

University for the Creative Arts  
Research Project Portfolios

# Music, Mountains and Geological Time

By J. Harry Whalley



# Project Details

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Name of Researcher: Dr J. Harry Whalley

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Name of Output: *Music, Mountains and Geological Time*

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UCARO link: <https://research.uca.ac.uk/5545/>

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Output Type: T – Other; multi-component output comprising musical compositions, poetry and a sound walk

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Year and mode of dissemination (see also ‘Further Dissemination’)

*Seven Rocks*  
— string quartet based on a poem by Norman Nicholson, 2014  
Premiered by the Gildas Quartet, St Vincent’s Chapel, Stockbridge, Edinburgh, 22 October 2016

*Water Over Time*  
— poem, 2016  
Displayed in ‘Artists Are Present’, Banff Centre, Alberta, Canada, 2016  
Published in *Comet* (2016), vol. 12, issue 2, p.13

*This Fragile Expanse*  
— composition for solo cello and spoken voice, 2018  
Performed by Anna Menzies and read by Alexander McCall Smith, Sacred Arts Festival, Edinburgh, 2019

*Strange Cathedrals*  
— work for orchestra, 2020  
Performed by the Edinburgh Contemporary Music Ensemble, conducted by Gordon Bragg, Reid Hall, Edinburgh, 11 January 2020

*Slower Still*  
— electronically manipulated and time-stretched recording, 2019-20, to accompany a geological walk from Cove to Siccar point, incorporating poetry and geomusic, available on the Geological Society website (<https://www.geolsoc.org.uk/GeositesSiccarPoint>)

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Key Words: Music, composition, geology, time

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*Seven Rocks, St George's Church,  
Millom, 2014*

*Gildas Quartet (<http://www.gildasquartet.com/>)*



*Water Over Time, Banff Centre,  
Alberta, 2016*



# Synopsis

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*Music, Mountains and Geological Time* is comprised of five components (musical compositions and poetry) which collectively respond to geological process and geological time.

The first component, *Seven Rocks* is a musical counterpart to the poem of the same title written by Norman Nicholson, and, like Nicholson's poem, responds to the landscapes and deep time of Cumbria. This work led to a residential fellowship at the Banff Centre, Alberta, Canada where these ideas were further developed, resulting in the poem *Water Over Time*, published in *Comet* and then used as the basis of a commission for solo cello entitled *This Fragile Expanse*. Like *Seven Rocks*, *This Fragile Expanse* combined music and text within performance. *Strange Cathedrals* is a major work for orchestra that combines and builds upon the methods developed over the course of this research, relating to the proportions of geological time scales. *Slower Still* is an

electronically manipulated and time-stretched recording of *Strange Cathedrals* that engages with the listener by inviting them to listen to the proportions of sound as they unfold over the course of four hours, mapped to a geological walk.

The investigation started with a translation of geological process into music-theoretical process. It was progressed through a 'poetics of description' which worked through greater levels of abstraction (proportion), and finally returned the artwork to the landscape where it started by mapping a musical form onto geological form.

Supporting contextual information presented here provides further explanation of research methods, processes and insights, and a range of relevant visual material. The research is presented as musical scores (with the text of the poem) and sound recordings of the performed pieces.

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# Context

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Mountain landscapes are a subject of research and investigation in many fields. They can be studied as geomorphic features, as part of tectonic systems, as sources of minerals, or through many scientific lenses. They are also a source of inspiration in the arts. Since the early nineteenth century the ideas of ‘the sublime’ and ‘beauty’ were applied to the investigation of mountain scenery, firstly in Britain, including in the Lake District, and subsequently in the context of the mountaineering, scientific and artistic challenges provided by the mountains of the European Alps and beyond. After Alexander von Humboldt, the aesthetic links between mountains, geology, scenery, painting and architecture were developed by John Ruskin, who in turn had a profound influence on the artists and geologists who explored the western USA. In visual art, painters and photographers such as Cézanne or Ansel Adams, have deployed a repertoire of techniques to portray mountains. However, simply looking at a mountain fails to lead to comprehension of the timescales involved in its formation and the volumes of material moved over (deep) time. This is the case even if the observer knows the geological history of the rocks (which is rarely the case).

This research is an attempt to address this discrepancy between what is observed and what is understood, and to ‘see’ the whole picture of mountain landscapes. The approach falls broadly into two categories, examining Geological Process and Geological Time.

Visual images represent the surface of a landscape at a particular moment in time. The landscape seems static, and it appears that, while water and sky may have movement, the rocks do not. Poetry can conjure vivid and active imagery of landscape. Examples include Norman MacCaig, *Water*, W.H. Auden, *In Praise of Limestone*, Edwin Morgan, *Slate*, Hugh MacDiarmid, *On a Raised Beach*, as well as the *Stanza Stones* of Simon Armitage. Mountains are a recurring

theme of Helen Mort, and likewise in much of the work of Norman Nicholson, including *Seven Rocks*.

In both music and poetry there is the opportunity to involve time and process, creating a different experience which can inform our understanding and place us in the scene in a way that other art forms cannot. Recent compositions on this topic include the opera *Anthropocene* by Stuart MacRae (2019) and the orchestral composition *Deep Time* by Harrison Birtwhistle (2016). These works, however, focus on story, narrative and abstraction; *Mountains, Music and Geological Time* works through mapping the proportions of time, and in doing so addresses a gap in interpretive knowledge, relating to Ian Cross’s immanentist position (1998) and Timothy L. Hubbard’s analogies between physical motion and musical succession (2017), for instance between velocity and tempo or path of motion and musical passage. Hubbard concludes that momentum-like effects offer a ‘single mechanism’ to explain otherwise disparate phenomena.

*Music, Mountains and Geological Time* is informed by Whalley spending time on glacial geomorphological field trips as part of the Queen’s University Belfast expeditions to Arctic Norway, his time in the Rocky Mountains at the Banff Centre and his daily walks over Salisbury Crags, Edinburgh, where James Hutton’s observations in the eighteenth century gave rise to modern geology.

## Key Texts:

Cross, I. (1998) ‘Music and science: three views’. *Revue Belge de Musicologie/Belgisch Tijdschrift voor Muziekwetenschap*

Hubbard, T. L. (2017) ‘Momentum in music: Musical succession as physical motion’. *Psychomusicology: Music, Mind, and Brain*, 27 (1)

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# Research Aims and Questions

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Research aim:

To reflect the expanse of geological time and geological process in music, through compositional process and poetry.

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Research questions:

How can the expanse of geological time be reflected in music?

How can music interrogate 'deep time' or geological time?

How can mountain landscapes be interpreted in musical composition?

How can music reflect the narratives of the mountains and our relation to them?

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# Research Methods and Process

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*Music, Mountains and Geological Time* is part of the 'Artiscience' movement, a word coined by curator Colin Sanderson (2011) to define the theory and practice of integrating arts and science and the knowledge of relations between them. Therefore, the methods used by Whalley sought to find interpretations of the scientific understanding that respect the science, but through the particular strengths of combined artforms; poetry and music.

Rocks vary widely in origin, chemical composition and resistance to erosion; this is what gives mountains their individual characteristics, a process that takes place on geological timescales far beyond normal human comprehension. Music is a series of events that happen 'in time', but more than that create a subjective emotional valence that changes our relationship to time (Droit-Volet, S. *et al*, 2013: 418).

The research has three broad methodological approaches:

## 1. The mapping of geological process to compositional process

The concept of 'mapping' situates the methodology at the intersection between scientific understanding and poetic response. A mapping can be considered to be isomorphic, as defined by Douglas Hofstadter, in the way that definable elements correspond from one area onto another, 'where corresponding means that the two parts play similar roles

in their respective structures' (Hofstadter, 1979:49). The compressing of sediment to create coal is a geological process of a progradation of a river delta and compressing layers of sands (Waters and Davies, 2006); this process is described by the Nicholson poem. Whalley's musical representation of this poem should, to a geologist, suggest the process, as the musical motifs compress in time. Whalley's interpretation of *Seven Rocks* has similar mappings for Limestone, Slate and Granite. *Strange Cathedrals* also maps process in a number of sections, especially in *First Vertebrates*, which uses a process akin to Conway's 'game of life' to represent the movement of life.

## 2. Interpretive isomorphism from poetry to music and music to poetry

Inspired and encouraged by Nicholson, *Water Over Time* is Whalley's poem exploring the journey of a molecule of water within the frame of the Earth's geology. The poem uses music as a poetic metaphor for the scale of space and time, 'Or a slow dance, with metronome set to the constant turning of the stars. A great rhythmic complexity evident in the grooves of the mountain, that play an ancient song'. This approach is common in the poetry of Helen Mort, whose imagery often blurs human scale and geological scale (Necessary, 2019). Whalley's commission for solo cello, *This Fragile Expanse*, led him to explore the process in reverse, the rhythmic material of the cello corresponding to and expanding upon the rhythms found in the text.

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# Research Methods and Process (continued)

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## 3. The proportions of time

*Strange Cathedrals*, broadly speaking, exchanges isomorphic for proportional mapping. Each of the piece's five movements is proportional to the length of the corresponding geological time span 1) First Vertebrates, c.380ma (million years), 2) Oxygen Rich c.580ma, 3) Atmosphere, c.2300ma, 4) Photosynthesis, c.3200ma, 5) Heavy Bombardment, c.4000ma. The audience were encouraged through the program notes to 'feel' how long each section was and be aware that all of humanity's approximately 200,000 years on the planet as a species is proportionally shorter than the first percussive note of the piece. In order to expand this envelope of time, this orchestral piece was then slowed down, through a combination of analogue and digital methods, to create *Slower Still*. The intention is to listen to the piece during a geological walk from Cove to Siccar point; this version is being released by RTR recordings in 2021.

*Music, Mountains and Geological Time* demonstrates how text and music, time and process can be explored in an interconnected set of works, connected to the context of twentieth-century poetry whilst maintaining an 'Artiscience' ethos that supports scientific truth.

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### Key texts:

Sanderson C. (2011) *Artiscience Library and Reading Room at Summerhall*, available at:  
<https://www.ascus.org.uk/artiscience-library/>

Droit-Volet, S., Bueno, L.J. and Bigand, E. (2013) 'Music, emotion, and time perception: the influence of subjective emotional valence and arousal?', *Frontiers in Psychology*, 4

Waters, C.N. and Davies, S.J. (2006) 'Carboniferous: extensional basins, advancing deltas and coal swamps', in *The geology of England and Wales*, Brenchley, P.J. and Rawson, P.F. (eds), London: Geological Society of London,

Necessary, I. (2019) *Poetry Commentary: "Scale" by Helen Mort*, available at:  
<https://writingverbaboutwritingnoun.wordpress.com/2019/02/09/poetry-commentary-scale-by-helen-mort/>



*Creation of Slower Still using  
analogue tape*

# Edinburgh Contemporary Music Ensemble

15th Anniversary Concert of Orchestral Music



**Tom David Wilson** Concertante oboe

**Harry Whalley** Strange Cathedrals

**Julien Lonchamp** Helicotrema

**Thea Musgrave** The Seasons

**Claire McCue** In Pursuit...

**Saturday 11th January 7.30pm** **Gordon Bragg** Conductor

Reid Hall, Bristo Square

£10 (£7 concessions)

Davur Magnussen Soloist (trombone)

Simon Johnson Soloist (trombone)

Fraser Kelman Soloist (oboe)

*Strange Cathedrals,  
Reid Hall, 2020*

# Research Dissemination and Contribution

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Further dissemination:

*Seven Rocks*

Further performances:

St Wilfrid's Church, Warrington, 2014

St Georges Church Millom, Cumbria; performed by the Gildas Quartet, 2014

Reid Concert Hall, Edinburgh, extract of orchestral version performed by the 'Composers Orchestra', 2015

INTIME Symposium, Coventry University; String Trio version, 2015

St Vincent's Chapel, Stockbridge, Edinburgh; performed by the Gildas Quartet, 2016

James Hockey Gallery, Farnham; performed by the Gildas Quartet, 2018

*Seven Rocks* has become part of the repertoire of the Gildas Quartet; the score is published by the Contemporary Music Centre, Ireland

Whalley J. H., conference presentation, 'Seven Rocks', at INTIME Symposium – Landscapes and Environments, Experimentation and transformation in sound and music, Coventry University, 2015

Whalley J.H, research presentation, 'Seven rocks and String Quartet', at Geo-Poetry Edinburgh, Geological Society, 2020

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Further Dissemination  
(continued):

*Water Over Time / This Fragile Expanse*

Performed by Anna Menzies and read by Alexander McCall Smith at St Vincent's Chapel, Stockbridge, Edinburgh Festival of the Sacred Arts, August 2019

Read by Harry Whalley, Geo-Poetry Edinburgh, Geological Society August 2020

*Slower Still*

This slowed down version of *Strange Cathedrals* to be released on the Rusted Tone Recordings (RTR) record label in 2021

Published online; included as a suggestion for a 'geological walk' from Cove to Siccar point by the Geological Society <https://www.geolsoc.org.uk/GeositesSiccarPoint> (2020)

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Follow-on Activities:

Beattie A., Whalley B., Whalley J.H., conference presentation, 'Norman Nicholson: An Exploration of His Poetry and Prose as Observations of Change', at Strata: Art and Science Collaborations in the Anthropocene, Aberystwyth University, 2016

*Seven Rocks* led to Whalley's commission to compose the score for the film *Bonington, Life of a Mountaineer* (2016), a feature length documentary about Sir Chris Bonington directed by Keith Partridge (<http://www.boningtonfilm.com>)

The film has been shown at the following festivals:  
Banff, Kendal, Graz, Krakow, Kathmandu, Bilbao, Warsaw, Penrith, Vancouver, Sydney, Bratislava, Royal Geographical Society, London, Bethesda, Trento, Milan, Wanaka, Teplice, Zakopane, Ulju, Ladek Zdroz, Horsky, Tegernsee, Athens.

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Follow-on activities (cont.):

The performance of *This Fragile Expanse* led to an invitation by the Edinburgh School of Divinity to take part in a 2-year (£250k) project, Art Seeking Understanding (2020 – 2022).

As a result of developing the geological walk that is part of *Slower Still*, Whalley was invited to talk at the Enhancing Fieldwork Learning Showcase, 2020

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Research insights and contribution:

*Music, Mountains and Geological Time* demonstrates how existing knowledge about mountain landscapes and geological time can be applied to music, and used to develop creative outcomes including composition, performance, poetry and sound art. While visual artistic invocations of mountains provoke aesthetic response, they cannot give more than an overall impression of geological process. Musical composition, using sound/audio (previously under-exploited in this regard) can represent mountain landscapes differently, representing deep time and process.

In the output, music interrogates deep time or geological time by exposing their proportions in ways that can be experienced and interpreted. And music communicates the narratives of the mountains and our relation to them, focussing on a narrativity that extends beyond storytelling.

*Strange Cathedrals* was reviewed in *The Scotsman*: ‘a strong filmic narrative . . . five beautifully honed snapshots of momentous events in the earth’s timeline. There was a homespun Copeland quality in Atmosphere while the militaristic snap of the brass in Heavy Bombardment channelled the might of Shostakovich.’

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*Bonington, Life of a Mountaineer, documentary feature film directed by K. Partridge (2016), score by Whalley: première, Banff Mountain Film and Book Festival 2017*



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