a common method (2013/2017)

SSAATTBB

Programme Note:

When I was asked if I wanted to write a piece in some way linked to X-ray crystallography I was surprised and intrigued. I did not know anything at all about the method of crystallography and nor did I know anything about the history of the Braggs who discovered it and their research in Leeds. In my background research for the piece, which was greatly aided by **Dr Arwen Pearson** and **Dr Kersten Hall**, I embarked on a journey which took in chemistry, the history and philosophy of science, the local history of Leeds, the first World War and much more. In all of this, finding a path towards writing a piece of music that was both coherent and short enough was not easy. Throughout the project I had been clear with myself that I wanted the resultant music to have a tangible link to crystallography, and hopefully one which was not just metaphorical. **a common method** is the result of this process.

The title came first, even before the music. I have taken it from a conversation with Arwen Pearson in which she described a sense of community amongst crystallographers, more so than amongst other groups of scientists, and said that they are “united by a common method”. This idea of community appealed to me; it is not only a link between today’s scientists but also a very real link between contemporary scientists and those who have used this method in the past. I had also explored the idea of community in a previous piece, written at the end of 2013, called **imagined community** so this thought gave me a starting point for the music.

a common method has two parts or movements, subtitled “rock salt” and “quartz”. These two substances are two of the first crystals that were examined by the Braggs using the method of crystallography. Rock salt was one of the first for which they worked out the structure using the method; leading to the ground-breaking observation that rather than pairs of sodium and chloride atoms the structure was made of evenly spaced sodium and chloride atoms. When I was in Leeds Kersten Hall took me to see the **Braggs’s notebooks** at the special collections in the Brotherton library, and it was seeing the calculations, results, and graphs that were recorded by the Braggs in this document that

inspired me most. In these notebooks I saw the most parallels between the work of the composer and the work of the crystallographer.

There are some basic types of material that are shared between the two parts of the piece. The first similarity is a catalogue of chords which are slow transitions from one idea to another, each time changing only slightly. The second similarity is a list of sounds that are made by the singers (the piece has no text) that are further split into voiced and unvoiced sounds. The third similarity are types of events or situations in which a “chord” is sounded by the singers who might perform different types of short or long notes in different combinations.

The first movement, “rock salt”, is much longer than the second. In this movement a full metric cypher is given in the score, meaning that in each part all of the combinations of four bars of different metres are given, along with a number of ‘unison’ sections. This cipher determines the length of the section. These changes in metre aren’t themselves audible in the performance, and in the score the overall rhythm is condensed into a single line for the conductor. In this movement the individual parts continue to observe the transitions in pitch and sound suggested by the other parts of the compositional plan, but they become separated and disjointed from the whole (the full choir) by their place in the cipher. The effect is that the same sounds and sound combinations are “observed” from a number of different angles—as if climbing a spiral staircase and looking down from each new flight—repetition that is never really repeated.

The second movement, “quartz”, can be heard almost as a commentary on the first, or as a further perspective on the same observations. The same pitches are heard, and the same situations. This time the choir remain as one in a rhythmic sense, but soloists bring out individual points in the texture. An accumulation of sound from the first movement is explored, observed in more detail, taken apart and put back together again. Once more, not-quite repetition and a number of cyclic strategies meet; the sound is both static and constantly moving.

Essentially, the piece enacts that which I saw written down in the Braggs’s notebooks: to make small markings, change the conditions slightly, make further markings, and continue with this iterative process until the end of a cycle. In each of the movements whilst one type of cycle may finish, another concurrent cycle may not yet be complete. In this respect

the music is a type of catalogue piece: all of the permutations or possibilities in some of its parameters are presented, and yet it is not a complete catalogue because not all possibilities in all parameters are heard. This is sometimes because some parts are left silent—so what could have been heard at that moment is left to the imagination—or sometimes because some of the cycles are greater than the length of the movement. The effect is of a structure that is clear in hindsight but that is only coming into view as the piece progresses. It is not possible to know the whole in advance, only afterwards.

This was also true of my compositional process. At each step I felt that I was contributing something to the overall picture of the piece, but I only knew the picture at the end. So, this method is held in common between the Braggs and other crystallographers, and it is also held in common between the choir and me, and between the individual members of the choir as well. The music commemorates not only the anniversary of the discovery of crystallography but the beauty-in-process that crystallography contains and maintains; something as relevant for composers as chemists in the twenty first century.

The piece was revised in 2017 at the request of Jessie Downs.

Recordings:
'quartz; movement: *https://soundcloud.com/sottovocevocalcollective/a-common-method-quartz-lauren*
first performance: *https://soundcloud.com/laurenredhead/a-common-method*

First performance:
'What days of discovery and triumph!': the Braggs, Crystallography, and Music':
Clothworkers' Centenary Concert Hall, University of Leeds, 7.30pm, 15th February 2014
Performed by the Clothworkers' Consort of Leeds
http://www.ccl.leeds.ac.uk/events/what-days-of-discovery-and-triumph-the-braggs-crystallography-and-music/

Second performance:
'Lullabies and Landscapes - End of Season Concert', *Unitarian Universalist Church of* Buffalo, 2pm, 7th May 2017
Performed by Sotto Voce Vocal Collective (dir. Jessie Downs)