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Dan Merriam
University of Kansas, dmerriam@kgs.ku.edu

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GEOLOGY and MUSIC

Daniel F. Merriam
Kansas Geological Survey
and the University of Kansas
1930 Constant Avenue
Lawrence, KS 66047 USA
dmerriam@kgs.ku.edu

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
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 *Moldau* (Vltana), 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 tempest di mmare* is a vivid portrait of a great storm at sea.
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 Bournemouth. 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](http://www.sciencecentric.com/news/07091001-music-inspired-by-antarctic-research.html)

**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](http://www.sciencecentric.com/news/07091001-music-inspired-by-antarctic-research.html)

We have Massenet’s *Scénes*, 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](http://www.sciencecentric.com/news/07091001-music-inspired-by-antarctic-research.html)

**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](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
court 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/Feature
s/planets_concert.html

What interaction is there really
between geology and music? None of the
famous composers are known to have had a
gеological 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. Geologist 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 a professional musicians, if they so
shoes. 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
gеologists 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
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 professional. 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.

**REFERENCES CITED**

