



Mineralogical Society of America



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PRESIDENT'S LETTER



MSA at 100: Looking Forward

As I compose my final President's Letter, I ponder the future of our society and discipline. As I look at the smiling faces of three of my former PhD students above, it gives me great hope. There are many like them without grey hair who will carry on with the service, teaching, and research in mineralogy that the grey-haired ones among us did. What I fret about can also be represented in the photo by the word "asbestos". It is not the fact that asbestos has presented health problems in modern society, but more how we tend *not* to be involved in some of these problems, because they can be very controversial.

What I have noticed over my career is a trend, especially among us academics, to look for problems more than to solve them. This hit home when I was working with an industrial hygienist for an industrial minerals company, and he said, "No problems, no funding." This was further reinforced when we went to visit a small industrial minerals mine, and the president of the company did not want to let us in because we were professors. It was not always this way: in "the good old days" we used to work more closely with such industries. Of course, in the USA, federal funding and university expectations play a role in what is "valued". Regardless, I think we need to work to help industry solve its problems, not to create more for them.

What I had thought less of over my career is how MSA has been the catalyst for many other professional societies and journals. The outcome of this has been to reduce our number of members. This might be good or bad overall for the geosciences, but it is important for us to be aware of. Something I do believe to be bad is how, along the way, we have given much less attention to what are sometimes referred to as "amateur mineralogists". They really are the heart of MSA, as they are the ones who collect the minerals we study.

Yes, this letter reads more like what one might see on the opinion page of a newspaper. In fact, I have never written one of those, and have only written one thing that might be close: a Triple Point article in *Elements* a decade ago on the subject of—you guessed it—asbestos. Regardless, for our society and discipline to exist over the next century, I think we will need to put more effort toward rebuilding our ties to industry and the collecting community. Also, we need to change the priorities of the funding agencies and universities to allow us to accomplish this.

Finally, I would like to thank all the members, past and present, of MSA for a successful 100 years, for the honor it has been to be the 100th MSA President, and all you have done for mineralogy in the last century. And really, finally, to wish the incoming MSA president, Carol Frost, best wishes to get us started off on a successful second century!

Mickey Gunter
2019 MSA President

Notes from Chantilly

- 2019 election results: the new President of MSA is **Carol D. Frost**, the Vice President is **Mark Ghorso**, and Past President is **Mickey Gunter**. **Kimberly Tait** is the new Secretary, and **Thomas Duffy** remains in office as Treasurer. New Councilors are **Przemysław Dera** and **Francis McCubbin**, joining continuing Councilors **Jay J. Ague**, **Donna L. Whitney**, **Mark J. Caddick**, and **Adam C. Simon**. The outgoing Councilors are **Sarah Carmichael** and **Sarah C. Penniston-Dorland**.
- MSA 2020 membership renewals will start in September with renewal notices sent electronically, followed by several electronic reminders, before a paper copy is sent to those who do not renew online by November.
- Member subscription rates to the print version of the 2020 *American Mineralogist* will increase. The U.S. member print subscription price will be \$150 (currently \$135), and the foreign member print subscription price will be \$165 (currently \$145). Institutional U.S. subscription price (paper and electronic) will increase to \$1,200 (from \$1,150), and foreign institutional subscriptions will be raised to \$1,225 (from \$1,150). The institutional electronic-only subscription will increase to \$1,125 (from \$1,050). Included in the institutional subscription will be all current-year (2020) print issues of *American Mineralogist*, *Reviews in Mineralogy and Geochemistry*, *Elements*, as well as access to the electronic version of these publications on the MSA website starting with volume 1, number 1. GeoScienceWorld subscriber prices for *American Mineralogist* and the *Reviews* are \$260 and \$200, respectively.
- Members and Fellows who are in the senior, honorary, and life categories are sent renewal notices. They need not pay dues but are sent notices as the best way to prompt an update of membership information, particularly mail and e-mail addresses.
- If you subscribe to other journals through MSA, please **renew early**, as MSA needs to forward your renewal to those publishers before your subscription expires. These journals are *Gems & Gemology*, *Journal of Petrology*, *Mineral News*, *Physics and Chemistry of Minerals*, *Mineralogy and Petrology*, *Rocks & Minerals*, and the *Journal of Gemmology*.

CONTRIBUTORS AND BENEFACTORS

Many members support MSA by including a contribution with their annual dues and/or by responding to special appeals. Depending on the wishes of the member, the money is deposited with the principal of the MSA Endowment, MSA Outreach, MSA Mineralogy/Petrology, J.B. Thompson, Edward H. Kraus Crystallographic Research, Bloss, or General Operating funds. The income of these funds is used to support MSA's research grants in crystallography, mineralogy, and petrology; publishing of the *American Mineralogist*; the MSA Undergraduate Prizes; the Mineralogical Society of America Award; the Distinguished Public Service Award; the Dana Medal; the Roebling Medal; the website; the lectureship program; and the Centennial Symposium. If you have not done so previously, please consider contributing at the next opportunity. Here, we want to extend our gratitude to the individuals and organizations that have contributed to MSA between 7 January 2018 and 30 June 2019. These contributors are listed on the MSA website and can be found by selecting "Contributions to MSA" on the MSA home page (<http://www.minsocam.org/>), under "About MSA."

MSA STUDENT GRANT AWARDEES



Clementine Hamelin, University of Minnesota (USA), received a 2019 Grant for Student Research in Mineralogy and Petrology for her proposal, "Putting QuiG to the Test: A High-Resolution, Microscale Investigation of the Quartz-in-Garnet Barometer in a Progressive Metamorphic Sequence".

Quartz-in-garnet (QuiG) barometry has been used to investigate the prograde history of metamorphic rocks; however, it has not been thoroughly "put to the test" against a suite of well-documented natural samples that formed over a range of P - T conditions in the same tectonic event. Ms. Hamelin proposes to test QuiG barometry against a classical, well-studied, prograde metamorphic Barrovian sequence. She will investigate entrapment pressures recorded throughout successive garnet-bearing Barrovian zones, focusing on the crystallographic and compositional microscale relationships between host garnet and quartz inclusions.

The research will test different formulations of the QuiG barometer in the systematic framework of a Barrovian sequence; focus on the microchemical and microstructural relationship between host garnet and quartz inclusions by characterizing spatial variations in inclusion and host geometry, crystallographic orientation of inclusions relative to host, stress-state of quartz inclusions, and microchemical variations in both host and inclusions; calculate the P - T conditions predicted from equilibrium thermodynamics and the P - T conditions recorded by a combination of Ti-in-quartz thermobarometry and QuiG barometry for each garnet-bearing zone; and assess the different formulations of the QuiG barometer to determine if they are in accordance with P - T conditions known from field settings and from thermodynamic equilibrium.



Marie Takach, Oregon State University (USA), also received a 2019 Grant for Student Research in Mineralogy and Petrology for her proposal: "Documenting Magma Mixing Processes and Timescales in Tephra Fall Deposits: El Misti Volcano, Peru".

El Misti is an historically active Andean arc volcano located within 15 km of Arequipa, the second largest city in Peru. Determining why arc volcanoes, such as Misti, sometimes erupt explosively is crucial for hazard mitigation, especially for volcanoes close to populated areas. Magma recharge and subsequent mixing or mingling are well-documented eruption triggers: the youngest plinian Misti eruption (2000 BP, VEI 5) was shown to have been triggered by an injection of andesitic lava into a rhyolitic magma reservoir. Macroscopic evidence for recharge and magma mingling is recorded in several older eruptions (<35 ky) at Misti. Monitoring can sometimes detect magmatic intrusions beneath volcanoes, but when an intrusion is detected, predicting when or if an eruption will occur remains elusive. Misti offers an opportunity to characterize the timescale of such processes at a very hazardous volcano. Having such information would be extremely helpful in understanding the timing and possible outcome of any future crisis when an intrusion is detected at Misti.

Ms. Takach hypothesizes that other explosive eruptions at Misti were also preceded by recharge events that forced magmas to mingle and erupt catastrophically. To test this assertion, she will use geochemical analyses of glasses and minerals to document end-member compositions; assess for the presence and degree of mixing/mingling based on observations of the glass and mineral geochemistry, mineral zoning, and crystal exchange between magmas; test the timeframes between episodes of magma mixing/mingling and eruption by modeling plagioclase trace element diffusion and measuring amphibole reaction rim

thicknesses; and quantify the time elapsed between the explosive eruptions that punctuate Misti's history via Ar-Ar geochronology.



Kathryn Hobart, University of Minnesota (USA), is the recipient of the 2019 Grant for Research in Crystallography funded by the Edward H. Kraus Crystallographic Research Fund for her proposal "Crystallographic Controls on Abiotic and Microbially Mediated Pyrrhotite Dissolution".

Pyrrhotite is the second most abundant sulfide mineral in the Earth's crust after pyrite and is frequently associated with intrusive ore deposits. The dissolution of sulfide minerals in environmental systems, particularly pyrite and pyrrhotite, results in the production of acidic and sulfate-rich water, which can have negative impacts on downstream water quality and ecosystem health. Most acid rock drainage is associated with pyrite, and its dissolution is well-studied. Comparatively little, however, is known about the abiotic or microbially mediated dissolution of pyrrhotite.

The Duluth Complex, located in Northern Minnesota, is the site of the largest unexplored copper, nickel, and platinum-group ore body in the world, with the metals held as sulfide minerals associated with pyrrhotite. The major environmental concerns are high concentrations of sulfate in surface waters and its toxicity to the wild rice that is central to the religious and cultural practices of the Anishinaabe people native to the Great Lakes region. The limited experimental work on pyrrhotite dissolution make the environmental impact of proposed mining in the Duluth Complex difficult to predict. Any predictions will require a knowledge of three things: (1) an understanding of pyrrhotite dissolution at near-neutral pH; (2) the microbial influences on that dissolution; (3) whether certain crystallographic directions in pyrrhotite dissolve at different rates or are preferred sites by microorganisms. Ms. Hobart's research is designed to understand the extent of crystallographic controls on both abiotic and microbially mediated pyrrhotite dissolution.

REVIEWS IN MINERALOGY AND GEOCHEMISTRY VOLUME 85: Reactive Transport in Natural and Engineered Systems

Jennifer Druhan and Christophe Tournassat, editors.
i-xv+ 528 pages. ISBN 978-0-9466850-01-0

The chapters in the 2019 volume fall into three categories. The first set emphasize the state of reactive transport simulation capability to address challenging new frontiers, such as multi-scale hybrid approaches, fractured and nanoporous media, multiphase systems, and evolving physical structures. The second set focuses on a variety of novel or expanded reactive transport applications in the Earth sciences, such as stable isotope partitioning, microbial catalysis, vadose zone systems, soils, and watersheds. Finally, the third set emphasizes industrial applications of reactive transport modeling in the fields of waste repositories, carbon sequestration, and subsurface resource recovery. In total, this volume serves as a significant update to its predecessor, describing the diversity of applications that reactive principles are now used to quantify and highlighting the key areas of reactive transport software development necessary to continue advancing these fields.

Description and ordering online at www.minsocam.org or contact Mineralogical Society of America, 3635 Concorde Pkwy Ste 500, Chantilly, VA 20151-1110 USA phone: +1 (703)652- 9950 fax: +1 (703) 652-9951 e-mail: business@minsocam.org. Cost is \$45 (\$33.75 members MSA, GS, CMS).

