



The enigma of Vitruvian resonating vases and the relevance of the concept for today

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Anyone who has visited a Greek or Roman theatre cannot fail to be impressed by the overall clarity of sound without any form of enhancement. The seats arranged in curved rows around the circular orchestra form large horizontal reflecting surfaces. This ensures that the path of the sound waves travel from the source (the actor or singer) to each of the listeners in a direct path (i.e. without reflection). Vitruvius, however, claimed further enhancements could be made.

In theatres, also, are copper vases and these are placed in chambers under the rows of seats in accordance with mathematical reckoning. The Greeks call them Echeia. The differences of the sounds which arise are combined into musical symphonies or concords: the circle of seats being divided into fourths and fifths and the octave. Hence, if the delivery of the actor from the stage is adapted to these contrivances, when it reaches them, it becomes fuller, and reaches the audience with a richer and sweeter note. (Vitruvius, on Architecture, Book I, - on training of architects, Loeb)

It is likely that the function of the vases would have been to make some sounds louder than others by allowing them to sympathetically vibrate when certain harmonics 'hit' them. So, when a singer performs a perfectly in-tune scale, a number of vases would ring creating a harmonic chord. An artificial 'reverberation' (RT60 time estimated as 0.2-0.5 seconds, Landels) containing only those harmonics listed in the vases pitches would be produced in an open-air theatre that would otherwise have none.

With the aid of modern effects systems that attempt to mimic real and imaginary spaces it may be difficult to imagine the importance of the Vitruvian idea. Part of my work as a composer has been to make an audience question the visual/aural relationship that they experience. My Vitruvian reconstructions, using a variety of methods, have made me question this aim and also address the arguably more complex issue, that of a potential fusion between archaeology, science and music.