

Sand Traces: Works in Sand by Jean-Pierre Hébert

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ABSTRACT

Since the late 1990's, artist Jean-Pierre Hébert has been creating miniature "Zen Gardens" in sand using a computer-controlled metal ball to make very precise lines. Besides their similarity to some historical gardens in Japan, these works are comparable to the work of some contemporary environmental artists and to certain natural processes, such as wind and erosion. The works are quite distinct from these, however, in their use of a digital hardware/software system driven by precise geometrical instructions. The use of the medium of sand and the complexity of the "drawings" create a satisfying blend of the natural and the artistic, partaking in the seven characteristics of Zen aesthetics.

Extending the Line

Artist Jean-Pierre Hébert has been extending the notion of line drawings since the 1960's. Initial sources of inspiration include prehistoric drawings such as those in the caves at Lascaux, drawings on Greek vases, Song Sumi drawings (Fan K'uan), Renaissance drawings (Dürer, Michelangelo, Tiepolo, Canaletto), Baroque drawings (Lorrain, Robert, Fragonard, Ingres, Goya), and modern and contemporary drawings (Michaux, Wols, Morellet, Pollock, Kandinsky, Bill, El Hanani, Kline, Marden, Chillida, Motherwell). Departing from the notion of an artist's hand making marks on paper with a pencil, Hébert's innovation has been to replace the paper with other media, to replace the pencil with other mark-making devices, and to replace the human hand with a computer-controlled digital apparatus. Most of his drawings are on paper, but he has also made drawings on films, glass, steel, copper plates, linoleum, wood, sand, and even on air and water.

I have been working with the conviction that to gain power and beauty, drawing should become a pure mental activity, rather than a mere gestural skill. I have endeavored to make it so by banning the physical side of drawing. I create drawings by composing and writing down for each piece an original, defining code. This code will precisely guide the devices actually producing on paper the physical proof of concept with pens, leads or brushes. The self-emergence of the drawing on the paper resulting from the mental vision is always a magically rewarding and

fascinating performance, when one can be both witness and creator, or Henri-Georges Clouzot and Pablo Picasso at the same time.[1] My process is thus very much akin to composing or choreographing, or simply...thinking.[2]

In order to become both “witness and creator” of his drawings, Hébert began working with computers as an integral part of his art. Rather than drawing lines himself (“mere gestural skill”), he creates a formula for the line and tells the computer to draw it. His “digital conceptual algorithmic” drawing, as he calls it, began in 1974 with a Hewlett Packard 9830 model computer. In 1978, he acquired his first plotter and began to produce a series of small ink works on paper. From 1987, the works grew in size. In April 1989, a first gallery show of his work was organized by curator Pierre Chave at the Galerie Alphonse Chave. He was then working independently and only later that year discovered the SIGGRAPH digital art community. He submitted work in time to participate in the SIGGRAPH art gallery show the same year— the first of seventeen to date.

Origins and Context of the Sand Traces

Using sand as a medium, then, was an extension of the artist’s experiments with materials for drawing lines. Just as algorithmically controlled lines could be made in ink by a plotter arm, a similar device could be used to draw a metal ball magnetically along the surface of a sand tray. The first of these devices, called Sisyphus I, was three feet square with a foot-high maple enclosure. This was followed by Sisyphus II, a six-foot octagonal canvas table with a frame of cedar. These sand trays were followed by Ulysses I, a four-foot table, and Ulysses II, a smaller version. Hébert has continued to use and modify Ulysses I through this writing in 2007. He plans to make a larger table soon, capable of using two metal balls at the same time for a series of more complex duocentric works.

Although he does not indicate the specific inspiration for the invention of the sand tray table, Hébert locates his resulting works in a larger tradition that includes both natural processes and works by other artists. Among natural processes, he notes effects of wind, gravity and water in natural erosion patterns, as well as animal tracks in sand, particularly of the desert-dwelling Sidewinder rattlesnake. Among art traditions, he notes the sand paintings of the Navajo, the Tibetan mandalas, the painted gyanamani stones, and traditional Japanese Zen Gardens.

Zen gardens, called karesansui (“bare stones and sand”[3]) originated in Japan in 612, according to François Berthier, and form a continuous tradition through the 1960 construction of the Gyokudō Museum garden at Ōme.[4] Perhaps the most famous of the karesansui is found at the Zen temple Ryōanji. The garden has no trees or other plant life besides moss that grows on the 15 irregularly-shaped rocks placed there in 10 by 30 meter bed of sand. The sand is raked everyday “in

patterns that suggest rippling water”.[5]

The sand traces differ from environmental art pieces in that they are indoor miniatures made by a computer-controlled device. Nonetheless, Hébert finds kinship with a wide range of “environmental artists”, citing as influential works by Andrea Di Castro (“Artwork with Global Technologies”), Carl Cheng, Richard Fleischner, Ned Kahn (“Rift Zone”), Andy Goldsworthy, Richard Long (“Vaeltava ympyrä”, 1988), Michael Heizer (Rift, 1968) and others. He also cites the conceptual work by Isamu Noguchi (“Sculpture to be seen from Mars”, 1947)— a face looking skyward with a nose a mile long. Cheng’s “Walk on LA” (1988) is a cast concrete and steel roller that, when pulled across the sand, leaves patterns. Goldsworthy’s “Fine Dry Sand” (1989) is a series of parallel curving swales that look like wind erosion naturally occurring in dunes. The work possibly most similar to Hébert’s sand tracing is the Circulograph from 1983 by Osmo Valtonen. It consists of a metal tray filled with sand and a metal arm suspended over the surface that moves a “finger” through the sand in circular patterns.

The attraction of using sand as a medium may inhere in properties of the sand itself. This perspective was the topic of a 1997 paper by Nitin Sawhney and Chris Dodge of the MIT Media Lab. The authors constructed a device that used compressed air to blow small conical divots in a sand surface.

Sand is not temporally bound since it retains its shape and form continuously, acting as a reservoir of inscribed actions or digital bits, over time. ... temporal patterns gradually emerge due to the persistence of sand, as current forces either reinforce or destroy the results of earlier forces. The surface of sand thus permits a four-dimensional display of information over space and time. The resulting sandscape is a temporal sculpture that encodes dynamic data through its shape, form, and texture.[6]

Sawhney and Dodge’s comparison of sand to “digital bits” points up another interesting quality: patterns made in sand may have a high resolution, due to the smallness and relative uniformity of the grains. As we shall see, sand has a number of other qualities that make it an excellent medium for drawing lines.

Gardens of Sand: Images of the Sand Traces

All art has a “moment of truth”, when words about it no longer suffice and the work must be experienced. In the case of visual art, that moment comes when an audience sees the work, because it must be seen to be believed. Two worlds come together for the first time: the aesthetic world of the artist meets the aesthetic world of the observer. At this moment the work, up to this point a kind of *in fetu* daemon, is born. The European graphics show Imagina 2000 said of the sand traces:

“Picture a sand garden in the spirit of the Zen gardens of Japan. A digital system conducive to meditation, peace and serenity: where beauty and nature stroll hand in hand through the rhythm of human existence...”[Z]

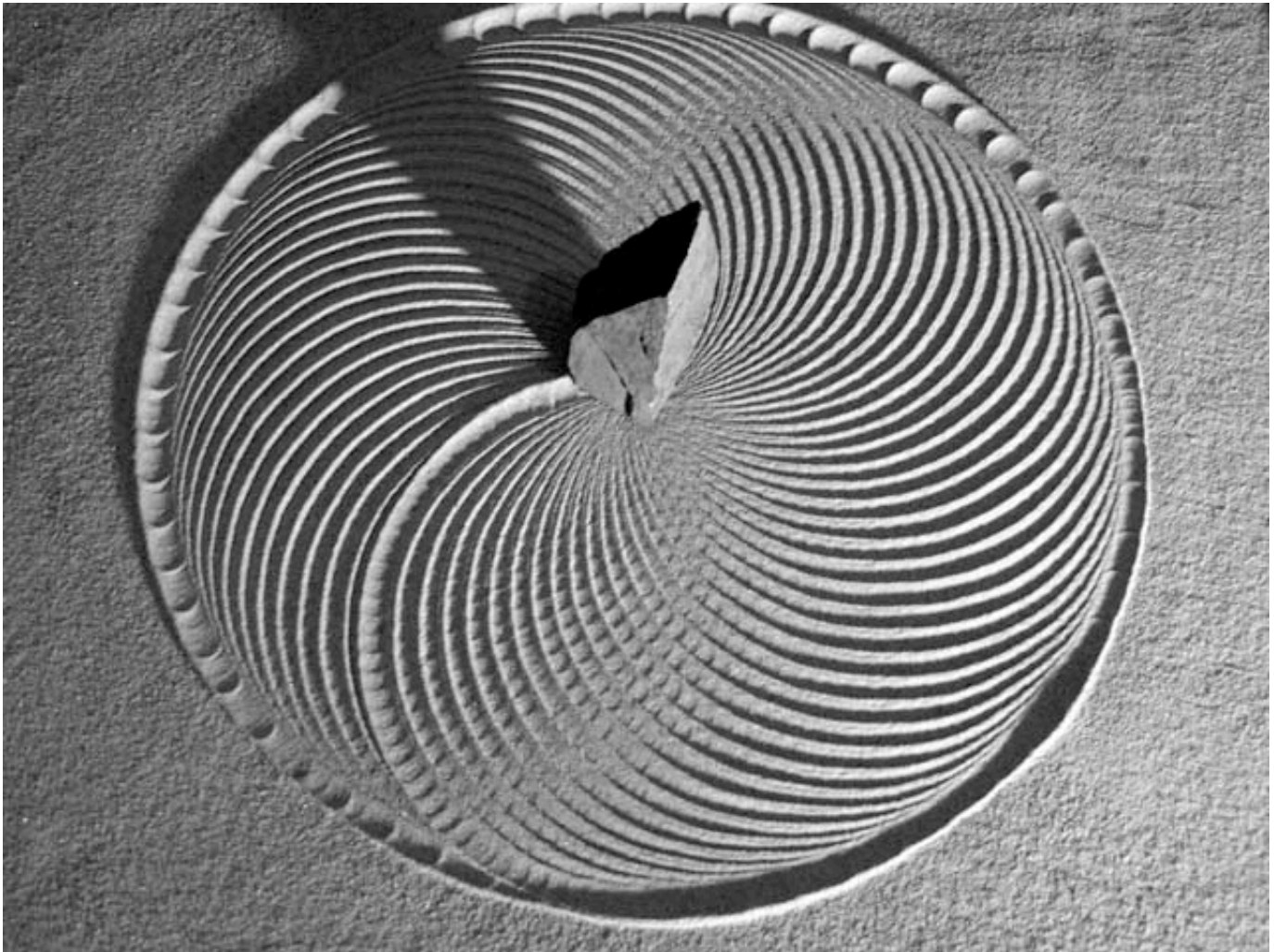


Fig 1: Full Circle With Stone

On first seeing “Full Circle with Stone”, the connection with the Zen Gardens is immediate— though it is difficult to imagine what Zen monk would have both patience and skill needed to rake the semi-circular crescent patterns in the sand. This is perhaps the “beauty and power” the artist spoke of in moving drawing from “mere gestural activity” to “pure mental activity”. Order, serenity, the extraordinary play of light and shadow are there. The almost-horizontal shadow of the rock and the sand surface seeming to go beyond the picture frame suggest twilight on the moon— though astronauts might have difficulty explaining the origin of those circular marks.

This image also illustrates two other very interesting features of the sand traces.

First, it is obvious that, unlike most other forms of drawing, the sand traces always consist of a single line. This is like the exercise of completing a whole drawing without ever lifting the pencil off the paper. Clearly, the last line in the drawing is the semi-circular arc leading from the bottom to the rock at center. There, it can be seen that the arc is drawn with the full rounded bottom of the metal ball. Why is this invisible in all the other arcs? The answer leads into the second artifact of the traces: as the ball moves through the sand, it pushes sand forward and to both sides, making forward and precessional “waves”. [Z] If two lines are close enough, as are consecutive arcs, some of the precessional (sideways) waves of sand partially cover the adjacent line. Rather than being an impediment, Hébert uses this artifact to make each arc more slender and crescent-shaped. Each of the marks around the perimeter circle is due to the ball stopping, depositing the forward wave of sand and reversing its direction. The effect again makes the overall design more complex and beautiful.



Fig 2: Hsuan-Tsang's Route

The title of “Hsuan-Tsang’s Route” refers, whimsically, to the path taken by the famous Chinese pilgrim and Buddhist translator, who lived from A.D. 600-664. Although the artist may not have intended the meaning, the path of our own lives might look as comical if it were traced upon the sand. I’m reminded of the trails visible in the morning on the beach made at night by little sand bugs. Though there is always symmetry in the curved path of the ball, the line of “Hsuan-Tsang’s Route” is more asymmetrical than most of the other sand traces. Yet it is quite strikingly beautiful, like the filigree on an Arabic scroll.



Fig 3: Metagonal Sand

“Metagonal Sand” introduces a shape invented by the artist and often used in his works on paper. A recent show of Hébert’s at the Kavli Institute of Theoretical Physics, where he is artist in residence, was entitled “One Hundred Views of a Metagon”. It is quite extraordinary how many designs of widely varying complexity he has produced beginning from relatively simple geometric concept. A metagon is a spiral figure that often begins with two sides of an equilateral triangle, then,

before the shape closes, becomes a square for three sides, then a pentagon for four sides, and so on. “Metagonal Sand” begins with a seven-sided figure, with scalloped sides and spirals out into ever-one-more-sided figures. This image shows how sand, besides reproducing lines faithfully, exhibits such extraordinary colors in different kinds of light. The ball that produces the traces in sand looks here like the moon, grown small and rolling around the surface of Mars.

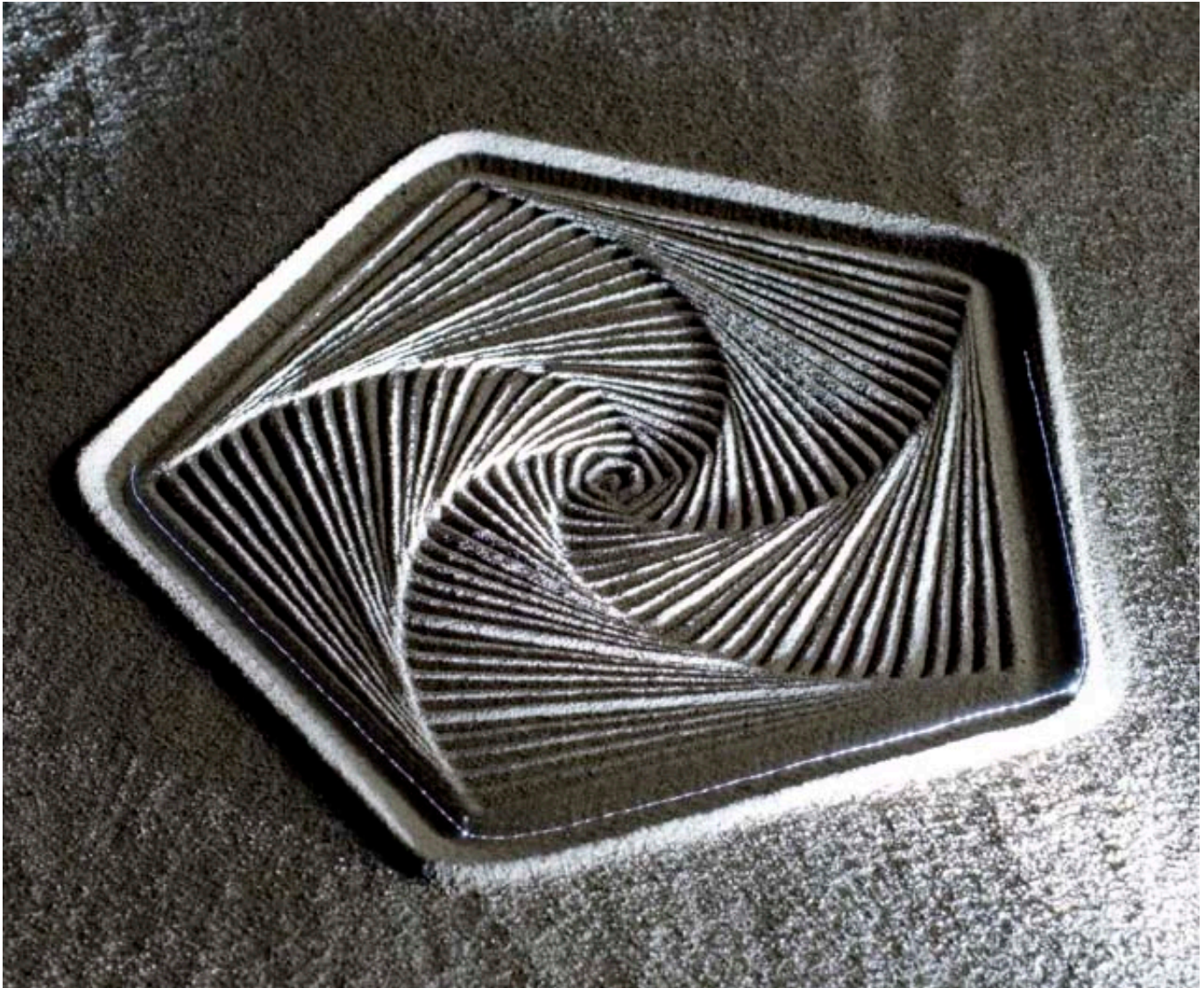


Fig 4: Pentagonal With Light Trace

As the name suggests, “Pentagonal With Light Trace” is a pentagonal figure that is rotated and enlarged with each iteration to produce a spiral. What is most extraordinary to me in this figure is the startling appearance of five spiral arms, like the arms of a galaxy, originating in the center and extending to the perimeter. These are what you might call a “secondary effect”, like moiré—the secondary

pattern that appears when, for example, two pieces of diaphanous fabric are viewed one in front of the other. In this case, the secondary effect is the result of the wave pattern of the sand, noted above, meeting where adjacent pentagonal vertexes come together. This effect gives the overall pattern the illusion of a shallow concave conical shape, with the vortex at the center.



Fig 5: Pentagonal With Light Beam

“Pentagonal With Light Beam” is a the same spiral pentagon as the previous image, except larger, in daylight, with a slant beam of light and the metal ball at center. The pentagonal perimeter is outside the picture frame. It might seem that the spiral arms would partially disappear in brighter light, but this image shows that the spiraliform secondary effect has become more powerful in the mind’s eye than the pentagonal trace. The spirals can be seen here to be made because sand is humped up from the precessional sand wave at adjacent vertexes, and these vertex humps are linked in the mind’s eye into a spiraliform. Under direct natural light, like the noonday sun, this image also shows the exquisite beauty of the sand itself, made more beautiful by the complex order of the shape. Looking carefully at the sand, it is possible to detect tiny rainbows made by the prismatic action of the

silica. The horizontal light beam makes the appearance of two suns in the sky.

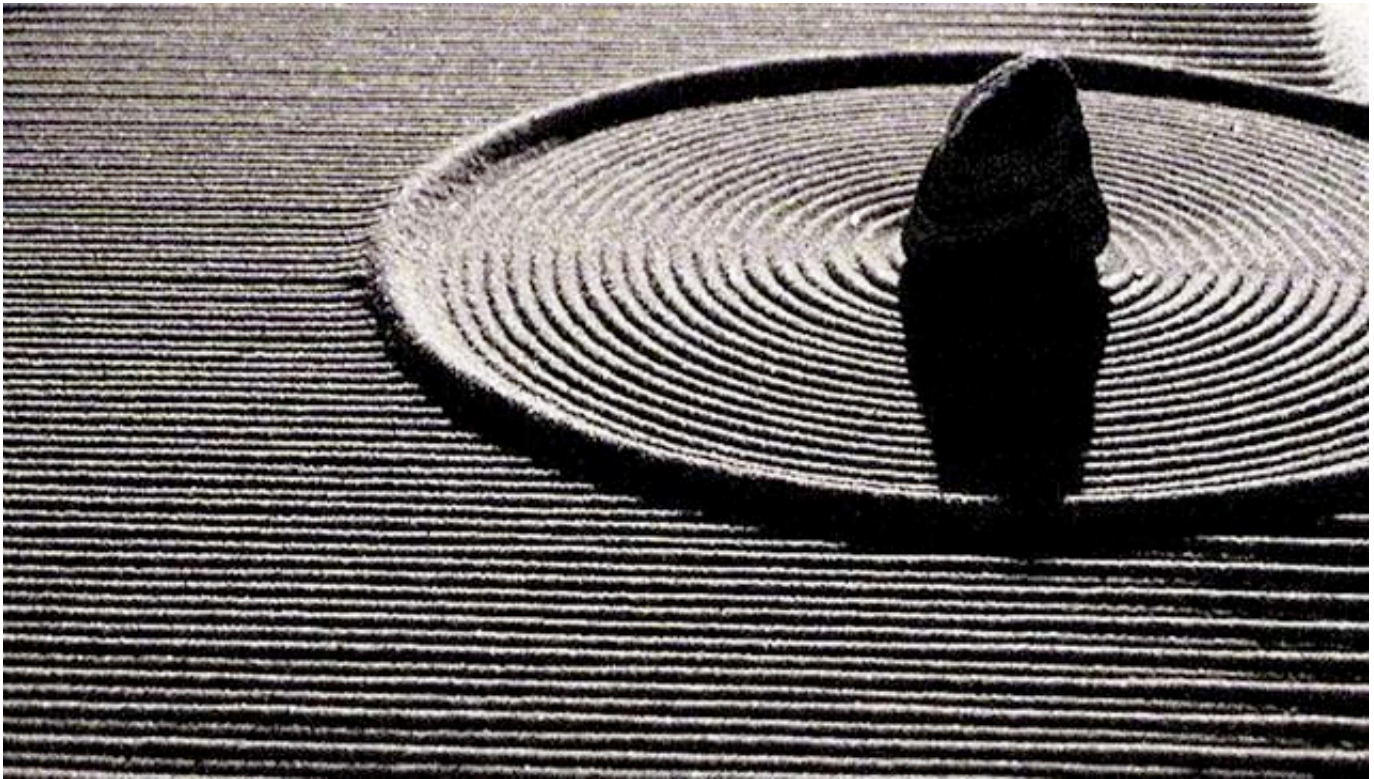


Fig 6: Sound of Stone / Silence de Pierre

“Sound of Stone / Silence de Pierre” is a simple spiral, made in circles with ever-increasing radii on a plain of straight parallel rows. The title reveals a pun between the artist’s two languages— pierre means “stone” in French and is, of course, also the artist’s first name. The title also sets up the contrast of the Sound/Silence polarity. Because the image is in twilight, the contrast between light and dark is maximized: successive peaks and valleys of the sand waves are lit and enshadowed. Both light and sound are forms of waves, one propagated in a medium, one in a vacuum. Sand is the medium of the wave propagation here and the medium that sets up the alternations of light and darkness. As Alan Watts points out, no sound is possible without silence, or vice-versa, and all of reality (both perceived and imperceptible) expresses itself in vibrational waves that are high/low or positive/negative polarities of presence/absence.[9]

Conclusion

In our moment of truth with these works, if we allow the sand traces to enter our awareness— whether through finished images, or by watching Ulysses draw the trace in real time, or both— we perceive all seven of the characteristics of Zen

aesthetics:

- Simplicity
- Subtle Profundity
- Naturalness
- Tranquility
- Freedom from Attachment
- Austere Sublimity or Lofty Dryness
- Asymmetry

So we return whence we started: the Zen Garden, a source inspiring artist Jean-Pierre Hébert, and, through his sand traces, a source to inspire us as well.

Notes and References

1. A reference to the film of Henri-Georges Clouzot, *Le Mystère Picasso*, 1955 in which Picasso draws and paints on glass as Clouzot films the process from the reverse side through the transparency.
2. Jean-Pierre Hébert, *Artist's Statement*
<http://hebert.kitp.ucsb.edu/docs/statement%20060301.pdf>, 2006
3. *Kare* means "Trees shedding their leaves", indicating bareness; *san* means "the mountains", or rocks; *sui* means "the water", or by association, the sand beach. See Hébert, 2001 at <http://hebert.kitp.ucsb.edu/sand/tradition.html>.
4. Berthier, Francois, *Les jardins japonais : principes d'aménagement et évolution historique*. 2000
5. Wikipedia, http://en.wikipedia.org/wiki/Zen_garden. 6. Chris Dodge and Nitin Sawhney, *Evolving Sandscapes: Emergent Traces of Being through Digital Spaces and Tangible Elements*, 1998
7. Quoted from Imagina 2000: "Un jardin de sable animé dans l'esprit des jardins zen du Japon. Enfin un système digital qui encourage la méditation, dans une ambiance calme et sereine: beauté et nature dans un rythme humain..." Translated by the artist.
8. It is important to note that the sand waves are literally waves of sand made by the ball in exactly the same fashion that a boat makes a wake as it plows through the water.
9. Alan Watts, *Out of Your Mind: the Nature of Consciousness*, series of recordings made in late 1960's.