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Life from a Wellcome Trust perspective

Guest post: The Organ of Corti

11 OCT, 2010

by Wellcome Trust

 tags: [Liminal](#), [PRS Foundation New Music Award](#), [The Organ of Corti](#),
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PRSF New Music Award Ceremony, Serpentine Gallery Pavilion, September 2010

The **Organ of Corti** is an acoustic device that, in the words of its creators, explores “the potential of recycling unwanted sounds from our environment into new music. It challenges expectations of what might constitute a piece of music, by adding nothing to the existing environment but rather, offering new ways of listening to what is already there”. Frances Crow, one of the creators of the project, explains how it came about and how it will evolve thanks to award success.

On 16 September, our idea, *The Organ of Corti*, won the 2010 **PRS Foundation New Music Award**. The award gives David Prior and myself £50,000 to develop the proposal into a full project premiering at the **City of London Festival** in July 2011.

The piece was a direct development of a Wellcome Trust funded research project that we developed in partnership with Sustrans, called ***Tranquillity is a State of Mind: Listening Aids for a Listening Impaired Society***. There, we brought together a team comprising an audiologist, a computational neuroscientist and two acousticians to look at the relationship between sound, the environment, health and wellbeing.

Through discussions with the audiologist and the computational neuroscientist, we became intrigued by the phenomenon of ‘tonotopic mapping’. This is the process by which sound is physically

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mapped according to its spectral content across the length of the basilar membrane, and continues up to the primary auditory cortex. This idea of the mapping of sound into physical space is an important theme for *The Organ of Corti*, where our acoustic intervention sculpts the incoming sound so that the listener can construct an unfolding musical experience as they move past it.

The Organ of Corti is based on the acoustic principles of sonic crystals, where a structure made up of a periodic array of cylinders attenuates or enhances frequency bands by redirecting the path of sound waves, radically altering their behavior. As part of the *Tranquillity* project, we built a prototype sonic crystal, which became the instigator for *The Organ of Corti*.

We're fascinated by the interface between art and science and we hope that *The Organ of Corti* will be a playful manifestation of the cutting edge science and technology on which it is based, while also asking questions about our relationship with sound and music.

Frances Crow, Liminal

The Organ of Corti will debut at the [City of London Festival](#) in July 2011, followed by a tour around the country to sites including the M6, Tebay Gorge, the A419 in the Cotswold Water Park and Diglis Weir, Worcester.

For further information about the *Tranquillity is a State of Mind* project and *The Organ of Corti* at <http://www.liminal.org.uk>

Tranquillity is a State of Mind was funded by an [Arts Award](#) from the Wellcome Trust.

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Liminal's *Organ Of Corti*, which won PRS For Music Foundation's New Music Award, will be open to the public outside St Paul's Cathedral, London, 1-7 July. The four metre high sonic crystal recycles the environmental sound it's placed in, so everyday sonic matter is highlighted. The sculpture, named after the hearing organ in the inner ear, is large enough for the audience to move about inside it. This movement helps the participants to compose the found sounds and experience them in a different context from their usual source. Frances Crow, one half of Liminal, says they wanted to create an environment where the audience could "listen to themselves listen."

Organ Of Corti will later be placed in different locations in the Lake District, the Cotswolds and the Diglis Weir in Worcester, with accompanying artist talks and sound walks.

Posted 06/06/11

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TOTNES TIMES



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Innovative organ ready for UK tour

by **RICHARD DAVIES**

TOTNES-based artists Frances Crow and David Prior have been at Dartington Hall for final testing of their award-winning experimental instrument the Organ of Corti.

The duo, who work under the name of Liminal, won the £50,000 national New Music Award from NES for Music foundation for the design of the pioneering new instrument last September.

And the prize money allowed them to turn their idea from initial prototype to fully-fledged reality.

Taking its name from the organ of hearing in the inner ear, Organ of Corti explores our understanding of acous-

tic day-to-day sounds such as traffic or a flowing river are filtered by the crystal and transformed into new musical structures.

The instrument allows users to become both composer and audience as they step into the instrument and move around inside, exploring the sonic landscape and making their own unique music. Ahead of taking Organ of Corti on a national tour this summer, David and Frances set up a final test of the instrument on the Dartington Hall estate.

Co-creator Frances Crow said: "Through use of space at the Dartington Hall Trust,

we are able to make sure Organ of Corti all fits together before it is dismantled again and

four sites nationwide, with its unique structure slightly altered in response to different sounds found at each of them.

From July 1 to July 7 it will be at Carter Lane Gardens, St Paul's for the City of London Festival, from July 9 to

11 it will be at the Lake District Summer Music Festival, from August 15 to August 17 it will be at the Cotswold Water Park and from August 19 to August 21 it can be found at Worcester Music Festival.



Sound of music organ prepares for nationwide tour

By STEVE PEACOCK

speacock@heraldexpress.co.uk

TOTNES-BASED artists David Prior and Frances Crow have been at Dartington testing a revolutionary new musical instrument they have built, which recycles unwanted noise into new sounds.

The duo are preparing to take the four-metre-high instrument called the Organ of Corti on a national tour which will involve setting it up in a road lay by in the Lake District, a water park in the Cotswolds and a weir on the River Severn.

David and Frances have produced the unique instrument, named after part of the human inner ear, with £50,000 they won by taking the top spot in the Performing Rights Society Foundation's New Music Award aimed at promoting an stimulating musical innovation in the UK.

The 'organ' is made of visually transparent sonic crystal that takes sounds from the surrounding area and recycles them, without adding any noise of its own. Day-to-day sounds such as road traffic or a flowing river are filtered by the crystal and transformed into new musical structures.

The instrument allows users to become both composer and audience as they step into and move around inside the large-scale instrument, thereby exploring the sonic landscape and making their own unique music, explained Frances.

Ahead of taking Organ of Corti on a national tour this summer, David and Frances set up a final test of the instrument on the Dartington Hall estate.

Frances said: "Through use of Space at The Dartington Hall Trust we are able to make sure the Organ of Corti all fits together before it is dismantled again and travels the country. We would like to thank all our friends in Totnes who have helped us with the project, as without them this project would not have been possible."

Following the final test, Organ of Corti will be open to the public at four sites nationwide. Its unique structure will be altered in response to the different sounds found at each of the locations.

The first is at Carter Lane Gardens at St Paul's Cathedral in London for the City of London Festival.

■ IMPRESSIVE: Artists David Prior and Frances Crow with their Organ of Corti at Foxhole Theatre, Dartington

al between July 1 and 7, the next will be on a lay by on the A685 overlooking the M6 at Tebay Gorge for the Lake District Summer Music Festival between July 9 and 11, the third will be at the Cotswold Water Park between August 15 and 17 and the last will be at the Diglis Weir on the River Severn for the Worcester Music Festival from August 19 to 21.

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DEAL LOCATION: David Prior and Frances Crow in Tebay Gorge, where their experimental musical instrument will be sited for two days next month.

£50,000 arts award winner coming to Tebay Gorge

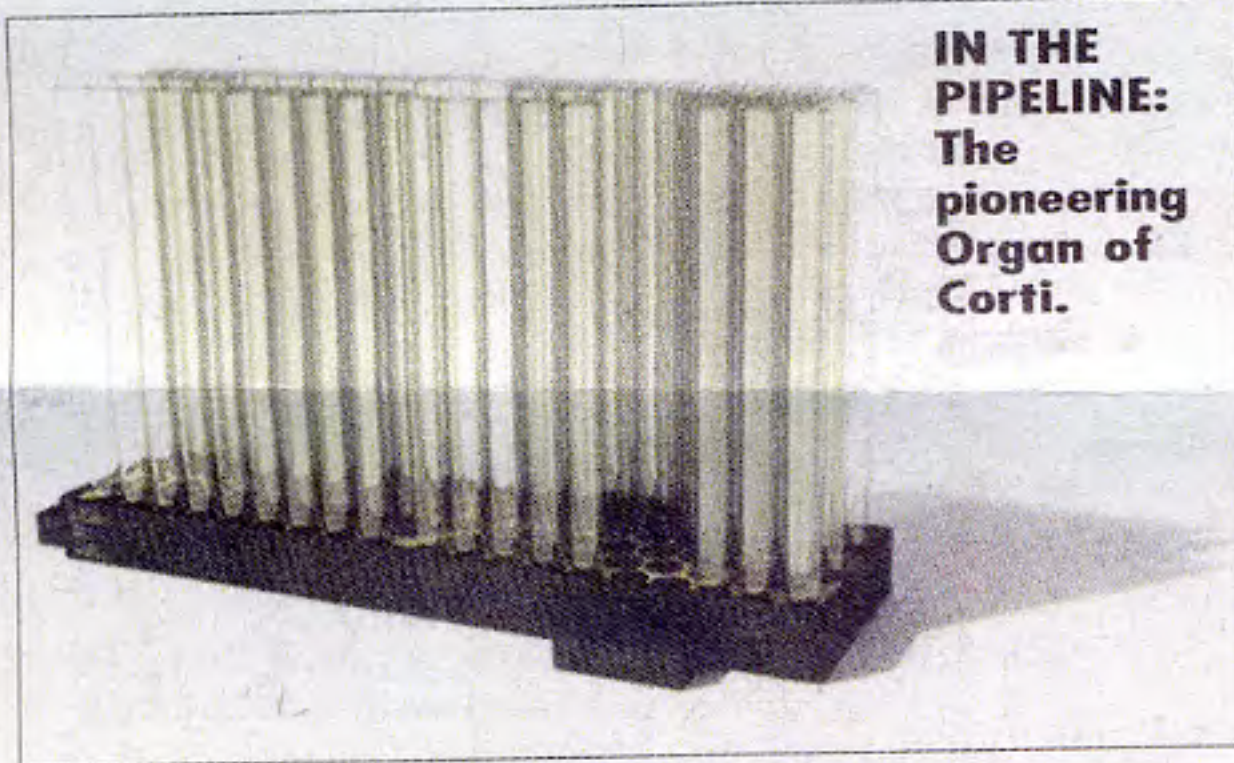
A "NATIONALLY important" arts event, in the shape of a pioneering musical instrument, is coming to Eden for two days next month.

The experimental instrument, winner of Britain's richest arts award, is to be installed in the Tebay Gorge on 9th and 10th July.

The Organ of Corti, standing four metres high, uses groundbreaking acoustic technology to manipulate sound frequencies already present in the environment.

Created by Devon-based designer Frances Crow and composer David Prior, the instrument scooped the £50,000 Performing Rights Society Foundation for Music's New Music Award and will be shown at St. Paul's Cathedral, London, immediately prior to being on display at Tebay.

Christian Barnes, of Eden-based arts consultancy Vista Projects (UK), has co-ordinated the Cumbrian event. "I am very keen that as many local people as possible have the opportunity to see



IN THE PIPELINE:
The pioneering Organ of Corti.

event has been delivered in the Tebay Gorge," he told the *Herald*.

The instrument, which is named after the the organ of hearing in the inner ear, uses the new technology of "sonic crystals", which are specially manufactured acrylic tubes.

The tubes can be arranged in different configurations to create an "enclosure" into which the listener can walk, their physical presence influencing the sound made by the instrument.

"These are the first sonic crystals to be commissioned for use outside a laboratory,"

technology". Tebay Gorge has been selected by the organ's creators as an ideal location because of its unique sound and landscape properties. The place chosen to site the organ is a lay-by on the A685, originally created as the official viewpoint over the newly-constructed M6.

The organ's creators made a thorough investigation of the sound properties of the place in October. The lay-by's acoustic landscape is thought to be ideal for the organ to operate, with distant traffic noise from the motorway sharing many acoustic properties with running water

that tranquility means quiet," said Mr. Barnes. "It need not mean quiet, there is environmental and ambient noise."

Access to the site over the two days is free but for road safety reasons will be managed. Anyone wishing to visit the organ in situ must book a ticket through the Lake District Summer Music Festival box office on 08456 442144 or at www.ldsm.org.uk. Visits can last up to 45 minutes.

People can choose their preferred time of day, and details of where to go and tickets will be mailed to them.

A park and ride service will operate from the Westmorland Hotel on Saturday and from St. James's Church and Tebay Social Club on Sunday.

Frances Crow and David Prior will be present to meet visitors and talk about their work throughout the two days. "We hope to challenge expectations of what might constitute a piece of music by adding nothing to the existing soundscape but by offering a new way of listening to what is already

Classical & Opera



Edited by
Jonathan Lennie
classical@timeout.com

Hear here Frances Crow and David Prior,
creators of the award-winning Organ of Corti



Breaking the noise barrier

Is it a sight? Is it a sound? Is it a sculpture? **Jonathan Lennie** lends an ear to the sonic artists behind the Organ of Corti

Listen to yourself listening. Those interested in accepting such an invitation and engaging with a sound experiment should check out the Organ of Corti, which takes up its position outside St Paul's Cathedral on July 1 for a week, as part of the City of London Festival.

The sonic sculpture, named after a part of the inner ear, comprises a 3m x 3m array of sonic crystals: 4m-high tubes made of transparent acrylic. Using the latest acoustic technology, the organ does not create sound itself but rather filters and reconfigures the sound around it – in this location, mostly of traffic – transforming unpleasant 'noise' into something more engaging.

It is the brainchild of Liminal, husband-and-wife team Frances Crow (architect and designer) and David Prior (composer and sound designer), who left the capital ten years ago to base themselves in Totnes in Devon. Their proposal for the now finished Organ of Corti won the most recent, snappily titled PRS for Music Foundation's New Music Award.

If music is the organisation of sound, and noise the unorganised complement, by applying specific new parameters (in this case, to the noise of traffic) the result, by definition, is a form of music. The technology, of course, has a serious purpose, too. This project has led on from Liminal's work for the Wellcome Trust investigating the relationship between noise and well-being. In the future, large arrays of sonic crystals could be used to act as noise barriers for traffic. In fact, after a week in

London, the Organ of Corti will move around the country to be installed in idyllic sites in the Lake District and the Cotswolds blighted by road pollution, plus a weir in Worcester.

Is the Organ of Corti art or science?

David Prior: 'It is certainly concerned with both; it is about revealing beauty in things that are around us through new discoveries in science and engineering. And it is incumbent on us in our art practice to be aware of what is out there in the scientific-research community and what that means to the state of play in art and music – we are trying to respond to that landscape just as artists have always responded to landscapes.'

Is the sculpture philosophical, like a John Cage experiment?

DP: 'I think we stand on the shoulders of a lot of inspirational artists and composers who have gone before us – and Cage is certainly one of them with pieces like his seminal '4'33"', which re-reads ambient sound and makes it reflexive by listening. The composer Alvin Lucier is an influence too. His work is about revealing that which is all around us but providing us with a new

frame through which to experience it. There are also parallels with visual art, like James Turrell and his "Skyscape" pieces. They don't change the view of the sky but give you a new frame though which to experience that which is already there. Similarly, this piece doesn't make any noise, it is just a frame through which to listen.'

How does it work?

Frances Crow: 'You can climb inside or just walk past it. The whole point is for people to use their ears to explore it, because there should be different sound experiences as you move around it. We went to each of the sites and made sound recordings, which we sent to acousticians at the Open University who analysed them and identified the frequency band that would be best to work with. They took those that our hearing is most receptive to. So, in London, where you have low-frequency rumbling traffic, they've used a 570Hz frequency band as a starting point for the design of the sonic crystal. And if you change the diameter of the tubes, you change the frequency. Or by changing the centre-to-centre spacing, you change the attenuation of the decibel level.'

Sonic crystal is a nickname for an array of columns or spheres that affect incoming sound signals



What will you hear?

DP: 'The device acts as a sort of filter, so the traffic noise passes through the array of cylinders. As soundwaves pass through them the effect is to re-guide the waves so that certain bands of frequencies are attenuated and, as that happens, the frequencies either side of the band gap are slightly accentuated, so you get resonances and reduction. The idea is that we are working with those two things in tandem to try and sculpt the sound, which is not dissimilar in principle to the way in which a conventional analogue synthesizer works, in that you start with a noise source and you are effectively sculpting that noise source by taking certain bits of it away and accentuating others to produce resonant frequencies and attenuations. In the Organ, that happens on a very large scale and not at once. So as you move through the structure you will have different experiences, depending on your proximity to it and the relationship of the different elements of the sonic crystal array.'

What is a sonic crystal?

DP: 'It's a collective term, and is a nickname given by acousticians to a periodic array of columns or spheres that affect incoming sound signals. The atomic structure of a crystal is also a periodic array, so it is a scientist-geek nickname. It's like what happens to light – the sound is being trapped and reflected by crystals. Acoustically it represents a significant advance in understanding how sound is bent around objects.'

How do you describe the organ?

DP: 'We think of this as a listening device that might encourage the listener to contemplate the act of listening itself. The device as a whole is an invitation to listen differently and has been designed to accentuate certain frequencies over others, and to that extent it is a more conventional compositional act. But we think of the whole thing as being the object – it is indivisible – it is a visual thing, it is a tactile thing, it is an event and it's also a sort of sculpture. I wouldn't want to isolate the fact that we have tuned the crystals to perform in a certain way as simply the musical point of it.'

The **Organ of Corti** is located at Carter Lane Gardens, St Paul's Cathedral, **July 1-7** (www.liminal.org.uk).

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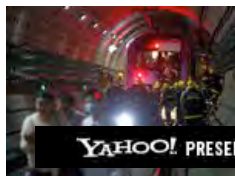
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A man walks through "Organ of Corti", a sound sculpture created by Liminal, outside St Paul's Cathedral in London July 1, 2011. The four metre tall installation absorbs surrounding noise from the city... [more](#)

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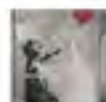
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NEWS (/NEWS)

Amazing sound sculpture 'Organ of Corti' installed in London

By [Duncan Geere \(/search/author/Duncan+Geere\)](#) | 05 July 11 (Tue, 05 Jul 2011 10:20:00 +01:00)



[Comments](#) A sculpture called the [Organ of Corti](#)

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(<http://www.prsformusicfoundation.com/newmusicaward/organofcorti.htm>), which [recycles ambient sounds](http://www.wired.co.uk/news/archive/2010-09/20/organ-of-corti) (<http://www.wired.co.uk/news/archive/2010-09/20/organ-of-corti>) to create music, has been installed in London.

The four-metre-high structure was created by sound consultancy Liminal, and consists of a number of vertical cylinders sized and spaced to act on differing frequencies. They take advantage of the principles of [sonic crystals](#) (<http://physicsworld.com/cws/article/news/2787>), which absorb different parts of sound, modulating it from one side to the other.

You can see it in action in Carter Lane Gardens, next to St. Paul's Cathedral, between 1 and 7 July, and it'll appear in [three more UK locations](#) (<http://maps.google.co.uk/maps/ms?hl=en&ie=UTF8&view=map&ctz=-60&msa=0&msid=212894143343541044149.0004a55977a4321e6e1a8&ll=52.981427,-1.354009&spn=3.638458,9.876709&t=h&z=7>) during the summer -- Tebay Gorge by the M6 motorway in the Lake District, Cotswold Water Park by the A419 in Wiltshire and next to the Diglis Weir in Worcester. At each, you'll get a different experience, thanks to the differing sonic landscape at each location.

Frances Crow, one half of Liminal, told Wired.co.uk: "Organ of Corti proposes a radical departure from traditional conceptions of what constitutes music, by mediating our experience of sound in the landscape simply by offering us a

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05 July 2011



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We're (probably) not living in a hologram

frame through which to listen to it. It reminds us that the phenomenon we are hearing is of course always changing, always new, and suggests a way of reconsidering the act of listening itself."

You can see what the Organ of Corti looks like in the gallery below.

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Written by [Duncan Geere](/search/author/Duncan+Geere/)

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Edited by Nate Lanxon

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Chris Kennedy

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(<http://twitter.com/duncangeere>): Spotify has put up a page where you can request an invite for the US launch:

<http://www.spotify.com/uk/coming-to-the-us/> <http://bit.ly/n4NCXm> by [@katiescott1980](#) (<http://twitter.com/katiescott1980>)

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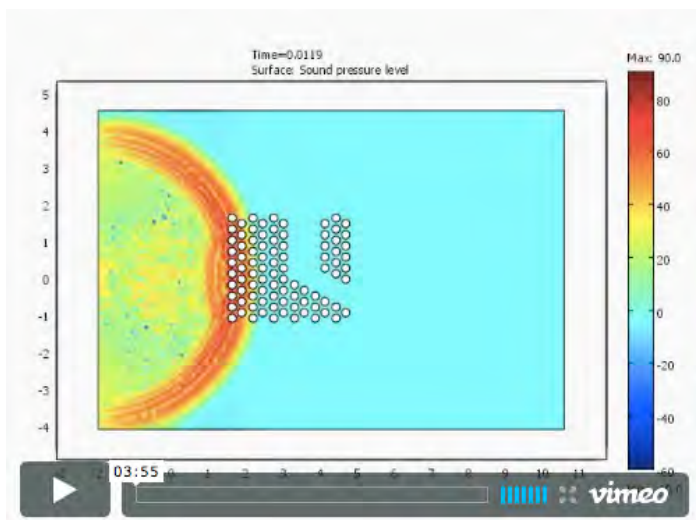
Drone noise weekend with Jamie Reid and the Organ of Corti

Posted by IMR on 06 July 2011

LAST WEEKEND I managed to record two drone-emitting sound sculptures: the Unity Stone at Jamie Reid's [The Ragged Kingdom](#) at the Isis Gallery off City Road, and liminal's [Organ of Corti](#) by St Paul's Cathedral.

The Organ of Corti was the subject of a presentation at a recent day-long event held at the [Sonic Art Research Unit](#). But no one was letting on exactly what it sounded like.

The Organ is a *sonic crystal*, that is, an upright array of cylinders which has a scattering effect on sound waves passing through it:



This is a 3D view of it, and in real life it's big enough for people to step up and walk through the short passageway among the columns:



Yes yes, but what's it *sound* like? While I was waiting to go up and record, I watched a few tourists clamber onto the Organ's platform and look around inside. All seemed to treat it as a visual rather than an auditory experience, gurning and waving at their friends through the optically-distorting perspex. Right enough the effect is quite subtle, as you can hear:

What's interesting is how the droning sound isn't the product of resonance or vibration (as I understand it). A visual equivalent would be something like a sculpture that could alter the colour spectrum of light rays passing close by it.

About a mile to the north in the Isis Gallery on Wenlock Road in Hoxton, formerly a laundry depot, was Jamie Reid's *The Ragged Kingdom* show, billed as a 'Peace Camp in our midst'.

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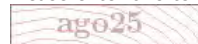
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Listening to yourself listening through the Organ of Corti

New Music Award-winner unveiled in City of London

[Martin Cullingford \(/podium/Martin%20Cullingford\)](#) 10:06am GMT 8th July 2011

When you listen, really listen, what do you hear? The likes of John Cage have of course already encouraged us to focus on the aural experience of the sounds around us, and it's a challenge – or perhaps rather an invitation – laid down by the latest winner of the PRS for Music Foundation New Music Award-winner, the Organ of Corti.

First, what is it? Well, it's a three metre square of 90 four metre high acrylic pipes, through which you walk, listening as you go. It was initially sited to one side of the beautifully-restored St Paul's Cathedral in the heart of the City of London, before heading on tour to a lay-by in the Lake District, a lake in the Cotswolds, and a weir in Worcester.



[\(/sites/gramophone.co.uk/files/imagecache/gallery_main_image/corti.jpg\)](#)

Listening to yourself listening: the Organ of Corti (photo: Chris Kennedy)

The cylinders together form a sonic crystal, and when sound waves reach the cylinders, the frequencies are accentuated and attenuated. That is, what you hear is sometimes filtered, sometimes enhanced, usually altered. As its developers Frances Crow and David Prior, who together form Liminal, put it, it's "an experimental instrument that recycles noise from the environment. It does not make any sound of its own, but rather it attempts to draw our attention to the sounds already present by framing them in a new way." It challenges us to "listen to ourselves listen". Prior neatly compared it to the work of artist James Turrell, whose work delineates a certain area of sky, focussing our attention on it, "framing serendipity". Acousticians, meanwhile, are looking at this sort of technology for more functional purposes – noise barriers for roads for example.

I walked through sonic crystal on arrival, and, feeling harried somewhat by the queue behind, didn't really notice what I was meant to hear. I tried again later when it was (slightly) less busy, with a little more opportunity to linger and listen. Which you need to do: it's quite subtle, but I imagine the sense of focus is part of the point. You hear different elements of the traffic noise, those elements changing as you move through. I'd recommend choosing an unhurried quiet hour though.

Leaving London, where it was hosted by the City of London Festival, the Organ of Corti now moves to (from July 9) a lay-by on the A685 overlooking the M6, at Tebay Gorge, Cumbria, where there's a greater juxtaposition between beauty and sonic noise – between the Lake district and the road. And then it moves to beside a waterfall, just as noisy but, observes Prior, it's interesting that similar sorts of noise – the sea, or a road from a distance – are viewed positively or negatively based largely on their origins. But that's another project perhaps – maybe for another round of the ever-intriguing PRS New Music Awards.



[Martin Cullingford \(/podium/Martin%20Cullingford\)](#)

Martin Cullingford is editor of Gramophone online - brought up in Britten country on the Suffolk coast, when not practising the guitar he can often be found enjoying Evensong.

COMMENTS

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EARFUL: Orton schoolchildren listen for sounds inside the Organ of Corti in the Lune Gorge at Tebay.

Hearing is believing ...

MORE than 500 people turned out to see and hear for themselves a groundbreaking musical instrument, which visited Eden at the weekend.

The Organ of Corti, an experimental instrument which recently scooped Britain's richest arts award — worth £50,000 — was installed at the Lune Gorge, near Tebay, on Saturday and Sunday.

The four metre tall organ was brought to Eden by Devon-based designer Frances Crow and composer David Prior, from London, where it had been installed outside St. Paul's Cathedral.

The instrument uses "sonic crystals" — specially manufactured acrylic tubes — to manipulate sound frequencies already present in the environment.

Christian Barnes, of Eden-based arts consultancy Vista Projects (UK), who co-ordinated the Cumbrian event, said that Tebay Gorge was an ideal location for the organ, because of its unique sound and landscape properties — in part due to the proximity of the M6.

Access to the instrument was managed over the two days via a park and ride scheme based at the Westmorland Hotel on Saturday, and St. James's Church and Tebay Social Club the following day.

Mr. Barnes said the event had been supported by many local people, some of whom had helped to install the organ on Friday in torrential rain. He thanked everyone who had got involved and made the event such a success.

"Fortunately we had good weather for the rest of it and, having spent three days camped out at the lay-by, it's been a real pleasure to really get in touch with what a beautiful place the gorge is," he said.

"It's been great to spend time talking to so many people about the project and the ideas behind it. Although many found the project 'difficult' and the acoustic impact hard to distinguish from the environmental noise, the opportunity to talk to David Prior and Frances Crow made a big difference."

Organ of Corti, National Cycle Network - route 45



Date uploaded: August 3, 2011

Organ of Corti, National Cycle Network - route 45

Gloucestershire, Cotswold Water Park, Lake 6, Gateway Centre:
Monday 15th – Wednesday 17th August

Worcester, River Severn, Diglis Weir: Friday 19th – Sunday 21st August

Conceived and made by Liminal an architect/musician partnership **Organ of Corti** is a four metre high, visually transparent sonic crystal that takes sounds from the environment in which it is placed and recycles them, without adding any noise of its own. Winner of the PRS for music Foundation's New Music Award 2010, this experimental instrument makes us reconsider the sounds that surround us.

For more information about the project visit: www.organofcorti.co.uk
http://www.flickr.com/photos/liminal_sound/

For more information contact katy.hallett@sustrans.org.uk or call 0117 9150221

Visit Sustrans website: www.sustrans.org.uk/sustrans-near-you/events/the-organ-of-corti-winner-of-the-new-music-award-worcestershire

Supported by: PRS Foundation New Music Award, Sustrans Connect2, Arts Council England, Cotswold Water Park, Worcester Music Festival, Worcester City Council, Worcestershire County Council, Severn Trent Water, University College Falmouth

Visit www.organofcorti.co.uk



Organ of Corti - Tebay Gorge, overlooking M6, 9 -11 July 2011. Image Liminal

Way out places to stay » Page 12

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Eccentric

Britain

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(£50) will give you the confidence to recover, reheel, resole and wear your favourite old pair of shoes. Courses run most weekends in Stoke Newington, London.

Guerrilla gardening

Yes, this movement is alive and blooming ... Recent achievements include a fabulous field of marigolds, poppies, cornflowers and sunflowers over what would otherwise have been a dreary roundabout in Chiswick, west London, and mass sunflower-seed sowing all over the capital in May. There's also a lavender harvest planned for 20 August at 3pm - check for updates at guerrillagardening.



Guerrilla lavender harvesting

org. There's also a "#mint revolution" on Friday 19 August in Manchester and Friday 26 August in Liverpool. "I'm creating pop-up mint gardens," says organiser Richard Reynolds. "People can come and help out, and then take free mint seeds that they can plant at home." The gardens will feature planters made out of recycled wheelbarrows and barrels, and events are supported by Havana Club rum - seed packets contain the recipe for a mojito, so you can whip up a cocktail with your homegrown mint.

Singing sculptures

Bristol-based installation artist Luke Jerram launched London's 30th Lift

festival last month with his hot-air balloon Sky Orchestra. Now his new project, Aeolus (lukejerram.com/aeolus), has just opened to the public in Lyme Park, Cheshire. This acoustic pavilion made up of myriad stainless steel tubes - like a giant Aeolian harp - has been designed to resonate and sing with the shifting patterns of the wind. After 21 August, the installation will go on tour, visiting MediaCityUK in Salford Quays and the Eden Project in Cornwall.

Artist collective Liminal's Organ of Corti (organofcorti.co.uk) is another listening wonder set to tour Britain in the coming months. Winner of last year's PRS for Music Foundation's New Music award, the piece stands four

metres high and its transparent acrylic pipes filter the incoming ambient sounds of wherever it's installed into a beautiful, subtle hum. It will be in the Cotswold Water Park until 17 August, before moving to the banks of the river Severn for Worcester Music Festival.

Early 2012 will see Flow, a floating version of a water organ (flowmill.org), installed on the river Tyne. It's a collaboration between the Owl Project, a Manchester artists' group, and musician and producer Ed Carter - check the website for updates, events and the grand launch date.

Dale Berning, with additional entries by Katie Antoniou, Jennifer Cox and Beatrix Zwart



The art of the billet-doux

guardian.co.uk

Life less ordinary: eccentric activities

Crochet graffiti, risqué cake-making, guerilla gardening, gin-themed meals, singing sculptures ... esoteric activities have never been so popular. Here's how to join in

guardian.co.uk, Friday 12 August 2011 22.45 BST



Cake fiend ... a slice of random baking from Emma Thomas at Cakey Perry. Photograph: Martin Godwin for the Guardian

Subversive cakes

On the basis that everyone likes cake, or at least that no one hates it, Miss Cakehead – the alter ego of London-based creative Emma Thomas (cakeheadlovesevil.wordpress.com) – is redefining the sweet experience. While she can't actually bake herself, her idiosyncratic ideas are taking the cake-makers she collaborates with to places they'd probably never thought they would go.

After devising last year's Eat Your Heart Out – the world's first over-18s cake shop – as well as a Morning-After dessert table at the Kerrang! Awards, complete with edible cigarette butts and spilt wine, and a gory Silent Hill cake installation referencing Alice Cooper's lyrics "I used to be such a sweet, sweet thing/Till they got hold of me", July saw Miss Cakehead organising Cakey Perry (cakeyperry.wordpress.com).

Set in Prangsta, a cult dress-up destination shop in Lewisham, London, and styled on the Katy Perry California Gurls video shot by Matthew Cullen, this three-day pop-up high tea was inspired (or rather clearly uninspired) by the ubiquitous and – to Miss Cakehead's mind – thoroughly boring "creative" high teas available in London. Her own version involved a whirlwind of chintzy crockery, paper doilies and red gingham plastic tablecloths, with gummy-bear wreaths, love heart-decorated sunglasses and more cake than you can imagine: cake pops from Molly Bakes (mollybakes.co.uk), painted gingerbread figures from Nevie-Pie Cakes (neviepiecakes.com), Hansel-and-Gretel-in-the-woods-style houses made of jelly babies and Liquorice Allsorts ...

"Complete randomness" is the general appeal: "People ask me why we do this, but I don't want to think up a big, long reason. We just thought it would be fun," says Miss



Yes, this movement is alive and blooming ... Recent achievements include a fabulous field of marigolds, poppies, cornflowers and sunflowers over what would otherwise have been a dreary roundabout in Chiswick, west London, and mass sunflower-seed sowing all over the capital in May. There's also a lavender harvest planned for 20 August at 3pm – check for updates at guerrillagardening.org. There's also a "#mint revolution" on Friday 19 August in Manchester and Friday 26 August in Liverpool. "I'm creating pop-up mint gardens," says organiser Richard Reynolds. "People can come and help out, and then take free mint seeds that they can plant at home." The gardens will feature planters made out of recycled wheelbarrows and barrels, and events are supported by Havana Club rum – seed packets contain the recipe for a mojito, so you can whip up a cocktail with your homegrown mint.

Singing sculptures

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Dale Berning, with additional entries by Katie Antoniou, Jennifer Cox and Beatrix Zwart

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HEREFORD & WORCESTER

19 August 2011 Last updated at 15:13

Organ of Corti is part of Worcester Music Festival

An instrument that makes music by recycling the sounds around it has been put on a river bank in Worcester.

The Organ of Corti will be on the river bank for three days as part of the [Worcester Music Festival 2011](#).

It uses sonic crystals, an enlarged version of the tiny hairs in the human ear, to compose a unique piece of music at each site it is placed.

Worcester is the final destination of a tour for the organ that started outside St Paul's Cathedral in London.

It was originally designed to explore the relationship between sound and health as part of a project involving the charity Sustrans and the Wellcome Trust.

Katy Hallett, director of Sustrans' art programme, said: "We're most excited about having it along parts of the National Cycle Network where it can enhance people's experience of walking and cycling, and make their journeys even more memorable."

The organ has been placed alongside a foot and cycle route near the new Diglis Bridge,

which was opened by Sustrans, Worcestershire County Council and Worcester City Council in July last year.



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Unique sound of organ to be heard

A REMARKABLE instrument which recycles noise will be music to the ears of people visiting the riverside in Worcester this weekend.

The Organ of Corti, which filters noise and creates harmonies depending on the sounds around it, will be near Diglis Weir for three days from today (Friday) as part of the Worcester Music Festival.

It is the final destination in the organ's UK tour and it will be situated near the Diglis Bridge.

The organ uses sonic crystals, which are an enlarged version of the tiny hairs in the human ear, to draw attention to existing sounds in the environment, and compose a unique piece of music at each site it is placed.

It has been created by Liminal, a partnership between architect Frances Crow and sound artist David Prior and was originally designed to explore the relationship between sound and health as part of a project with charity Sustrans and the Wellcome Trust.

Katy Hallett, director of Sustrans' art programme, said: "We're most excited about having it along parts of the National Cycle Network where it can enhance people's experience of walking and cycling, and make their journeys even more memorable."

Liminal will lead a Listening Walk on Sunday (August 21) at 2pm from Cripplegate Park. To book a place call 07804 819 818.



The Organ of Corti creates music by recycling sound from the surrounding environment. (s)

Have a pint and a point

YOUNG people can make their voices heard on some of the hottest political issues while enjoying a pint at an event taking place in a city centre pub next week. Worcestershire Conservative Future are holding a Pints and Policy night at the Slug and Lettuce from 8pm on Wednesday (August 24).

It is an opportunity for people to discuss issues ranging from the recent England riots to the conflict in Libya.

There will also be a raffle at the end of the evening. For more information about the event email Matthew Snape at snapeco@hotmail.com

Welcome to the web home of Mr. Underwood :: musician | sound artist | instrument designer

On sabbatical until April 2012 | PRSF New Music Incubator participant 2011-2012



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If you are interested in collaborating with me or booking me for an event, or anything else, please [pop me an email](#)

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Organ Of Corti

by [MR.UNDERWOOD](#) on AUGUST 23, 2011 · [LEAVE A COMMENT](#)

As part of the [Worcester Music Festival](#) I was lucky enough to visit Organ of Corti last weekend, a project by [Liminal](#). I also attended the “Meet The Artists” event on the previous day.



I became aware of this project some time ago and was chuffed, to say the least, when I realised it would be visiting Worcester. It transpires that Diglis weir was actually the place initially chosen to sight it. A real bonus for me as it gets a little tedious when so much intriguing stuff of this nature requires an all-day round trip (at best) to witness it. The weir is only a bike ride away.

The presentation on the Friday night gave a really fascinating insight into the project. Rather than me trying to go into much detail about what was covered, check out the [Organ of Corti](#) page for an overview. Based on what we heard and saw, in terms of the science, images of the piece and the enthusiasm of the artists, I was keen to experience the piece myself.

Before I come back to that though, David Prior of Liminal mentioned a project by one of his former students, which I had to mention, as it's a real gem. He took four drummers, each playing snare drums, and spaced them along a path into the distance. He then conducted them with a semaphore flag from next to where the audience stood. Each player hit

their drum simultaneously but given the (carefully measured) space between them and the time it took for the sound of each drum to reach the audience, a recognisable rhythm was created. The players then walked to the next designated spot. As they did so, the rhythm got jumbled. On reaching the next spot another recognisable rhythm was formed. The players ultimately ended up by the crowd, still playing in unison. Great idea that! Anyway, I digress...

On the Saturday I visited the piece by the weir. It is a stunningly beautiful object. I read the description and instructions and tried my best to get myself into listening mode. If anything I generally listen to stuff too closely. For example, I'll get distracted from a fascinating interview by a squeaky shoe. I gathered myself, listened deeply and entered. The first thing that struck me was a shift in where I perceived the sound to be coming from. All of a sudden it seemed to have shifted to emanate from the piece itself, directly in front of where I stood. This was something I hadn't expected.



I passed from right to left listening to the distinction between different parts of the "sonic crystal". I could definitely distinguish changes in the frequencies of sound I was hearing. The weir was chosen as the site due to the wide frequency range it produces, in an effort to highlight the effect.

I did some sound recordings to try to illustrate what it sounded like. The first is from outside the Organ of Corti, the second from just inside, and the third is a “fly-through”. They were all somewhat compromised by a mixture of me forgetting my wind sock, not having whatever the audio equivalent of a steady cam is and by people talking and making sounds...but I think it illustrates the effect to some degree.

Note: these are quite noisy!

I must admit I was left wondering how different it would've been if I'd walked behind / into something else. The animation we saw on the Friday evening suggested that the specific form of the piece was vital to the effect. I can't say that my ear is well trained enough to be confident of this. I understand this version of the piece is due to be used as a research tool for a period now. I'd be fascinated to hear what comes of this.

It's great to see such projects in Worcester. I hope this piece and pieces like it are given a permanent home here. Only the other day, on seeing a photograph of the Worcester skyline including the new Worcester University Library & History Centre, I remarked that it's stuff like this which makes for a truly international city. The same applies to the quality of the art that resides in the city. More please!

Tagged with: [Diglis Weir](#) • [Liminal](#) • [Organ of Corti](#) • [PRS Foundation](#) • [Sound art](#) • [Sustrans](#) • [Worcester](#) • [Worcester Music Festival](#)

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A crystal clear organ sound

A REMARKABLE instrument which recycles sounds captivated visitors during its stay in Worcester.

The Organ of Corti filters noise and creates harmonies depending on the sounds around it and the position of the listener using sonic crystals. It was installed on the west bank of the Diglis Weir on Friday, August 19, where it remained until Sunday (August 21).

The organ's sonic crystals are a massively enlarged version of the tiny hairs in the human ear, which draw attention to existing sounds in the environment, creating a unique piece of music at each site it is placed.

The showing in Worcester marked the end of the organ's UK tour, which has seen it installed outside St Paul's Cathedral in London and on a junction of the M6 in Cumbria after it won the prestigious £50,000 PRSF New Music Award last year.

The instrument was created by architect Frances Crow and sound artist David Prior and was designed as part of a project with safer travel charity Sustrans and the Wellcome Trust.

Grace Bowen, six, experiences the sounds of the Organ of Corti. Picture by Nick Hands 3411022NHR2 Order this picture at www.buyphotos247.com



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a psychologist's
perspective

Organ of Corti –
an invitation to listen
to ourselves listen

*'As economic
uncertainty continues,
the ISM has made
the decision not to
increase membership
subscription rates.'*

page 1



Organ of Corti – an invitation to listen to ourselves listen

Liminal, a partnership between architect **Frances Crow** and sound artist and composer **David Prior**, introduce their award-winning piece.

On 16 September 2010, we won PRS for Music Foundation's New Music Award for our piece, *Organ of Corti*. One of five shortlisted projects our piece recycles sound in the environment by filtering incoming sound-waves through a lattice of 4 meter high acrylic cylinders, known as a 'sonic crystal' array. Depending on a listener's position in relation to the array, the structure will attenuate or accentuate areas of the frequency spectrum to create an evolving sound environment that relies entirely on the sound energy already present in the place in which it is installed.

Organ of Corti is an experimental instrument that recycles noise from the environment. It does not make any sound of its own, but rather it attempts to draw our attention to sounds already present by framing them in a new way. Named after the organ of hearing in the inner ear, it filters the noise of road traffic or falling water, sculpting the sound of the environment by accentuating certain frequencies while attenuating others. By recycling surplus sound, we hope to challenge expectations of what might constitute a piece of music by adding nothing to the existing soundscape, but rather offering new ways of listening to what is already

there. For us then, this instrument is a device that rematerialises our experience of sound, inviting us to 'listen to ourselves listen'.

This summer's national tour with *Organ of Corti* started at Carter Lane Gardens in front of St Paul's in London. It was then installed in a Lay-by on the A685 overlooking the M6 in the Tebay Gorge, Cumbria, at the Cotswold Water Park near the A419 and finished its tour at Worcester Music Festival next to the Diglis weir on the River Severn in Worcester.

While this project has always been an experiment in testing the new technology of 'sonic crystals' in a real context, it has for us more importantly been a project that creates a frame through which people are invited to actively listen to what many would consider 'noise'. The effect of the sonic crystal is subtler than we had originally envisaged, being perceived at the edges of our hearing. However we would suggest that this provides a challenge to the listener to engage more fully in the active process of listening deeply to what many would instinctively push to the background. Instead of focussing on 'hearing' what effect the sonic

Continued overleaf →



Above: Organ of Corti, St Paul's,
London
Photo: Chris Kennedy

crystal has on the incoming sound, it requires us to listen, perhaps 'reverently' to the sounds of the landscape, giving each element equal weight and immersing ourselves in the experience.

The proposal for *Organ of Corti* came out of a sustained period of research into the relationship between sound, health and wellbeing funded by the Wellcome Trust and developed in partnership with Sustrans, the sustainable transport charity. During this project, entitled *Tranquillity is a State of Mind*, we became interested in the physiology, as well as the neuroscience of hearing, and in particular, the process by which sound is physically mapped according to its frequency content along the length of the basilar membrane in the inner ear. We became fascinated by the fact that like so many organisms, our auditory system is predicated on the physical separation of sound into space and we began to explore ways of representing this on an architectural scale.

During this time, we came across the technology of sonic crystals and we were introduced to Keith Attenborough, Professor of Acoustics at the Open University and a pioneer in the development of this area of acoustical understanding. We were intrigued to discover that one of the problems the sonic crystal research teams were encountering

in their attempts to apply the technology to general purpose noise barriers, was that when a sonic crystal array is successful in attenuating a portion of the frequency spectrum (a band-gap), a resonance is often created either side of the affected area. Like a tinnitus sufferer who hears sounds caused by the over-stimulation of hair cells either side of an area of damage to the basilar membrane, the resonances exhibited by the sonic crystals presented a similar problem for the acousticians trying to implement them in the design of noise barriers. For us though, this behaviour was both conceptually and practically appealing and we began to explore the creative potential of a filtering device that would utilise the resonance, as well as the attenuating effects of the sonic crystal arrays.

Our first idea was for a permanent installation that would recycle the sound of Diglis weir in Worcester. This project is called *Cochlea Unwound* and was developed with Sustrans in response to our *Tranquillity is a State of Mind* research. It is currently in development, with *Organ of Corti* also acting as a prototype to gauge the effect of the structure and responses from Worcester communities. *Organ of Corti* is a portable version of the *Cochlea Unwound* idea and was devised

'we hope to challenge expectations of what might constitute a piece of music'

specifically for PRS for Music Foundation's New Music Award.

Organ of Corti for us, is continuing to be a fascinating experiment in which listeners are challenged to consider environmental sounds as part of a fuller experience of our urban or rural landscapes, by drawing attention to not only what can be heard, but what it is to listen.

London Sound Survey made a recording of a pitched harmonic through *Organ of Corti* outside St Paul's. You can find it under 'Sound Actions – Social 3' on their website, www.soundsurvey.org.uk.

Organ of Corti has been made possible through the generosity of funders PRS for Music Foundation and Arts Council England. It is hosted by the City of London Festival, Lake District Summer Music Festival, Cotswold Water Park Trust and Worcester Music Festival. It has been developed in partnership with the Acoustics Research Group at the Open University, Vista Projects and Sustrans, with support from University College Falmouth, the Knowledge Escalator South West Proof of Concept Fund (administered by the University College Falmouth), City of London Pollution Team, Eden Arts, Friends of the Lake District, Cumbria Tourism, Worcester City Council, Worcestershire County Council, Severn Trent Water, Diglis Hotel, Worcester, Worcester New College and Mark Leahy. The design team are Liminal, Acoustics Research Group at the Open University, OMK Design Consultancy and Tandem. Sponsorship from Westmorland Ltd. Westmorland Hotel & Tebay Services. The project was developed at Space with support from The Dartington Hall Trust.

Frances Crow and David Prior (Liminal)

Frances and David began working together in 1996, and formalised their working partnership in 2003. Their work focuses on exploring the relationship between sound, listening and the environment. It encompasses site-specific interventions and sound walks, gallery installations, performances, research and consultancy as well as sound and music environments for exhibitions.

www.liminal.org.uk

Below: *Organ of Corti*, Tebay Gorge, Cumbria
Photo: Chris Kennedy



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Experimental instrument at Diglis Weir

An instrument that recycles noises was at Diglis Weir as part of the Worcester Music Festival in August.



The 'Organ of Corti' has been created by Liminal, a partnership between architect Frances Crow and sound artist David Prior and was originally designed to explore the relationship between sound and health as part of a project with Sustrans and the Wellcome Trust.

Katy Hallett, Director of Sustrans' art programme, said: 'Sustrans has been involved in this innovative research into sound and acoustics since the beginning, so it was great to see it finally on site in Worcester and to get the public's reactions to it.'

The organ filters noise and creates harmonies depending on the sounds around it and the position of the listener. It uses 'sonic crystals', which are a massively enlarged version of the tiny hairs in the human ear, to draw attention to existing sounds in the environment, and thus composing a unique piece of music at each site it is placed.

It has been on a UK tour funded by winning the prestigious £50,000 PRSF New Music Award last year. As the final destination of the tour, the organ was placed near to the new Diglis Bridge, which was opened by Sustrans, Worcestershire County Council and Worcester City Council in July last year providing a safe and direct traffic-free route linking communities on either side of River Severn.

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THE INCIDENTAL

How do cities sound? What is the relationship between what we hear and urban space? These were some of the questions Sound and Music's **Ways of Hearing** project aimed to investigate. *Gian Luca Amadei* reports

Sound enhances the way we perceive and understand space. In the city it does this by connecting the realm of public space to the private and intimate space of our minds. Sound gives any space, interior or exterior, its identity and is an important navigation and orientation tool.

Yet actually identifying a space aurally is difficult, especially in busy cityscapes where incessant noise erases and blurs the traces of other sounds. This, however, was the first task the participants of contemporary music and art promoter Sound and Music's Ways of

Hearing project were asked to carry out. This was the inaugural workshop that kick-started a national programme of sound exploration and research.

In all, 36 sound artists, acousticians, designers, policy-makers and researchers took part, grouped in three distinct research city hubs: Bristol, London and Leeds. As well as bringing together these professionals to explore the relationship between sound and built environment, Ways of Hearing aims to help individual practices with a specific interest to develop new design approaches, processes and innovations in sound.

The Ways of Hearing project can be defined as an experimental platform aiming to provoke new research and creative ideas combined with sound technologies. It also focuses on the cross-disciplinary intersection between sound, architecture and the arts.

As part of broadening the spectrum of sound exploration and creative investigation on a national

scale, Sound and Music invited Arup and Blueprint to be project partners for Ways of Hearing. It also established a substantial network of local partners including Opera North and Lumen in Leeds, Musarc in London, and Arnolfini and the Architecture Centre in Bristol.

After the initial two-day workshops, which were run by a core group of practitioners brought in by Sound and Music to support each city group, participants had a week to finalise and submit their research proposals. They then had a further eight weeks to work on their projects.

Although the workshops were designed for experimentation and work-in-progress research, some projects reached completion during the process, while others continue to develop.

Over the following pages we take a look at five specific research projects from the Ways of Hearing, which illustrate the wide spectrum of theoretical enquiry and practical creative research engendered.

Above: An image from one of David Gunn's Open Cities performances, which involve increasingly manipulating live images and sounds from the place of the performance





DAVID GUNN INCIDENTAL – OPEN CITIES PROJECT

For Ways of Hearing David Gunn, founder of cross-disciplinary practice Incidental, developed his on-going Open Cities project. This began as a two-hander, Gunn plus a musician.

'I am interested in developing a way of hearing that does not settle on either the idea of musical performance or pure sound, but actually includes both at once,' explains Gunn.

His Open Cities project involves him actively intervening in sounds and videos by changing them as they happen live. As an example, during a concert, a microphone is placed directly outside of the venue, gathering ambient noise. A video camera is also located outside the venue, pointing in same direction as the microphone. The show is then created entirely from these live feeds without the use of prerecorded material. This means Gunn is able to capture and distort the sound and visual qualities of each site in a way that is specific to that place.

During his performances, audiences begin by listening to the raw, live feeds, and during the show the sounds and visuals become ever-more heavily transformed by Gunn.

This process is made possible by software programs which Gunn has personally designed and built over the past year as part of the Ways of Hearing research project. theincidental.com



THE INCIDENTAL



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FRANCES CROW LIMINAL – ORGAN OF CORTI

Developed by Frances Crow and David Prior, principals at sound and architecture practice Liminal, the Organ of Corti is an experimental instrument that recycles noise from the urban environment.

It is named after the spiral structure within the inner ear's cochlea that contains hair cells stimulated by sound vibrations. Liminal's Organ of Corti uses the acoustic technology of sonic crystals to accentuate and attenuate different frequencies within the broad range of sound frequencies present in surrounding noise.

'The Organ of Corti does not make any sound of its own,' explains Crow, 'but rather it attempts to draw our attention to the sounds already present by framing them in a new way.' By recycling surplus noises from the environment, Crow and Prior hope to challenge our expectations of what might constitute a piece of music by adding nothing to the existing soundscape, but instead offering new ways of listening to what is already there.

Although Liminal had already begin its work on the Organ of Corti, it was further developed as part of the Ways of Hearing project and started officially touring the country in July of this year. The first prototype was displayed next to St Paul's Cathedral. Since then, it has travelled to the Cotsworld Water Park and in September to Poltmore House in Exeter. liminal.org.uk



LIMINAL



LIMINAL VISUALISATION BY JIM MORRIS



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PAUL BAVISTER
UNCOORDINATED
CONCERT HALL

Paul Bavister is the project architect on the arts development of performance, rehearsal and teaching spaces for the Royal Welsh College of Music and Drama in Cardiff.

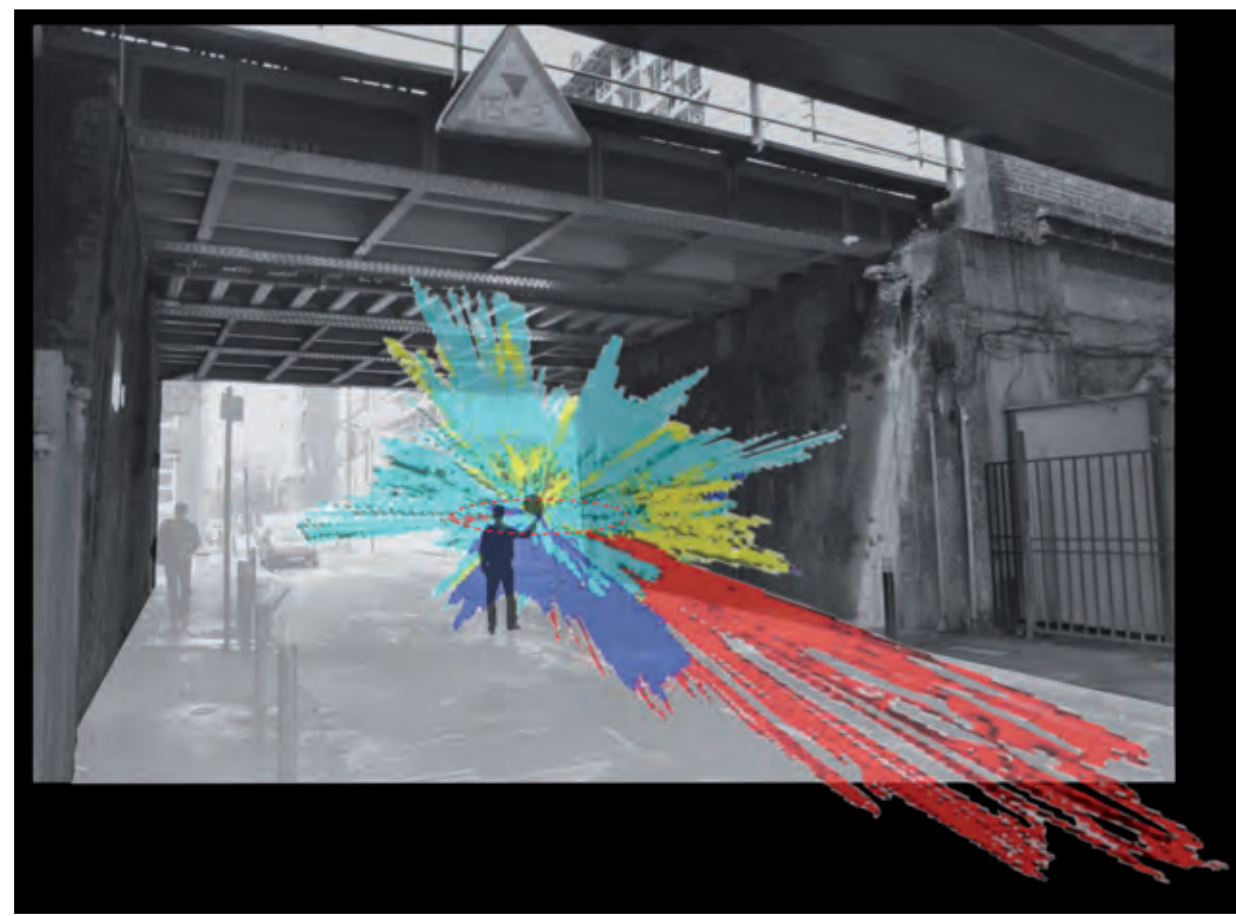
Bavister's research project in conjunction with Ways of Hearing involved him in acoustically testing sites in East London, by popping balloons. The various locations were chosen for their potential to be acoustically interesting as impromptu 'concert halls'. Bavister also worked with Arup Acoustics on this.

'Cities have similar physical similarities – surfaces, balconies, windows and other architectural ephemera – in common with concert halls, but they are uncoordinated, and not focused on the experience of the listener,' says Bavister.

During the project interesting sites were probed and analysed to find out their potential for different types of performance.

Bavister goes on to explain that concert halls are designed to bounce sound off surfaces in such a way that all the reflections will arrive at the ear of the listener in a correct order: starting with the energy released by the performer and followed by subsequent reflections. This is achieved by way of acoustic modelling involving ratios of surfaces to volume. This is a coordinated response to achieve the desired acoustic. Sometimes however, the surfaces of the city, by random happenstance, fits these predetermined ratios, and for a fleeting moment produce a harmonious aesthetic for a listener, in effect, like a 'random' concert hall.
bfls-london.com

PAUL BAVISTER





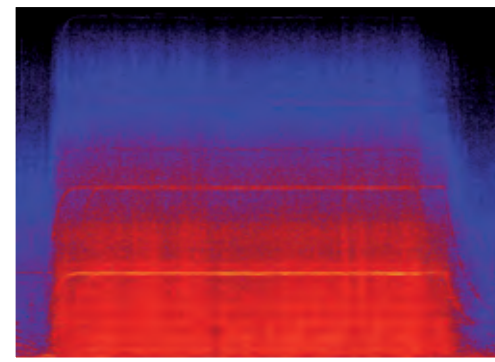
YVONNE BUCHHEIM SONG ARCHIVE PROJECT

The role of the audience and the performer, and their interaction and relationship in the context of a performance, formed the core of Yvonne Buchheim research.

For Buchheim this became an opportunity to further expand research for her ongoing Song Archive Project. An artist and senior lecturer at the University of the West of England in Bristol, Buchheim began the Buchheim Song Archive Project in 2003. Its purpose is to examine contemporary song culture in the context of the visual arts. Buchheim's archive now includes more than 900 songs. It involves people performing a song of their choice in front of a video camera, and she has persuaded people from as far apart as Wales and Iran to participate. This collection of recordings then becomes a resource for art works ranging from site-specific video/sound installations to events and collaborative projects, in museum spaces, galleries and the public realm. One event for Ways of Hearing was Stagefright performance at Chapter Arts Centre in Cardiff which involved the song archive, photographs and relaxation techniques.
song-archive.org



PHIL BABOT



JOHN DREVER

JOHN DREVER SANITARY TONES

John Drever is the senior lecturer in composition and head of the Unit for Sound Practice Research at Goldsmiths in London. For Ways of Hearing Drever continued to develop his Sanitary Ambience project – a study of the auditory qualities of public toilets.

As part of the project, Drever has been making sound recordings of toilet mechanisms and background noises in loos, and analysing the spectrum of these recordings. He then took his research and created a surround-sound composition specifically based on an environmental noise assessment of hand dryers. While investigating the dryers and their reverberant and resonant casings, Drever found that they produce some very loud, continuous high-frequency tones, way above the highest notes of orchestral instruments, for instance. These are also sound pressure levels that children find intolerable.

'What prompted me to this field of research was as a father, subjecting my young kids, who have sensitive hearing, to the auditory bombardment of the new generation of ecological hand dryers,' he says.

And it was not just his children; further research revealed that there were whole tranches of society being affected by these dryers, including those who suffer with hyperacusis (over sensitivity to certain frequency ranges of sound), blind people and hearing-aid users.

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