

## MINERALOGY AND THE COMPOSITION OF AN AMERICAN SCIENCE



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On February 1, 1958, Leonard Bernstein conducted the second of his Young People's Concerts in Carnegie Hall. He entitled his lecture "What is American Music?" It is telling that Bernstein selected this topic near the beginning of his decade-long series – before his dissection of symphonic form or even his review of the instruments in the orchestra. Americans are afflicted with a restless itch to define themselves, and only four months after the launch of Sputnik and at the height of the Cold War, Bernstein was trying to satisfy the country's craving for a righteous national identity.

Not surprisingly, Bernstein focused on that most democratic of musical idioms – jazz, which was born in the saloons and brothels of America's inner cities and which eschewed the formal structures created by the great European masters. Bernstein argued that classical music in America matured along a prescribed path. In its infancy, native composers weakly mimicked the styles of Beethoven and Brahms. Later, under the benign influence of Antonin Dvorak, serious music in this country drew from Native American and African American songs and spirituals for their ideas, but it was so self-consciously imitative that these works are largely forgotten.

Classical music that could justly claim the label of "American" required the emergence of an art form that borrowed from as many sources as there are ethnicities in this melting pot of a country. In the 1920s, Bernstein asserted, "the jazz influence became a part of living and breathing, became a habit, and the composers didn't have to think twice about using jazz; they just wrote music, and it came out American, all by itself." Even when pieces were not intentionally jazzy, the syncopations and harmonics of jazz had infused themselves so integrally into the sinew of musical culture that they have come to embody a sound that the world recognizes as American.

Bernstein's rapturous discourse on the birth of an American musical style must strike a chord with many readers of this journal. The evolution of the dynamo that is modern American science can be rendered using precisely the same motifs. And mineralogy is the jazz of American science.

The Gershwin-esque figure in this history is Benjamin Silliman. Vaguely known to most geologists today through the eponymous aluminosilicate mineral, Silliman was unarguably the most famous scientist in the United States during the first half of the nineteenth century. A professor of chemistry and mineralogy at Yale from 1801 to 1853, he was the first president of the Association of American Geologists (known today as the American Association for the Advancement of Science). For three decades, he was one of the most actively sought members of the lyceum circuit and lectured all over the country. He also served as a founding member of the National Academy of Sciences.



Benjamin Silliman

Yet even Chandos Brown, his most trenchant biographer, is forced to acknowledge an uncomfortable fact: "Silliman's contributions to *science*, as such, were negligible."<sup>1</sup> Unlike his younger contemporaries, who included Lyell and Darwin in Europe and Agassiz in the States, Silliman fomented no revolutions that are grist for today's undergraduate textbooks. What distinguished Silliman from his colleagues was a vision of science as a national ambition. As with music, American science in 1800 was a pale and fragmentary facsimile of the European model. With a clarity of insight that seems breathtaking in retrospect, Silliman knew that American scientists were destined to labor in the shadow of those intellectual giants across the Atlantic unless they unshackled themselves from local allegiances and united as a professional society. What could bind a severely balkanized assortment of intellectuals? Silliman realized that a magazine to which naturalists from every region of the country could contribute would rivet the community together.

The prototype for such a periodical already existed. It was *The American Mineralogical Journal*, which one historian has called "the first purely scientific journal in North America." Founded by Dr. Archibald Bruce, a professor of materia medica and mineralogy at the College of Physicians and Surgeons in New York, it appeared in 1810. A lack of financial support and medical rivalries that entangled Bruce, however, led to its sporadic publication and ultimate demise in 1817. Anxious that the loss of this organ would seriously inhibit the growth of science, Silliman single-handedly gave birth to its successor, *The American Journal of Science*, which thrives to this day.<sup>2</sup>

Two features of this infant magazine strike the modern reader. The first is its unabashed appeal for a scientific nationalism. Silliman stated that it was "designed as a deposit for original American communications" that would lead "in no small degree to nourish enlarged patriotism, by winning the public mind from the odious asperities of party." As biographer Brown eloquently describes, Silliman's efforts to distribute the *Journal* throughout the fledgling country required herculean persistence. No public mail system existed for the national dissemination of the volumes, and Silliman in effect had to create a countrywide delivery network by contracting subscription agents. Moreover, only 400 of the 1200 recipients of the first volume remitted payment, and Silliman was forced time and again to dip into his personal financial reserves to keep the *Journal* alive.

Secondly, it is no accident that mineral sciences served as the focus of Bruce's journal and of Silliman's. The extended title of the original version is a testament: *The American Journal of Science, More Especially of Mineralogy, Geology, and the Other Branches of Natural History*. The intimate connection between mineralogy and the rise of a national science is captured in Bernstein's thesis. Astronomy, physics, and chemistry can be equally well studied on any part of the Earth, but the Old World boasted an insuperable lead in these subjects. Americans had to distinguish themselves from their foreign counterparts by excelling in a branch of science that sprung from native roots and was protected from alien encroachment. Mineralogy filled that promise, because mineralogy is uniquely local and global. The rocks from Maine to Georgia may have analogs in the Alps and the Himalayas, but they are still the tissue of the North American continent. Native mineralogy may be applied across the oceans, but it is always particular to its home. It is the folk music from which a young country can craft a scientific identity.

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"Jazz. Right! Jazz had been born, and that changed everything. Because at last there was something like an American folk music that belonged to all Americans. Jazz was everybody's music."

– Leonard Bernstein

<sup>1</sup> Brown, Chandos M (1989) *Benjamin Silliman: A Life in the Young Republic*. Princeton University Press, New Jersey, 377 pages

<sup>2</sup> Baatz, Simon (1991) "Squinting at Silliman": Scientific Periodicals in the Early American Republic. *Isis* 82: 223-244