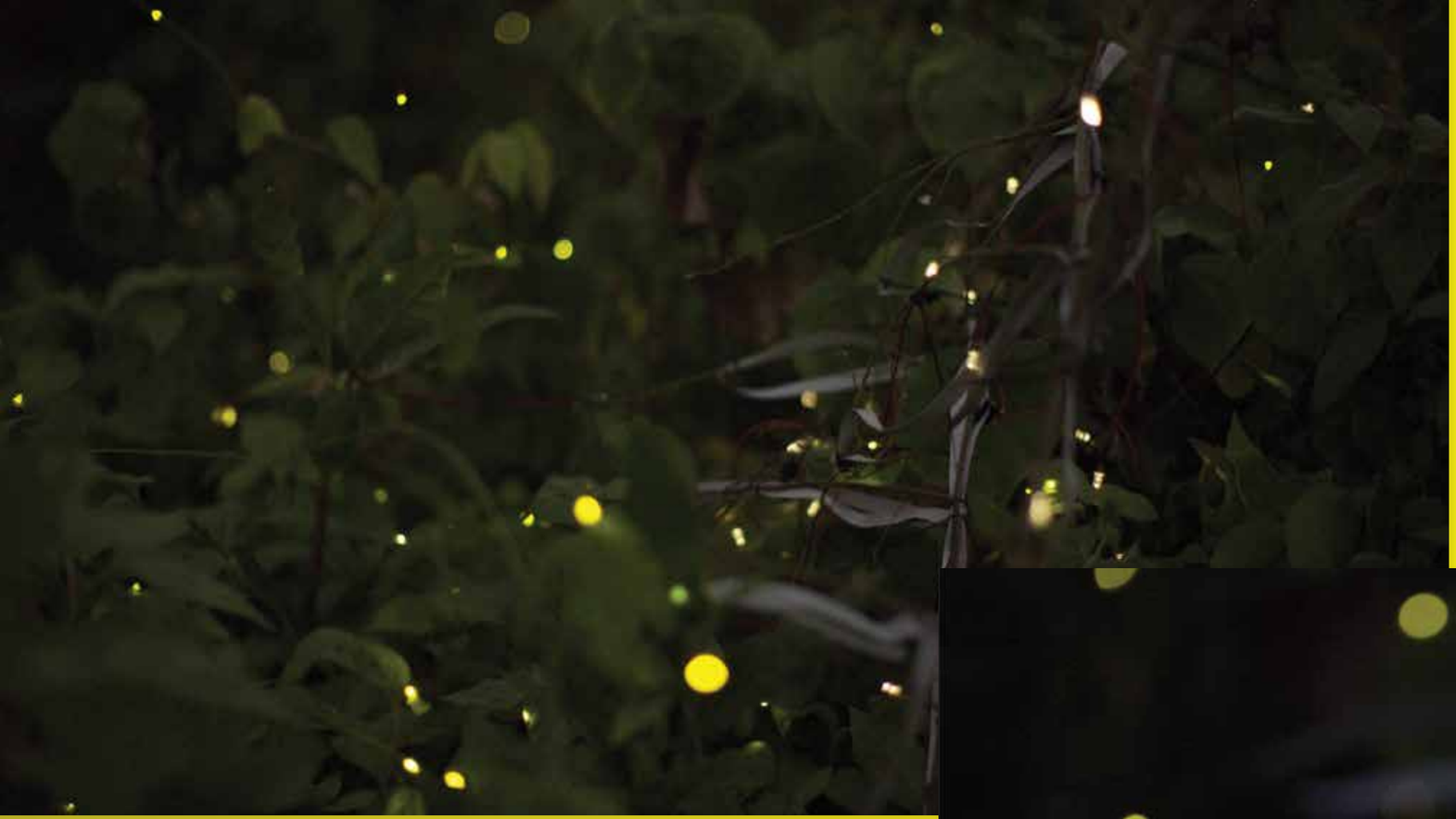
Robin Meier and Bastien Gallet

The Vanishing Actor



Robin Meier and Andre Gwerder, Synchronicity (Thailand), video still, Samut Prakan, Thailand, 2015

opposite: Live fireflies are made to synchronise their flashes with computer-controlled LEDs. By imitating the insects' bioluminescent signals, the artists could influence the rhythm of thousands of fireflies.

left: By engaging in a dialogue with the insects, the artists explored how organisation can arise from the inside out without a single force driving this collective behaviour.

Synchronicity is a series of artworks that explore the self-organisation of collective organisms by manipulating the flashing of fireflies and the chirping of crickets. One of its co-creators, artist and composer **Robin Meier**, together with philosopher **Bastien Gallet**, explain how it relates to personal and societal emergence, through constantly evolving networks of interactions. They go on to describe the different manifestations of the series in detail.

How to Let Things Happen: The Art of Order Without Orders

Organisation can arise from the bottom up, emerging from local interactions without help from an outside planner or guide. This kind of self-organisation is a distinctive feature of life itself: a cell, maybe the minimum form of life, maintains its boundaries with its environment by taking energy from the same environment to literally make itself (autopoiesis).[1] In this sense, organisation – and particularly self-organisation – is a fundamental property of life, a biological concept reflected in the word 'organism'. It is at the heart of the conceptual puzzle connecting physical matter to life.

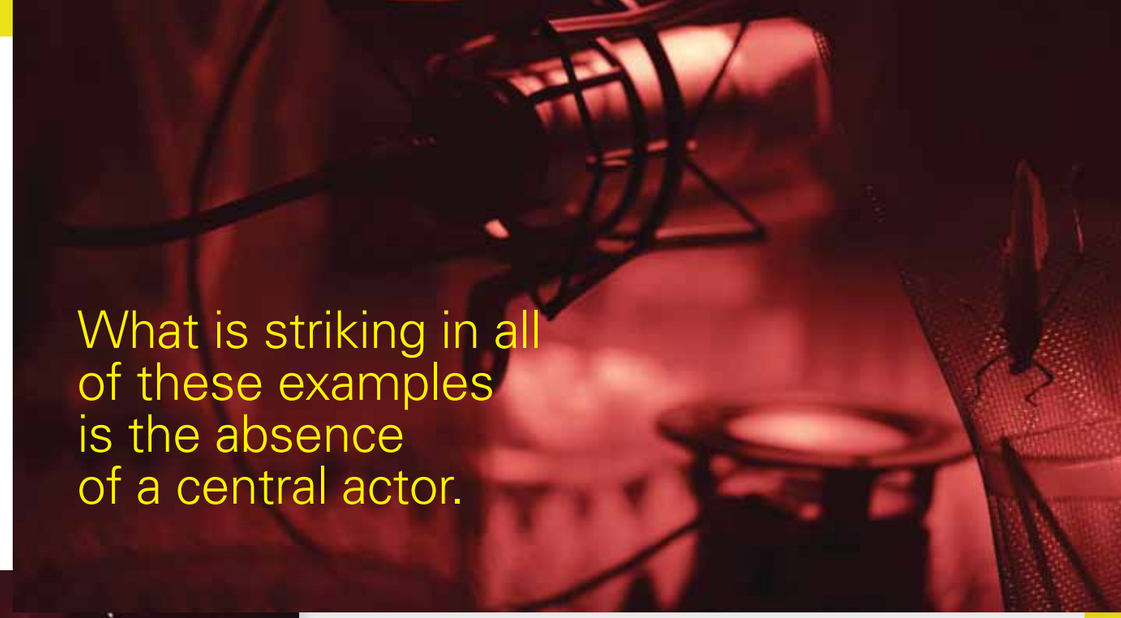
Studies of self-organisation are abundant: from synchronising fireflies, mating mosquitoes and bird swarms to human interactions such as posture and speech coordination when having a conversation. But self-organisation is also used to explore the relationship of mind and matter in theories of perception and even consciousness. How does a physical arrangement of atoms give rise to an individual experience of the self? For example, what creates that 'sensory feel' we get when we see the colour red as opposed to just imagining it?

Many would suggest this is caused by the activity of neurons in the brain. But what is it about neural activity that creates the distinct feel of this sensory consciousness? One explanation is that this kind of consciousness is a skill rather than a mechanism: a process rather than a state.[2] It is an ongoing interaction with the environment around us – an autopoietic loop of sorts between what we perceive and what we do. It is something that happens to us as we are embedded in our environment, just like the meaning of a word is not caused by the shapes of its letters, but in the way it is used and embedded.

Robin Meier and Andre Gwerder, Synchronicity, Volkshaus Basel, 2015

In sync with the pendulums, dozens of LEDs imitated the fireflies' regular flashing. Confusing these LEDs with other males, the fireflies living inside the installation readily adjusted their own rhythm to match that of the light sources, and synchronised to the beat of the pendulums.

For the installation version of *Synchronicity*, a simple toy-like mechanism beat the central pulse of a self-organising orchestra of machines, crickets and fireflies: two electromagnetic pendulums were placed close enough for their magnets to slightly influence each other's field. Steadily synchronising, they settle on a common beat that pervades the entire installation.



Lodged inside acoustically isolated chambers, small groups of Mecopoda elongata crickets were subjected to regular bursts of noise emitted by an analogue synthesiser. Sure enough, they joined the synchronised choir of pendulums, fireflies and various other machinery inside this strange rhythmic organisation.

Removing the 'Self' from Organisation

What is striking in all of these examples is the absence of a central actor. Agency is not simply distributed among many actors, because the resulting behaviour is more than the sum of individual actions. Perhaps the proper way to consider it is to imagine organisation (in the broad sense, including organisms, societies and even cognition) as something inherently passive. It is self-organisation without the self. It is the intelligence of a river flowing through a landscape finding the optimal path through its constant interaction with the environment.

The artistic practice described here is concerned with how we emerge as persons, minds and societies in continuous exchange with the world around us. Art is used as a tool to represent and think about how we organise and how we are organised by our environments physically, biologically and culturally.[3] In this sense it is a tool similar to writing. Writing allows us to represent and explore language by externalising it and making it amenable to physical manipulation. In the same way, art can be seen as a tool for exploring behaviour and phenomena that are beyond our control because they emerge autonomously through our engagement with the world around us. Much like philosophy and science, this artistic practice, in its own way, strives to make sense of the world.

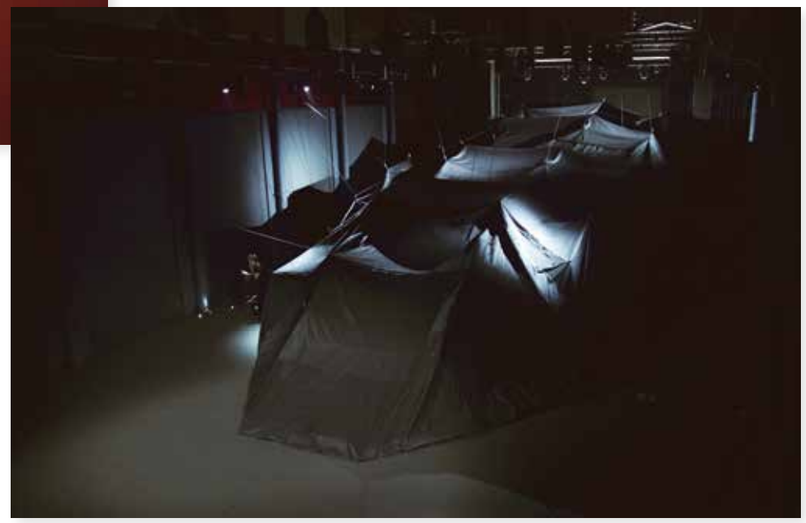
Oscilloscopes, electroencephalograms, synthesisers and other objects were synchronised to the regular rhythm of the synchronising pendulums.

The Order of the Fireflies

Every night, shortly after sunset, thousands of tiny insects gather in the bushes of the Thai mangrove forests for a fascinating mating ritual. *Pteroptyx spp*, a male Southeast Asian firefly, starts blinking in a regular rhythm, isolated at first, but slowly coordinating the timing of its flashes to synchronise with other fireflies around it. Patterns soon start to emerge – waves of light like on a ferris wheel at times, a single synchronised flash at others – as the thousands of fireflies coordinate to illuminate entire streams, trees and fields in a hypnotic light show, highly organised but constantly evolving.

Who creates this stunning coordination between thousands of tiny insects? There is no central conductor or agent that controls them. There is no outside signal that allows them to sync. Rather, the synchrony emerges from the bottom up through simple interactions between individual fireflies: each reacts to the flashing of a neighbouring firefly, slowly adjusting its own timing to match that of its neighbours. Through this simple exchange, based on a low-level neural circuit, the insects achieve a degree of organisation that surpasses that of the individual. A meta-organism seems to have arisen. Although facilitating the fireflies' mating process, it remains completely out of the control of its constituent individuals.

There is no ghost in the machine to lead the insects. Mathematical models and computer simulations confirm the absence of a leading actor.[4] With a few lines of code, millions of virtual fireflies can be simulated and their virtual flashing patterns observed and measured: the same waves, spirals and synchronies emerge autonomously out of a chaotic flickering of what resembles static noise on an old TV.



A massive tent designed by architect Ivan Mata recreated the necessary climatic conditions for the synchronisation of fireflies, crickets and machines inside the Volkshaus concert hall.

Synchronicity was produced by the Audemars Piguet Art Commission and shown during Art Basel 2015.

Synchronicity

Synchronicity is a series of artworks including a filmed experiment with synchronising fireflies in Thailand and a large-scale installation where live fireflies, crickets and various objects are synchronised with each other. Achieved by emitting specific light patterns for the fireflies and sounds for the crickets, the work asks the question: Can the common rules of self-organisation be used to compose environments where various organisms and objects self-assemble into one collective organism?

Synchronicity can be read on various levels: poetic, scientific, visual, but as a composition it is a musical form emerging on its own from the natural interactions between individuals and their environment. The organisms and objects here are not piece materials, but actors of their own individuation made audible as an ever-evolving composition brought forth by this self-creating process.

Strictly speaking, the composition resides not in the music, but in the conditions of this perpetual process of synchronisation. The music emanates from this very process, not just during static moments of synchrony, but rather as the consequence of the constantly evolving dynamics in a complex network of interactions. A multiplicity of differentiated synchronisations relate to one another, as if every evolving group is interpreting the common pulse in its own way, creating idiosyncratic rhythms of lights, movements and sounds. These rhythms appear and dissipate only to reappear a moment later, slightly different, elsewhere in the installation.

The visual and acoustic musical forms that emerge from this process are not predictable, for they are the result of a living and evolving relationship. But they are nonetheless produced. The process that *Synchronicity* reveals is neither natural nor artificial, but what French philosopher Gilbert Simondon, known for his theory of individuation, would call 'transindividualistic'.[5] This relationship surpasses and transforms the beings it relates to one another. It enables them to act in new and unpredictable ways and to collectively become something else. In such a system, relations precede the individuals they associate: there are in fact no more individuals, only processes of individuation.

Synchronicity is music without authors. Or rather, the authors are the insects, but they are not present through stylised reproductions of their songs and tunes; they are present – and creative – because they seek to adjust to the piece's central pulse. They do not sing, they evolve. And the voices we hear and see are theirs. ◘

Notes

1. Francisco Varela, Humberto Maturana and Ricardo Uribe, 'Autopoiesis: the Organization of Living Systems, its Characterization and a Model', *Currents in Modern Biology*, 5 (4), 1974, pp 187–96.
2. Kevin O'Regan, Erik Myin and Alva Noë, 'Sensory Consciousness Explained (Better) in Terms of "Corporality" and "Alerting Capacity"', *Phenomenology and the Cognitive Sciences*, 4, 2005, pp 369–87.
3. Alva Noë, *Strange Tools*, Simon & Schuster (New York), 2015.
4. Renato Mirollo and Steven Strogatz, 'Synchronization of Pulse-coupled Biological Oscillators', *SIAM Journal on Applied Mathematics*, 50 (6), 1990, pp 1,645–62.
5. Gilbert Simondon, *L'individu et sa genèse physico-biologique*, PUF (Paris), 1964.