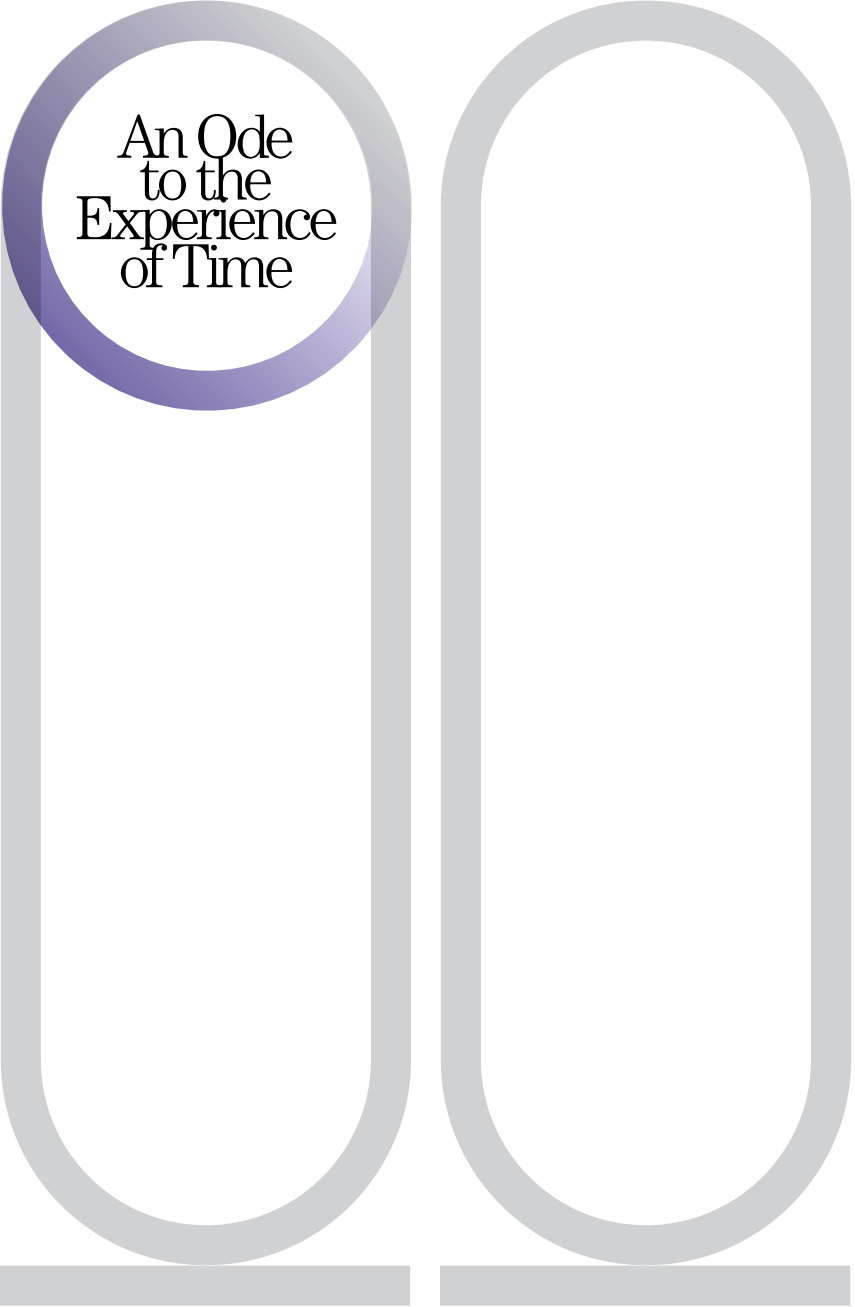




An Ode to the Experience of Time

This book is an accompaniment to Sonic Acts XIV, a four-day festival of concerts, performances, lectures, presentations and exhibitions, taking place from 23–26 February 2012 in Amsterdam. *Travelling Time* explores a number of radical ideas relating to time. We usually conceive of time as something that passes, with the future being in front us, the past behind us, and the clock as a device for measuring time. But is there an absolute time, or is time always relative to motion? Relativity theorists and quantum mechanics have tinkered with the concept of time since the beginning of the previous century. And in September 2011 the global press announced that scientists had apparently made a neutrino travel faster than light – a revolutionary breakthrough. In July that same year it had already been reported that scientist had discovered a way to conceal events in time by creating an information gap in a beam of light. What do we know about time? Time is a highly complex and ambiguous concept that refuses simple conceptualisations. Yet we also have an intimate knowledge of time – as becomes clear in music making.

Travelling Time is based on the idea that music and the other arts enable us to investigate the nature of time and make the concept of time tangible. The arts are instruments that can change, manipulate, or intensify our experience of time. *Travelling Time* starts with the premise that ongoing technological developments constantly challenge, change and undermine our perception of time. Consider, for example, the fact that communication networks operate at light speed, or that computers process data in real time without human mediation. This has lead to mind-boggling financial shenanigans, and the idea that our society is increasingly ruled by algorithms that know no time. Rapid advances in technology have created a growing gap between ‘machine time’ and ‘human time’. As George Dyson notes in his book *Turing’s Cathedral*: ‘Time in the digital universe and time in our universe are governed by entirely different clocks. In our universe, time is a continuum. In a digital universe, time is a countable number of discrete, sequential steps.’

Travelling Time is a quest to reveal some of the significance and the intricacies of time and how we experience it. We can only scratch the surface by presenting a few perspectives on the experience of time,

and on the Deep Time of culture from a limited number of fields – notably contemporary music, and the history of technology. What these suggest is that our concepts and encounters with time are difficult to put in words, but we intuit a lot about time in non-verbal ways. This book is, in that sense, a homage to the human experience of time. One half of this anthology consists of articles dealing with conceptions and imaginings of time in the fields of technology, culture and literature. The other half consists of interviews with composers and performing musicians.

A short – but richly illustrated – excerpt from George Dyson’s forthcoming study of the origins of the digital universe, *Turing’s Cathedral* opens this anthology.

Siegfried Zielinski probes the Deep Time of media in his ‘Minimal Encyclopaedia of Sound Apparatuses and Automata’. This account, which features Athanasius Kircher and Arabic inventors like Ibn al-Razzaz al-Jazari, can also be read as an assessment of the long and deep history of generative music.

This theme returns in the essay by Thomas Patteson about the composer Roland Kayn and his ideas relating to cybernetic music.

Usually the history of technology is seen as a progression of inventions, each one newer than its predecessor. David Edgerton – author of *The Shock of the Old* (2006) – argues in his essay that the history of technology should be seen in more complex ways.

Hillel Schwartz’s essay is an exploration of noise and time in the twentieth century: ‘When sounds run out of time, they end up as noise’.

In his long essay on *James Joyce’s Ulysses*, Enda Duffy shows how this novel conveys a shift in a view of life in which notions of electricity and energy become central, and change the human relationship to lived time. According to Duffy, Joyce’s work is a thorough analysis of the effects of the new technological era, presenting an aesthetics of adrenaline and the modernist regime of time.

An excerpt from a longer essay by Timothy Druckrey elaborates on how new technologies of the moving image have imposed new time regimes.

Time travel used to be one of the mainstays of science fiction. The essay by Omar Muñoz-Cremers treats the history and intricacies of this topic, how it became popular,

and why its popularity declined. We have added to it a short excerpt from Alfred Jarry’s instructions on how to build a time machine. The literary imagination of time travel is further illustrated by an index to time in Thomas Pynchon’s *Against the Day* (2006) which is scattered throughout the book.

The interviews and conversations with musicians and composers are grouped in the middle, they are embraced by the essays, and form the heart of the book. There are interviews with: Joel Ryan, Mark Fell, Pauline Oliveros, Catherine Christer Hennix (& Bill Dietz), Robin Hayward, Hilary Jeffery, Keith Fullerton Whitman, and Gilles Aubry. They have an intimate knowledge of working with time, and though the interviews treat many subjects, they do touch on time, time after time – sometimes implicitly, sometimes explicitly. Together these eight interviews also present an intriguing, critical and exciting overview of contemporary music, with many detailed insights into the aesthetic positions of these boundary-breaking musicians and composers.

In making a book like this – working with texts from different backgrounds and with different approaches – it is always a pleasure to see how it comes together in the end: not as a rounded whole, but as a complex mix with unforeseen cross-references as well as many gaps to be filled by future research. That there would be many connections between the interviews was to be expected, as most interviews were conducted in the period leading up to the festival. The hidden affinities between the interviews and the articles were something we hoped for, but sometimes they came as a surprise. Part of the joy of reading this book lies in finding those relations, being inspired and acquiring knowledge for subsequent explorations of trajectories not followed here but alluded to: open roads to a future, to new imaginings (or old imaginings made new) of experiencing time – through art, music, sound, image...

Sonic Acts / Arie Altena

Reading Through *Against the Day*

Arie Altena

It was the connection between mathematics and time that led me back to Thomas Pynchon. Googling the subject of time I was repeatedly referred to the theory of quantum gravity, but the search engine also kept displaying links to the nineteenth-century Irish mathematician Sir William Rowan Hamilton (1805–65), especially his paper 'Algebra Considered as the Science of Pure Time', or, more correctly 'Theory of Conjugate Functions, or Algebraic Couples; with a Preliminary and Elementary Essay on Algebra as the Science of Pure Time'.¹

Sir William Rowan Hamilton is the inventor of quaternions. It's a famous anecdote from the history of mathematics:

Hamilton was looking for ways of extending complex numbers (which can be viewed as points on a 2-dimensional plane) to higher spatial dimensions. He failed to find a useful 3-dimensional system, but in working with four dimensions he created quaternions. According to Hamilton, on 16 October 1843 he was out walking along the Royal Canal in Dublin with his wife when the solution in the form of the equation $i^2 = j^2 = k^2 = ijk = -1$ suddenly occurred to him; Hamilton promptly carved this equation using his penknife into the side of the nearby Broom Bridge, for fear he would forget it.²

Quaternions – I knew the term from Thomas Pynchon's novel *Against the Day* (2006), which is also where I had previously read about Hamilton. Among the many subjects *Against the Day* (2006) deals with are the developments in mathematics and physics around 1900, just before Einstein's Special Theory of Relativity and the first formulations of quantum mechanics that would revolutionise our ideas of time and space. *Against the Day* anticipates these developments by referring to the struggle

between the new mathematical theory of quaternions and the equally new theory of vector analysis at the end of the nineteenth century. The famous Michelson-Morley experiment from 1887 also features in the book – this was the experiment that should have proven the existence of the ether as the medium through which light travels. It failed to do so. Instead it became one of the strongest proofs against the existence of ether, and provided evidence that Einstein's Special Theory of Relativity was correct.

Against the Day elaborates in the form of a novel on some of the implications for the conception of time, space and light that the scientific developments around the turn of the century seemed to entail, and which people at the time were beginning to phantasise about. It was the period when H.G. Wells' novel, *The Time Machine* (1895), became immensely popular. All of this is related in a characteristic Pynchonian way with an eternally youthful crew of the sometimes invisible airship, Inconvenience (the Chums of Chance), a 'subdesertine frigate' for voyaging beneath desert sand, a cast of cowboys, criminal capitalists, mad inventors, shamans, clairvoyants, terrorists, beautiful women, drug abusers, and many clichés and stock figures from popular literature.

In his review 'Do the Math, Thomas Pynchon Returns', which was published in *The New Yorker* on 27 November 2006, the literary critic Louis Menand stated:

I think that the idea behind *Against the Day* is something like this: An enormous technological leap occurred in the decades around 1900. This advance was fired by some mixed-up combination of abstract mathematical speculation, capitalist greed, global geopolitical power struggle, and sheer mysticism. We know (roughly) how it all turned out, but if we had been living in those years it would have been impossible to sort out the fantastical possibilities from the plausible ones. Maybe we

could split time and be in two places at once, or travel backward and forward at will, or maintain parallel lives in parallel universes. It turns out (so far) that we can't. But we did split the atom – an achievement that must once have seemed equally far-fetched. *Against the Day* is a kind of inventory of the possibilities inherent in a particular moment in the history of the imagination.³

As a way of 'Travelling Time', an index to the subject 'time' in Thomas Pynchon's *Against the Day* is spread throughout this book.⁴

1. Sir William Rowan Hamilton, 'Theory of Conjugate Functions, or Algebraic Couples; with a Preliminary and Elementary Essay on Algebra as the Science of Pure Time', in *Transactions of the Royal Irish Academy*, vol. 17, part 1 (1837), pp. 293–422.

2. Quoted from http://en.wikipedia.org/wiki/William_Rowan_Hamilton (accessed 31 December 2011).

3. Louis Menand: 'Do the Math, Thomas Pynchon Returns', in *The New Yorker*, 27 November 2006.

4. The indispensable PynchonWiki at <http://pynchonwiki.com> of course provided a first start for an index on 'time'. I checked all the entries and added to it.