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GEOLOGY and MUSIC

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In a previous issue of *The Compass*, I explored geologists and their visual art (Merriam, 2008), and now I would like to explore the geologist's adventures into music.



Ah music, sweet music – just think about it for a minute. Man has always been intrigued by music. The ancient Indians in southern India used boulders to make ‘rock music’ for rituals. You can appreciate and understand music without knowing a single spoken or written word, spelling, grammar, or composition. It is another art form that is pleasing and satisfying, and can be enjoyed by all; music can invigorate you or soothe you or take you places you’ve never been.

You can appreciate Bach, Debussy, or Tchaikovsky without knowing a single word of German, French, or Russian. You can enjoy the singing of José Feliciano or Linda Rodstadt without knowing Spanish, Andrea Bocelli with no knowledge of

Italian, Edith Piaf with no knowledge of French, or Nana Mouskouri without knowing a word of Greek. Sousa’s march music, Bach’s Toccata, Fugue in D Minor, or Saint-Saën’s Symphony No. 3 can stir you deep from within without knowing how to march or play the organ. How about Tchaikovsky’s *Swan Lake*, Handel’s *Fireworks Music*, Vivaldi’s *The Four Seasons*, Holzt’s *The Planets*, Berry’s *Out of Africa*, or Evvis’ *Blue Hawaii*? There is music for everyone’s taste and mood.

Music has even surmounted political problems. Daniel Barenboim’s conducts the West-Eastern Divan Orchestra (fig 1) composed of Israelis and Palestinians. Through music, Israelis and Palestinian musicians have overcome discord and found harmony. Barenboim (Vulliamy, 2008) states,

“The Divan is not a love story, and it is not a peace story. It has very flatteringly been described as a project for peace. It isn’t. It’s not going to bring peace, whether you play well or not so well. The Divan was conceived as a project against ignorance. A project against the fact that it is absolutely essential for people to get to know the other, to understand what the other thinks and feels, without necessarily agreeing with it. I’m not trying to convert the Arab members of the Divan to the Israeli point of view, and I not trying to convince the Israelis to the Arab point of view.”

Composers have used natural phenomena as subjects for their music; rivers are a favorite. Ferde Grofé expresses the power of rivers with his Grand Canyon, Mississippi, and Hudson River suites. You



Figure 1. Barenboim conducting the West-Eastern Divan Orchestra performing Beethoven's 9th Symphony in 2006. <http://skyarts.sky.com/daniel-barenboim-west-eastern-divan-orchestra>

can visualize sunrise and the rainstorm in the Grand Canyon from the musical expression and experience the energy of Grofé's music without ever seeing or visiting the sites (fig. 2).

Grofé also describes Niagara Falls and Death Valley in his musical suites. *Old Man River*, *Blue Danube*, and *Boatmen on the Volga* give you an experience along a river. Smetana's the *Moldau* (Vltava), a river with its slow flow from springs at the headwaters, picking up tempo flowing through rapids to mid-course, and eventually merging with the Elbe River, is exhilarating! Telemann depicts the ebb and flow of tides in Hamburg's harbor. Handel's *Water Music* describes a summer evening on the Thames River in England, whereas Vivaldi's *La tempesta di mare* is a vivid portrait of a great storm at sea.

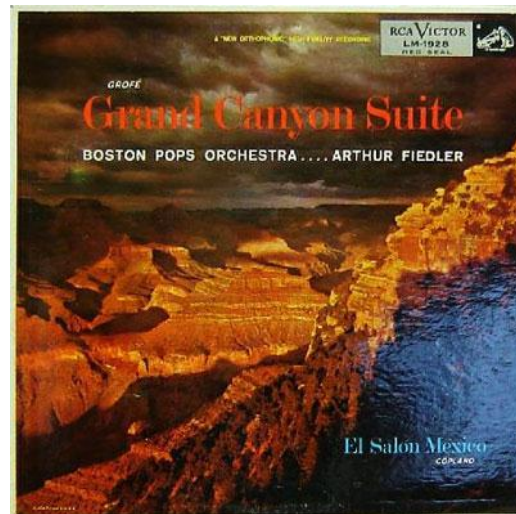


Figure 2. Album cover of Grofé's Grand Canyon Suite by Arthur Fiedler and the Boston Pops Orchestra. From: http://www.grandorchestras.com/bostonpops/albums/fiedler_grandcanyon_salonmexico.html

Mountains are another favorite of composers. Mussorgsky's *Night on Bald Mountain* gives you the experience of being on the mountain. Alan Hovhaness, an Armenian American, was fascinated by mountains and composed nine symphonies about them with his *Mysterious Mountain* being the most famous.

In London, the 2007 Bicentennial Conference of The Geological Society enjoyed the first performance of *Antarctic Sonata*, composed and performed by Kevin Jones and conceived jointly with geologist Nick Petford of the University of Boumemouth. The music was accompanied by graphic animations of rock thin sections (fig. 3) and maps on which the musical material was based and provided a compelling example of science-art crossover.

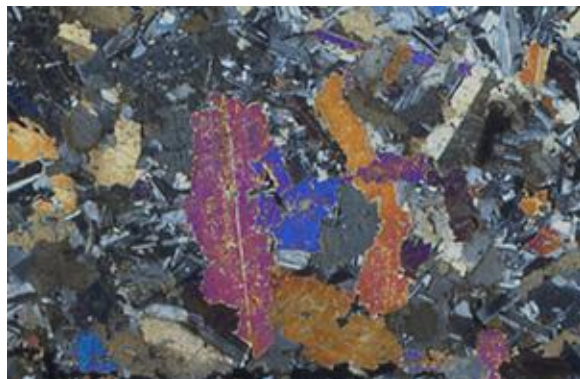


Figure 3. Photomicrograph of an Antarctic rock used in presenting the *Antarctic Sonata*. From: <http://www.sciencecentric.com/news/07091001-music-inspired-by-antarctic-research.html>

We have Massenet's *Scènes*, Copland's *Appalachian Spring*, or Mendelssohn's Hebrides overture, *Fingels*

Cave; and Rondstat's *Blue Byuou*, all of which provide geologic imagery. In *America the Beautiful*, the words "spacious skies, purple mountains majesties, fruited plains, and from sea to shining sea", all paint a musical impression. The inspiration of these words occurred on a trip to Colorado's Pike's Peak by Massachusetts English teacher and poet, Katharine Lee Bates (fig. 4) in 1893. All of these musical pieces conjure up a mental conception of the feature or physiography.

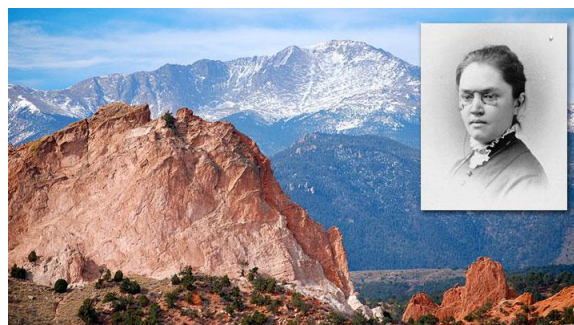


Figure 4. *America the Beautiful* was written by Katharine Lee Bates in 1893, after seeing the view from Pike's Peak. From: <http://www.nature.org/ourinitiatives/regions/northamerica/slideshow-nature-inspires-art.xml>

For an out of this world musical experience, we have Gustav Holst's (1914-1916) musical picture of the solar system. *The Planets* is a seven-movement orchestral suite with each movement named after each of the planets known at the time – Mars, Venus, Mercury, Jupiter, Saturn, Uranus, and Neptune. Earth was at the center and Pluto was not yet known (of course, not considered a planet by some today). You can take this imaginary space musical tour

in the comfort of your own home or in a concert hall (fig. 5).



Figure 5. Promotion of Holst’s *The Planets* by NASA’s Dryden Flight Research Center for a concert performed by the Antelope Valley Symphony Orchestra on 17 October 2009.

From: http://www.nasa.gov/centers/dryden/Features/planets_concert.html

What interaction is there really between geology and music? None of the famous composers are known to have had a geological background; no known geologist is a music composer. Until the mid-20th Century, geology was viewed as a soft (qualitative) science; that is, geologists were more humanistic and artsy, data collectors, and big thinkers rather than hard (quantitative), mathematically inclined scientists. Geologists expressed their ideas in words not formulae or equations. Witness Lord Kelvin’s famous saying,

“If it cannot be expressed in numbers, it is not science”

and, other than geophysics, geology by his definition, until the mid-20th Century, was

not a science. [Although even today, some do not see geology as a *real science*, see Davis (2012), this volume.] Could the background of those attracted to geology been those with a strong interest in the arts?

Numerous, or at least several, geologists have or had the proficiency to become professional musicians, if they so choose. Being a professional musician requires a talent that is difficult to assess because if not born with it, then it takes years of patience and practice to acquire. In most circumstances this dedication is an unknown factor and as an amateur musician; that is, one that does not make their living in this medium, it is a personal passion, so geologists usually perform music for their own enjoyment.

James H. Zumberge (1923 –1992) a structural geologist and author of *Elements of Geology* and *Laboratory Manual for Physical Geology*, was president of three universities – Grand Valley State University (1962-1969), Southern Methodist University (1975-1980), and University of Southern California (1980-1991). His piano playing was exceptional and on occasion, with very little encouragement, he would entertain his friends and colleagues with an impromptu concert of pop or classical music. Václav Němec, a geologist retired from Geofond (Czech Geological Survey) in Prague, Czechoslovakia, and one of the founders of the International Association of Mathematical Geology, also is an excellent classical pianist, and has performed professionally with a symphony orchestra. Raymond C. Moore, State Geologist of Kansas and Chair of the University of Kansas Geology Department, was an

outstanding paleontologist, who envisioned and implemented publication of the *Treatise on Invertebrate Paleontology*. On occasion, when few were witness, he would tinkle the ivories for his enjoyment or a few friends, however as with his other extra circular accomplishments, if he had chosen to do so, he could have been good enough to perform professionally. Robert J. King, retired curator at Leicester University in England sang with the church choir and has a beautiful voice, as did Frank Foley, State Geologist and Director of the Kansas Geology Survey. Susan Guhl Browne, who plays the guitar and sings folk songs, could have easily done so professionally. Carolyn G. Olson, a geologist with the U.S. Soil Service of the USDA, is an accomplished organist. Norman D. Newell played clarinet in local dance bands to help pay for his education at the University of Kansas, and Fred James, a petroleum geologist in Wichita, Kansas, plays a flugelhorn in local dance bands.

There are many, many other examples of talented, artistic geologists, who, if they had elected, could have been first-class performing artists. You may know such a talented geologist or be one yourself. You can follow up on the subject of geology and music by logging on *Geology Songs and Music* on the internet for some examples of geologist and their involvement with music.

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