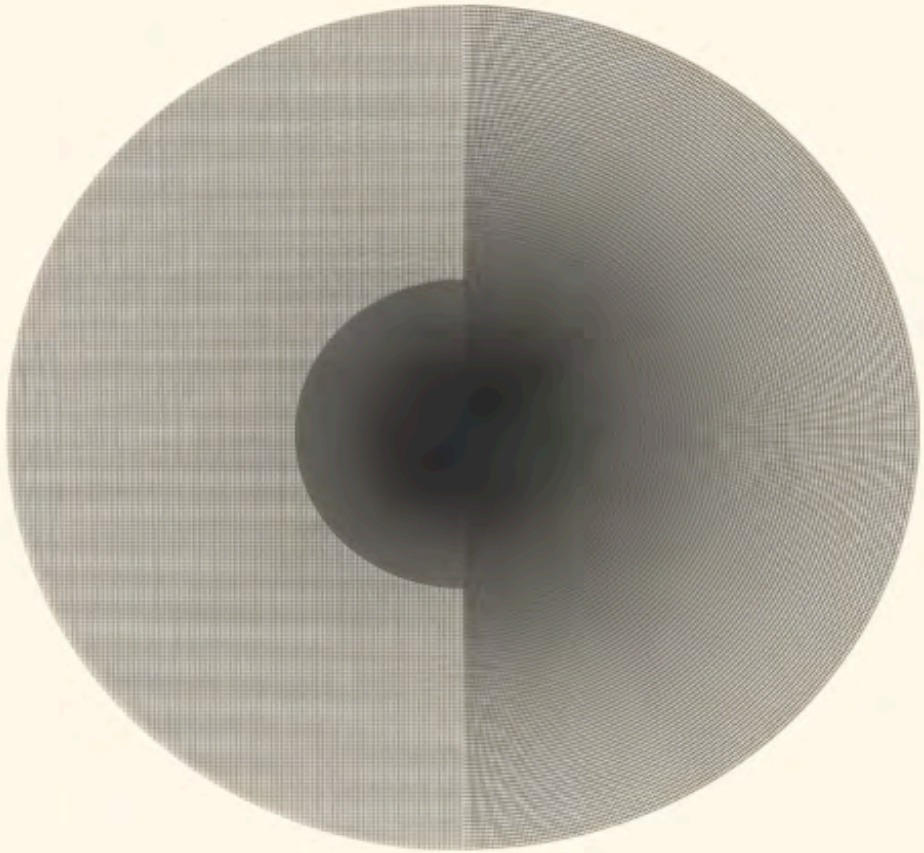
ORGAN OF CORTI



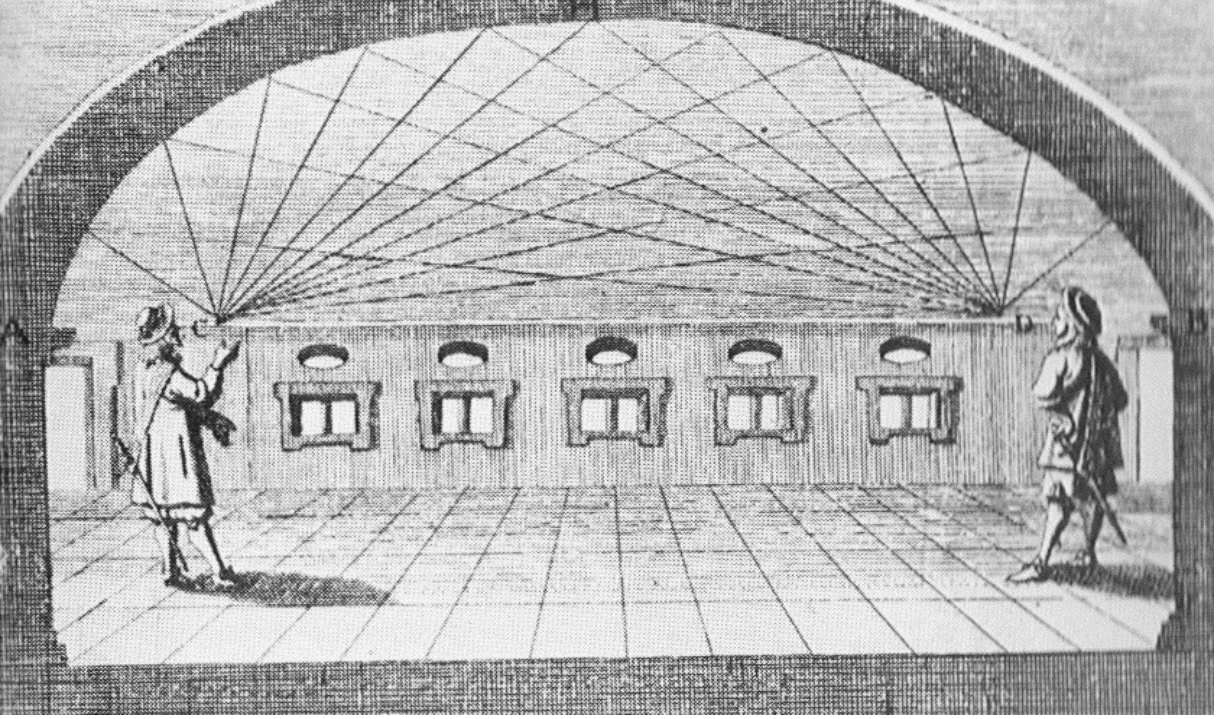
ORGAN OF CORTI

JAMES TURRELL: DEER SHELTER

YORKSHIRE SCULPTURE PARK, 2006

‘I feel my work is using the material of light to affect the medium of perception. I’m using light in its material aspect…I try to take light and materialize it in its physical aspects so that you really feel it – feel the physicality; feel the response to temperature and its presence in space, not on a wall.’

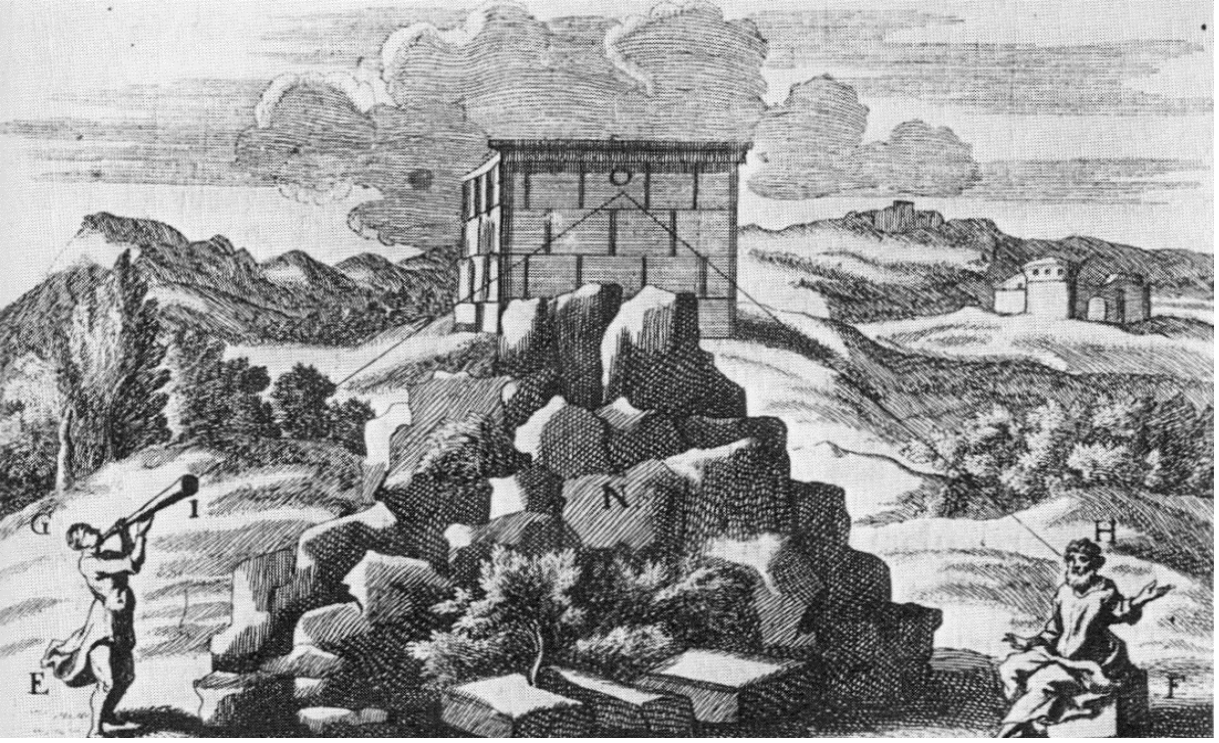
Turrell in Andrews, Richard (1992) The Light Passes By in Turrell, James – Sensing Space Henry Art Gallery, University of Washington, Seattle



Athanasius Kircher' s *Phonurgia Nova* of 1673
(Yale University Library)

"Most people would probably say that as architecture does not produce sound, it cannot be heard. But neither does it radiate light and yet it can be seen. We see the light it reflects and thereby gain an impression of form and material. In the same way we hear the sounds it reflects and they, too, give us an impression of form and material."

Steen Eiler Rasmussen 1959, *Experiencing Architecture*. MIT Press, Massachusetts 224



The acoustic principle of reflected sound- enabling speech between two people who can not see one another.

Athanasius Kircher' s *Phonurgia Nova* of 1673 (Yale University Library)

"Sight isolates, whereas sound incorporates; vision is directional, sound is omni-directional. The sense of sight implies *exteriority* whereas sound creates an experience of *interiority.* I regard an object but sound approaches me, the eye reaches but the ear receives. Buildings do not react to our gaze, but they do return a sound back to our ears."

Juhani Pallasmaa, 2005, *The Eyes of The Skin, Architecture and the Senses.* Wiley-Academy, London. 49

Tranquillity is a State of Mind:

Listening Aids for a Listening Impaired Society

ROUTE BETWEEN MEADOW AND WIR SHEETS BETWEEN DISTANT OPEN SOUNDSCAPE TO DENSE CLOSED SOUNDSCAPE

VIEWS BACK TO WORCESTER

NEW BRIDGE OVER RIVER SEVERN

THE TRANQUILIZER

As the cyclist or walker travels towards the weir the amplitude of the dense broadband noise increases. The route takes the traveller through the *'Tranquilizer'* and physically closer to the weir. As they move through the tranquilizer space, the soundscape is filtered so that the frequency (pitch) and the amplitude (loudness) decrease until at one point all sound is removed. The experience will be uncanny as visually you will see the weir close by, but the sound will have been turned off, as though it has been sucked out of the environment.

THE JOURNEY OF SOUND THROUGH THE AUDITORY SYSTEM

Illustrations of the auditory system derived from: Anderson, G. et al. (2005). Tortus, A multidisciplinary approach. Wilson Publishers Ltd. London/ Purves, D. et al. (2001). Neuro Science, second edition. Sinauer associates. Massachusetts, USA/ Grabowski, S. & Tortora, G. (1993). Principles of Anatomy and Physiology. Seventh edition. Harper Collins. New York.

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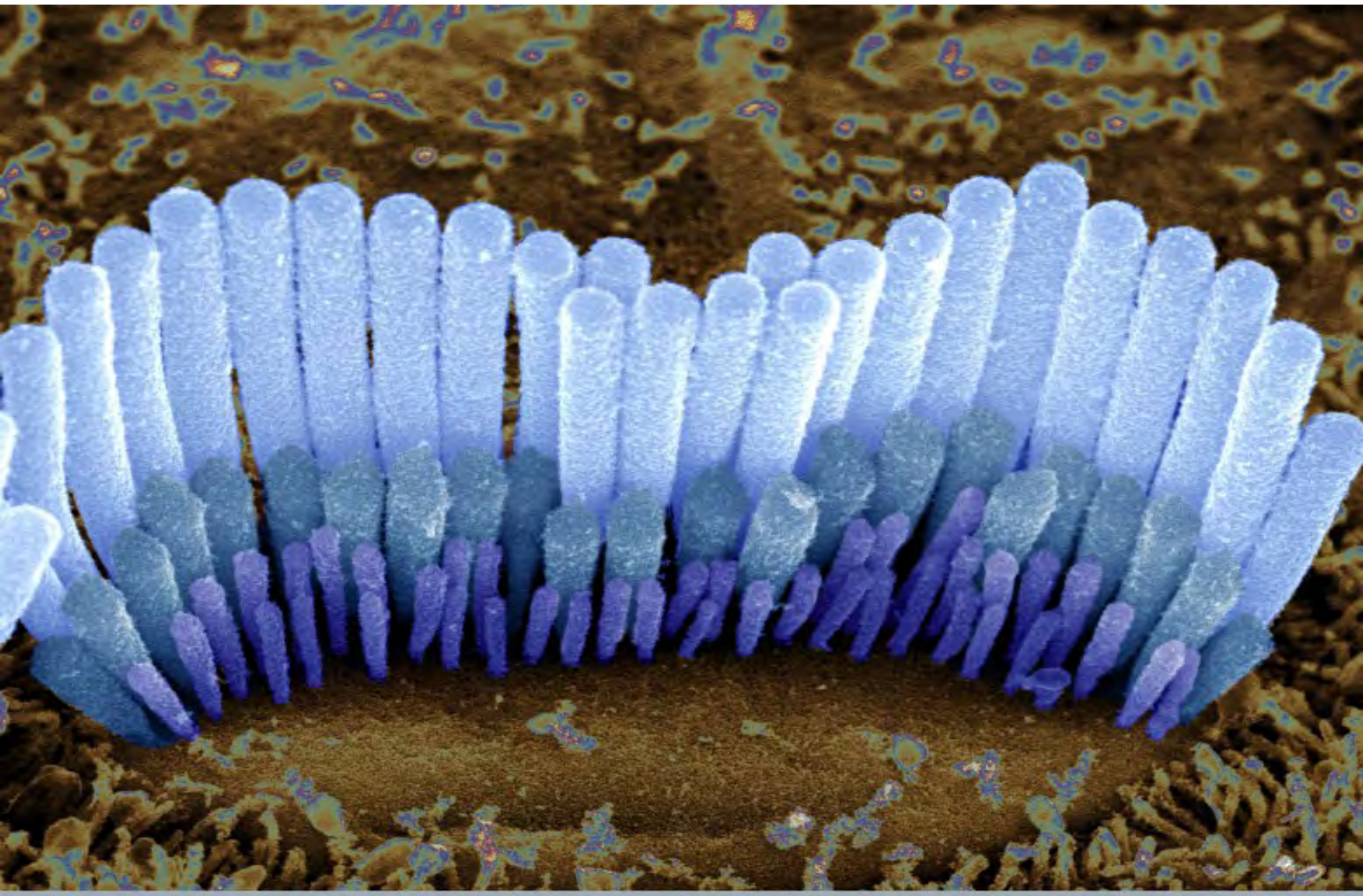
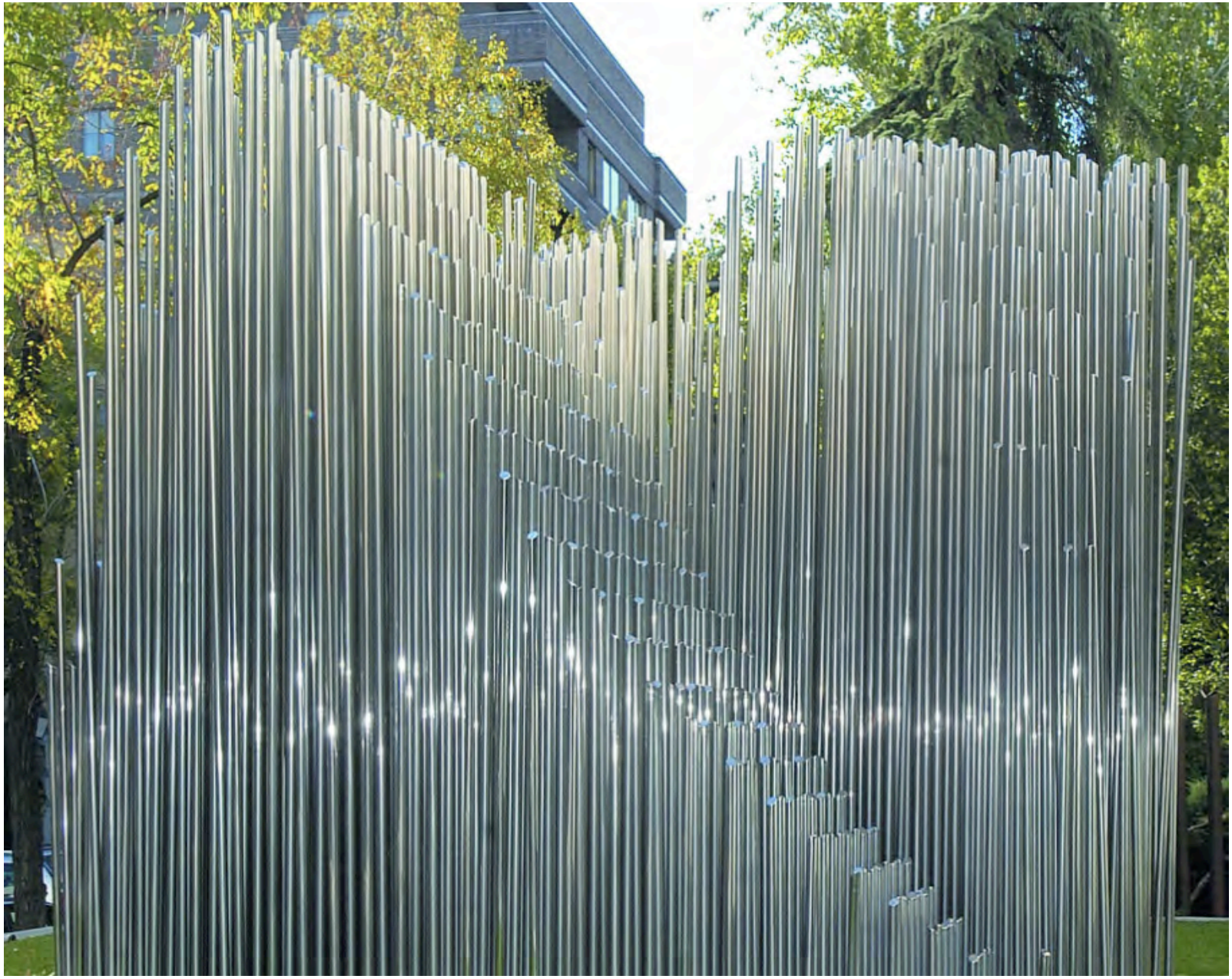
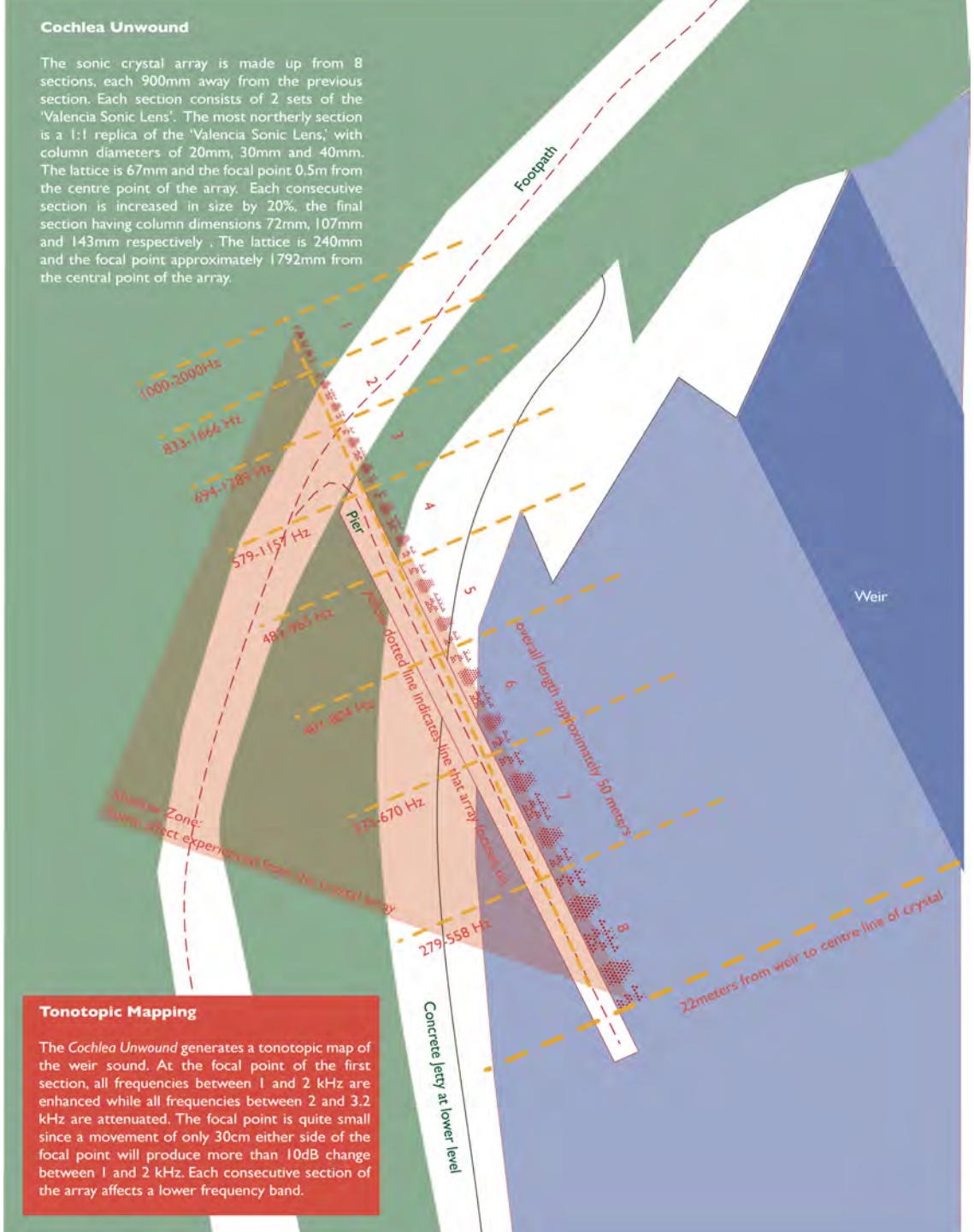




Eusebio Sempere sculpture, Madrid

Cochlea Unwound

The sonic crystal array is made up from 8 sections, each 900mm away from the previous section. Each section consists of 2 sets of the 'Valencia Sonic Lens'. The most northerly section is a 1:1 replica of the 'Valencia Sonic Lens,' with column diameters of 20mm, 30mm and 40mm. The lattice is 67mm and the focal point 0.5m from the centre point of the array. Each consecutive section is increased in size by 20%, the final section having column dimensions 72mm, 107mm and 143mm respectively . The lattice is 240mm and the focal point approximately 1792mm from the central point of the array.



Tonotopic Mapping

The *Cochlea Unwound* generates a tonotopic map of the weir sound. At the focal point of the first section, all frequencies between 1 and 2 kHz are enhanced while all frequencies between 2 and 3.2 kHz are attenuated. The focal point is quite small since a movement of only 30cm either side of the focal point will produce more than 10dB change between 1 and 2 kHz. Each consecutive section of the array affects a lower frequency band.

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