

# PASKIAN PIECES

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## 1 Introduction

The significance of Gordon Pask's work, which has generally been overlooked by a computationally conditioned scientific community, is only now becoming more widely appreciated through the work of a small number of researchers<sup>1</sup>. Pask demonstrated a number of electrochemical systems that were able to construct their own sensors and thereby determine the relations between their own states and the environment. One significance of Pask's electrochemical devices is that their form and function is not pre-specified or imposed by a designer; rather, the devices autonomously grow 'components' from an undifferentiated chemical medium using the energy input into as a consequence of the controlled input of energy by an experimenter who rewards certain interactions with the environment. These devices can be described as 'epistemically autonomous'<sup>2</sup> when they determine the nature of their relation to the world, rather than a programmer or designer.

My interest in Pask has developed through an ongoing collaboration with artificial life researcher Jon Bird from the University of Sussex. Although the replication of Pask's electrochemical experiments is central to our collaboration, the influence of Pask has stretched across several projects such as *Tabula Rasa*, 2002, an evolutionary curation system, and *Drive*, 2003, an interactive installation.

We have three aims in attempting to replicate Pask's electrochemical experiments:

1. we want to verify his findings - something which still hasn't been done in the sixty years since the experiments were first carried out;
2. we want to use these systems to investigate the question - 'how can form and function emerge without being pre-specified or externally imposed?';

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<sup>1</sup>Peter Cariani's research has perhaps been the most significant in raising the profile of Gordon Pask's work to a wider audience in the last twenty years - see his paper in this Maverick Machine Exhibition series. Also see the paper by Usman Haque for an overview of a range of current research projects that are directly inspired by Pask's work.

<sup>2</sup>To use a Peter Cariani term, see his paper accompanying this exhibition and: P. Cariani, "Epistemic Autonomy through Adaptive Sensing", in *Proceedings of the 1998 IEEE ISIC/CRA/ISAS Joint Conference, Gaithersburg, MD, September 14-16, 1998*, pp. 718-723.

3. we want to explore the potential of using electrochemical devices as real-time generative artworks that are directly linked and responsive to their environment and whose form is shaped by the history of these environmental interactions.

Pask did not leave detailed descriptions of his original electrochemical experiments, meaning that in order to replicate his results we have to adopt something of his unorthodox and maverick approach in our own practice. Collaborating with others working in very different fields is one effective strategy for achieving this as it forces one to engage with novel ideas, some of which may appear unorthodox from the perspective of one's own discipline. Another key 'maverick' strategy in my artistic practice is to respond to, re-imagine and reconfigure other artists' work. I describe some recent examples of this approach in the following sections, specifically projects where I have explored the potential of electrochemistry as a medium for artworks.

## 2 Tuning Pask's Ear, 2002

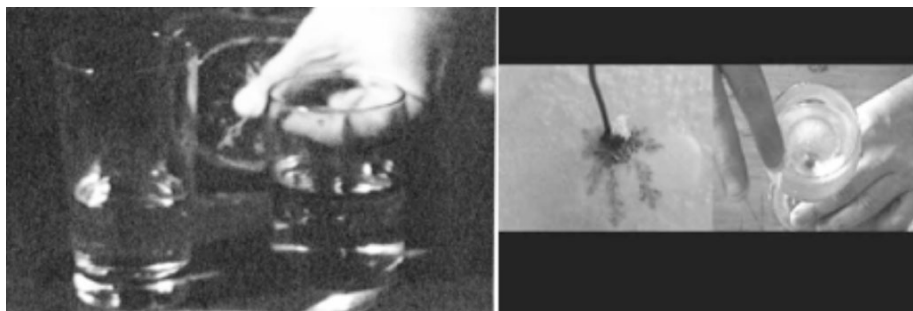


Figure 1: Left - *Four Minutes of Trying to Tune Two Glasses (for Phil Glass Sextet)*, John Baldessari, 1976 Right - *Tuning Pask's Ear*, Andy Webster and Jon Bird, 2002

*Tuning Pask's Ear* (Figure 1, right), 2002, represents an initial exploration of the relations one might have with Pask's electrochemical devices. What I found intriguing was imagining what one might be able to do with a system capable of responding in real-time to environmental input, or even more thought provoking, what it might do to you! The notion that the system might respond to user input and then, potentially, determine new relations by adapting and changing formed the starting point for the work.

I was particularly interested by the electrochemical device's capacity to respond to and be steered by sonic input. Stafford Beer's description of the initial, improvised experiment where early one morning he held a microphone out of a window onto Baker Street to get input for the system while Pask observed the growth of an ear, inspired me to develop new work that explores the artistic potential of driving electrochemical systems with sound.

There is the risk of viewing electrochemical systems as some sort of circus act <sup>3</sup>. I therefore feel that it is necessary to focus on an electrochemical device's potential to behave *autonomously*: to have its own voice, its own say in the generation of form, its own way of feeding back into an artwork. In general, my motivation for using electrochemical systems is to diminish human agency and elevate the system's voice.

John Baldessari's *Four Minutes of Trying to Tune Two Glasses (for Phil Glass sextet)* (Figure 1, left), 1976, became the catalyst for the video work *Tuning Pask's Ear*. Working against the clock, Baldessari plays upon the absurdity and contingency of making melodic sounds whilst trying to tune two glasses of water. Re-imagining Baldessari's piece, *Tuning Pask's Ear* similarly shows a contingent and absurd attempt to tune a glass of water, but in real-time to a variable tone generated by an electrochemical device - Pask's Ear.

In *Tuning Pask's Ear*, the tone generated from tuning a glass of water acts as sonic input into the electrochemical device, resulting in the growth of metallic threads. The consistently changing and evolving thread growth is converted into a tone which is then amplified to act as output to steer the glass tuner. As the tuner attempts to tune the glass to the existing tone, the sounds generated changes the state of the electrochemical device, leading to new thread growth which in turn alters the tone emitted. Continuing attempts to tune the glass flounder in an absurd and futile feedback loop.

The work was made as a maquette to consider the potential of using electrochemical devices as real-time artworks that are directly linked and responsive to their environment, and whose form is shaped by the history of those environmental interactions. In particular, the video explores the capacity of such systems to have their own voice, their own say in the emergence of form. The impossibility of the task attempted by the tuner, I hope, works to counter the view that matter is inert and awaits the imposition of form. On the contrary, matter has a voice, it leads the way, and it chooses the tune to dance to.

### 3 From Splashing to Solar Stacking

*Solar Hedge (Stacking)* (Figure 3) is one piece from a series of electrochemical works made throughout 2006. The context for these works is an ongoing practice-lead research project whose aim is to develop a model of arts practice that has the potential to contribute new insights into the relationship between art and ecology.

The impetus for the solar hedges emerged from various concerns:

1. as a response to artworks made by Richard Serra which he generated by selecting from a list of transitive verbs (Figure 2);

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<sup>3</sup>This is a clear problem in much of my later work using electrochemistry where the input, be it audio or solar energy, leads to the generation of metallic threads but these do not do anything except work as a physical, residual trace of the interactions between system and input. One is definitely left with a feeling of 'so what'?



Figure 2: *Verb-list*, Richard Serra, 1969

2. through discussions with Jon Bird about the potential of using electrochemical systems as real-time artworks;
3. and reading Manuel DeLanda's writings about self-organisation and machinic thinking<sup>4</sup>.

In Richard Serra's *Verb-list* (Figure 2), 1969, initial parameters for a work are set up though the choice of a verb. The verbs prompt actions to be performed but also constrain activity by specifying the particular nature of the act. The selection of a material to work with, and its associated properties, forms another set of constraints. The inherent tendencies of a material and the specificity of the verb to be performed become the twin determinants of a way of proceeding and behaving.

In Serra's *Splashing* (Figure 4), 1969, the work emerges as a consequence of responding to the verb 'to splash', and through the artist's interaction with the inherent qualities of molten lead.

In *Splashing* the materials themselves have a say in the resulting, emergent form. Serra does not impose form on the material but responds to and collaborates with its immanent qualities<sup>5</sup>.

<sup>4</sup>For example, M. DeLanda, *Intensive Science and Virtual Philosophy*, Continuum International Publishing Group: New York, 2002.

<sup>5</sup>It is arguable that it is impossible to impose form on fluid matter. But in the later works where Serra uses gutters to catch and shape the pourings, there is a definite sense of imposing form.



Figure 3: *Solar Hedge (Stacking)*, Andy Webster, 2006

*Splashing* is the clearest example in Serra's practice of the unfolding of a work through a constant dialogue with the inherent tendencies of a material, rather than as the result of imposing a pre-thought sculptural idea. The work is slight and contingent and perhaps one of Serra's least overtly sculptural pieces. In contrast almost every other Serra work feels over-determinately sculptural and less sympathetic to the nature of the materials being used<sup>6</sup>.

In *Skullcracker* (Figure 5), 1969, Serra stacked lengths of steel until the point of collapse. Through this process Serra seems to be exploring the weight bearing, immanent tendencies of steel rods, as well as their sheer physicality. There is a strong sense of Serra exploring the material qualities of steel; in fact, there appears to be no other objective as the material has not been moulded, forged or fused together to make a predetermined form.

Whereas in *Splashing* there is a strong sense that the fluid material could have found its own form, in *Skullcracker*, the particular configuration of the materials appears wholly reliant on human agency. There is no sense that the

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<sup>6</sup>Although in other works materials do yield an influence on the work, the underlying trait (to varying degrees) is that a sculptural logic dictates, and is over applied, denying the richness and relations found in *Splashing*. There is a sense that the materials used are considered as inert matter, that is, as stuff that things can be done with and done to. This critique of Serra is from the perspective of an admirer of his work. In a broader artistic context, there are far more obvious and extreme examples of form being imposed on a supposedly inert matter.

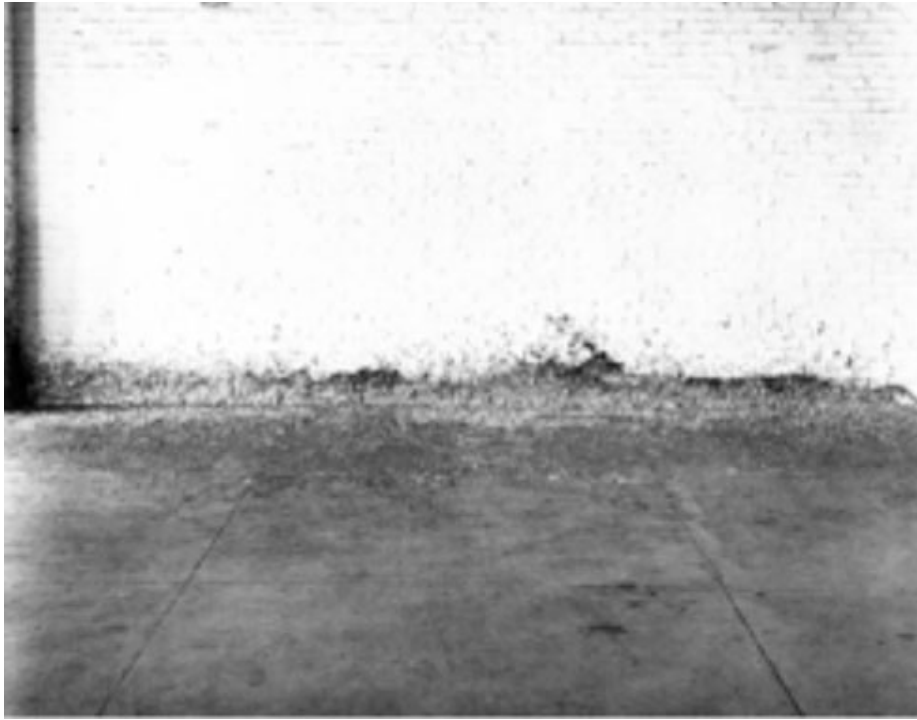


Figure 4: *Splashing*, Richard Serra, 1969

work could have arrived at this outcome without the human hand: the materials appear to have had little say in the final configuration.

This contrast formed the starting point for *Solar hedge*, (*Stacking*). My aim was to reconfigure Serra's *Skullcracker* by adopting the instinctive, intuitive relations with materials found in *Splashing*. Re-imagining Serra in this way foregrounds the inherent capacity of materials to have a say in the form of the work, and gives materials independence from human agency. I sensed that by reconfiguring the existing work, a different and potentially more productive configuration could emerge<sup>7</sup>.

Electrochemistry provides a medium with the potential for reconfiguring Serra, allowing the material some autonomy and enabling the exploration of the physical and temporal interactions of an artwork and its environmental context.

A simplistic understanding of the processes underlying the emergence of metal deposits in electrochemical systems gave impetus to the new work. When

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<sup>7</sup>In the context of my research the reconfiguring of existing artworks, artefacts, and activities has become an important strategy. In this piece, the aim was give the materials a dominant voice in the work in order to critique the notion that matter is inert and awaiting the imposition of form. More generally, the motivation for reconfiguring existing work is to use them as a foil against which a new piece can be compared, thereby hopefully providing some critical purchase.



Figure 5: *Skullcracker*, Richard Serra, 1969

an electrical current passes between two electrodes submerged in a copper sulphate solution, a deposit of copper forms at the base of one electrode. The stacking of each particle is analogous to the process that Serra enacted in *Skullcracker*, although they do not stack one at a time and there is no particular order. Furthermore, unlike Serra's piece where human agency causes the stacking to occur, in the new work it is solar energy, fed into the electrochemical system over a twenty-four hour period, that causes the autonomous stacking of copper particles and the subsequent emergence of hedge-like forms.

Although a key aim of *Solar Hedge (Stacking)* was to reconfigure Serra's work by giving the materials more autonomy to generate their final form, the final thread structures are static and the work does not fully utilise the potential of using real-time, self-organising media. *Thread system - Generated by the Sound of its Own Generation* (Figure 6), 2007, is a response to this critique. The aim of this work is to reconfigure Robert Morris's *Box with Sound of its Own Making* as an open, autonomous system. For his work, Morris recorded the sound of making a wooden box. When he exhibited this box, he placed a tape player inside it to playback a recording of the three hour construction. Morris's artwork can be instantly grasped, even if it is not seen or heard. The title alone is an effective conceptual hook for the work, akin to Weiner's statement works. *Thread System* substitutes a real-time unfolding of the work for the tape recording. Sound from the generation of metallic threads is captured using a hydrophone, and then

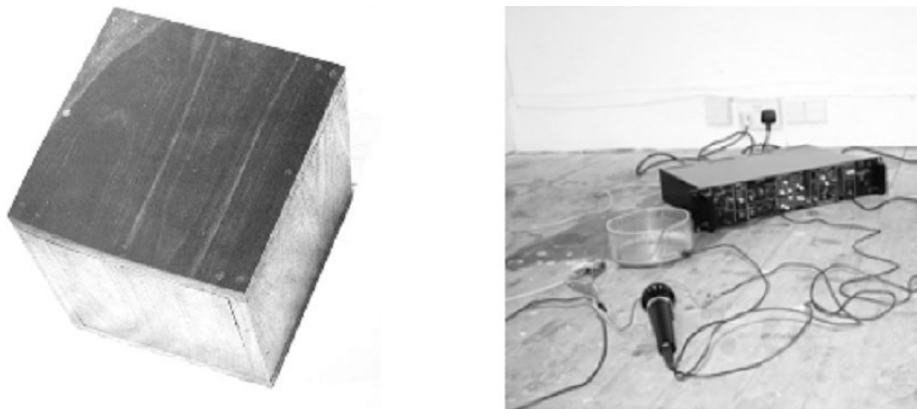


Figure 6: Left - *Box with Sound of its Own Making*, Robert Morris, 1961 Right - *Thread System - Generated by the Sound of its Own Generation*, Andy Webster, 2007

amplified and used as the electrical input for the electrochemical system. The piece operates through a very simple self-generating positive feedback loop.

## 4 Where's the Art?

For Serra, the unfolding actions performed with and on a material become the subject and meaning of the work. To access the work one perceives and re-imagines the sets of processes and acts that have occurred between artist and material. One becomes aware of the relations between human agency and the immanent tendencies of the material, and the degree of dialogue between them<sup>8</sup>.

On encountering *Solar Hedge (Stacking)*, one is required to similarly perceive and re-imagine the unfolding sets of processes, events and energies that have resulted in the final form. However, in this work one becomes aware that form has *not* been predetermined, specified or imposed by a designer. One is no longer perceiving and re-imagining the behaviours of the artist/maker but is instead made aware that form has emerged autonomously through the interaction of the immanent tendencies of materials and energies.

Through encountering the work there is the potential for one to develop a comprehension of the capacity of materials to generate their own form through interactions with the environment. Hopefully, such work may assist in a shift away from the view that matter is inert and awaiting the imposition of form to an acknowledgement that all materials inherently possess rich morphogenetic capacities.

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<sup>8</sup>Context is all here as in the late sixties Serra wanted 'the hand', that is, human agency, to re-emerge in the artwork.