

The Intentional Use of Sound Design in the Egyptian Temples and the Great Pyramid

Carl Hayden Smith
Founder and Director
The Museum of Consciousness
Balliol College, Oxford University, UK
carlhaydensmith@gmail.com

Tom Middleton
Co-founder
White Mirror Studio
UK
tomcosmos@gmail.com

Joe Crossley
Director/Founder
Astralprojekt
UK
joe@astralprojekt.com

1. INTRODUCTION

The significance of the resonant frequency of the Kings Chamber is still a matter of debate among scholars and researchers. Some have suggested that the chamber was designed for ceremonial purposes, with the resonant frequency serving as a kind of "sonic key" that would allow priests to commune with the gods. Others have suggested that the chamber may have been used for healing or meditation, with the resonant frequency helping to induce altered states of consciousness. Still, others believe that the resonant frequency may have been purely accidental, with no particular significance intended by the builders of the pyramid.

The Great Pyramid of Giza is one of the most well-known examples of architecture that exhibits sound resonance. The Kings Chamber, located in the heart of the pyramid, is a highly resonant space that is believed to have been constructed with specific acoustic properties in mind. The chamber is made of rose granite, a material known for its hardness and density, which allows it to effectively reflect and amplify sound waves.

The Kings Chamber dimensions, which measure approximately 10.47 meters in length, 5.23 meters in width, and 5.81 meters in height, are also thought to have been chosen specifically to create a resonant frequency of around 117 Hz.

The exact method by which the ancient Egyptians determined the resonant frequency of the Kings Chamber is not known, but it is believed that they may have used simple methods such as clapping or chanting to identify the chamber's most resonant frequencies. The precise frequency of 117 Hz has been identified through more modern methods, such

as the use of sensitive microphones and spectrum analysers.

2. SIGNIFICANCE

The significance of the study and its relevance to the wider field of archaeology and acoustics can be summarised by the discovery of archaeoacoustic frequency signatures in multiple locations in Upper and Lower Egypt. For space to be designed and built and present specific resonance it would be not only require highly detailed construction, but it also leads to a level of understanding of sound frequency beyond even our contemporary levels today. It is our intention to map and document these findings, and create practical methodologies for experiencing and measuring the influence of these on the human condition via a collection of data inputs.

3. THEORETICAL FRAMEWORK

Considerations of Sonic environments have been presented in many industrial, performance and spiritual structures around the world. The archaeoacoustics of churches, for example, is a feature for entering into religious prayer. Modern day iterations of these sonic frequency features are used in music, entertainment, and healing practices. With this considered, the temples of circa 2500 BC and earlier also indicate this knowledge and understanding of sound resonance.

It is clear sound plays a role in generating belief, spiritual connection and in some spaces healing effects. Today we see technologies and products focused on the use of sound for some of these reasons. We intend to not only catalogue and collect the specific frequencies found in these locations, but

also generate practical methodologies for better understanding the efficacy, and potential hidden applications of use in areas of healing, consciousness, and wider industrial use.

4. METHODOLOGY

We will take a collection of frequencies we have collected from sites including the Kings Chamber of Giza, Saqqara tomb, and other temples of upper and lower Egypt (Frequencies 117hz, 139.01hz, 369hz, 432hz and others) and offer the participatory experience for guests of hearing the frequencies, but also to use their own voices to match these frequencies and their associated harmonics. In this study a 5-minute audio file is played pertaining to each frequency value, inviting the guest to match their own voice to the tone they are hearing. We will use 3 methods of assessment for collecting the data from each individual:

- (i) EEG – EEG device will read their Alpha to Gamma brain waves delivering data on brain activity, location of activity, and rate of change.
- (ii) Wearable – Wearable sensors (such as Fitbit / Apple Watch) will detect heart rate BPM, Body temperature, body motion (subtle movement).
- (iii) Direct Questionnaire – A form to answer specific questions before and after the experience.

5. RESULTS AND CONCLUSIONS

The test will look for repeatable patterns in both EEG and Body data specifically under the influence of different sound Hz frequencies, at different volumes (safe audio range only) as well as different combinations of Hz frequencies, and correlate these back to their own individual and collective response across these data input formats.

Results will be mapped to different events on a timeline with the aim to express cause and effect of Hz frequencies of these sacred sites on the human condition.

6. LIDAR SCANNING

Using lidar scanning, geometrically accurate 3D models can be generated of these sites so that the acoustic properties can be reverse engineered and explored remotely. These techniques enable us to predict how the acoustics of a space will evolve as its geometry or materials change over time.

7. REFERENCES

- Dunn, Christopher (1998) *The Giza Power Plant: Technologies of Ancient Egypt*. Inner Traditions/Bear & Co.
- Jahn, Robert G., and Brenda J. Dunne (1992) Acoustical resonances of archaeological sites. *Journal of the Acoustical Society of America* 91(6): 3324–3328.
- Mattern, Birgit (2011) Resonant architecture. *Journal of Sonic Studies* 1(1): 1–9.