argument that we have let ourselves become trapped in a self-perpetuating bubble of implicit bias resulting from almost complete racial segregation.

It is time to learn from the examples of less segregated disciplines around us and to hold ourselves and our institutions to a higher standard. Doubtless, many changes are needed, and Dutt and others offer better guidance than I can. But a key step each of us can take is to accept personal responsibility for popping our own racially segregated bubbles; to make it our own jobs to forge new relationships with the many talented, ambitious people we know are out there but who haven't been placed conveniently in front of us.

Many of us have the power to change who finds their way into our Earth science community, either as lab leaders or members of a faculty or other larger group. Next year's applicants to my department's graduate program might not include any Black or Indigenous students, but there is a good chance that those in other departments on my campus will; who is to say I couldn't recruit one of them? Postdocs often find their way to my lab through my web of personal connections with established colleagues. Perhaps it is time I gave more lectures and made more friends at institutions, departments, and countries that have more Black and Indigenous students. And, as an *Elements* editor, I can put more effort into understanding who lives beyond the frontiers of my research-university comfort zone and what they might contribute to an upcoming issue.

Finally, I think it is helpful to approach this problem with a sense of optimism and opportunity. Imagine the fresh creativity and energy that the changes we can make will bring to our field. Somewhere out there in the future are waiting 1/5$^{th}$ of the world's Earth-science geniuses; 1/5$^{th}$ of its problem solvers; 1/5$^{th}$ of the world's supply of young students to energize your lab; 1/5$^{th}$ of our *Elements* editors and authors.

**John M. Eiler**
Principal Editor

## REFERENCE

Dutt K (2020) Race and racism in the geosciences. Nature Geoscience 13: 2-3