

CELESTINE FOR STATE MINERAL! A SABBATICAL PROJECT

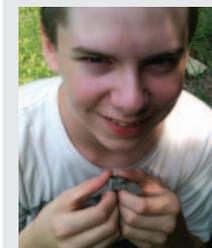


Peter Heaney

Fifteen years ago, a faculty colleague contemplated his upcoming sabbatical—and decided that he would vanish. He informed few people of his destination and made sure that every technological intrusion met with polite rebuff. To all but his closest associates, he simply disappeared one day and reappeared a year later—project completed.

The efficiency of his model was so absolute I decided to replicate it for my own sabbatical—with one exception. Can we shut off e-mail for an entire year and emerge professionally intact? In 1997 it was possible, but today? Reluctantly, I opened the gates to that one Trojan horse, but no other. I secured a corner office within the Department of Mineral Sciences at the US National Museum, whose entry demands multiple stations of identity confirmation. I pointed my chair away from the office door to dissuade the very friendly people in the department from being very friendly to me. Waves of e-mails washed across my computer screen without eliciting a response. Days passed without one ring from my office phone.

I was luxuriating in my isolation when one January morning a message appeared that raised the hairs on the back of my neck.



Royce holding a piece of celestine

Mr. Heaney,

I am a 6th grade student at Commonwealth Connections Academy. I did a science paper on what would I like to have as a state mineral, and I was excited to find that there was none already listed. So, I am on a journey to get celestine named as the Pennsylvania State Mineral. I am currently in the “lobbying” step. Would you be interested in helping me?

Royce Black, Geologist-in-Training

As Paul McCartney’s lyrics to “Yesterday” played through my mind, I frantically began to consider my various avenues of plausible deniability. I could pretend that the e-mail was lost in my spam filter. It happens all the time! But Royce, whom I would come to admire as an indomitable force of nature, had blanketed the Pennsylvania mineralogical community with his request, and many of his recipients redirected their messages to me with copies to him. Rats! I could of course claim to be busy with more important matters. What, after all, are the public obligations of a professor whose governor has cut by 20% the state’s contribution to the university budget?

In the end, it was “Geologist-in-Training”—the sign-off that would grace all of Royce’s future e-mails to me—that I could not resist. Maybe, with the right encouragement at the right time, Royce would develop into a future Roebling medalist. Or, at least, maybe he will figure out how agates form. So I accepted my fate and began to turn two questions over in my mind: What claim does celestine hold on the title of Pennsylvania State Mineral? And what is the purpose of state objects anyway?

A few days’ worth of Internet sleuthing settled the first question persuasively. MinDat.org cites a 1791 pamphlet in which the existence of a new “kind of barite” from central Pennsylvania is first recorded. Authored by Andreas Gotthelf Schütz in High German (with the Gothic type used in the masthead of the *New York Times*), the 16-page article is freely downloadable from the digital archive at the Bavarian State Library. Gerhard Franz of the Technical University of Berlin provided an annotated translation for us, and the hunt was on. We now know that Schütz (1771–1807) was a German naturalist trained at the famed Mining

Triple Point raises issues of broad interest to the readers of *Elements* and explores different aspects of our science (teaching, publishing, historical aspects, etc.), our societies, funding, policy, and political issues

Academy of Freiberg, and that he explored the Pennsylvania wilds in the late 1780s, collecting rocks and fossils for scientific study in his home country. Martin Klaproth (discoverer of Ti, Zr, and U) published the composition as strontium sulfate in 1797; a year later, Abraham Gottlob Werner gave celestine a formal physical description and its name, based on its lovely sky-blue color.

Does that legitimate the designation of celestine as the Pennsylvania State Mineral? You bet! Only about 300 different minerals are found in the Keystone State. Of those, eight represent the first discoveries worldwide of a new mineral species: celestine, sauconite, lansfordite, nesquehonite, downeyite, matulaite, laphamite, and eastonite. Given the scientific royalty associated with the first characterization of celestine, its historical precedence, and its beautiful blue color, wouldn’t you choose it as state mineral?

Though they sometimes seem to exist only to provide answers for *Trivial Pursuit* and *Jeopardy*, state objects fundamentally are symbols of celebration—of a region’s heritage, its natural resources, and its economic foundation. Surprisingly, only 20 of the 50 US states officially have designated state minerals (excluding state rocks and gems; see TABLE 1). Some states have opted for glitter (gold: Alaska, California, North Carolina); some favor stolid ores (galena: Missouri, Wisconsin); and other states are a bit quirky (bowenite of Rhode Island is a “jade-like” variety of serpentine).

TABLE 1 OFFICIAL US STATE MINERALS

US State	Mineral	US State	Mineral
Alabama	Hematite	Massachusetts	Babingtonite
Alaska	Gold	Missouri	Galena
Arkansas	Quartz	Nevada	Silver
California	Gold	New Hampshire	Beryl
Colorado	Rhodochrosite	North Carolina	Gold
Connecticut	Almandine garnet	Rhode Island	Bowenite
Delaware	Sillimanite	South Dakota	Rose quartz
Georgia	Staurolite	Utah	Copper
Illinois	Fluorite	Vermont	Talc
Kentucky	Coal	Wisconsin	Galena

Celestine is economically less prominent than some state minerals, but it was an actor in a major scientific drama that now is largely lost to history. Thanks to the likes of Lavoisier, Priestley, Davy, and Scheele, techniques in chemical analysis blossomed in the late 1700s. At that time, a budding natural philosopher could establish an international reputation through the discovery of a new element; such breakthroughs were accorded the public and professional acclaim that greets advances in fundamental particle research today. Unknown minerals were targeted as the most likely repositories of new elements, and naturalists like Schütz traveled to exotic localities across the world in hopes of finding them. Déodat de Dolomieu (of dolomite fame) had in fact reported celestine occurrences in Sicily in 1781, but he misinterpreted the mineral as barium sulfate—today’s barite. Klaproth, a true genius of analytic chemistry, inferred that Schütz’s material was insufficiently dense to be *barium* sulfate. Fortunately, strontium was discovered as a new element in the early 1790s (from a carbonate in Strontian, Scotland). It took a few years—but only a few—for Klaproth to identify celestine as the Sr-rich analogue of barite.

Unlike my former colleague, I cannot claim to have completed this sabbatical project. Royce has hand-delivered hundreds of letters to Pennsylvania state legislators, of whom a few have expressed strong support for his proposal. A hearing in the state capitol, however, has been postponed from the summer to an indefinite date in the fall, and Royce may be learning more than he wanted to know about the legislative process. Nevertheless, those assisting his mission have gained an unexpected appreciation for the impact that state minerals can wield in educating the next generation of Earth scientists. Maybe the 30 missing states will join the charge.

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