

# SOUND MAZE

BY PAUL DRESHER

A VISIONS AND VOICES SIGNATURE EVENT

Friday, March 3, through Wednesday, March 8, 2017

Opening Reception: Saturday, March 4, from 5 to 7 p.m.

USC Fisher Museum of Art

University of Southern California

## KNOW BEFORE YOU GO

- ◉ PAUL DRESHER is an experimental musician and composer who makes his own instruments, often using found or scrap materials.
- ◉ Dresher performs his own music as well as works by other innovative composers with the Paul Dresher Ensemble Electro-Acoustic Band.
- ◉ In *Sound Maze*, you will have a chance to interact with, explore, and improvise on newly invented instruments and sound sculptures.
- ◉ *Sound Maze* was created and built by Paul Dresher in collaboration with ALEX VITTUM and DANIEL SCHMIDT.

## MAKING INSTRUMENTS

Every instrument in the world started as someone's experiment. Some experimenters try to figure out how to make a particular sound, and others explore what they can do with a given kind of wood or other material. The oldest-known musical instruments are flutes made of bird bone and mammoth ivory more than 40,000 years ago. They were found in a cave in what is now southern Germany. The earliest electronic instruments emerged between 1870 and 1915.

## SOUND

We hear **sound** when a moving object makes the air vibrate. These vibrations move through the air in the form of **waves** or ripples of squeezed air. These ripples move back and forth in the direction the sound is traveling. This back-and-forth movement is called **longitudinal movement** and the sound waves are called **longitudinal waves**.

Think about when you drop a rock into water. Sound waves spread out as ripples of squeezed air in the same way that ripples of water spread out. High-pitched sounds, like whistles, create waves that are close together. Low-pitched sounds, like thunder, create waves that are farther apart. The number of these waves per second is the **frequency** of the sound. The amount that the air is squeezed in each ripple is the **amplitude** of the sound. The greater the squeeze, the louder the sound.

## HOW WE HEAR

Our outer ears pick up sound waves and lead them into the auditory canal, through which they are directed to the eardrum, a very thin, stretched sheet of membrane that vibrates when a sound wave strikes it. The eardrum passes the sound wave on to the hammer (malleus), anvil (incus), and stirrup (stapes) resting on the inner side of the eardrum. These tiny bones transmit and increase the sound to the inner ear, a long tube curled up like a snail's shell about the size of a pea. The spiral-shaped **cochlea** is filled with fluid and about 15,000 tiny hairs of different lengths. When different sound vibrations pass into the cochlea, they cause different hairs to vibrate. This information passes to the brain through the auditory nerve that is attached to the cochlea. This nerve then carries the sound to the brain and the brain tells us what we have heard. All of this happens in about a second.

## AMPLIFICATION OF SOUND

Like ripples in water, as sound waves travel further from the source the energy spreads out and the sound becomes quieter. To make a sound louder, you need to collect more of the energy in the waves. There are two ways to collect, or amplify, that energy. One way is to concentrate the waves into a small space. This is how a stethoscope works. Another way is to put more energy into the waves at the source. This is how speakers and megaphones work.

## WHAT IS MUSIC?

Music is sound arranged in patterns. Most sounds are a mixture of **frequencies** (the number of waves per second). Sounds of only one frequency are called **notes**. A pattern of notes is called music. Musical notes can be arranged in a pattern called a **scale**. The most common scale in western music has eight notes and is called an **octave**. Chinese music uses a five-note **pentatonic** scale. Classical Indian music uses a 22-note scale.

### MORE MUSICAL TERMS:

**Dynamics** are the loudness and softness of music.

**Melody** is a meaningfully arranged pattern of notes and rhythms.

**Rhythm** is the pattern of long and short sounds, and stresses, in music in relation to an underlying structure of beats.

**Timbre** (pronounced tam-ber) is the unique quality of every sound-producing object. Your voice, a bird's song, and every instrument has its own unique timbre.

## FOR FURTHER REFLECTION

- Do different sounds make you feel different ways?
- Do you experience sound differently when you are creating it than when you are only listening to it?
- What kinds of instruments do you imagine might be created in 10 years? 100?

## IF YOU LIKED SOUND MAZE, YOU MIGHT WANT TO CHECK OUT

- The Paul Dresher Ensemble online  
Learn more at <http://dresherensemble.org>
- Paul Dresher and the Dresher/Davel Invented Instrument Duo at USC on March 7  
Learn more at [visionsandvoices.usc.edu](http://visionsandvoices.usc.edu)
- Experimental Musical Instruments  
Visit <http://windworld.com>
- The Virtual Museum of Music Inventions  
Learn more at <http://www.musicinventions.org>
- The Los Angeles Free Music Society  
Learn more at <http://www.lafms.com/>
- The Society for the Activation of Social Space through Art and Sound  
Learn more at <http://sassas.org/>



Hurdy Grande, photo by Mark Palmer



Percussion Table, photo by Chi Wang



Field of Flowers



Paul Dresher and the Dresher/Davel Invented Instrument Duo  
Tuesday, March 7, 2017, at 7:30 p.m., Alfred Newman Recital Hall

## DISCOVER MORE AT THE USC LIBRARIES

Music librarian **ANDREW JUSTICE** has selected the following resources to help you learn more about the artists and their installation. Except where a call number is given, the materials below are all electronic resources, which you can access through the search bar on the USC Libraries homepage at [libraries.usc.edu](http://libraries.usc.edu).

### ARTICLES

- Alburger, Mark. "Bananas at Large: A Round Table Discussion with Anthony Davis, Paul Dresher, Paul Hanson, Joan Jeanrenaud, Terry Riley, and Tracy Silverman." *21st-Century Music* 8/4 (2001): 1-2. [Accessible via Freely Accessible Journals]
- Carl, Robert. "Three Points on the Spectrum: The Music of Louis Karchin, Lois V. Vierk, and Paul Dresher." *Contemporary Music Review* 10/1 (1994): 11-31. ML5.C66 [Doheny Journals]
- Dresher, Paul. "The Paul Dresher Ensemble." *TheatreForum* 15 (1999): 68-69. [Accessible via Periodicals Archive Online]

### BOOKS

- Floyd, James. *Composers in the Classroom: A Bio-Bibliography of Composers at Conservatories, Colleges, and Universities in the United States*. Lanham: Scarecrow Press, 2011. [E-book]
- Lochhead, Judith Irene. *Postmodern Music / Postmodern Thought*. New York: Routledge, 2002. ML3800.P67 2002x [Music Library]

### RECORDINGS

- Dresher, Paul. *Cage Machine*. New Albion Records NA125, 2004. [Accessible via Naxos Music Library]
- Opposites Attract*. New World/Counter Currents 80411-2, 1991. Compact Disc 8980mus [Music Library]
- This Same Temple*. Lovely Music, 1996. [Accessible via Classical Music Library]
- Paul Dresher Ensemble. *Slow Fire*. Minmax Music MM-010, 1992. [Accessible via Naxos Music Library]

### SCORES

- Dresher, Paul. *Chromatic Quadrachord: For Violin, Clarinet, Piano, Marimba and Quadrachord* (2001). Minmax Music. M547.D747 C57 2001 [Music Library]
- A Picture Screen Stands in Solitude: For Mezzo-Soprano and Six Instruments* (2014). Minmax Music. M1613.3.D747 P54 2014 [Music Library]
- Time Passes: For String Quartet*, 2006. Minmax Music, 2013. M452.D747 T55 2006 [Music Library]
- Two Entwined: Solo Piano: 2011*. Minmax Music, 2014. M25.D747 T96 2014 [Music Library]

