

## COLLAPSE VI

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# COLLAPSE

Philosophical Research and Development

VOLUME VI

*Edited by*

Robin Mackay



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FALMOUTH





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# COLLAPSE VI

January 2010

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### Editorial Introduction

Robin Mackay

As far as we know, philosophy, indeed *thinking* as such, happens only on one planet. In our previous volume, we examined the ways in which philosophical and scientific thought pursued a liberation from the local conditions of ‘earthly thought’, counteracting the limitations imposed by our terrestrial locale and the biological heredity that binds our cognition to it. In this volume, we turn our gaze back towards our home planet to ask how, as products of the Earth, philosophers, scientists and artists have attempted to encompass it in thought; and how the philosophical enterprise of *thinking* ‘the whole’ has been, and continues to be, determined by our belonging to the Earth.

There is a timely aspect to this inquiry: Whereas the optimism of the late twentieth century saw ‘globalisation’ become a byword for limitless expansion, our image of the global in the first decade of the twenty-first century was

characterised instead by contraction, by a forced recognition that the increasing technological interconnection and ever-intensifying exploitation of the Earth by humans was exposing finite limits, economic and ecological, of the planet upon which their world-systems are imposed.

Much of the response to the ensuing crises has remained entrenched within nostalgic regret, emotional imprecation and moral imperative. In this volume we attempt to forego this panic response and instead to present a diverse selection of contributions which demonstrate that philosophy, science and contemporary art continue to address the condition of thinking on and of Earth in original and engaging manners.

We know that thinkers have long used the surface of the Earth as a rich source of metaphor: in so far as it seeks for secure 'ground' on which to place thought, geographic cartographic and geological metaphors are endemic to philosophy. But beyond this metaphoricity, as **NICOLA MASCIANDARO** argues in his 'BecomingSpice: Commentary as Geophilosophy', the practice of philosophy itself can be seen as a continual process of 'worlding'.

Beginning with the failure of the 'philosophical flight' from the earthbound in Dante, Masciandaro argues that philosophy belongs not to the 'folly' of a vertically-oriented 'straight path' but to a 'circular and endless' movement on the surface of the earth. And for Masciandaro, who directs the project *Glossator*,<sup>1</sup> dedicated to a contemporary revivification of the practice of commentary, it is the latter that provides the key to understanding this endless movement: commentary as the continual production of knowledge, a practice that 'proceeds by staying'. Philosophy's aim 'to

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1. See <http://www.glossator.org/>.

render actual its absoluteness', to enter into self-immanence – the 'Copernican' impulse to absolutise – only proceeds, according to Masciandaro, through commentary's continual 'dwelling on the problem'. He further sees this role of commentary as being encoded in spice, as a global commodity whose currency and commercial movement figures the production of understanding through continual differentiation and distribution. Thus, commentary is not a mere 'condiment', but figures a peripatetic wandering and returning that draws forth the immanence of what is, only by adding to it, by 'spicing' it and thereby 'bringing out' the mode in which it is *more* than it is. For Masciandaro, therefore, 'the *telos* of commentary, its far-off end, is *tellus*, what bears us'; thinking brings us back to a continually-differentiated Earth.

One significant modern attempt to create a philosophy that addresses the Earth system as an 'All' is **F. W. J. SCHELLING's** *Naturphilosophie*, which sought to encompass within a single set of philosophical principles the production of nature and thought; of thought out of and as a part of nature. In Schelling's 1798 work, previously unavailable in translation, the philosopher revendicates the ancient theory of the 'World-Soul', entirely reconstructing it through the contemporary science of his time, which he supplements with the necessary speculative basis that will allow him to effect his grand synthesis. As **IAIN HAMILTON GRANT** tells us in his introduction to his new translation, Schelling's book must be understood as a bold experiment in systematically thinking 'the All': Not content with providing a transcendental account of thought's *a priori* determination of its object, Schelling attempts to ground this determination in a Nature conceived as a *prius*, the polarisation of

whose primitive forces can be traced through all of natural organisation, conditioning even the consciousness through which they become manifest as concept.

The contemporary ecological crisis demands a (somewhat more modest) reframing of the task of conceiving systematically the 'All' of nature – the biosphere within which human beings are increasingly aware of their implication. We are all well acquainted with the dread auguries emerging from what the media generically refer to as 'scientists'; but this reception reveals little as to the difficulties that beset those tasked with making such projections.

Our interviews with **STEPHEN EMMOTT**, **DREW PURVES**, **RICH WILLIAMS** and **GREG MCINERNY**, scientists working in Computational Ecology and Environmental Science at Microsoft's Research Laboratory in Cambridge, England, offer some insight into the contemporary stakes of ecological thought, revealing ecology as a science in a state of flux and renegotiation.

They describe how, combining empirical knowledge of the mechanisms of growth, evolution and competition with an arsenal of statistical and computational techniques, their virtual 'in-silico' world-systems – Purves talks of them as involving a selection from a 'universe of universes' – aim to refine hypotheses and constrain predictions regarding the effects of climate change. As the interviewees reveal, the challenges they face make necessary a 'new kind of science' in which the barriers between disciplines are being broken down, and the order of scientific research disrupted or reversed. Negotiating the fearsome task of creating, in Emmott's words, 'a precise, predictive science of complex natural systems' calls for a meticulous questioning of received truths, and a triage between abstraction, accuracy,

and uncertainty, in a quest for a ‘simplicity on the other side of complexity’. As Purves suggests, it is ecologists who are above all properly placed to give a ‘high-level view’; but as we see in McNerny’s description of his work, the indications of such a high-level view depend crucially on the selection of theoretical frameworks and on our understanding of low-level biological and genetic factors, shifts in the understanding of which can have radical consequences for prediction. In incorporating them into new computational models, Purves, McNerny and Williams have shown that the presence and interaction of these additional factors can crucially alter our understanding of global processes.

As well as exploring the details of the research underway, it was also important in these conversations to reflect on the predicament of the scientist called on to estimate the fate of the planet; a specialist whose area of research has been reinvigorated by the ecological crisis, but who must remain vigilant against overconfidence and oversimplification. Despite their optimism, the unanimous conclusion of our interviewees is that ecology remains a ‘young science’: a science already capable of providing an adumbration of the future of the biosphere, but which still faces a great many ‘unknown unknowns’.

In addition, it emerges that this work is constrained on all sides by the contingencies of its history: dependent on legacy data and the choices made by those who preceded them, ecologists are involved in a continual reevaluation of their scientific and theoretical inheritance. Perhaps the most serious constraint, however, lies in the additional task of presenting their results to a concerned public. Struggling to be heard clearly amidst political manoeuvring, economic exigencies, and the evangelising of activists and

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conservationists, as Emmott remarks, ecology today must concern itself not only with theorisation and analysis, but also with clear communication of its point of view as a science.

As McNerny points out, ‘activism’ often reflects the uninterrogated prejudices and desires of those involved more than the state of scientific knowledge. **TIMOTHY MORTON**’s work in ecocriticism dissects the ways in which the narratives and aesthetics of ‘environmentalism’ remain captive to such unavowed assumptions. Morton’s *Ecology Without Nature*,<sup>2</sup> which argued that the idea of ‘Nature’ is only ever an obstruction to ecological thinking, opened by making a heartfelt case for the importance of philosophical thinking and the creation of new concepts in order to prevent our sense of ecological emergency from precipitating a retreat into nostalgia and the safety of thinking ‘Nature’ as ‘something over there’. In his article for **COLLAPSE**, ‘Thinking Ecology’ – a preview of his forthcoming book *The Ecological Thought*<sup>3</sup> – Morton proceeds to pick apart the ideological attitudes, still in thrall to the Romantic view of ‘Nature’, that allow environmentalism, under cover of a naive sincerity, to avoid thinking ecological interdependence. As he argues, the latter thought is not to be attained through blithely asserting our ‘community’ with the denizens of nature. Simple denial of our own gaze, and the ‘framing’ it imposes on nature, is not an option: it amounts, as he argues, to the perpetuation of a ‘beautiful soul syndrome’. Instead Morton invites us to experience the ‘humiliation’ of recognising our disturbing collective intimacy with ‘life’ as a

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2. *Ecology Without Nature: Rethinking Environmental Aesthetics* (Cambridge, Mass.: Harvard University Press, 2007)

3. Cambridge, Mass.: Harvard University Press, forthcoming 2010.



‘strange stranger’, drawing us into a ‘dark ecology’ in which awareness, rather than implying a contemplative ‘letting-be’ of ‘Nature’, delivers a melancholy, ironic recognition that our very rendering of the ‘crime scene’ implies our necessary and constitutive implication in the crime.

This critique of the ideology of environmentalism is extended and dramatised by UK artist collective **F I E L D C L U B**. Their work explores the humour that emerges in actually following self-sufficiency edicts ‘on the ground’; and the irony that comes from raising the principles of ecology to the most general context imaginable. Underpinned by a theoretical position drawing on the long-forgotten neo-Gnostic lore of ‘agrosophy’,<sup>4</sup> **F I E L D C L U B** remove ecology and the ‘anthropic technosphere’ from the parochial domain of environmental politics and replace it within the framework of a Batailleian ‘solar economy’.

Their irony is not the cynical resignation of the city-dweller; for their work documents a continuing attempt to live ‘off-grid’, disconnected from public utilities and drawing as little on outside resources as possible. Much of the collective’s work draws wryly on incidents in the day-to-day course of this experiment in living, small occurrences that never fail to blacken the name of Eden. This intimate engagement allows them to challenge the credo according to which just a little goodwill and a little less technology could enable humans to temper their depredations in favour of a more gentle and wholesome coexistence with nature.

**F I E L D C L U B**’s concern with this uneasy ‘complicity’ with other living beings leads precisely into what can be

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4. See <http://www.fieldclub.co.uk/texts.php>

seen as assays into Morton's 'dark ecology'. To become close to nature, they demonstrate, is at the very least to repudiate the notion that the Earth is something unreservedly worthy of our admiration, and from which we can draw comforting meaning. The series of devices exhibited in FIELD CLUB's contribution to this volume intimate that man's relation to the soil, no matter how 'traditional' or 'simple', strips us of our 'beautiful soul' credentials and reminds us we must 'kill to live'; at the same time, they lampoon the efforts made through technological mediation to flee the 'scene of the crime'.

Evidently, any examination of the relation of thought to the Earth must address the way in which we dwell upon, thus transforming, its surface. OWEN HATHERLEY's project to rescue architectural modernism from the 'Ikea modernism' of 'light and airy' interior design belonging to the vacuous economic optimism of the late twentieth-century<sup>5</sup> leads him to the contention that, in restoring the links of modernism with its less palatable predecessors – such as the proto-brutalism of Hitler's Atlantic Wall – we reawaken a suppressed, but rich and provocative, historical lineage. Hatherley's analysis is inspired by Ballard's discovery of a 'warped modernism' in the structures of the Atlantic Wall. And as Hatherley's discussion implies, if we are to consider Ballard as a precursor to 'psychogeography', the latter must be understood in terms of *regression*, so that, as in Ballard's novels, in the contemplation of these (non)structures we experience an 'end-point of architecture': The enterprise of design and construction degenerates into an atavism where 'primal impulses and prehistoric building forms recur', but which paradoxically (as evidenced by Virilio's adaptation of this aesthetic for his brutalist church)

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5. See Hatherley's *Militant Modernism* (London: Zer0 Books, 2009)

also communicates with an impulse to the sacred. These 'instant ruins' thus tap into an architectural phylum which, actualised by a military 'science of compaction and impact', marries emergency with eternity.

Hatherley traces the few instances in which this rich seam resurfaces in architecture, but as he observes, in an increasingly hygienically-conservative architectural climate, it now belongs more to speculative thinking and to the work of artists such as Nicholas Moulin. The suggestion that with more attention, it might fuel an 'apocalyptic pulp of our own time' brings to mind the fact that, of course, Ballard's apocalyptic *Drowned World* must be considered the first science-fictional treatment of climate change. From Ballard's reflections on these forgotten structures, Hatherley thus draws out a as-yet unrealised 'earth-philosophy' as remote from tree-hugging as Ikea is from the Atlantic Wall; one that, via the exigencies of total war, sets the chthonic forces of the inner earth flowing through the Apollonian veins of modernism.

Architect and theorist **EYAL WEIZMAN** transports this immanence with the 'chthonic' into architectural practice: His project *Decolonizing Architecture* seeks to apply an 'ungrounding' process to spaces previously invested with colonialism, practicing 'design by destruction'. *DA* has evolved from Weizman's examination of the role that architecture has played in the Israeli occupation of Palestine; in our interview, he describes the way in which he sees architecture per se as interacting with the 'political architecture' of this occupation, and how the structure of the latter has entered into conceptual commerce with theory. Weizman's conception of 'forensic architecture', in seeking to read the nature of historical events through their material traces, implies a new articulation of 'forces and

forms', wherein forms not only register the multiplicity of forces that bear upon them, but in turn become actors in this political 'forcefield'. We discuss the way in which this materialist-pluralist conception of politics demands a rethinking of the notions of responsibility, ideology, and resistance, and how *DA's* processes of 'design by destruction' and 'ungrounding' seek to disrupt the temporalities according to which the very question of a 'solution' to the problem of occupation has been posed.

Discussing the in some cases hostile reception to this work, Weizman also describes how it has led him to reconsider the very function of theory in the context of global politics: The theoretical enterprise can only operate, he argues, through an engagement with actual protagonists, whose functional roles within twenty-first century conflict bring to light the new conceptual frameworks within which that conflict is being conducted. Thus, concepts are not 'in the head' but 'in the world', and only by affirming this embeddedness of theory – by forensically examining the material traces of specific sites, and by journalistically naming names – can theory become a weapon of resistance.

Weizman's examination of the bonds between architecture and the martial recoding and territorialization of the Earth is further developed in **MANABRATA GUHA's** 'Introduction to SIMADology'. Surveying today's 'global security ecology' Guha suggests that its regime of thinking the relation of war to the Earth – inherited, as he suggests, from the 'father' of the theory of warfare, Clausewitz – fails to register the radical difference that terror-operations impose upon the martial landscape. What Guha calls the SIMAD – Singularly Intensive Mobile Agency of Decay – disrupts the Clausewitzian paradigm, drawing

war-machines into a 'chthonic battlespace' which they are constitutively incapable of navigating. Even within the new paradigms of warfare which seek to confront changing conditions through 'network' or 'swarm' paradigms, the weapons of 'surprise' and 'terror' are read in the terms of a political and martial imaginary whose inappropriate causal and economic principles doom them to become, ultimately, a component of the threat they aim to neutralise. Extending Reza Negarestani's analysis of 'hypercamouflage',<sup>6</sup> and through a critique of the conclusions of prominent contemporary theorists of war, Guha depicts terror-operations as effecting a transformation on the instrumentalised war-machine of the state, causing it to proliferate and morph uncontrollably as it confronts the chthonic forces against which it attempts to differentiate itself – forces that owe nothing to tellurian structures, and whose eruption can only be registered as having already taken place. In attempting to 'seal off the tellurian surface' from these terror-Events, Guha suggests, war-machines operating on the Clausewitzian model merely generate self-deceiving fictions – bringing about a 'process of ontological decay' whose nature is opaque to strategic thinking. Maintaining the state at a 'tipping point [...] between self-destruction and absolute consolidation', the SIMAD thus becomes the co-ordinator of 'global security governance' and the 'biopolitical model of the post-modern state'.

Confronting this 'complicity of visions' and drawing on **REZA NEGARESTANI's** contribution to **COLLAPSE IV**,<sup>7</sup>

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6. R. Negarestani, 'The Militarization of Peace: Absence of Terror or Terror of Absence?', **COLLAPSE I**, 53-91.

7. R. Negarestani, 'The Corpse Bride: Thinking with Nigredo', **COLLAPSE IV**, 129-61.

Guha in closing declares that '[w]e are that which decays *and* the agents of decay. We are expressions of the terrifying envolding chemistry of decay'. Negarestani's contribution to the present volume expands this theme into the analytic description of an 'architecture and politics of decay'. Excavating some of the more bizarre preoccupations of mediaeval thought, and tracing their influence on early-modern mathematics, Negarestani suggests that they offer us the formal basis for an 'architecture, mathesis and politics of decay'.

This mathesis, of which Negarestani finds 'the most refined expression' in politics, sees the interior ideal of a form not as an origin, but as emerging processually through its decay, in tandem with a production of exteriorised derivatives. Distancing his thesis from any nostalgic fetishising of ruins and insisting that it not only applies to superficially 'decayed' states but must be thought of as a general principle, Negarestani notes that a 'politics of decay' is disturbing precisely because – like Guha's *SIMAD* – it invokes a universal dynamic principle that undermines any claims to wholeness and wholesomeness.

Notably, Negarestani's argument also contains a confrontation with the nihilism expounded by Ray Brassier in his *Nihil Unbound*:<sup>8</sup> Science's evacuation of the realm of organic interiority into the exteriority of space, Negarestani suggests, does not take place without a 'twisting' in time and in space. His suggestion of a calculus of decay as 'mathematics with a chemical disposition or chemical revolution via mathematical distributions' problematises any straightforward vector of exteriorization, both in the

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8. R. Brassier, *Nihil Unbound: Enlightenment and Extinction* (Basingstoke: Palgrave Macmillan, 2007).

realm of in/organic matter and in the history of thought, by locating both within a *humus* whose vermicular twisting can never fully be ‘worked out’. In a parallel to his remarkable book *Cyclonopedia*, where the molten core of the Earth attests to its immanence with the sun – and again, recalling Guha’s SIMAD – for Negarestani exteriority is already a chthonic ‘insider’.

In his precise definition of this positive process of ‘decay as a building process’, Negarestani in fact provides the abstract key to the strange confluences not only in Hatherley, Weizman and Guha’s analyses, but also in Masciandaro’s account of the continual self-differentiation of knowledge. As Masciandaro reminds us, commentary’s addressing of the earthly condition constitutes, not a resignation to the inescapable finitude of the text, but philosophy’s very ‘boldness’, its ‘monstrous’ aspiration to continually deform, denature and multiply what it attends to, in a twisting wherein the poetic impulse rejoins with the philosophical imperative, the wandering on the Earth with the will to flight. Negarestani’s turn towards those incorrigible commentators, the Scholastics, elicits the formal identity of his vermicular chemico-mathematics with this process of exegetical ‘twisting’. Perhaps then Negarestani not only succeeds Schelling as ‘the philosopher of the new chemistry’ – albeit, as Iain Hamilton Grant has suggested, a ‘chemistry of darkness’ – but also presents us with a ‘chemistry of (the history of) philosophy’.

Needless to say, the Earth, in our dealings with it and our navigations on it, exists for us not in ‘immediate experience’, but in coded form. The work of artists **ANGELA DETANICO** AND **RAFAEL LAIN** examines the many ways in which the surface of the planet is coded, and their playful

constructions explore the peculiar grammatologies that emerge once this stenography between the geographical and the symbolic is in place; its disorientations highlighting the faith we place in our mediated figure of the world, often mistaking the map for the territory.

**CHARLES AVERY**'s work returns to what has long been a favourite geographical trope for philosophy. At a certain point in his practice, Avery decided to locate all of his future work within an imaginary Island, whose locations, inhabitants and culture he continues to render beautifully in a variety of media – including text, as in the enigmatic travelogue *The Islanders: An Introduction*,<sup>9</sup> an 'epilogue' to which Avery contributes to this volume. In **COLLAPSE V** one of Avery's maps accompanied cosmologist Milan Ćirković's discussion of the 'archipelago of habitability'.<sup>10</sup> Setting out from this pairing, **ROBIN MACKAY**'s prefatory essay to our presentation of Avery's work seeks to locate the latter as a possible contemporary successor to a rich history of 'Philosophers' Islands'. As Mackay remarks, the nature of Avery's project demands that 'the work' and its significance be sought, not in any one of the exquisite pieces exhibited by Avery, but in the Island 'itself' – the (unfinished) structural whole that will bind them together.

Our volume closes with two contributions that in very different ways address this philosophical obsession with the island and with the ocean that surrounds it. **GILLES GRELET** presents us with a manifesto of refusal: the task of philosophy as conceived by Althusser and systematically diagnosed by François Laruelle's 'non-

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9. C. Avery, *The Islanders: An Introduction* (London: Parasol Unit/Koenig, 2008).

10. M. Ćirković, 'Sailing the Archipelago', **COLLAPSE V**, 292-329.



philosophy' – as a series of 'decisions' producing trenchant lines of demarcation that partition the ground of thought – is rejected. 'Ungrounding' himself by taking to the other, predominating element of the planet, with a boat as his 'theory-body', Grelet extols theory as 'world-less', indeed as 'a full-on attack on the world', an angelic thought whose 'crossings' operate without the territorial imperatives of the 'worldly'.

**RENÉE GREEN's** film 'Endless Dreams and Water Between', originally shown in 2009 as part of an installation at the National Maritime Museum in Greenwich, uses the island and its surroundings as the setting for an interrogation into the making of thought in-between four protagonists. Inconclusive, dreamlike and – recalling Masciandaro's opening contribution – both referential and peripatetic, Green's film, the script of which is presented here, concerns itself with the geophilosophical precipitation of thought, as four women driven by a curiosity about their own location and inclinations move toward a speculative coherence that the work preserves in a state of 'clear-obscure'. The island, a 'non-location' which serves as a navigational point of reference, also allows its inhabitants those uninterrupted vistas for the imagination that have provided writers with (sometimes, as in the case of George Sands, ultimately disappointed) dreams of freedom. As suggested by Masciandaro, it is by 'staying', by contemplating their island locations, that Green's protagonists move towards a collective **thinking** that expands into the realms of the abstract only on the basis of their localisation and the contingency of their respective interests and circumstances.

Like Avery's, Green's work highlights shifting relations between fiction and fact, physical geography and imaginary geography, that govern our thinking of the Earth and the

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worlds we build upon it. They join the other contributions to this volume in demonstrating that 'Planet Earth' qua terrestrial entity or biosphere is but one among those many inextricable 'wholes'. Even new efforts at reconstructing it in scientific models are never entirely free from evolutions and selections of their own, from the contingencies of history, and from the legacy of its duality in thought as 'object and omnipresence'.

The bringing together of apparently divergent perspectives within this volume is, we must as ever insist, not merely whimsical. It aims to bring into view avenues of thought which run between them and which may lead to new spaces outside the rigid boundaries of disciplinarity. In our introduction, as in previous volumes, we hope to have indicated some of these; others it will be the reader's business (and, we hope, pleasure) to trace.

It seems appropriate in closing to reflect briefly on the coherence, not only of this particular volume, but of the project as a whole; a coherence which, as is appropriate for a journal of 'research and development', has slowly come to light only in the process of working on the series. Through the creation of these volumes, from the beginning deliberately and sincerely billed as an 'experiment', has emerged a curatorial model in which, rather than all of the contributions to a publication falling within a circumscribed discipline or subject, a broad theme allows contributions from diverse practitioners to form an overlapping chain or (adopting Timothy Morton's term) mesh, whose intermediate links span otherwise disparate elements. The hope is that this connectivity should reproduce itself in the broad audience that **COLLAPSE** assembles; that the 'forced collaboration' operated within these pages should

find its counterpart in a strange collectivity of readers who, drawn in by one or two contributions appropriate to their interests, find themselves unexpectedly befriended by writers and thinkers from entirely different ‘mindsets’. This in turn suggests a model of the concept according to which the latter resides, not in an hierarchical structure of progressive generalisation (a structure which reproduces and is reproduced in institutional specialisation), but in transversal connections discovered, or produced, ‘in the making’. Thanks to a growing network of contributors and readers, each volume brings with it such discoveries, so that its finished state bears but a faint resemblance to the terms of its initial conception.

If, in search of this conceptual consistency, we have traversed the abstractions of mathematics (Volume I), the emerging paradigms of Speculative Realism (Volumes II and III), the legacy of Deleuze (Volume III), the horrors of thought and the **thinking** of horror (Volume IV) and the Copernican Turn in its many guises (Volume V), only to come back ‘down to Earth’, it is an Earth which we no longer fully recognise, and which continues to offer numerous challenges – by turns urgent, melancholy, and twisted – to the thought it has given birth to.

We would like to conclude by thanking all of our contributors for their work and their patience in collaborating on this volume, and to our readers for their continued enthusiasm for this process of ‘research and development’.

Robin Mackay,  
Falmouth, January 2010.



Fig. 1. Martin Behaim's *Erdapfel*

## Becoming Spice: Commentary as Geophilosophy

Nicola Masciandaro

*The overman is the meaning of the earth [...] Once the sacrilege against God was the greatest sacrilege, but God died, and then all these desecrators died. Now to desecrate the earth is the most terrible thing, and to esteem the bowels of the unfathomable higher than the meaning of the earth.*

Friedrich Nietzsche<sup>1</sup>

*I don't know if you were frightened, but I at any rate was frightened when I saw pictures coming from the moon to the earth. [...] Only a god can save us.*

Martin Heidegger<sup>2</sup>

*No knower necessarily stands so close to the verge of error at every moment as the one who philosophizes.*

Martin Heidegger<sup>3</sup>

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1. F. Nietzsche, *Thus Spoke Zarathustra*, trans. A. Del Caro (Cambridge: Cambridge University Press, 2006), 'Zarathustra's Prologue,' 6.

2. M. Heidegger, "'Only a God Can Save Us': *Der Spiegel's* Interview with Martin Heidegger (1966)," trans. M. P. Alter and J. D. Caputo, in *The Heidegger Controversy: A Critical Reader*, ed. R. Wolin (Cambridge, MA: MIT Press, 1993), 105-7.

3. M. Heidegger, *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude*, trans. W. McNeill and N. Walker (Bloomington: Indiana University Press, 1995), 19.

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*Mankind's movement through deep space placed a unique stamp on religion during the one hundred and ten centuries that preceded the Butlerian Jihad. [...] Immediately space gave a different flavor and sense to ideas of Creation [...] All through religion, the feeling of the sacred was touched by anarchy from the outer dark.*

Frank Herbert<sup>4</sup>

*Perhaps only a language in which the pure prose of philosophy would intervene at a certain point to break apart the verse of the poetic word, and in which the verse of poetry would intervene to bend the prose of philosophy into a ring, would be the true human language.*

Giorgio Agamben<sup>5</sup>

*We are allured by the fragrance of it.*

Nicholas of Prato, letter to Nicholas Trevet, praising his commentary on Boethius's *Consolation of Philosophy*<sup>6</sup>

*We are the heretics, apostates, false messiahs, deserters, non-believers, and nihilists, who immediately realise life outside the law on the body of the earth.*

Benjamin Noys<sup>7</sup>

*They took the body of Jesus, and bound it in linen cloths with the spices.*  
John 19:40

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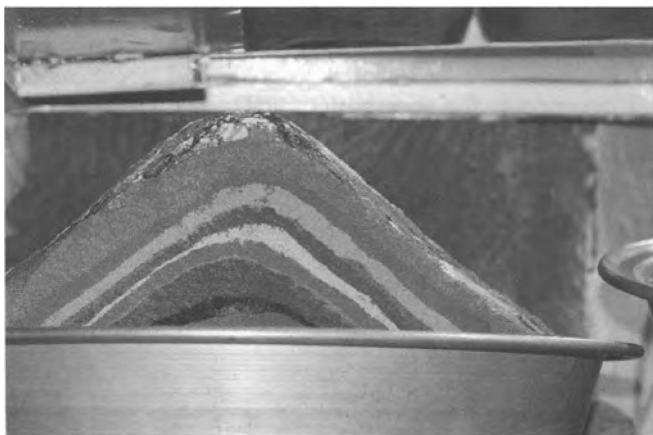
4. F. Herbert, *Dune* (New York: Ace Books, 198), 501.

5. G. Agamben, *Language and Death*, trans. K. E. Pinkhaus with M. Hardt (Minneapolis: University of Minnesota Press, 1991), 78

6. 'Huius rei odore sumus allecti,' cited from R. J. Dean, 'Cultural Relations in the Middle Ages: Nicholas Trevet and Nicholas of Prato,' *Studies in Philology* 45 (1948), 550n16.

7. B. Noys, 'Anarchy-Without-Anarchism', at <http://www.sans-philosophic.net>.

I. PREAMBLE



The twenty-sixth canto of Dante's *Inferno* voyages via the figure of Ulysses into the folly of philosophical *flight*: 'e volta nostra poppa nel mattino, / de' remi facemmo ali al folle volo' (26.124-5) [and turning our stern to the morning, we made our oars wings for the mad flight].<sup>8</sup> The deeper sense of the image is that oars are not wings, that such epistemological search, for what Ulysses calls 'l'esperienza [...] del mondo senza gente' (26.116-7), is fatally, merely earthbound. Ulysses's pursuit of 'virtute e canoscenza' (26.120) [virtue and knowledge] beyond the Pillars of Hercules ends in shipwreck within sight of the mountain Dante passes on his way beyond the stars: 'de la terra nova un turbo nacque / e percosse del legno il primo canto' (26.137-8) [from the new land a whirlwind

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8. Dante Alighieri, *The Divine Comedy*, ed. C. S. Singleton (Princeton: Princeton University Press, 1973).

rose and struck the forepart of the ship]. As accentuated by *canto* (prow), homonym with Dante's song-meaning word for the units of his poem, what is crucially at stake here is the boundary between philosophic and poetic modes of knowledge, the very boundary Dante's visionary text would overcome.<sup>9</sup> Ulysses's fate, recalled at the end of *Purgatorio*'s first canto ('Venimmo poi in sul lito deserto, / che mai non vide navicar sue acque / omo, che di tornar sia poscia esperto' (130-2) [we came on to the desert shore, that never saw any man navigate its waters who afterwards had experience of return]), also mirrors the opening impasse of the *Commedia*, where Dante is turned back from direct ascent of 'il diletto monte / ch'è principio e cagion di tutta gioia' (*Inferno* 1.77-8) [the delectable mountain, the source and cause of every happiness]. As commentators have noted, Ulysses's unidirectional demise refracts the abandoned prosimetric project of Dante's *Convivio*, which sets sail under the Aristotelian banner of knowledge=happiness.<sup>10</sup> The so-brief rejoicing of Ulysses and his men thus figures the impermanence and impropriety of such an easy equation, the impossibility of realising its truth by any straight path. The way to real knowledge passes through

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9. 'convien saltar lo sacro poema, / come chi trova suo cammin riciso [...]. non è pareggio da picciola barca / quel che fendendo va l'ardita prora, / né da nocchier ch'a sé medesimo parca' (*Paradiso* 23.62-9) [the sacred poem must needs make a leap, even as one who finds his way cut off [...]. It is no voyage for a little bark, this which my daring prow cleaves as it goes, nor for a pilot who would spare himself].

10. The *Convivio* opens: 'As the Philosopher says at the beginning of the *First Philosophy*, all men by nature desire to know. The reason for this can be and is that each thing, impelled by a force provided by its own nature, inclines towards its own perfection. Since knowledge is the ultimate perfection of our soul, in which resides our ultimate happiness, we are all therefore by nature subject to a desire for it' (Dante Alighieri, *The Convivio*, trans. R. Lansing [New York: Garland, 1990], I.1).



the underworld.<sup>11</sup> ‘A te convien tenere altro viaggio’ (*Inferno* 1.91) [It behooves you to go by another way]. This way pursues a path that returns, one that begins by entering the earth.

The geophilosophical significance of Ulysses *folle volo*, newly seen from the sphere of the fixed stars with cartographic clarity as ‘il varco / folle d’Ulisse’ (*Paradiso* 27.82-3) [the mad track of Ulysses], lies in its contrast to the chthonic-celestial journey that surpasses it. Fleeing the place of human habitation, Ulysses remains ironically fixed to the earth’s surface. Entering this place, Dante paradoxically reveals the heavenly beyond within the planet. The former movement is geometrically linear and terminal, the proper projection of the hero’s finite concept of life as ‘questa tanto picciola vigilia / d’i nostri sensi’ (*Inferno* 26.114-5) [this so brief vigil of our senses]. The latter movement is geometrically circular and endless, the mode of the poet’s impossible, always-already entering into eternity.<sup>12</sup> The former is terrestrial and territorializing.<sup>13</sup> The latter is spherical and peripatetic.

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11. ‘The distance that separates Ulysses’ point of shipwreck from the pilgrim’s survival, or, for that matter, the *Convivio* from the *Purgatorio*, is measured by the descent into hell. This is literally true, according to the geography of the poem, and figuratively true as well, as the descent into the self, *intra nos*, is the prerequisite for the kind of transcendent knowledge that all men desire’ (J. Freccero, *Dante: The Poetics of Conversion* [Cambridge, MA: Harvard University Press, 1988], 146).

12. ‘A l’alta fantasia qui mancò possa; / ma già volgeva il mio disio e ’l velle, / sì come rota ch’igualmente è mossa, / l’amor che move il sole e l’altre stelle’ (*Paradiso* 33.142-5) [Here power failed the lofty phantasy; but already my desire and my will were revolved, like a wheel that is evenly moved, by the Love which moves the sun and the other stars].

13. As indicated by the opening of Canto 26 of *Inferno*, which prefigures the terms of Ulysses’s flight: ‘Godi, Fiorenza, poi che se’ sì grande / che per mare e per terra batti l’ali, / e per lo ’nferno tuo nome si spande! (1-3) [Rejoice, O Florence, since you are so great that over sea and land you beat your wings, and your name is spread through Hell!]

Yet there is continuity between the two, an umbral link that repeatedly foregrounds the latter as the realisation of the former.<sup>14</sup> Shadowing himself with Ulysses, Dante illuminates the geophilosophical trajectory of his journey. In particular, he uses Ulysses to reflect upon the coming-to-be of the *Commedia* out of and after the unfinished auto-commentarial project that precedes it. Dante's epic originates at the crossing of a threshold or crux defined by the intersection of the boundaries between poetry and philosophy, text and commentary, authorship and exegesis. These are the generic 'Pillars of Hercules' he crosses to become the 'first modern author' and anomalous object of an immediate commentary tradition.<sup>15</sup> The ongoing moment or engine of this becoming, the Ulysses-passing 'navicella del mio ingegno' (*Purgatorio* 1.2) [little bark of my genius] whereby Dante overleaps his own autoexegetical impasse, is the *Commedia's* originary digression within the dark wood,<sup>16</sup> the pilgrim's turning back from direct philosophic ascent and admission into a subterranean path.

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14. As Singleton explains in his commentary on *Paradiso* 27.82-3, the poet's recollections of Ulysses coincide with threshold moments: 'the wayfaring Dante and the souls of those who pass Purgatory both complete successfully a fording which is denied Ulysses. And now, as the pilgrim is about to cross over from "the human to the divine, from time to eternity" (*Par.* XXXI, 37-8), his last glance earthwards takes in the "mad crossing" of Ulysses: again he stands on a "shore" that will forever be denied to the ancient hero.'

15. See D. Parker, 'Interpreting the Commentary Tradition to the *Comedy*,' in *Dante: Contemporary Perspectives*, ed. A. A. Iannucci (Toronto: University of Toronto, 1997), 240-58; A. R. Ascoli, 'Auto-commentary: Dividing Dante,' chapter 4 of *Dante and the Making of A Modern Author* (Cambridge: Cambridge University Press, 2008), 175-226.

16. 'Nel mezzo del cammin di nostra vita / mi ritrovai per una selva oscura, / che la diritta via era smarrita' (*Inferno* 1.1-3) [Midway in the journey of our life I found myself in a dark wood, for the straight way was lost].

I take this moment, which corresponds more precisely to the duration between the pilgrim's being turned back by the *lonza* (panther or leopard) and his meeting with his poet-guide Virgil (*Inferno* 1.31-60), as an invitation to think commentary's geophilosophical dimension, its constituting the *form* of philosophy's belonging to the earth. The question of this form is not only a problem of style and representation. The problem, as Dante's dramatisation of it reveals, concerns the very *how* of thought as a necessary relation between its content and its experience.<sup>17</sup> To succeed philosophically, to indeed arrive at and produce its truth, thought must realise or render actual its own absoluteness, the 'identity of identity and difference' with respect to itself. Thought must become the body it belongs to, a self-moving vehicle that carries its subject with it.<sup>18</sup> This imperative is beautifully presented in the *problemic* movement of the Dantean pilgrim who neither ascends above nor enters the earth, whose lower foot is always the firmer ('l piè fermo sempre era 'l più basso,' 1.30), and who is repeatedly turned back ('i' fui per ritornar più volte vòlto,' 1.36).

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17. A problem to which commentary in particular speaks: 'Western culture could be characterized as being irreparably driven between *Halacha* and *Aggada*, between *shari'at* and *haqiqat*, between subject matter and truth content. Any healing between these terms has become impossible (this, incidentally, is evident in the loss of the commentary and the gloss as creative forms) – at least since the demise of the medieval theory of the four meanings of writing. (This theory has nothing to do with the gratuitous exercise of four successive and distinct interpretations of a text; rather, it takes place among them, in the *living relationship* between subject matter and truth content' (G. Agamben, *Infancy and History: The Destruction of Experience*, trans. L. Heron [London: Verso, 1993], 160, my emphasis).

18. Cf. Augustine's description of the way of arrival as what joins seeing and dwelling: 'discernerem atque distinguerem, quid interesset [...] inter videntes, quo eundum sit, nec videntes, qua, et viam ducentem ad beatificam patriam, non tantum cernendam sed habitandam' (*Confessions* [Cambridge, MA: Harvard University Press, 1950], 7.20) [I could discern and distinguish what difference there was between [...] those seeing where to go but not seeing how, and those seeing the way leading to the blessed homeland, which is not only to be discerned, but dwelt in].

Such a turning and circling motion which passes inside and across the philosophy/poetry boundary is exemplary of the commentarial impulse, an impulse which paradoxically proceeds by staying. Understood in these terms, the pilgrim's impasse, whereby he is caught in a motion that keeps him to the earth, is not simply the problem which the salvific production of the *Commedia* resolves, but its very labour.<sup>19</sup> Staying with the earth is the means of not remaining stuck on it, just as a boulderer proceeds by tenaciously experiencing the problem, staying *within* the encounter of the crux and passing through its difficulty (*ex-per-ientia*, 'coming out of and going through'). On this model, the geophilosopher is one who philosophically experiences rather than flees the earth, who passes through by remaining with it. Geophilosophical experience entails facing, more and more deeply, the fact of earth as the place of philosophy, and more profoundly, experiencing earth as facticity itself, the site of thought's passage to the absolute.<sup>20</sup> Commentary, the space of deictic and anagoric understanding, encodes this experience in the form of spice. As spice is a foundational term of terrestrial exploration, so commentary is the form of our geophilosophical becoming-spice, the practice whereby thought enters the earth and makes itself aromatic, that is, achieves the nature of a

19. The circular form of this productive impasse is elaborated in the pilgrim's later disclosure of the cord with he had hoped to capture the *lonza*: 'Io avea una corda intorno cinta, / e con essa pensai alcuna volta prender la lonza: a la pelle dipinta' (*Inferno* 16.106-8) [I had a cord girt round me, and with it I once thought to take the gay-skinned leopard]. The cord is figurally associated with dialectic. See F. Masciandaro, 'La corda di Gerione e la cintura-serpente della Dialettica,' *La conoscenza viva: Letture fenomenologiche da Dante a Machiavelli* (Ravenna: Longo, 1998), 45-54.

20. 'We now know the location of the narrow passage through which thought is able to exit from itself – it is through facticity, and through facticity alone, that we are able to make our way towards the absolute' (Q. Meillassoux, *After Finitude: An Essay on the Necessity of Contingency*, trans. R. Brassier [London: Continuum, 2008], 63).

panther: ‘This is an animal that is said to be parti-coloured, indeed colourful, and is extremely beautiful [*speciosissimum*] and gentle. [...] When it eats and is thus satiated, it hides in its cave and sleeps. But after three days it rises from sleep, and emits a great roar, and from its mouth comes forth a very sweet odour like all spices.’<sup>21</sup>

A more literal image of geophilosophic implication between commentary and spice is provided by Martin Behaim’s annotated globe (Fig. 1), made in 1492 on the eve of the great European voyages of discovery. The globe presents the superimposition of two geometries: one, of commentary, a global ancient genre, as a kind of writing that in its very form seeks to sphericise a text, to surround it on all sides; the other, of spice, the original global commodity, as a kind of writing on the earth, a movement that marks and remarks relational networks. Next to the Spice Islands, Behaim provides a lengthy gloss detailing how ‘spices pass through several hands in the islands of oriental India before they reach our country’ that concludes as follows: ‘Twelfthly, those who use the spices buy them of the retail dealers, and let the high customs duties profits be borne in mind which are levied twelve

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21. W. B. Clark, *A Medieval Book of Beasts: The Second-Family Bestiary: Commentary, Art, Text and Translation* (Rochester, NY: Boydell & Brewer, 2006), 123. Given Dante’s emphasis on the beauty of the *lonza*, this is very likely the animal he has in mind, although the determination of its species ‘seems next to impossible’ (R. T. Holbrook, *Dante and the Animal Kingdom* [New York: Columbia University Press, 1902], 95) and is ‘another of the *Comedy*’s little mysteries likely to remain unsolved’ (Robert Hollander, commentary on *Inferno* 1.32–54, Dartmouth Dante Project <<http://dante.dartmouth.edu>>). More importantly, Dante’s *lonza* is thus itself both figure and instance of the production of commentary’s perfect object, something that generates unending commentary via the fact that it cannot be said or explained, only shown or indicated. Fulfilling the relation to *spice*, such an object is *special*: ‘The *species* of each thing is its visibility, that is, its pure intelligibility. A being is special if it coincides with its own becoming visible, with its own revelation’ (G. Agamben, *Profanations*, trans. J. Fort [New York: Zone, 2007], 57).

times upon the spices, the former amounting on each occasion to one pound out of every ten. From this it is to be understood that very great quantities must grow in the East and it need not be wondered that they are worth with us as much as gold.<sup>22</sup> As the product of these geometries, the comment demonstrates interpretation as commerce, a laborious extraction of significance across time and space whose very process generates the value it apparently only translates, and exposes the inescapable spatiality and topology of understanding, the matrices of distance and desire that make for the production of meaning, its being brought into presence. It brings to mind the enigmatic lines, interpreted by Francis Bacon as prophesying the age of discovery and made to comment on the image of a ship passing the Pillars of Hercules in the frontispiece to his *Novum Organum* (1620): 'But you, Daniel, shut up the words, and seal the book, until the time of the end. Many shall run to and fro, and knowledge shall increase' (Daniel 12:4).<sup>23</sup> These may be read, phenomenologically rather than factually, as figuring exactly the earthly restlessness of understanding, its interpretive movement *around* that draws forth from what cannot be penetrated. Between the sealing of the text and the increase of knowledge is established the

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22. Cited from L. Jardine, *Worldly Goods: A New History of the Renaissance* (London: Macmillan, 1997), 296-8. On Martin Behaim's understanding of the spice trade, see P. Freedman, *Out of the East: Spices and the Medieval Imagination* (New Haven: Yale University Press, 2008). 141-2.

23. 'And this proficience in navigation and discoveries may plant also an expectation of the further proficience and augmentation of all sciences; because it may seem they are ordained by God to be coevals, that is, to meet in one age. For so the prophet Daniel speaking of the latter times fortelleth, "Plurimi pertransibunt, et multiplex erit scientia": as if the openness and through passage of the world and the increase of knowledge were appointed to be in the same ages' (Francis Bacon, *The Advancement of Learning*, 2.10, cited from *Francis Bacon: The Major Works*, ed. B. Vickers [Oxford: Oxford University Press, 2002], 184).

*surface* over which understanding moves, a surface that is planetary, in the sense of enclosing what it contains. This is in an essential way the movement of philosophy, or rather philosophy itself as movement, ‘the urge,’ in Novalis’s optimal topological definition, ‘to be at home everywhere.’<sup>24</sup> For the practice of this restless urge also moves as over the surface of a whole, *as if movement itself would be relocated* and made the omnipresent term of equation between anywhere and everywhere. Such an equation is present in Heidegger’s call to ‘practice planetary thinking along a stretch of the road, be it ever so short,’ which locates the global in a local path, the universality of thinking in the grounded practice (figural and/or literal) of walking where one is.<sup>25</sup> The movement of philosophy is thus not the means to, but precisely a freedom from destination, a *peri-patos* or around-walking that realises itself as processual and gerundive. ‘Philosophy is philosophizing.’<sup>26</sup>

Tracing the movement of philosophy in these terms, as grounded in a movement of being that is unmistakably earthly and planetary, intersects with two essential features of commentary and geophilosophy that my exploration will pay particular attention to: digression and immanence, respectively. Digression belongs to commentary with respect to its ‘go-and-stop’ structure, its pausing of the text so as to

24. Novalis, *Philosophical Writings*, trans. M. M. Stoljar (Albany: State University of New York Press, 1997), 45.

25. M. Heidegger, *The Question of Being*, trans. J. T. Wilde and W. Kluback (New Haven: College & University Press, 1958), 107. On walking and philosophy, see D. Macauley, ‘Walking the Elemental Earth: Phenomenological and Literary Footnotes,’ in *Passions of the Earth in Human Existence, Creativity and Literature, Analecta Husserliana* 71, ed. A.T. Tymieniecka (Boston: Kluwer Academic Publishers, 2001), 15-31; and R. Solnit, ‘The Mind at Three Miles an Hour,’ Chapter 2 of *Wanderlust: A History of Walking* (New York: Penguin, 2001), 14-29.

26. Heidegger, *The Fundamental Concepts of Metaphysics*, 4.

move tangentially from it in any direction, but never so far or long as to prevent or forget returning.<sup>27</sup> The place of digression is the margin, the space into which commentary moves simultaneously away from, toward, more deeply into, and far beyond its text. The digression of commentary is not aimless or arbitrary, not merely wayward or adjacent. It is rather a wandering at once in and against the gravity of its return, like hunting or gathering *along the way*. Immanence belongs to geophilosophy, in all of its permutations and senses, as philosophy oriented to Earth, this earth, as the here-and-now place of its origin and space of its truth or realisation. Geophilosophy, above all via Nietzsche and Deleuze and Guattari, who established the term in the former ('Nietzsche founded geophilosophy'), embraces the experiential, phenomenological fact of the absence of a transcendental outside and the rootedness of thinking in earth. 'There is no outside!' says Zarathustra, and the animals reply, 'In every Instant being begins; round every Here rolls the ball. There. The middle is everywhere. Crooked is the path of eternity.'<sup>28</sup> 'Thinking is neither a line drawn between subject and object nor a revolving of one around

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27. 'Between the seemingly unavoidable and somehow joyful drive of commentary toward *copla* and commentators' obligations to show that their work is task oriented [...] between an aesthetics of exuberance and an aesthetics of streamlined reader functionality, commentators tend to develop a specific rhythm that one could perhaps characterize as "go-and-stop". On the one hand, they certainly want the user to appreciate the *copla* of the knowledge offered, but on the other hand, they hardly ever forget to insist on the rigorous functionality of their commentary, as if they anticipated protests of readers who would get lost in the meandering cross-references of the text on the margin.' (H. U. Gumbrecht, *The Powers of Philology: Dynamics of Textual Scholarship* [Urbana: University of Illinois Press, 2003], 45).

28. Nietzsche, *Thus Spoke Zarathustra*, 'The Convalescent', 175. Cf. 'Nietzsche performs on the metaphorical level what Hegel attempts on the systematic one: the centralization of the earth, its relocation in the middle of the universe making the sun a satellite of our planet, the final withdrawal of the Copernican Revolution' (S. Günzel, 'Nietzsche's Geophilosophy,' *Journal of Nietzsche Studies* 25 [2003]: 82).



the other. Rather, thinking takes place in the relationship of territory and earth,' say Deleuze and Guattari.<sup>29</sup> Or, as Diane Chisholm explicates, 'The prefix *geo* does not signify a specialized branch of philosophy; it signals, rather, the *topos*, or the *now here*, of philosophical inquiry in place of a transcendental metaphysics that believes itself above being placeable, abstractly nowhere and universally everywhere.'<sup>30</sup> Geophilosophy's characteristic discursive ambivalence or confusion regarding the distinction between the literal earth and earth-as-metaphor, encapsulated in its Nietzschean phrasal cornerstone 'the meaning of the earth' [*Sinn der Erde*] and erroneously dissected by academic commentary, is part and parcel of its investment in immanence. The earth is the present object par excellence that can never be approached from distinctions between metaphorical and literal, figure and ground. Earth is so deeply present that its meaning is always falling back into earth 'itself.' Earth is 'too much with us,' as Wordsworth says of 'the world,' the *saeculum* of human work and worry, longing for a proportional belonging to the earth that world occludes. But it is exactly the combination of the earth's phenomenal unboundedness as object and omnipresence as fact that constitutes its inevitable diurnal occlusion, its constantly being forgotten via its very presence. So Heidegger grasps earth by defining it as closed and closing on itself: 'The earth appears openly cleared as itself only when it is perceived and preserved as that which is by nature undisclosable, that which shrinks from every disclosure and constantly keeps itself closed up [...] The earth is essentially self-secluding.

29. G. Deleuze and F. Guattari, *What is Philosophy?*, trans. H. Tomlinson and G. Burchell (New York: Columbia University Press, 1994), 85.

30. D. Chisholm, 'Rhizome, Ecology, Geophilosophy (AMap to this Issue),' *Rhizomes* 15 (2007): 4, at <http://www.rhizomes.net/issue15/chisholm.html>.

To set forth the earth means to bring it into the Open as the self-secluding.<sup>31</sup> Earthly immanence (from *in manere*, to remain within) is the remaining-within-itself whereby earth always remains within, is immanent to, world, the mode of its being that makes it always here. Earthly immanence is thus the counterpart of the presence of space, as that which everything always remains within. Earth is proportional to space, the chthonic to the khoral, which always remains without: 'And there is a third nature, which is space [*chōra*] and is eternal, and admits not of destruction and provides a home for all created things, and is apprehended when all sense is absent, by a kind of spurious reason, and is hardly real – which we, beholding as in a dream, say of all existence that it must of necessity be in some place and occupy a space.'<sup>32</sup> In short, space is to the sky as earth is to the ground. Earth and space are the twin dimensions where the boundary between the topological and the spatial totally breaks down. In one direction, space, embodied in the sky, gives way to absolute place, Plato's imperceptible container where everything must be. In another direction, place, embodied in the ground, gives way to absolute space, the abyss whose bowels Nietzsche esteems. In the neighbourhood of their mutual extremity, each becomes the other. And in the region of their most proximate differentiation, there is world (ground-sky), the mutually disclosing relation of earth and space that Heidegger calls the Open and feared technology to be closing.<sup>33</sup>

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31. M. Heidegger, 'The Origin of the Work of Art,' in *Poetry, Language, Thought*, trans. A. Hofstadter (New York: Harper & Row, 1971), 47.

32. *The Collected Dialogues of Plato*, eds. E. Hamilton and H. Cairns (Princeton: Princeton University Press, 1963), *Timaeus* 52b, 1178-9.

33. Keith Tester comments on Heidegger's fear upon seeing photos from the moon: 'The photographs implied a containment of the meanings of the earth even as they also implied a freedom of humanity [...] from their natural home. But in that

Commentary is geophilosophical in the sense of being a movement that produces the immanence of the earth both formally and actually. Formally, commentary makes of a text, its earth, an *orbis*, a round world, by bringing text into the space around it. A dwelling in and on the text, commentary accords with Heidegger's explication of work as a dialectic of earth and world: 'Upon the earth and in it, historical man grounds his dwelling in the world. In setting up a world, the work sets forth the earth [...]. The work moves the earth itself into the Open of a world and keeps it there. *The work lets the earth be an earth.*'<sup>34</sup> Commentary likewise does not break its text, but preserves its integrity, shaping itself to it even in the midst of digging through it interlinearly and dwarfing, dominating it circumferentially. Something of the phenomenal earthiness of this complex relation is captured by our tendency to speak both of footnotes as *mines* and of *mining* footnotes. Commentary lets the text be a text and furthermore brings it into the open as self-secluding in the sense of presenting itself, not as some transparent medium for seeing behind or underneath it, but as *further* text. 'What [...] hermeneutic topologies of the below and the behind share,' says Gumbrecht, 'is a categorical – not to say dramatic – distinction between a level of primary perception and an always 'hidden' level of meaning and intentionality [...]. In contrast, commentaries do not aim at a level 'below,' 'behind,' or even 'beyond' the textual surface, but commentators nevertheless do not see texts 'from above' or from that famous 'distance' that we so

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containment, the photographs also made the earth a problem to be dealt with; an opportunity to be exploited, a standing reserve waiting for animation by the designs and desires of humanity through technology' (*The Inhuman Condition* [London: Routledge, 1995], 3).

34. Heidegger, 'The Origin of the Work of Art,' 46.

readily associate with objectivity. We expect commentaries [...] rather to be “lateral” in relation to their texts of reference, and we want commentators to position themselves in “contiguity” not so much with an author but with the text in question. It is this contiguity between the commentator’s text and the text on which to comment that explains why the material form of the commentary depends on and has to adapt to the material form of the commented-on text.<sup>35</sup>

Yet, it is absolutely necessary to add (else the deep *dialectical* relation between text and commentary might be lost), that commentary’s topological contiguity with its text does not delimit its interpretive, archaeological function, but rather institutes it as realised and to-be-realised in the text itself and our being before it. In other words, commentary is an immanent geo-graphy, an inscriptional earth-writing that continuously asserts by its very movement that its truth belongs *here* in the most palpable and factual sense, that it is *written into* the place of reader and text, as exemplified by the formal continuities between glossing and graffiti. This more complex relation between commentary and text, the movement, neither orthodox nor subversive, whereby commentary keeps to and maintains the surface of its text by perforating it, is present within Reza Negarestani’s concept of Hidden Writings: ‘Hidden Writing produces [...] positive disintegration, or more accurately collectivization of one author (voice) or an authorial elite, and its transformation to an untraceable shady collective of writers, a crowd [...] So-called hermeneutic rigor follows the logic of textual stratification, and can be achieved by hermeneutical tools corresponding to the layering order of its text. But the subsurface life of Hidden Writing is not the object of layers

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35. Gumbrecht, *The Powers of Philology*, 43-4.

and interpretation; it can only be exhumed by distorting the structure of the book or the surface plot [...] To interact with Hidden Writings, one must persistently continue and contribute to the writing process of the book.<sup>36</sup> Commentary constitutes a structure of understanding and experience, i.e. consciousness, that opens world to earth. It is writing's way of staying original, in ever-new nearness to its earthly origins, in productive proximity to the fact that all writing is only on the earth. The *telos* of commentary, its far-off end, is *tellus*, what bears us. 'Turn it and turn it again for everything is in it; and contemplate it and grow gray and old over it and stir not from it' (Abot 5.22). What the Talmudic commentator here says of the Torah is sayable of the earth.<sup>37</sup>

Understanding commentary as geophilosophy, then, will involve understanding the relation between digression and immanence, as when two people, walking in conversation, stop walking and face each other. Or as when the Phoenix, in order to re-become itself, departs from her home, the blissful enclosure of Paradise, and seeks 'hunc orbem, mors ubi regna tenet' [this circular world where death rules].<sup>38</sup>

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36. R. Negarestani, *Cyclonopedia: Complicity with Anonymous Materials* (Melbourne: Re.Press, 2008), 62.

37. Richard A. Cohen similarly identifies the 'concrete and productive integrity of spirit and matter' as a chief characteristic of (Levinasian) exegesis: 'Letters give rise to spirit, call for commentary, and spirit is rooted in letters, in a textual richness that is one of the marks of sacred literature, or literature taken in a sacred sense [...]. To fly with a text, to be inspired by it and discover its inspiration, requires not that one have wings, that one hover above it. Rather, it requires that one's feet be firmly planted on the earth, in touch with the concrete, never losing sight of a properly human dignity' (*Ethics, Exegesis and Philosophy: Interpretation After Levinas* [West Nyack, NY: Cambridge University Press, 2001], 247).

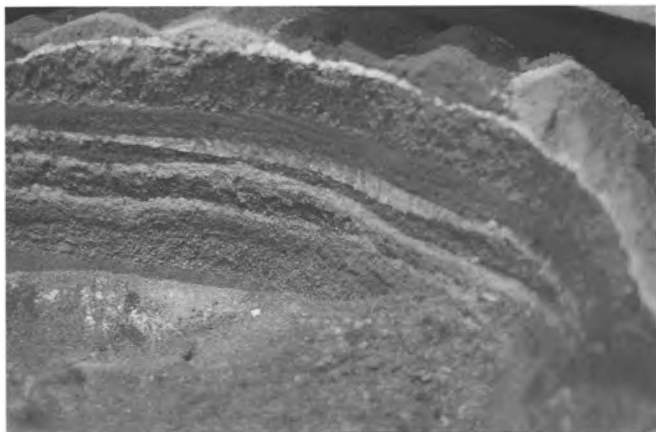
38. Lactantius, *De Ave Phoenix*, ed. M. C. FitzPatrick (Philadelphia: University of Pennsylvania, 1933), line 64.

## COLLAPSE VI

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Here she encloses herself in a nest of spices, burns in her own flame, and is reborn. On the way back home, she carries in her claws the remains of her own body, mixed with balsam, myrrh, and Sabeian frankincense, which she 'in formam conglobat ore pio' [forms with loving mouth into a globe].<sup>39</sup>

### II. THE SPICE MUST FLOW



That spice has in fact been used to conceptualise commentary exemplifies one of its essential functions: to confound distinctions between utility and pleasure, necessity and luxury, food and flavor, literal and figural. In the Talmudic tractate *Masekhet Soferim*, which deals with regulations concerning the preparation and study of the holy books, it is stated, 'The Torah is like salt, the Mishnah like pepper, the Gemara like spices.

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39. Lactantius, *De Ave Phoenixe*, line 120.

The world cannot exist without salt, without pepper, or without spices. So also the world cannot exist without the Scriptures, and the Mishna, and the Gemara' (15.8). The evident purpose of the comparison is to articulate simultaneously the shared absolute necessity of all three texts and the superior value of the commentaries, in keeping with a reverence expressed more extremely elsewhere in the Talmud: 'He who only occupies himself with the study of the Torah is as if he had no God' ('Abodah Zarah 17b). Logically, the comparison produces a kind of ambivalence-without-ambivalence with regard to their relative values, so that the Gemara (commentaries on the Mishna, the written oral Law which, by a proportional logic, both expounds and is esteemed as equiprimordial with the Torah), are identified as more valuable than the value that grounds them. Commentary-as-spice is not merely an authoritative supplement to revealed scripture, not a condiment, but something that actually holds the essence of revelation as living process. Or as Gershom Scholem explains, in fortuitously tellurian terms: 'The Biblical scholar perceives revelation not as a unique and clearly delineated occurrence, but rather as a phenomenon of eternal fruitfulness to be unearthed and examined [...] Out of the religious tradition they bring forth something entirely new, something that itself commands religious dignity: commentary.'<sup>40</sup> This is commentary's ex-uberance, the way it bears forth a text's unending abundance, the durable newness of its sempiternal self-difference, the perfect plenitude of its unfinishing futility, in other words, a text's *continuing being*, its staying itself by always being other and more than itself.

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40. G. G. Scholem, 'Tradition and Commentary as Religious Categories in Judaism,' in *Understanding Jewish Theology: Classical Issues and Modern Perspectives*, ed. J. Neusner (New York: Ktav Publishing, 1973), 46-7.

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“Futility.” [says Dr. Yueh to Lady Jessica] He glanced at her. “Can you remember your first taste of spice?” “It tasted like cinnamon.” “But never the twice the same,” he said. “It’s like life – it presents a different face each time you take it. [...] And, like life, never to be truly synthesized.”<sup>41</sup> Commentary-as-spice thus upholds commentary as more *text* than the text it comments on, in a mysterious manner than both destroys and leaves intact the commentary/text distinction. Or, commentary embodies, not simply the relation of reader to text, but the relation whereby the text is itself. It is an externalisation of the existential medium whereby it is what it is, its essence or being. This accords with a proportional Talmudic passage which makes the ambivalence-without-ambivalence logic explicit: ‘They who occupy themselves with the Bible [alone] are but of indifferent merit; with Mishnah, are indeed meritorious, and are rewarded for it; with Gemara – there can be nothing more meritorious; yet run always to the Mishnah more than to the Gemara’ (Baba Mezia 33a). In other words, commentary materialises the movement, the flow of the text that makes it more than itself. And this *more*, this thing that is not a thing that makes all the difference, is spice. Commentary belongs to its text paradoxically as a property at once incommensurable and identical with its substance. In the graded terms of the comparison, such paradox is held within the aspecificity of the category of spice, the way it is both genus and species, such that spice simultaneously includes, exceeds, and is one of several among salt and pepper. With regard to spice’s mixed resonances with the dimensions of pleasure and value, the metaphor may be understood as signaling that commentary is luxury as the perfection of necessity, the fruition of an

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41. Frank Herbert, *Dune*, 64.



essential textual value, or that commentary embodies the value of the value of the text, the earthly sublime or beyond *within* the text that makes it meaningful in the first place. Accordingly, talmudist Rabbi Hanina claimed that ‘were the Torah, God forbid, to be forgotten in Israel, I would restore it by means of my dialectical arguments [*pilpul*]’ (*Baba Metzia*, 85b).<sup>42</sup> Wondrously, *pilpul* registers at once with round movement, hermeneutic dialectics, and spice. Jeffrey Rubenstein explains: ‘Although literally meaning “turn from side to side”, hence “search, examine, investigate”, *pilpul* was derived by the Bavli from “pepper” (*pilpel*) and refers to intellectual sharpness and acumen. The term seems to be applied to a range of activity, including reasoning, interpreting and discussion, and need not always refer to sharpness in dialectics per se.’<sup>43</sup> *Pilpul*, glossed by Daniel Boyarin as the dialectical ‘logic of commentary,’ thus denotes the very *movement* of commentary’s becoming, the roundabout way it enters into vital relation with the text as its own event.<sup>44</sup> ‘Suspending time and space,’ says Sander Gilman, ‘[*pilpul*] confronts the opinions of all authority, seeking the moment of resolution hidden within seemingly contradictory positions.’<sup>45</sup>

The place of commentary is the space of spice. The sense of this is fulfilled by understanding spice as flow,

42. Cited from Jeffrey L. Rubenstein, *The Culture of the Babylonian Talmud* (Baltimore: Johns Hopkins University Press, 2003), 48.

43. Rubenstein, *The Culture of the Babylonian Talmud*, 48. Similarly, Gematria (fr. Greek *geometria*), the numerological interpretation of Hebrew words, is called the ‘spice of Torah.’ See Gutman G. Locks, *The Spice of Torah – Gematria* (New York: Judaica Press, 1985).

44. Daniel Boyarin, ‘Pilpul: The Logic of Commentary,’ *Dor le-dor* 3 (1986), 25.

45. Sander L. Gilman, *Jewish Self-Hatred: Anti-Semitism and the Hidden Language of the Jews* (Baltimore: Johns Hopkins University Press, 1986), 90

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currency, a travelling thing that does not leave its site of origin, something whose aromatic ability to permeate what is proximate to it, to have always already permeated it, marks it as not a *thing* at all, something not bounded by time and space. Spice as the figure of commentary's hermeneutic *location* of meaning as a center, the turning movement that reveals and re-reveals a text's heart, also coordinates with the identification of spices with Eden as the mythic, lost, metaphysical center of the world. As Milton writes of Satan's approach to Eden, 'now gentle gales / Fanning their odiferous wings dispense / Native perfumes, and whisper whence they stole / Those balmy spoils' (*Paradise Lost*, 4.156-9). Just as the alar movement of these lines destroys the distinction between breeze and scent, so not only spice's aroma but spice itself *is* what it is *of*. Spice is the substance of the *topological* filling of space, a fundamentally spherical phenomenon whose pluridimensionality defines it as the olfactory analogue to the ancient definition of God as a sphere whose center is everywhere and circumference nowhere. Accordingly, when a thirteenth-century Beguine named Sybil sought to demonstrate to her community the fact of her conversations with angels, she strewed, or more properly glossed, her house with spices.<sup>46</sup> And in the *Zohar*, the height of mystical vision, which intersects with the cabalist's intercourse with his wife on the midnight of the Sabbath, 'the point in time outside of time when God, attracted by their devotion, likes to visit them,' happens through the saturating medium of spice: 'These souls are there bathed in the spices of Paradise, and behold all that is within their capacity to behold.'<sup>47</sup>

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46. See Freedman, *Out of the East*, 84ff.

47. P. Beitchman, *Alchemy of the Word: Cabala of the Renaissance* (Albany: State University

Commentary-as-spice shows commentary as the savour of the significance of text, the actual phenomenal third thing between reader and text, subject and object, that exceeds both in a manner correlative to Aristotle's definition of tragedy as mimesis in 'spiced language' [*hêdusmenôî logôî*] (*Poetics*, 1449b25) – a definition which follows not condiment-logic but the ancient understanding of spice as the very potential of the edible: 'For when salts and seasonings [*hêdusmata*] generally are combined with a food,' says Alexander of Aphrodisias in his commentary on Aristotle's *Meteorology*, 'out of both a single thing is created (*apoteleitai*), when the food takes on an edible character from the seasonings.'<sup>48</sup> The sense of this notion becomes especially palpable in the context of commentary on the *Song of Songs*, not coincidentally at once the most spiced and the most

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of New York Press, 1998), 33; *The Zohar*, ed. J. Abelson, trans. M. Simon and H. Sperling (with P. Levartoff, vols. 3 & 4), 5 vols. (London and New York: Socino Press, 1933), III.389. Here citing the latter from the former.

48. Alexander of Aphrodisias, *On Aristotle's Meteorology* 4, trans. E. Lewis (Ithaca: Cornell University Press, 1996), 89. Clarifies: '*hêdusmata*, which is a metaphor from cooking (sweeteners, condiments, aromatic herbs, spices), are usually taken [by modern commentators] to be non-essential additives to food, while it is precisely these additives which characterize the art of cooking [...] it is the interpreters of the *Poetics* rather than Aristotle who underestimate the importance of condiments to cooking as much as the significance of music for tragedy [...]. The proper use of *hêdusmata* is identified, not only with the art of cooking, but with the civilized way of eating: without seasoning, foodstuffs like meat and fish are undesirable and almost as if they would be eaten raw. This is at least what Hegesandros claims, an author of the second century BC, who 'in his Commentaries (FHG iv 418) says that everybody is fond of *hêdusmata*, not of meats or fish; and if they are not available nobody is happy to offer the meat or the fish (alone), nor does anyone desire the raw and the unseasoned' (G. M. Sifakis, *Aristotle on the Function of Tragic Poetry* [Herakleion: Crete University Press, 2001], 56-70) – a human logic that is followed even (and perhaps especially) when the human is the meal: 'When police searched the kitchen of the late twentieth-century cannibal Jeffrey Dahmer, so the story goes, they found nothing but the refrigerated flesh of his victims and [...] condiments; no fruit, vegetables, cereals or dessert' (T. Morton, *The Poetics of Spice: Romantic Consumerism and the Exotic* [Cambridge: Cambridge University Press, 2000], 31, Morton's ellipsis).

commented-upon of biblical books. Here, elaborating upon more universal links between odour and divine presence, the work of interpreting what spice is becomes spicy itself, the contemplative activity of commentary a becoming-spice. Spice, like a textual aroma of the Paradise which both is and is to come, signifies for the commentator the highest sense of Scripture, the ‘anagoge, foretaste of heavenly things.’<sup>49</sup> The possibility for such loving collusion between embodied imagination and intellectual experience, for the interpretation of spice to become a kind of transcendental tautology, is captured in Bernard of Clairvaux’s generous exegetical invitation in a sermon on the Song of Songs: ‘Every person [...] is free to pursue the thought and experiences, however sublime and exquisite, that are his by special insight, on the meaning of the Bridegroom’s ointments.’<sup>50</sup> Alan of Lille, remembering the Song of Songs, defines cinnamon and its theological meaning in one breath: ‘Cinnamomum est species aromatica, interna contemplatio’ [cinnamon is an aromatic spice, inward contemplation].<sup>51</sup> That *species* here still holds a semantic relation to appearance underscores the overlap. Commentarial contemplation, like those pleasurable sensations that happen to us near other substances, is an *aromatic* phenomenon. This phenomenon is realised in the mind’s own becoming-spice or attaining of a quality that is open, expansive, permeating.

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49. R. F. Littledale, *A Commentary on the Song of Songs, from Ancient and Medieval Sources* (London: Joseph Masters, 1869), 379. ‘The spices are anagogical interpretation, the foretaste of heavenly things’ (*Song of Songs*, trans. and commentary M. H. Pope, Anchor Bible, Vol. 7c [Garden City, NY: Doubleday, 1977], 697).

50. Bernard of Clairvaux, *On the Song of Songs*, trans. K. Walsh, 4 vols (Kalamazoo, MI: Cistercian Publications, 1983), 22.2.4, vol.2, 16.

51. Alan of Lille, *Liber in distinctionibus dictionum theologicarum*, s.v. ‘cinnamomum,’ *Patrologia Latina*, 201:741, <http://pld.chadwyck.com/>.

As Hugh of St. Victor explains, whereas meditation is an ‘assiduous and shrewd drawing back of thought [...] [that] is always about things hidden from our understanding,’ contemplation is ‘a keen and free observation of the mind expanding everywhere to look into things [...] [and] is about things *as manifest*.’<sup>52</sup>

Spice is not a figure, but a generational integrity of spirit and letter, matter and desire, a sensuous reality whose structure takes the mind that *absorbs* it beyond itself, a hermeneutic psychedelic. Commentary, whose etymology (via *comminisci*, to devise, invent) indicates the creativity of thinking *with* something, is the inverted, external projection or manifestation of spice as such an integrity, the materialization of thinking as a condensation and spreading over a surface; or as Deleuze and Guattari say in their chapter on geophilosophy: ‘thinking consists in stretching out a plane of immanence that absorbs the earth (or rather, ‘*adsorbs*’ it).’<sup>53</sup> Susan Ashbrook Harvey perceives this in commenting on Gregory of Nyssa’s *Commentary on the Song of Songs*: ‘Gregory’s olfactory imagery highlights the limits of noetic experience [...] In such instances he seems to rely on what the body can know through smell in order to capture what eludes the mind in understanding.’<sup>54</sup> And Arthur Green

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52. ‘Meditatio est assidua et sagax retractatio cogitationis, aliquid, vel involutum explicare nitens, vel scrutans penetrare occultum. Contemplatio est perspicax, et liber animi conuictus in res perspicendas usquequaque diffusus. Inter meditationem et contemplationem hoc interesse videtur. Quod meditatio semper est de rebus ab intelligentia nostra occultis. Contemplatio vero de rebus, vel secundum suam naturam, vel secundum capacitatem nostram manifestis’ (*In Salomonis Ecclesiasten Homiliae XIX, Patrologia Latina*, 175:116-7).

53. Deleuze and Guattari, *What is Philosophy*, 88, my emphasis.

54. Susan Ashbrook Harvey, *Scenting Salvation: Ancient Christianity and the Olfactory Imagination* (Berkeley: University of California Press, 2006), 175. See also Rachel Fulton, ‘Taste and see that the Lord is sweet’ (Ps. 33:9): The Flavor of God in

feels this when saying ‘The canticle itself, we might say, became the “locked garden” of which it speaks, opening itself to those whose hearts longed to dwell by its streams and to be intoxicated by the spices of its perfumed gardens.’<sup>55</sup> Although my body, in the lightness of its earthly gravity, as the very space of odour, of what is neither/both subject and object, needs desperately to delete their critically-safe correlationism (Susan’s *seems* and Arthur’s *we might say*) or at minimum, ~~strike it through~~. How else will we ever taste the joy Bernard testifies to: ‘Happy the mind that has been wise enough to enrich and adorn itself with an assortment of spices such as these’?<sup>56</sup> And not simply to adorn, but to become, following spice as the potentiality of a non-consumerist relation to world: ‘In eating the world, boundaries between subject and object are broken down and in another way rigidly maintained. In the poetics of spice, however, a utopian space is imaginable in which boundaries between subject and object evaporate, as they are not predicated on a dialectic of consumer and consumed.’<sup>57</sup> Where else will we dine on texts in this way, the way late mediaeval bibliomane Richard de Bury asks us to, like *panthers*: ‘You must first eat the volume with Ezekiel, that the stomach of your memory may be internally sweetened; and thus after the manner of the perfumed panther (to the breath of which men, beasts,

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the Monastic West,’ *Journal of Religion* 86 (2006):169-202. Cf. ‘By smelling things, we absorb them directly into our bodies, and consequently they provide what Kant otherwise only attributes to God: *unmediated* knowledge of the thing in itself’ (A. Jaspar and N. Wagner, ‘Notes on Scent,’ *Cabinet Magazine* 32 [2009]: 37).

55. Arthur Green, ‘Intradivine Romance: The Song of Songs in the Zohar,’ in *Scrolls of Love: Ruth and the Song of Songs*, ed. Peter S. Hawkins and Lesleigh Cushing Stahlberg (New York: Fordham University Press, 2006), 215.

56. Bernard of Clairvaux, *On the Song of Songs*, 12.1.1, vol. 1, p. 77.

57. Morton, *The Poetics of Spice*, 229.

and cattle draw near that they may inhale it), the sweet odour of your aromatic conceptions [*conceptorum aromatum odor suavis*] will be externally redolent’?<sup>58</sup>

More discursively, commentary-as-spice embodies the risky work of philosophy, understood by Levinas as the ‘adventure’ of producing ‘the truth of what does not enter into a theme’ via the reduction of the said to the saying, a reduction which is ‘both an affirmation and a retraction of the said’ and which operates as a *continual interruption of essence*. ‘The reduction could not be effected simply by parentheses which, on the contrary, are an effect of writing. It is the ethical *interruption of essence* that energizes the reduction.’<sup>59</sup> This is philosophy not, of course, as a discipline among several, but as the spice of disciplines, what makes all disciplines ‘ways and kinds of philosophizing,’ part of the movement Heidegger calls the attack [*Angriff*] that ‘*the Da-sein in man launches [...] upon man,*’ driving us ‘out of everydayness and [...] back in to the ground of things.’<sup>60</sup> Like *pilpul*, the movement of philosophical truth-production, says Levinas, is round and multitemporal: ‘it is produced out of time or in two times without entering into either of them, as an endless critique, or skepticism, which in a spiralling movement makes possible the boldness of philosophy, destroying the conjunction into which its saying and its said continually enter. The said, contesting the abdication of the saying that everywhere occurs in this said, thus maintains the diachrony in which, holding its

58. Richard de Bury, *Philobiblon*, trans. John Bellingham Inglis (New York: Meyer Brothers, 1899), ch.4.

59. E. Levinas, *Otherwise Than Being, or Beyond Essence*, trans. A. Lingis (Pittsburgh: Duquesne University Press, 1981), 44, my emphasis.

60. Heidegger, *The Fundamental Concepts of Metaphysics*, 32, 21, respectively.

breath, the spirit hears the echo of the *otherwise*.<sup>61</sup> And, it is a movement that originates in proximity: 'Saying states and thematises the said, but signifies to the other, a neighbor, with a signification that has to be distinguished from that borne by words in the said. The signification to the other occurs in proximity.'<sup>62</sup> So commentary, which happens in proximity to and not (as in the case of its bastard offspring the annotated critical edition) in parenthesis from the text, which moves from this proximity as the very ground of its truth, and which is saturated with its own event in the form of the *extra* or outside presence of its essentially deictic gesture, may be called the *savoury circulation of the interruption of our exposure to the otherwise*.<sup>63</sup>

This essentially philosophical othering function of commentary, its diachronic expansion of the saying within the said, or holding open of the event of the text via the very procedure of encircling and enclosing it on all sides, like an unending erection of fortifications each inviting further and new forms of attack, is analogous to the apophatic function of the monstrous as explicated by David Williams: 'In the aesthetic production of the Middle Ages a favoured way of achieving [the progressive negation of logical affirmations about the world and the real] was to deform the representation of the thing described in such a

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61. Levinas, *Otherwise Than Being*, 44.

62. *Ibid.*, 46.

63. Cf. 'Citation and commentary open up the non-compelling obligation in reading – without abandoning discourse (and which only the most recalcitrant of readers can doubt reflects yet again on how we are reading and commenting, reading these others and writing for still other others – here, 'at this moment itself' that is also not now. I read and write commentary here to hold open for others, to call for other books to read. This text is a reading text, reading in the ethical exigency to call to other readers)' (R. Gibbs, *Why Ethics?: Signs of Responsibilities* [Princeton: Princeton University Press, 2000], 113).



way as to call into question the adequacy of the intellectual concept of the thing in relation to its ontological reality.<sup>64</sup> Or as Carl Pyrdum writes, saying more than he thinks, 'Nothing *spices* up the margins of your boring old psalter like a picture of a cute monkey doing something really odd, like riding a stork who has a demon's head for a butt.'<sup>65</sup> Just as spice also deforms and distorts the material to which it is applied through a kind of reverse denaturation that turns the merely ingestible into the truly edible, so commentary is a fundamentally monstrous discourse directed toward the denaturing of the text into the earthy, ontic immanence of what it represents. Mazy, decentring, gargantuan, discombobulating, rhizomatic – the formal structure of commentary, geometrically proportional to the characteristic conceptual density and difficulty of philosophical and theoretical language that digressively makes one stop and think, is essential to its quote-unquote-meaning, its desire to multiply explanation and representation fractally, to generate more and more perceptual enclosures, spaces within which the unrepresentable is brought into presence. Commentary thus exemplifies a more universal intervention tendency within human thinking that can be called the *inevitable intrusion of the fictive*, our irreplaceable and individuating poetic compulsion to deform the object of understanding precisely so as to understand it, as the only way it can *actually* be understood.<sup>66</sup>

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64. D. Williams, *Deformed Discourse: The Function of the Monster in Mediaeval Thought and Literature* (Montreal & Kingston: McGill-Queen's University Press, 1996), 5.

65. <http://gotmedieval.blogspot.com/2008/03/welcome-boingboingers-here-have-monkey.html>. My emphasis.

66. Cf. 'But since there is some comparison between eating and learning, it may be noted that on account of the fastidiousness of many even that food without which life is impossible must be seasoned' (Augustine, *On Christian Doctrine*, trans. D.W. Roberston, JR. [New York: Macmillan, 1958], 4.11.26).

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Yet another way of saying this: commentary *twists* its text spatially, that is, *the geo-metry of commentary is spicy*, following Timothy Morton's ingenious modeling of the word-concept of spice: 'The poetics of spice is a Möbius strip upon which an object appears to behave like a subject, until we have followed this behaviour right round to the "other" side, upon which a subject appears to behave like an object. The distinction, however, between subject and object is not collapsed, and they remain in tension [...]. *Species*, *specious* and *specie* suggest that *spice* belongs to a set of words that denote the non-universal, particular, contingent realm of appearance. But when we look 'behind' spice to find some general or universal category that might substantiate its meaning or fix its place, we find none. We simply re-encounter spice. It is as if the universal were on the side of the particular itself.'<sup>67</sup> Spice is a pure immanence or double one-sidedness whose structure is only intelligible in the form of *spherical* movement, movement that reaches the other side by staying on this one and in so doing simultaneously destroys and realises the distinction between the two. Explorer or exegete, spice is what gets you around earthily, what manifests the universal as the particular itself, in the place where you stand. Via spice, one goes through an impenetrable surface by going over it, by *staying* with it.

So the impulse *not* to escape, *not* to flee, to stay, to remain, not in stillness, but in the movement that one already is, in the more restful motion that dwells in the space of the ontological ambivalence of statements like *I am walking*, that knows it will arrive on the other side only as *this* one, resonates seismically with both geophilosophical immanence and the work of commentary.

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67. Morton, *The Poetics of Spice*, 33-5.

The project of Nietzsche's tradition-dislocating and tradition-deepening call to 'remain faithful to the earth' and dwell in the 'new gravity' of the eternal recurrence of the same, a call that emanates with the earth itself, in the moment of Nietzsche's stopping before and being stopped by 'a powerful pyramidal rock nor far from Surlei,' is ordered towards immanence not as the negation or opposite of transcendence, but more truly as its *forgetting*, the experience of which he finds in sound: 'There is no outside! But we forget this with all sounds; how lovely it is that we forget!'<sup>68</sup> Sonically forgetting that there is no outside is not negation, much less some enchanting illusion that there is an outside, but more purely the post-cephalic letting go of the burden of consciousness that there is *no outside*, the apophatic negation of the negation of an outside that opens into full experience of the becoming of the *this*. '[N]o longer bury your head in the sand of heavenly things, but bear it freely instead, an earthly head that creates a meaning for the earth!'<sup>69</sup> Commentary is a homologous *amor fati* that stays with its text gravitationally, remains faithful to it as what remains, as what it cannot depart from. 'The womb of the inexhaustible earth ceaselessly gives birth to what is new; and each one is subject to death [...] Man should not cast aside from him the fear of the earthly; in his fear of death he should – stay. He should stay. He should therefore do nothing other than what he already wants: to stay.'<sup>70</sup> Commentary *stays* with its

68. Quoting, respectively: Nietzsche, *Thus Spoke Zarathustra*, 'Zarathustra's Prologue,' 6; 'The Recurrence of the Same,' notebook entry from August 1881, cited from *Thus Spoke Zarathustra*, trans. G. Parkes (Oxford: Oxford University Press, 2005), xxii; and *Thus Spoke Zarathustra*, 'The Convalescent,' 175.

69. Nietzsche, *Thus Spoke Zarathustra*, 'On the Hinterworldly,' 21.

70. F. Rosenzweig, *The Star of Redemption*, trans. B. E. Galli (Madison: University of Wisconsin Press, 2005), 9-10.

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text, commits wholly to it, both in the quantitative sense of promising to *produce* commentary across its continuity and in the qualitative sense of promising to *extract* significance from each of its moments as a plenitude. In the words of fifteenth-century Talmudic scholar Isaac ben Jacob Campanton, 'Always strive to show the necessity of all the words of the commentator or author, and for every utterance, why did he say? [...] And you shall take care to compress (*Itsamtsem*) his language and to squeeze out the intention, in order than not one word shall remain superfluous.'<sup>71</sup> In other words, commentary stays with its text *as a sphere*, as an object whose every point, via structural identity with every other, is both infinite and infinitesimal. Commentary's durational staying with its text equals its self-acceptance as labour, as sustaining and unfinishing diurnal production-towards-death. Commentary thus means praxis, not without, but freeing itself from results, from anxious care about what does not belong to us. Accomplishing nothing, commentary becomes *capable* of everything and so constitutes the potentiality of a hermeneutic whose teleology and instrumentality fundamentally differ from, but do not necessarily contradict, the dominant *thesistic* standards of academic discourse. Commentary is knowledge-production as *immanent* to its labour, whether of writer or reader (which goes to explain the genre's superior survival in law, religion, philosophy, pedagogy).

Why not therefore also make in *this* place a hermeneutic bridge between commentary and the sound which Nietzsche indicates as the vehicle of immanence, of what cannot, if it is to really be itself, have a vehicle? Again, spice provides the link, the material to build across space.

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71. Cited from Boyarin, 'Pilpul: The Logic of Commentary,' 6.

‘The verb (*verbum*),’ says Isidore of Seville, is so called because it resounds by means of reverberation (*verberatus*) in the air.’ And: ‘Spices [...] seem to have gotten the name “spice” (*aroma*) either because they are proper for putting on altars (*ara*) for invocations to the gods or because they are known to blend and mingle themselves with air (*air*). Indeed what is scent if not air that has been tintured with something?’<sup>72</sup> Ergo, the spiciness of commentary similarly consists in its being textual sound, semantic aroma, the re-verberation, to play Isidore’s etymology backwards, of the word it comments on.

Like word, like spice, commentary is space-filling. Whence Gumbrecht’s suggestion of an imminent return to commentary in the context of our being haunted by new technic vistas of emptiness: ‘The vision of the empty chip constitutes a threat, a veritable *horror vacui* not only for the electronic media industry but also, I suppose, for our intellectual and cultural self-appreciation. It might promote, once again, a reappraisal of the principle and substance of *copia*. And it might bring about a situation in which we will no longer be embarrassed to admit that filling up margins is what commentaries mostly do – and what they do best.’<sup>73</sup> Yet commentary does not simply fill space the way all writing *takes up* space. Rather, it fills space only in the sense that it also *folds* space, produces moments of identity across it, across the impassible, intimate distance that commentary auto-institutes as the text/commentary distinction. This distinction is simultaneously the inviolable, irreducible space of writing itself (the dimension of the

72. Isidore of Seville, *Etymologies*, trans. Stephen A Barney (Cambridge: Cambridge University Press, 2006), 1.9.1, 17.8.1, respectively.

73. Gumbrecht, *The Powers of Philology*, 53.

page that cannot be filled in order for writing to ex-sist) and the crease through which commentary folds this space. Accordingly, commentary works to hold forever open *and* totally fill writing's space, as if to absolutely disclose the place of writing, which means to realise it as *curved space*, the immanent space-becoming-place through which everything leads back to itself. This spatial curving that commentary realises is visible materially as the becoming-round of the text/commentary border and conceptually as the turning motion commentarial reading and writing take: away from the text, turning back towards it, repeat [...] Commentary rotationally transforms the *space* of writing into an earthly *place*. Simple textual space-filling discloses the space of writing as writing's potentiality, the page, by enclosing and surrounding it *from the inside*. Commentary, whose meaning is founded upon proximate separation from its text, continues the enclosure *from within the outside* and thus holds open the space of writing by bounding it, pushes writing to the limit where the space of writing *intersects* with what it already is, the real space of the world. In other words, commentary does not merely take up room, but *uses room* to make itself the world, to bring its text back to earth. Infinite commentary on an infinitesimal text is commentary's ideal, not actually, but only as an unimaginable concept reasserting its deep desire, namely, to spatially achieve the ontological breaking-point of the text, the situation where there is *neither anything outside the text nor nothing outside the text*. Commentary seeks not to end, but to un-end writing, to arrive at writing's plenitude and ouroboric starting/stopping point, the saturated phenomenon of its perfection, as grasped by Agamben while contemplating the completion of the unfinished last work of Damascius, and final scholar of the School of Athens and so-called last of the Neoplatonists,

*On First Principles* (!): ‘The uttermost limit thought can reach is not a being, not a place or thing, no matter how free of any quality, but rather, its own absolute potentiality, the pure potentiality of representation itself: the writing tablet! [...] This was why he was unable to carry his work through to completion: what could not cease from writing itself was the image of what never ceased from not writing itself [...] [E]verything was finally clear: now he could break the tablet, stop writing. Or rather, now he could truly begin.’<sup>74</sup> This point is not being finished with writing, but writing’s becoming an unending beginning, the sphericization of the space of writing or our finding of the page as *unbounded finitude*, a surface for limitless writing whose every mark is first and last. Commentary’s filling of the margins is an exercise in intentional, exuberant futility directed toward an ultimate forgetting of the outside, toward continual writing of the omnipresent impossibility of separateness, the always-never asymptotic union of text and world.

All of above goes to explain why, in the appendix of Frank Herbert’s *Dune*, we read that ‘the O.C. [Orange Catholic] Bible and the Commentaries,’ a product of humanity’s encounter with the outer dark via space travel and the textual analogue of the orange spice gas used by Guild Navigators to fold space, ‘permeated the religious universe.’<sup>75</sup>

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74. G. Agamben, *The Idea of Prose*, trans. M. Sullivan and S. Whitsitt (Albany: State University of New York Press, 1995), 34.

75. Herbert, *Dune*, 506.

## COLLAPSE VI

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### III. DIGRESSION AND IMMANENCE



*Dune.* Dir. David Lynch. 1984.





Von  
Der Weltseele,  
eine  
Hypothese der höheren Physik  
zur Erklärung  
des allgemeinen Organismus.

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Nebst einer Abhandlung  
über das  
Verhältniß des Realen und Idealen in der Natur  
oder  
Entwicklung der ersten Grundsätze der Naturphilosophie an  
den Principien der Schwere und des Lichts.

Von  
F. W. J. Schelling.

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Dritte verbesserte Auflage.

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Hamburg,  
bey Friedrich Perthes.  
1809.

## Introduction to Schelling's *On the World Soul*

Iain Hamilton Grant

### EDITIONS

The first edition (1798) of Friedrich Wilhelm Joseph Schelling's *On the World Soul. An Hypothesis of Higher Physics for Explaining Universal Organism* was published by Perthes in Hamburg, as was the second, revised edition (1809) to which a new Foreword and Essay 'On the Relation between the Real and the Ideal in Nature, or the Development of the Basic Propositions of the Philosophy of Nature from the Principles of Gravity and Light' were added. The third edition (1809), also published by Perthes, slightly revised the second edition, but added no new material.

The edition from which the present translation is taken is that found in vol. II of K.F.A. Schelling's edition of *Schellings sämtliche Werke (SW)*, XIV vols (Stuttgart and Augsburg: J.G. Cotta'scher Verlag, 1856-61), reprinted in

a new order, ed. Manfred Schröter (Munch: Beck, 1927), and the numbers in the margin refer to this edition. It is based on the 1809 edition of Schelling's text, and supplies the changes from the first edition in footnotes.

The text is found in vol. I, 6 of the new *Historisch-Kritische Ausgabe (HKA)* of Schelling's works, which provides a concordance with *SW*, but does not contain the 1806 essay, despite retaining the second edition's Foreword, which serves principally to introduce the accompanying essay, along with Schelling's revisions to the main text (in footnotes). The *HKA* edition is a work of considerable scholarship, with some one hundred and fifty pages of explanatory notes (some translated here), and was used as the source for Stéphane Schmitt's translation *De l'âme du monde* (Paris: Éditions Rue d'Ulm, 2007), which I have also consulted. Also consulted is the magnificent *HKA Ergänzungsband zu Werke Band 5 bis 9*, which contains a wealth of material on the scientific background against which Schelling produced his naturephilosophical writings up to 1800. Since the *HKA* remains incomplete yet infuriatingly references Schelling's works, where these have appeared in the *HKA*, only in that edition's pagination, I have maintained the *SW* pagination, since it remains the only complete referenceable edition of Schelling's works as a whole.

The section translated here includes the first edition preface (*SW* II, 347-51), which contains the nearest thing to an overview provided for this work, and the initial setting out of the 'primary force in nature' (*SW* II, 381-97). The footnotes are in part my own, in part K.F.A. Schelling's notes to *SW* II, and in part Jörg Jantzen and Thomas Kisser's, from *HKA* I,6, and their provenance is noted in the text.

## INTRODUCTION

This is the second of Schelling's three major, early naturephilosophical books, published in 1798 between the *Ideas for a Philosophy of Nature* (1797; *SW* II, 1-343) and the *First Outline of a System of Naturephilosophy* (1799; *SW* III, 1-268). The other key naturephilosophical works of this period are the *Introduction to the Outline* (1799; *SW* III, 269-326) the *Universal Deduction of the Dynamic Process* (*SW* IV, 1-78), which Schelling published in his *Journal of Speculative Physics* vol. 1, no. 2 (1800). Across these works, Schelling had demonstrated an extraordinary capacity for synthesising the results, procedures and hypotheses that were leading the field in each of the sciences. As a result, the *Weltseele* is a systematic yet experimental, or 'constructive' work in the sense Schelling gave this term, pursuing the 'decomposition' of the All by chemical, electrical, meteorological and vital means across the entirety of the 240 pages of the *SW* it takes up.

It is often claimed that Schelling merely pursues the goals established by Kant's transcendental philosophy – namely, to suspend ontology in the interests of rational certitude, and therefore to place the ethical at the head of philosophy. Yet whereas analysis and synthesis were powers of the understanding for Kant, for Schelling, they are powers of nature; not content with chemical *analogies*, Schelling pursues a chemical philosophy, a distinction recognised by Novalis when he called Schelling 'the philosopher of the new chemistry, the absolute oxygenist'.<sup>1</sup>

Accordingly, *On the World Soul* presents a single, consistent 'decomposition' or *analysis* of nature into its primitive forces. Indeed, 'primitive force' is precisely the

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1. Novalis, *Die Christenheit oder Europa und andere philosophische Schriften* (Köln: Könnemann, 1996), 300.

*object* of a 'higher science of nature', i.e., that at which this science aims. The work therefore pursues this object through the media of light, heat, gases, electricity, magnetism, meteorology, until it arrives at a determination of the concept of polarity, which became something of the cliché of Idealist philosophy of nature. At the core of this concept, however, is the 'dualism' or *real opposition* of forces<sup>2</sup> that animate all natural phenomena. Therefore, upon making the transition from 'anorgic' to organic nature, *On the World Soul* demonstrates a continuity of analysis in the twofold sense that primitive forces are thereby exhibited as the common medium of all phenomena, and that there is therefore no *specifically vital matter or vital force*. Rather than seek a substance dualism dividing the natural world, Schelling pursues that immanent duel of forces throughout it, by which nature is *organised*. So just as the concept of polarity is misunderstood if considered purely conceptual rather than actual, so too the oft-touted 'organicism' of romantic naturephilosophy ignores the true focus of Schelling's work: the origins and conditions of natural *organisation*, of which minerals, animals, weather systems and chemicals are merely regional expressions.<sup>3</sup>

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2. See the third thesis with which the present translation concludes: 'real antithesis is possible only between things of one kind and common origin' (SW II, 397). Note the *chosiste* difference Schelling here introduces with respect to Kant's account of real antithesis in 'Attempt to introduce the concept of negative magnitudes into philosophy' (Ak. II, 167-204), tr. David Walford in *The Cambridge Edition of the Works of Immanuel Kant. Theoretical Philosophy 1755-1770* (Cambridge: Cambridge University Press, 1992), 207-41.

3. There has been a lively debate on Schelling and self-organisation, beginning with Marie-Luise Heuser-Kessler, *Die Produktivität der Natur. Schellings Naturphilosophie und das neue Paradigma der Selbstorganisation der Naturwissenschaften* (Berlin: Duncker und Humboldt, 1986). Bernd-Olaf Küppers' *Natur als Organismus. Schellings frühe Naturphilosophie und ihre Bedeutung für die moderne Biologie* (Frankfurt: Klostermann, 1992) is a critical response to the thesis that there is a parallel between the modern natural scientific conception of self-organisation and Schelling's conception of the

What Schelling may here be said to retain from Kant is therefore twofold: (1) the conclusions of the latter's study of real (or actual, *wirkliche*) opposition; (2) that because the primitive conflict of forces is the *object* of the philosophy of nature, such forces are never (by 1, above) 'transcendently' available, i.e., uninvolved in actual oppositions, on the one hand, or something 'in themselves', on the other. In other words, the analysis of forces results necessarily in actual individuation. Rather therefore than the structure of consciousness furnishing phenomena and their conceptual forms, nature is its own analyst. This point is clearly made by Karl August Eschenmayer,<sup>4</sup> whose *Propositions from the Metaphysics of Nature* Schelling excitedly noted towards the end of his *Ideas for a Philosophy of Nature* of the same year.

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same, and the debate is critically presented by Camilla Warnke, 'Schellings Idee und Theorie des Organismus und der Paradigmawechsel der Biologie um die Wende zum 19. Jahrhundert', *Jahrbuch für Geschichte und Theorie der Biologie* 5 (1998): 187-234. See also *Selbstorganisation. Jahrbuch für Komplexität in den Natur-, Sozial- und Geisteswissenschaften* 5: *Schelling und die Selbstorganisation* (1994), ed. Marie-Luise Heuser-Kessler and Wilhelm G. Jacobs.

4. Karl August Eschenmayer (1768-1852), medical doctor (1797) and chief medical officer (1800-1811) in Kirchheim an der Teck, Württemberg, before becoming professor of medicine and philosophy in the University of Tübingen. After two excellent critiques of Schelling's philosophy of nature, the first, 'Spontaneität = Weltseele', published in Schelling's own *Journal of Speculative Physics* vol. 2, issue 1 (1801), and the second, anonymously, as 'Über Schelling: Erster Entwurf und Einleitung' in the *Erlanger Literaturzeitung* no.67 for July 4, 1801. In *Propositions from the Metaphysics of Nature applied to Chemical and Medical Objects (Sätze aus der Natur-Metaphysik auf chemische und medizinische Gegenstände angewandt*. Tübingen: Jacob Friedrich Heerbrandt, 1797: 8), from which Schelling quotes at the end of the *Ideas for a Philosophy of Nature* (SW II, 313-14n; tr. Errol E. Harris and Peter Heath. Cambridge: Cambridge University Press, 1988: 249), Eschenmayer writes: 'There is no absolute freedom or bondage of the forces in matter. – For the concept of matter would be eliminated thereby. In absolute freedom the forces would be independent of one another, and an infinitely larger or smaller degree of matter, that is, no degree at all, would be existent. Absolutely bound, the gradation would be equally eliminated and sensibility = 0.' Jörg Jantzen gives an excellent account of Eschenmayer's work in Thomas Bach and Olaf Breidbach, eds., *Naturphilosophie nach Schelling* (Stuttgart-Bad Canstatt: Frommann-Holzboog, 2005), 153-79.

In deciding whether naturephilosophy extends Kant's transcendental philosophy or inverts it, such passages are crucial:

[I]t is only from the standpoint adopted by the metaphysician of nature that the necessary assumption of these forces can be proven and the duplicity of matters and forces which so many have introduced into natural science to explain the phenomena, justified. The theoretical dualism for natural science is actually postulated by dynamics, but we do not commonly observe its lineage. Thus we set acids and alkalis in opposition to one another, two electrical and two magnetic materials; hence Gren assumes a gravitational and an expansive force [...]. Ultimately such a dualism is deduced from the necessity of the original positing and opposing, which are the conditions under which even the possibility of our consciousness stands.<sup>5</sup>

If the dualism in question amounts to the actual opposition of forces – in a later passage from the same work,<sup>6</sup> Eschenmayer argues that even Kant *proves their existence*, rather than demonstrates their transcendental necessity – and conditions ‘even the possibility of our consciousness’, it is clear that the ‘positing’ at issue is primitive, issuing *in* rather than *from* consciousness. It is precisely this inversion that *On the World Soul* pursues. Of course, that the ensuing ‘constructions’ thereby lose any purely epistemic guarantee follows from this; and here we note, albeit telegraphically, a central difference between Schellingian and Hegelian speculation: if the latter aims at the identity of identity and difference, the former differentiates the identity of the dualism that forms it.

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5. Eschenmayer, *Propositions from the Metaphysics of Nature*, 3.

6. Ibid, 60.



Finally, then, what sort of a theory of nature is the higher one from which this hypothesis concerning ‘universal organism’ derives? It shares with Kant’s *Transition between Metaphysics and Physics* (*Opus Postumum*),<sup>7</sup> and with a great many contemporaneous natural scientists, the aether hypothesis. While the beginning of the twentieth century marked the end of the hypothesis concerning such a substance, its real import is that it is an attempt at a physical field theory. As such, the problem it poses concerns whether this ‘universal medium’ is a substance separable from the forces it vehiculates, or whether it is nothing other than the totality of such forces in actual oppositions. If this seems a merely historical point now, consider the extent to which powers ontologists from Bruno to our contemporaries, consider forces not as primitive, but as properties – the question ‘what of?’ still remains.<sup>8</sup>

In consequence, the animating ‘soul of the world’ that is the object of the work translated below is no indicator of a substance dualism, and instead assumes the character of a properly dynamic, field-theoretical theory of nature *within which alone* a dualism not of substances, but of forces accounts for individuation and organisation.

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7. Schelling supplies this as the title of what is published as the *Opus Postumum* in his obituary for Kant (SW VI, 8).

8. On contemporary powers ontology, see G. Molnar, *Powers* (Oxford: Oxford University Press, 1993) and S. Mumford, ‘The Ungrounded Argument’, *Synthese* 149 (1996): 471–89. On Bruno, see G. Harman, ‘On the Undermining of Objects: Grant, Bruno, and Radical Philosophy’, in L. Bryant, N. Srnicek, and G. Harman, eds, *The Speculative Turn* (Melbourne: Re.Press, forthcoming), my response to it, ‘Mining Conditions’ and my ‘Does Nature Stay What-it-is?’, in *ibid.*

# ***On the World-Soul***

***An Hypothesis of Higher Physics  
for Explaining  
Universal Organism***

to which is adjoined a

**Treatise**

on

**The Relation between the Real and the  
Ideal in Nature**

or

**The Development of the first Principle of  
Naturephilosophy in the Principles of  
Gravity and Light**

**F.W.J. Schelling**

**1798**

**2nd edition 1806. 3rd edition 1809**

[SW II, 345-583; HKAI,6]

## On the World-Soul

F.W.J. Schelling

### FOREWORD TO THE FIRST EDITION

34

The reader, provided only that he has sufficient desire or curiosity, will become acquainted with what the goal of this treatise might be, and why it bears this inscription at its head.

The author first finds it necessary to explain himself on two points, so that no prejudices are assumed with regard to this inquiry.

The first is that no artificial unity of principles is sought or intended in this work. Consideration of the universal metamorphoses of nature as well as the state and progress of the organic world certainly conducts the natural scientist to a *common principle* in which, fluctuating between inorganic and organic nature, is contained the first cause of all change in the former and the final ground of all activity in the latter. Because this principle is *everywhere* present, it is *nowhere*; and because it is *everything*, it cannot be anything *determinate* or *particular*; language has no appropriate term for it, and the earliest philosophies (to which, after having completed its cycle, ours is gradually returning) have handed down to us an idea of it only in a figurative guise.

But a unity of principles is unsatisfactory if it does not return to itself through an infinite series of individual  
 148 effects. I hate nothing more than the mindless striving to eliminate the multiplicity of natural causes through fictitious identities. I observe that nature is satisfied only by the greatest dominion of forms, and (according to the claim of a great poet)<sup>1</sup> that it delights in *arbitrariness* in the deathly management of decomposition. The law of gravitation alone, to which even the most mysterious of cosmic phenomena are finally reduced, does not only permit, but even causes the heavenly bodies to be disturbed in their course, so that in the most perfect of cosmic orders there reigns the greatest possible disorder. Thus has nature circumscribed the vastness of space, which it has sealed within eternal and unchanging laws, widely enough in order within it to delight the human mind with the appearance of lawlessness.

Just as soon as our consideration of the idea of nature as a *whole* arises, the antithesis between mechanism and organism, which has held up the advance of natural science for long enough, and that may be as contrary to our inquiry as to many others, disappears.

It is an old illusion that organisation and life cannot be explained from natural principles. – If it were thus to be said: the *first* origins of organic nature are *physically* inscrutable, then this *unproven* assertion serves only to discourage investigators. It is of course permissible to oppose one audacious assertion to another equally audacious one, and so science advances not a single step. Yet at least *one* step towards this explanation would be taken were we able to show that the graduated series of every organic being is formed from a

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1. Schelling is referring to Schiller's *Dom Karlos*, act 3, from which he borrows his language.

gradual evolution of one and the same organisation.

That our experience has known no reorganization of nature, no transition of one form or type into the other (although the metamorphoses of many insects and, if every bud is a new individual, also the metamorphoses of plants could at least be adduced as analogical phenomena) is no proof against this possibility; for, were a defendant to answer it, the changes to which organic as much as<sup>34</sup> anorgic [*anorgische*] nature is subjected, could (until a universal stagnation of the organic world comes about), have happened over ever longer periods, for which our small periods (which are determined by the cycles of the earth round the sun) provide no measure, and are so large that until now there has been no experience of the course of a single one. Fine. Let us abandon these possibilities and see what then is true and what is false in the antithesis between mechanism and organism, so as to determine with as much certainty as possible the limits within which our understanding of nature must remain.

What then is that mechanism which frightens you as would a ghost? Is mechanism something that persists in itself, or is it not instead simply the negative of the organic? Must not the organic precede the mechanical, the positive precede the negative? Now if in general the negative presupposes the positive (as darkness does light, as cold does heat) and not vice-versa, then our philosophy must not begin with mechanism (as the negative), but rather with the organic (as the positive), and therefore of course the former is not so much to be explained by the latter, but rather only can be explained by it. Not where there is no mechanism, no organism, but rather conversely, where there is no organism, there is no mechanism.

## COLLAPSE VI

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To me, organisation in general is nothing other than an arrested stream of causes and effects. Only where nature has not inhibited this stream, does it fly forward (in a straight line). Where it inhibits it, it turns back on itself (in a circular line). Therefore, the concept of organism does not rule out all succession of causes and effects; rather, this concept indicates only a succession that *enclosed within certain limits*, flows back on itself.

Now, that the original limit of mechanism cannot be explained empirically, but must instead be *postulated*, I myself will show (by induction) in what follows; it remains  
50 however to be proven philosophically. For since the world is only infinite in its finitude, and an unrestricted mechanism would destroy itself, then universal mechanism must be restricted *to infinity*, and there will be as many *individual, particular worlds* as there are spheres within which universal mechanism revolves in itself, so that, in the end, the *world* is an *organisation*, and a *universal organism* is itself the *condition* (and to that extent, the positive) of *mechanism*.

Viewed from this height, the particular successions of causes and effects (that delude us with the appearance of mechanism) disappear as infinitely small straight lines in the universal curvature of the organism in which the world itself persists.

Now what philosophy has long taught me, that the positive principles of organism and mechanism are the same, I have sought to prove in the following work from experience, in that the universal changes in nature (on which even the existence of the organic world depends), lead us at last to the same *first hypothesis* on which the universal assumption of natural scientists has long since made the explanation of organic nature dependent.

The following treatise therefore falls into two sections, the first of which treats of the force of nature that is manifest in the universal changes, while the other undertakes to search for the positive principle of organisation and life. The common result of these is that *one and the same principle binds anorgic and organic nature*.

The incompleteness of our knowledge of first causes (such as electricity), the atomistic concepts that lay here and there in my way (e.g. in the theory of heat), and finally the impoverishment of the dominant modes of thought regarding many objects of physics (e.g. meteorological phenomena), soon required that I be early led in the first section to make many special explanations – explanations that scatter the light, that I would wish to cast on the whole amongst particular objects, so indeed, that at the end they<sup>35</sup> can be collected again in a common focus.

The *wider* the sphere of inquiry is drawn, the more clearly one sees the deficiency and impoverishment of the experiments that up to now fall within its circumference, and thus few will feel the incompleteness of this attempt more deeply or vividly than he who conducts it.

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Note. This work is not to be viewed as a continuation of my *Ideas for a Philosophy of Nature*. I will not continue it before I find myself in a position to conclude the whole with a *scientific physiology*, that alone can round off the whole. First I hold it as a duty not merely to *venture* something in this science, the errors of which at least the perspicacity of others will effect the discovery and refutation.

I must nevertheless wish that the reader and critic of this treatise be familiar with the ideas presented in that work. The authority for assuming all positive natural principles as homogeneous, is only to be gained philosophically. Without this *postulate* (I presuppose that one knows what a *postulate with a view to a possible construction* is),<sup>2</sup> it is impossible to construct the first concepts of physics, for example, the theory of heat. Idealism, which philosophy is gradually introducing into all the sciences (it has long since become dominant in mathematics, especially since Leibniz and Newton), still seems to be little understood. The concept of *action at a distance*, for example, against which some still beat their heads, rests entirely on the idealist notion of space: for according to this notion, two bodies at the greatest possible distance from each other can be represented as in contact with one another, and contrariwise, bodies which (in accordance with the common conception) are in actual contact, as acting on one another at a distance. It is quite true that a body only *acts* where it *is*, but it is equally true that it only *is* where it *acts*, and with this single proposition the last piece of armour of the atomistic philosophy is overcome. I must abstain here from offering still further examples.

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2. Schelling's theory of the postulate is given in 'On Postulates in Philosophy', the appendix to the 'Explanatory Essays on the Science of Knowledge' (1797), where Schelling writes, 'the expression "postulate" is borrowed from mathematics. In geometry, the *original* construction is not *demonstrated*, but *postulated*. This *original* (the simplest) *construction* in space is *the moving point*, or the *line*' (SW I, 444). Adopting this as the principle of a constructive philosophy, Schelling advocates a philosophy concerned 'only with original constructions', which does not 'consider any existential proposition *analytically*, but *synthetically* (as *arising* in synthesis)' (SW I, 447).



## PART I: ON THE FIRST FORCE OF NATURE

37

Venient tempus, quo ista, quae nunc latent, in lucem dies extrahat et longioris aevi diligentia. Ad inquisitionem tantorum una aetas non sufficit. – Itaque per successiones ista longas explicabuntur. Vient tempus, quo posteri tam aperta nos nesciisse mirentur.

[Grant him time and lifelong diligence to bring to light what is hidden. Life is not sufficient for so many inquiries together. – Therefore let him make far-reaching advances in explanation. In time to come, we must wonder to whom so much will later be clear.]

Seneca<sup>3</sup>

Every motion that returns to itself presupposes, as the<sup>38</sup> condition of its possibility, a *positive* force that (as *impulse*) *initiates* motion (turning the starting point, as it were, into a line), and a *negative* force, that (as attraction), draws the movement back into itself (or prevents it from flattening out into a straight line).

In nature everything strives continuously forwards; we must seek the ground as to why this is so in a principle that, as an inexhaustible source of the *positive* force, always reinitiates movement in the world and uninterruptedly maintains it. This *positive* principle is the *first force of nature*.

But an invisible power draws all the world's phenomena into an endless circuit. We must seek the ultimate ground as to why this is so in a *negative* force that, in that it continuously limits the effects of the positive principle, conducts motion in general back to its source. This *negative* principle is the *second* force of nature.

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3. Seneca, *Naturalis Quaestiones*, VII, 25, 4-5.

These two conflicting forces conceived at the same time in conflict and unity, lead to the idea of an *organizing principle*, forming the world into a system. Perhaps the ancients wished to intimate this with the *world-soul*.

If the originally positive force were infinite, it would lie entirely beyond the limits of all *possible perception*. Restricted by the opposing force, it becomes a *finite magnitude* – it begins to be an object of perception, or manifests itself in *phenomena*.

The one *immediate* object of *intuition* is the *positive* in every phenomenon. We can only *infer* the *negative* (as the cause of the merely *experienced*).

82 The *immediate object* of the *higher theory of nature* is therefore only the *positive* principle of all motion, or the *first force of nature*.

The first force of nature *conceals* itself behind the *individual phenomena* in which it is revealed to the desirous eye. In *individuated matter* it breaks out throughout the entire cosmos.

To grasp this *Proteus of nature* that recurs again and again in ever changing forms and in numberless phenomena, we must cast the net more widely. Our progress will be slow, but all the more certain.

The matter that in every system radiates from the centre to the periphery – *light* – moves with such force and velocity that some have even doubted its materiality, since it lacks the universal characteristic of matter, inertia. But to all appearances, we know light only in its *propagation*; most probably it is only in this state of *original motion* capable of reaching our eyes as light. Now every *propagation* and every *becoming* is accompanied by a particular and appropriate motion, however. If a very much higher yet nonetheless

finite degree of elasticity were instantaneously to arise, there will also arise a matter of the highest degree of elasticity that, since the essence of elasticity is the expansive force, will expand into a space in proportion to the degree of this force. This will now give the appearance of matter in free motion, as if, so to speak, exempted from the universal laws of inertia, it held in itself the cause of its own movement.

Now this movement, however great or fast we may assume it to be, differentiates itself from every other, so that an equilibrium of the forces arises in any given matter, only according to degree. For let that elastic matter, without <sup>38</sup> any resistance that a body of lesser elasticity could set against it by its impenetrability or by the attractive force of its dissemination, spread out in a completely empty space, then since the degree of its elasticity is of course finite, and the elasticity of every matter decreases in proportion as the space in which it expands is increased, by which its gradually lowering elasticity reaches an equilibrium of forces relative to its degree of expansion, and thus makes *rest*, that is, a permanent state of matter, possible.

Therefore *light*, although it moves with wonderful speed, is nevertheless for that very reason neither more nor less *inert* than any other matter whose movement is no object of perception. For, to state it at the outset, *absolute* rest in the world is *not anything*, all rest in the world is merely apparent, and properly only a *minus*, but in no way a complete absence, of motion (= 0). The movement of light is therefore an *original* movement of which *every* matter as *such* has its share, except that, no sooner has matter *reached* a permanent state, with the minimum speed that light would equally have attained, than its original forces will have reached a common moment.

Since every matter fills its particular space only through the reciprocity of opposing forces, that it therefore *permanently fills that same space*, i.e. that the body persists in its condition, cannot be explained without accepting that these forces are equally *active*, whereby then the non-thing of absolute rest disappears of itself.

All rest and all persistence of a body is simply *relative*. The body *rests* in relation to a *determinate state* of matter; as long as this state continues (as long, e.g., as the body is solid or fluid), the moving forces will fill space with *equal quantity*, i.e. they will fill *the same space*, and *to that extent* the  
 184 body will appear to *rest*, although that this space is continuously filled can only be explained by a continuous motion.

That therefore light expands on all sides in rays, must be explicated by conceiving it as in *constant propagation* and as *originally* expansive. That light also reaches relative rest we can directly infer from this, that the motion of light from an unending mass of stars is not transmitted to us.

It is not in the interest of natural science to admit anything *unlimited*, nor any absolute force, but rather to consider each of these always and only as the *negative of its opposite*. Now we too may, of whichever of the forces we wish, let it grow to the highest degree thinkable, but we will never be able to bring it to the *absolute* negation of its opposite. Hence the striving of those who derive universal gravitation from the impact of some unknown matter that forces bodies against one another, is entirely idle; for since this matter creates gravity, without itself being heavy, we must conceive it as an absolute negation of the attractive force; but as such it would cease to be an object of possible construction and would as it were disappear into the universal repulsive force, leaving no material principle to explain universal

gravitation, but only the obscure idea of a *force*, which is precisely what this hypothesis sought to avoid.

What keeps light within material limits, what *finally* turns its motion into an object of perception, is the force of attraction.<sup>4</sup> If some natural scientist assumes light itself or a part thereof as *imponderable*, all they thereby state is that a great force of expansion (which, as an original force, leaves all our explanations at a standstill) is active. Since however<sup>38</sup> this force of expansion never exceeds the limits of matter, i.e. can never become absolute, so *gravity* can certainly be considered as *collapsing* into a matter, as into light, but never as completely *negated*.

To that extent, it is not absurd to assert a *negative gravity* of light;<sup>5</sup> for since this expression, borrowed from mathematics, always indicates not a mere *negation*, but rather an *actual opposition*,<sup>6</sup> so *negative attraction* is in fact nothing more

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4. 1st ed.: 'its ponderability'. [K.F.A. Schelling].

5. The concept of 'negative gravity' was applied by Friedrich Albert Carl Gren, amongst others, although he later modified it, in his *Systematic Handbook of General Chemistry*, 4 vols (2<sup>nd</sup> edition, Berlin and Halle: Waisenhause 1794-6), vol.1, 136: 'The gravitational being of particles of free caloric cannot consist in their rectilinear radiation. Hence it may already be demonstrated *a priori* that caloric is not subject to gravity, and nor can it be proven to be gravitational by any number of *a posteriori* experiments. Caloric is therefore an imponderable elastic fluid.' [editors' note, *HKA* I,6: 288].

6. See Kant, 'Attempt to introduce the concept of negative magnitudes into philosophy', *Kants Werke* (Berlin: Königl. preussische Akademie der Wissenschaften, 1901ff) *Ak.* II, 165-204, tr. David Walford and Ralf Meerbote in *Theoretical Philosophy 1755-1770* (Cambridge: Cambridge University Press, 1992, 202-41; here *Ak.* II, 193; 1992: 230-31: 'So far I have merely considered the grounds of real opposition, in so far as they *actually* posit in one and the same thing determinations, of which one is the opposite of the other. A case in point would be the motive forces of one and the same body which tend in exactly the opposite direction; and here the grounds cancel their reciprocal consequences, namely the motions. For this reason, I shall [...] call this opposition *actual opposition* (*oppositio actualis*).'

nor less than *real repulsion*,<sup>7</sup> so that this term states nothing more than what we have long known, that a repulsive force is active in light. Should this however suggest some cause by which the absolute (not the specific)<sup>8</sup> gravity of the body may be reduced, the concept of such a cause has long since been banished into the realm of fantasy.

If accordingly no degree of elasticity can be thought as the highest possible, so that above this there are still higher degrees, and between these given degrees and the complete negation of all degree innumerable intermediary degrees can be thought, so too can each elastic material can be considered as the mean proportion of a higher and a lower degree, that is, as *composite*. If we have the means to decompose such a matter chemically, we never arrive at it; it is enough that such a decomposition is possible, and that nature has the means to effect it. Therefore (even if the colours of a body do not indicate a decomposition of light), we will consider *light* not as a simple element, but rather as the product of two matters,<sup>9</sup> one of which, as elastic as light,

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7. Kant *Ak.* II, 179-80; 1992: 218: 'Now if you call *attraction* a cause, of any kind you please, in virtue of which one body constrains other bodies to press upon the space which it itself occupies or to set in motion (though here it is sufficient simply to think of this attraction), then impenetrability is a *negative attraction*. This serves to show that impenetrability is as much a positive ground as any other motive force in nature. And since negative attraction is really true repulsion, it follows that the forces with which the elements are invested and in virtue of which these latter occupy a space, albeit in such a way that they impose limitations even on space itself by means of the conflict of the two forces which are opposed to each other – it follows, I say, that these forces will give rise to the elucidation of many phenomena.'

8. 'With the term "specific gravity" is designated the relations of the weight of a body to the space it occupies. A body is called *specifically more gravitational* or *heavier*, than another when it weighs more, *specifically lighter* when it weighs *less* than the other, when they occupy the same space.' J. S. T. Gehler, *Physikalisches Wörterbuch*, 6 parts (Leipzig: Schwickert, 1787-1796), part 3, 902 [editors' note *HKA* 1,6: 291].

9. 1st ed.: '*two matters*' [K.F.A. Schelling].

can be called the *positive* matter of light (the *fluidum deferens* according to de Luc), and the other, less elastic by nature, the *negative* (ponderable) matter of light.

The positive matter of light is, in relation to light, the ultimate ground of its susceptibility to expansion and *to that extent*, absolutely elastic, although we cannot at all think it <sup>38</sup> as matter without considering even *its* elasticity in turn as finite, that is, as itself *composite*. It is the first principle of natural science that no principle be considered absolute, and that a *material* principle be assumed as a vehicle of every force in nature. Natural science has, as if by some happy instinct, steadfastly pursued this maxim, and would sooner always hypothesise unknown matters to explain natural phenomena than resort to absolute forces.

Hence the advantage of the concept of the *original forces*, which dynamic philosophy has introduced into natural science,<sup>10</sup> is now strikingly evident. Namely, they do not in any way serve as *explanations*, but rather only as *limit concepts* for empirical natural science, by means of which the freedom of the latter is not only unthreatened, but is rather secured, because the concept of forces, since each of these admits an infinity of possible degrees, none of which is an absolute (the absolutely highest, or the absolutely lowest), opens for it an infinite scope within which it can explain all phenomena *empirically*, that is, from the *reciprocity of diverse matters*.

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10. The background of the 'dynamic philosophy' to which Schelling here refers is provided by Kant's *Metaphysical Foundations of Natural Science*, but also by his own *Ideas for a Philosophy of Nature*, which draws also on Eschenmayer's *Propositions from the Metaphysics of Nature* (cf. n.4 in my introduction above, and George di Giovanni, 'Kant's Metaphysics of Nature and Schelling's *Ideas for a Philosophy of Nature*, *Journal of the History of Philosophy* vol.17 (1979): 197-295.

Indeed, natural science has from the very first helped itself to this freedom in explanation, albeit indeed without being able to protect itself against the charge of arbitrariness which from this point on becomes invalid, since according to the principles of a dynamic philosophy outside the sphere of known matters there yet remains a broader one for unknown, other matters that yet we cannot pass off as invented, as soon as the degree of their energy is assumed to be proportional to actually observed phenomena.

So much for the rectification of common notions.

When I assert the *materiality* of light, I do not thereby exclude the opposite view, namely, that light is the motion of a moved medium. In the *Ideas for a Philosophy of Nature*, I posed the question: Must not the light from the sun propagate to us by decomposition? At issue was whether  
 187 we might not unify the *Newtonian* and *Eulerian* theory of light. What exactly do Newton's supporters want? A matter that has its own, proper relations to bodies, that is, that is capable of its own effects.<sup>11</sup> And what, by contrast, does Euler, and those who agree with him, want? That light is the mere phenomenon of a moving, vibrating medium. Yet must the vibration be necessarily *mechanical*, as Euler thinks? Who can prove that, between earth and sun, a matter does not fill it that is decomposed by the effect of the sun; and could not this decomposition propagate even into our atmosphere, since in precisely this there is a source of light?

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11. 'Aether, celestial air, the fine matter of the universe, *materia subtilis*, *elementum primum* Cartesii. Names that the natural scientist applies to the finest and most elastic fluid matter that is spread throughout the entire universe and penetrates the interstices of all bodies. Everything that can be said about these objects is *hypothetical* and acknowledged only to explain certain appearances; direct and clear experimentation on the existence and properties of the aether are entirely lacking.' Gehler, *op. cit.*, part 1: 82 [editors' note *HKA* I,6: 294-5].



In this way, we would have what Newton wants: a particular light-matter that is equally capable of chemical relations; and what Euler wants: a propagation of light by simple vibration of a decomposable medium.

As far as I know, both *Newton's* and *Euler's* supporters admit that each of these theories have their own difficulties, which elude those of the opposing theory. Would it not therefore be better, instead of setting these views in opposition one to the other as has until now been done, to consider them as *reciprocally supplementing one other*, so as to combine the advantages of both into *one* hypothesis?

One important argument for this new theory is that all the light we know is indeed only the *phenomenon of a propagation*. For

1) Assuming too, that the light that now reaches us is the same light that less that around eight minutes before radiated from the sun, then as has already been shown, we cannot explain the diffusion of light in all directions without assuming that this motion is *original*. But there is original motion in a matter only for so long as it has not yet reached a *dynamic equilibrium*, that is, for as long as it is still conceived as *becoming*.<sup>12</sup> Therefore all light that is in

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12. Compare Eschenmayer, *Propositions*, 22ff: 'According to dynamical concepts, an equilibrium arises when two opposing degrees of reality act against one another. Here, however, we are only discussing a relative equilibrium, in which the effects of the two forces are thought not as cancelled by, but rather only as equal to, one another. An absolute equilibrium exists where two forces completely cancel each others' effects so that they are no longer an object either for mathematical construction or for the analysis of experience. We may think of an absolute equilibrium symbolically by way of the lever. As long as force and weight are distributed over the arms of a lever in some manner, then a calculation of the magnitude of motion also takes place, just as when I think of the force and weight as combined in the hypomochlion (fulcrum), the magnitude of motion is = 0. This is absolute mechanical equilibrium which, for mathematicians, is no longer an object. We can indicate a dynamic absolute equilibrium with the example of plus and minus electricity. As long as each works

contact with our organ is indeed such as remains in a state of *propagation*.

2) That the light from the sun is actually *merely the phenomenon* of a constant decomposition of its atmosphere has been carried to a high degree of probability by *Herschel* (*Philosophical Transactions for the Year 1795*, vol.1).<sup>13</sup> According to the simplicity of means that we apply to the greatest and most widespread effects of nature, we may all the more extend this conjecture to all self-illuminating bodies in the cosmos, as many phenomena of its light seem to confirm such an origin; of which more below.

Since I have seen Mr *Herschel* himself, to make his hypothesis of the origin of sunlight more probable, appealing to the *propagation of light in our terrestrial atmosphere* (the Northern Lights, that are frequently so large and luminous, that they can probably be seen from the moon; the light that often in clear, moonlit nights, covers the sky), I am all the more strengthened in the conjecture that indeed all light is propagated by the vibration of an easily decomposable medium (see *Ideas for a Philosophy of Nature*, S.36).

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on the other at a distance, we have the sensation of electricity, but as soon as the one passes over into the other, every expression of this fluid vanishes and becomes = 0 for experience.' [Editors' note *HKA* I,6: 297]

13. William Herschel, 'On the nature and construction of the Sun and the fixed stars', *Philosophical Transactions of the Royal Society of London for the Year 1795*, part 1, 46-72: 'That the sun has a very extensive atmosphere cannot be doubted; and that this atmosphere consists of various elastic fluids, that are more or less lucid and transparent, and of which the lucid one is that which furnishes us with light, seems also to be fully established by all the phaenomena of its spots, of the faculae, and of the lucid surface itself.' [Editors' note *HKA* I,6: 297-8]

Since then, I have read *Lichtenberg's Meteorological Fantasies*<sup>14</sup> from the opportunity afforded by *Herschel's* hypothesis, and from this too it seems to me that the hypothesis is more confirmed than refuted.

3) It is now agreed that the light that arises in the combustion of bodies, is propagated from the environing air, and indeed from those parts of it that, from their efficacy in the advancement of vital functions,<sup>15</sup> have acquired the name *vital air* (*aer vitalis*). Already from the outset it may be conjectured that indeed *all* the light that we are in a position to create, takes its origin from the vital air.

In the work referred to, I have maintained that the new system of chemistry, as soon as it has acquired its due extent, could indeed develop into a universal system of nature. The present work should provide the test for such an extended employment of it. The discoveries concerning the properties of the *gaz oxygène* should long ago have made it clear that oxygen, if it is what it is currently taken to be,<sup>38</sup> will indeed be much more than just that. We have even begun to ascribe to the ponderable basic matter of the vital air the most extraordinary effects in nature. Against this, one remark, that strikes me as very true, will be made, that it is absurd to accord an in itself inert body of the sort that so-called oxygen is, such power. (See, for example,

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14. Gorg Christoph Lichtenberg, 'Geologisch-Meteorologische Phantasien', in *Göttinger Taschen Calendar. Für das Jahr 1798*: 83-120. *HKA* 1,6: 298-9 cites Lichtenberg's discussions of the conditions under which variations are observed in the quantity of light from the fixed stars.

15. Christoph Girtanner, *Anfangsgründe der antiphlogistischen Chemie*, second edition (Berlin: Unger, 1795), 61: 'Combustion consists in the decomposition of oxygen gas by a body with which oxygen has a greater affinity than with caloric. *Burnable* or *combustible bodies* are such as have a great affinity to oxygen. During combustion oxygen is combined with the combustible body and acidifies it. The caloric previously bound to oxygen becomes free and bonds with the adjacent bodies; hence light and heat'

## COLLAPSE VI

what Brandis says in *Essay on the Vital Force*, p. 118.)<sup>16</sup> Most important in this chemical discovery is the *constant coexistence of this basic matter with the energetic matter* manifest in *light*, so that until now one had at least every right to consider it as genuinely that matter to which nature opposes the constant effects of an *ethereal, universally distributed fluid*.

Since the vital air is a composite matter, and since all expandible fluids must be considered as composed of an original elastic fluid and a ponderable matter, we may here, since we find ourselves in the domain of a higher science, abandon the metaphorical language of chemistry and conceive the so-called acid-matter [*Sauerstoff*] or oxygen<sup>17</sup> as the *negative matter of the vital air* that in combustion is combined with the body, while the *positive* goes under the form of *light*. For brevity's sake we will designate light by +O, but oxygen itself by -O (provided that we do not thereby think of +E and -E).

If accordingly the vital air is the source of light, and -O is the *ponderable* matter whereby a *freely circulating*, highly elastic *fluid*, surrounding the planet, *limited in its motion* and as it were fastened to gravitating bodies, then the *old theory of Descartes, Huygens and Euler ceases, at least partly, to be hypothetical*, and perhaps, as *Newton* himself dared only conjecture, at the end of his *Optics*,<sup>18</sup> will be proven.

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16. J. D. Brandis, *Versuch über den Lebenskraft* (Hannover: Hahn, 1795).

17. A. Lavoisier, 'Freier Auszug aus dem *Traité élémentaire de Chimie à Par. 1789 mit Anmerkungen*', in *Physikalisch-chemische Schriften. Aus dem Französischen gesammelt und übersetzt*, vol. 5 (Greifswald: Anton Ferdinand Röse, 1794), 161: '*Vital Air*. Like all gaseous matters, the breathable part of our atmosphere contains caloric, to which something must be added to manifest this kind of gas. We may most appropriately call this acid-matter (oxygen, from oxus and geinomia), because through its bonding with most substances it produces acid; hence the vital air is acid-matter gas (oxygen gas).'

18. Isaac Newton, *Optics*, Query 22, in Andrew Janiak, ed., *Newton. Philosophical Writings* (Cambridge: Cambridge University Press, 2004): 138-9. 'May not planets

What we call *light* is now itself the phenomenon of a *higher* matter capable of many more and other combinations, and with each new combination takes on yet another mode of activity. Although it seems to be the most simple element, an *original duplicity* must nevertheless be assumed in light, or at least the light from the sun seems to be the sole cause that sparks and maintains all duplicity amongst the earths. 39

In light, as it radiates from the sun, only one force seems to govern, but doubtless as it approaches the Earth, another, antithetical matter enters with it and thus, since it is itself capable of bifurcation, forms together with that matter *the first principle of the universal dualism of nature*.

Such a dualism must however be assumed, because without opposing forces, no motion is possible. Real opposition is only thinkable, however, between *magnitudes of the same kind*. The original forces (to which in the end all explanations revert) would not be opposed to one another were they not originally *one and the same (positive) force*, which only acts *in opposite directions*. For this very reason it

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and comets, and all gross bodies, perform their motions more freely, and with less resistance in this aetherial medium than in any fluid, which fills all space adequately without leaving any pores, and by consequence is much denser than quick-silver or gold? And may not its resistance be so small as to be inconsiderable? For instance; if this *aether* (for so I will call it) should be supposed 700,000 times more Elastick than our air, and above 700,000 times more rare; its resistance would be above 600,000,000 times less than that of water. And so small a resistance would scarce make any sensible alteration in the motions of the planets in ten thousand years. If any one would ask how a medium can be so rare, let him tell me how the air, in the upper parts of the atmosphere, can be above an hundred thousand times rarer than gold. Let him also tell me, how an Electrick body can by friction emit an exhalation so rare and subtle, and yet so potent, as by its emission to cause no sensible diminution of the weight of the electrick body; and to be expanded through a sphere, whose diameter is above two feet, and yet to be able to agitate and carry up leaf-copper, or leaf-gold, at the distance of above a foot from the electrick body? And how the *effluvia* of a magnet can be so rare and subtile, as to pass through a plate of glass without any resistance or diminution of their force, and yet so potent as to turn a magnetick needle beyond the glass?

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is necessary to think all matter as *originally homogeneous*, for only insofar as it is *homogeneous with itself* is it capable of a *bifurcation*, that is, of *real opposition*. But every *actuality* already presupposes a bifurcation.

Where there are appearances, there are already opposing forces.<sup>19</sup> *Natural science* therefore presupposes as its immediate principle a *universal heterogeneity*, and to be able to explain this, a *universal homogeneity* of matter. Neither the principle of absolute homogeneity nor that of absolute heterogeneity is the true one; the truth lies in the *union of the two*.

- 91 Without original heterogeneity no partial motion would be possible in the earth. For the opposing forces possess a necessary striving to *equilibriate*, that is, to set themselves into a relation of *minimal reciprocity*; consequently, were the forces not *unequally* distributed throughout the universe, or were the equilibrium not constantly *destroyed*, all partial motion would ultimately vanish from planets, and only a universal motion would persist, until perhaps finally even the inert, lifeless masses of the planets would collapse into a single heap, and the entire world sink into inactivity.

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19. Kant, *Critique of Pure Reason* (A265/B321) 'We are acquainted with substance in space only through forces which are active in this and that space, either bringing objects to it (attraction) or preventing them penetrating into it (repulsion and impenetrability). We are not acquainted with any other properties constituting the concept of the substance which appears in space and which we call matter.' See also Eschenmayer, *op. cit.*, 5-7: 'Matter is conceivable only by assuming two basic forces, and matter fills a space not through its mere existence, but by forces. Now since the empirical filling of space is given as endless difference in our intuition, but the multiplicity of a force can only consist in degrees, we may also consider these differences as degrees. Qualities are therefore degrees, and a degree of matter is any magnitude of proportion in which the attractive and repulsive forces stand one to the other. It is in this way that the dynamic is distinguished from the mechanical philosophy of nature.'

In order that the forces be unequally distributed throughout the universe [*Welt*], an original heterogeneity of the planets in each system must be postulated. There must be a principle that not only incites, but also, by continuous influence, sustains the conflict of particular matters on subordinate planets. Were this principle uniformly distributed throughout the universe, then it would soon find itself in equilibrium with opposing forces. It must therefore flow from somewhere else than, and from outside, the individual planets; in each system there must be only *one* body that always generates this principle anew, and dispatches it to all the others.

There is therefore no doubt that the *self*-illuminating bodies of the solar system owe this property to a quality that is properly their own, and which they obtain from the very beginning through a universal precipitation from the common solvent medium that precedes the formation of worlds.

To this extent, the view that the light from suns is generated from their own laps, still has a great deal going for it. Or should suns only be *light magnets*<sup>20</sup> for the universe, and all the light that nature generates from throughout all space be collected in them? Must there be, apart from planets and suns, a third class of bodies that are expressly determined to those processes by which nature generates ever new light matter (perhaps comets)? If for a moment we 35

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20. Peter Joseph Macquer, *Chymisches Wörterbuch oder Allgemeine Begriffe der Chymie nach alphabetischer Ordnung. Aus der Französischen nach der zweyten Ausgabe übersetzt und mit Anmerkungen und Zusätzen vermehrt von Johann Gottfried Leonhardi*, 2<sup>nd</sup> edition, 7 parts (Leipzig: Weidmann, 1788-1791), part 4, 577: *light magnet* is the 'Proper name for Balduinic Phosphorous. This is nothing other than a combination of chalk with nitric acid. [...] This phosphorous (which some... call *light magnets*, because it only lights once exposed to light at a distance) [...]'. [Editors' note *HKA* I,6: 303.]

think the world as finite, we must believe that from that point where the common centre falls, there emanates a constantly renewed and inexhaustible stream of positive matter. Is *Lambert's* argument that the planets that cycle within the centre of the solar system must be *dark*, convincing?<sup>21</sup> The star that in the sixteenth century suddenly appeared in Cassiopeia shone for one month more brightly than Sirius, and once it had arisen, as if from the void, gradually reduced in brightness, manifesting always weaker colours before finally disappearing completely; or was the star that Kepler saw at the start of the following century near the heel of the Ophiuchus, which demonstrated a constant change of colour (running through almost all the colours of the rainbow), but was as a whole *white* – according to Kepler's statements the brightest phenomenon in the heaven of fixed stars – perhaps, as *Kant* suggested, extinct suns reviving from their ashes, or were they the stage for another great process, by which nature generated light in the depths of the universe?

At least if, following Herschel,<sup>22</sup> the propagation of light in the sun is only an *atmospheric process*, then there must

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21. See J. H. Lambert, *Cosmological Letters on the Arrangement of the World Edifice* (Augsburg: Klett, 1761), tr. S. L. Jaki (Edinburgh: Scottish Academic Press, 1976): 'Should I, however, out in the common centre of the fixed stars, which together constitute a system, a body toward which they all gravitate, then I must give that body an enormous size and I must enhance its mass so much that even the most distant stars of the system would have considerable gravity toward it, because this is always proportional to the mass. Were I here to write a novel, I would then state that this body has either no proper light or only a very weak one. I would so arrange the world that the smaller dark bodies, like, for instance, the planets, would move around bright suns, but these again would orbit around dark bodies. For the suns would need no other light because they themselves possess so great a brightness, while the dark body can still sufficiently be illuminated by the suns which move closest around it.' [Editors' note *HKAI*,6: 303.]

22. See note 13, above.



be a reason why at all solar atmospheres erupt into light propagations. Must we assume that originally some elastic essence from which nature propagates light, accumulates around the solar body, and that the existence of this matter in the atmospheres of subordinate astronomical bodies is due to the long influence of the sun alone? At the very least, the source of light in our atmosphere is not *purely* and *unmixedly* to hand.

Who knows if suns are not surrounded by a completely *pure air*,<sup>23</sup> while a principle proper to planetary atmospheres prevents the outbreak of the propagation of light? There, in the sun's vicinity would shine an unchangingly pure light, unmenaced by any hostile principle. If it developed from the constant decomposition of a gaseous essence, we<sup>39</sup> would have to think this as provided with an extraordinarily high degree of elasticity, since as the largest masses of every system, suns, through the original transition from a fluid to a solid state, emit the largest quantity of elastic matters. To this, of course, is to be added the effect of gravity, which maintains the sun's atmospheric cover by intense compression, increasing its original elasticity to an extraordinarily high degree.

It is known that the intensity of light in its propagation is proportional to the degree of elasticity of the air from which it propagates. We experience this in great cold, when all fire burns brighter, sparks spread more quickly, electric light arises from the least friction, and even the earth's atmosphere at the poles radiates in electrical rays.

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23. Gehler, *Physikalisches Wörterbuch* part 2, 371: 'Gas, dephlogisticated, dephlogisticated air, non-combustible air, pure air (Bergman), Fire air (Scheele), artificial pure air (Keir), vital air (Ingenhous), Empyrean air, Gas dephlogisticatum, aer dephlogisticatus, Aer purissimus, aer verus factitius, aer vitalis, gas ou air dephlogistique: That component of the atmospheric air that makes it suited to sustaining fire and the breathing of animals.' [Editors' note HKA 1,6: 304.]

## COLLAPSE VI

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If then around the central body a gaseous essence emanates of so high a degree of elasticity that light propagation erupts unprovoked of itself, then continuous rays of light from these would spread in all directions and an ethereal sea would fill the empty spaces of the entire system whose midpoint they occupy, then indeed even spread into the spaces of more distant systems. For if the light developed never comes to rest until the gradually decreasing elasticity of its mass attains equilibrium, then the space it occupies at rest becomes proportional to its elasticity. But the degree of elasticity can increase to infinity, and be assumed to be as great as the explanation of appearances requires. Therefore the elastic matter that is propagated from the circumference of our sun can spread in a steady, unbroken stream to our atmosphere. The daily revolution of the earth will necessarily create the change of day to night, but not prevent the light from other, far distant suns from maintaining the continuum of their atmosphere with ours. Just as the hemisphere that we inhabit turns  
94 towards our sun, so too will larger light rays penetrate it, and effect the phenomenon of *day*. A common medium fills our entire solar system; every individual planetary body will acquire as much light from the commonality as is possible in accordance with the quality of its materials, but nowhere in the whole planetary system is there a hiatus, or a space that is not filled by the common atmosphere of all.

If finally the fixed stars too yet belong to a higher system, governed from a common central body, then the atmosphere of this system will also be common. Thus the atmosphere of each sun is in contact with the atmosphere of a higher system, and all the light that is spread throughout the world is the common light of one *universal atmosphere*.

If meanwhile an original diversity amongst the planetary bodies exists, then the universal light cannot be *uniformly distributed*, but must radiate from all spaces of the world to the *sun*s, and only from these to the planets.

Doubtless, however, it is not only individual, divergent rays that come to us from the sun, it is the *decomposed solar atmosphere*<sup>24</sup> itself that, as a constant whole, reaches even to us. The phenomenon of day is inconceivable as an accidentally diffused light. Since a source of light was formed in the vicinity of dark bodies, would this not at the same time have to be set in motion by the influence of the sun? The conflict of elastic matters in our atmosphere can only arise when our globe is transformed into a self-lighting body by an alien influence, becoming *sun and planet* at the same time, and thus combining heterogeneous properties in itself.

It is not enough, however, that the positive principle is only non-uniformly distributed throughout particular solar systems. If it radiates uniformly to a subordinate planetary body, a universal uniformity would soon arise upon it, that would ultimately terminate in a universal decomposition.

Light could not act upon the subordinate planetary bodies unless a force were extended over them that, excitable by light, must be primitively affinate to it. That however no enduring excess of this force of nature arises through the influence of the sun's light, is ensured by the world's very structure, by the change of day and of night, of the seasons, even by the form of the planets, since, to judge analogically in accordance with the form of our earth, without doubt wherever light rays strike most vertically (towards the equator), the greatest mass is accumulated; while where they more obliquely hit (towards the pole), they gradually flatten off.

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24. See note 13, above.

195 The *positive* cause of all motion is the force that fills space. If motion is to be maintained, then this force must arise. The phenomenon of every force is therefore a *matter*. The first phenomenon of the universal force of nature, through which motion is sparked and maintained, is *light*. What radiates to us from the sun (since it maintains motion) appears to us as the *positive*; what our earth (as mere reagent) opposes to that force, appears to us as the *negative*. Without any doubt, what bears the aspect of the *positive* is a constituent of *light*; with it, we simultaneously acquire the positive elements of electricity and magnetism. The *positive* in itself is *absolutely-one*, therefore the primitive idea of an inexhaustible *primal matter* (of aether), which, as if broken down in an infinite prism, extends into innumerable matters (as individual rays). All multiplicity in the world arises only by the various *limits* within which the positive acts. The factors of universal motion on the earth are *positive*, which radiates to us from outside, but the *negative* is what belongs to our earth. The latter, evolved from a positive force, is capable of an infinite multiplicity. Where a force of nature encounters resistance, it forms its own sphere, the product of its own intensity and that of the resistance it encounters.

:96 The negative force is aroused only by the positive. Therefore in all nature, neither of these forces exists without the other. In our experience, as many individual things (particular spheres, as it were, of the universal forces of nature) arise as there are different degrees in the reaction of the negative force. Everything terrestrial has this property in common: that it is opposed to the positive force that radiates to us from the sun. In this original antithesis lies the seed of a universal world organisation.

This antithesis is postulated *absolutely* by natural science. It is not susceptible to an empirical, but only to a transcendental deduction. Its origin is to be sought in the original duplicity of our mind, which only constructs a finite product from opposing activities.<sup>25</sup> Those who adhere to experimentation know nothing of this antithesis, although they could not deny that their constructions of natural phenomena (for example, combustion) are wholly and utterly incomprehensible without such a necessarily postulated, if not empirically demonstrable, conflict. Those who simply propound this antithesis (for example, in the theory of combustion), expose themselves to the reproach that they invent hypothetical elements where they ought to experiment. This contradiction can only be settled by a philosophy of nature.

Experimental physicists are right to adhere to the positive, for this alone is directly intuitable and cognizable. Those capable of the larger view of nature must not be afraid to confess that they have *inferred* the negative; it is not for that reason any less real than the positive. For where the positive exists, the negative exists – and precisely because of it. Neither the latter nor the former exists *absolutely* and *in itself*. Both maintain a single, isolated existence only in the

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25. See Eschenmayer, *Propositions*, 3: 'A remark is to be made here that it is only from the standpoint adopted by the metaphysician of nature that the necessary assumption of these forces can be proven and the duplicity of matters and forces which so many have introduced into natural science to explain the phenomena, justified. The theoretical dualism for natural science is actually postulated by dynamics, but we do not commonly observe its lineage. Thus we set acids and alkalis opposite one another, two electrical and two magnetic materials; hence Gren assumes a gravitational and an expansive force [...]. If we understand ourselves properly, then it is only in name that these materials differ, but are one in concept, and the assumption of such a dualism becomes necessary as soon as we analyse the concept of matter in regard to the category of quality [...] Ultimately such a dualism is deduced from the necessity of the original positing and opposing, which are the conditions under which even the possibility of our consciousness stands.' [Editors' note, *HKA* I,6: 306]

moment of conflict; where this breaks off, the two disappear into one another. Nor is the positive perceptible without contradiction; and when they boast of a direct intuition of the positive, they themselves presuppose the negative.

- This is what Newton found. As he established the force  
 17 of attraction as the negative principle of universal planetary motion, he does not deny, but rather affirms, that it is an *inferred* principle. He does not attempt to present a direct intuition of it, but rather *postulates* it, since not even the directly-intuited positive would be possible without it. He even acknowledges that if this principle were intuitable, merely apparent, then rather than being the actual force of attraction, it would have to be simply the illusion of a jostling, gravity-producing matter. That is, he shows that the demand to know something positive concerning the force of attraction is vain, and is based on inconsistent concepts.<sup>26</sup>

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26. See Newton, *Optics* Query 31: 'Have not the small particles of bodies certain powers, virtues or forces, by which they act at a distance, not only upon the rays of light for reflecting, refracting and inflecting them, but also upon one another, for producing a great part of the phaenomena of Nature? For it is well known that bodies act one upon another by the attractions of gravity, magnetism and electricity; and these instances shew the tenor and course of Nature, and make it not improbable, but that there may be more attractive powers than theses. For Nature is very consonant and conformable to herself. How these attractions may be performed, I do not here consider. What I call attraction, may be performed by Impulse, or by some other means unknown to me. I use that word here to signify only in general any force by which bodies tend towards one another, whatsoever be the cause. For we must learn, from the phaenomena of Nature, what bodies attract one another, and what are the laws and properties of attraction, before we inquire the cause by which the attraction is performed.' Eschenmayer, *Propositions*, 60f: 'I conclude with the remark that Kant, in the proof of the existence of an attractive force and the explication of its properties, has gifted us the key with which in the future the majority of the burdensome problems of nature may be resolved, and even the windows that were opened by the immortal Newton, when he accepted the attractive force as valid but not a priori provable presupposition for discovering the laws of gravitation, is satisfied by the proof of their existence that Kant presented.'

Let us from the first solemnly renounce a *physical* explication of that universal conflict of the negative with the positive principles, from which alone the system of nature develops harmoniously. And in order that our philosophy does not, by reason of its assertions, take second place to experimental physics, let us demonstrate, by a complete induction, embracing all phenomena, that its one-sided explanatory method actually comes to nothing without inner contradiction (the source of all life), and makes any construction of the first phenomena of nature impossible.

We will consider it proven:

- 1) That light is *the first and positive cause of universal polarity*;
- 2) that *polarity can create* no principle without having *an original duplicity in itself*;
- 3) finally, that *real antithesis* is possible only between things *of one kind and common origin*.

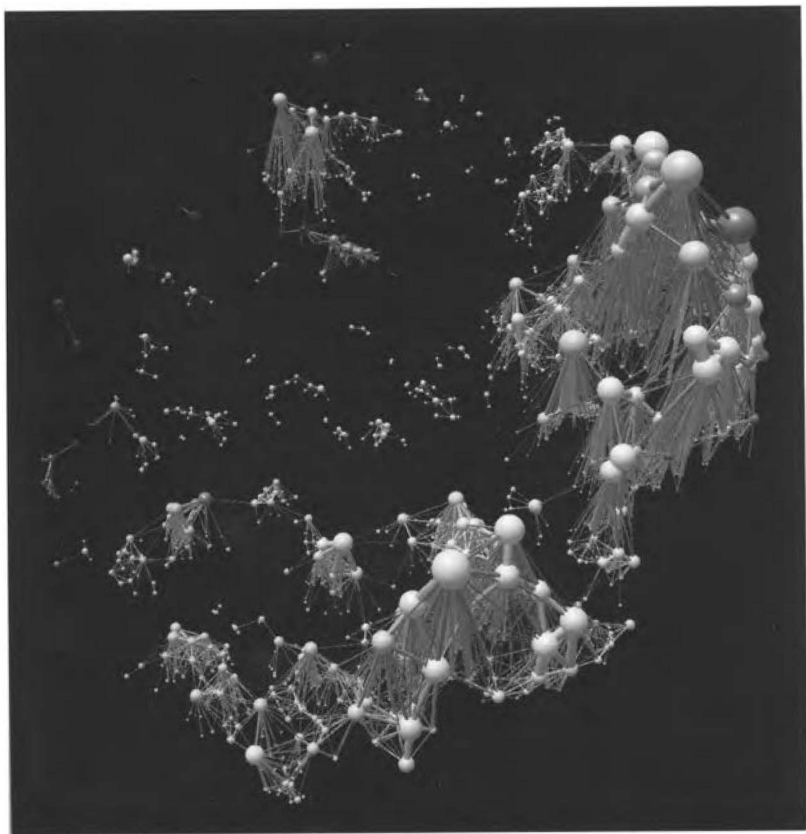


Fig 1. Meadow network from Yosemite National Park. Each node (ball) is a meadow. Node diameter is proportional to area. Each link is a possible connection between meadows, where link strength is proportional to meadow size and inversely proportional to distance between meadows and links below some threshold strength are omitted. The network is viewed looking to the north and looking down; the x, y location of each node is the meadow's geographic location and height is the meadow's connectivity (number of links attached to the meadow). Node colour is proportional to elevation and link colour is proportional to distance between nodes. Data courtesy of Eric Berlow.



### New Ecologies

Interview with Stephen Emmott, Drew Purves,  
Greg McInerny and Rich Williams

*The many dire environmental warnings to which we have become accustomed all have their basis in predictive models devised by scientists. But what degree of confidence can we place in such models, and on what basis are they constructed? Scientists in the Computational Ecology and Environmental Science Group at Microsoft's Computational Science Lab, based in Cambridge, England are working at the cutting edge of environmental science, devising new methods to computationally model climate change and its effects. This work involves adapting statistical methods to reflect the particularities of the extremely complex and interconnected objects of biology and ecology.*

*In COLLAPSE's interview with four of the scientists working at the Lab, we discuss the new impetus that environmental concerns have imparted to ecology as a science, demanding a re-examination of its objects and its aims. They describe the delicate compromises that must be made between tractability, complexity, and the urgency of the problems which they are addressing, and the necessary confrontations with the historical scientific legacy involved in rethinking the biosphere. In this process, new models of scientific thought and practice are emerging.*

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**STEPHEN EMMOTT** (HEAD OF COMPUTATIONAL SCIENCE)

**COLLAPSE:** Some may be surprised to see Microsoft involved in scientific research of this kind; could you explain the aims of, and the **thinking** behind, your team's work?

**STEPHEN EMMOTT:** When Microsoft asked me to join the company, science certainly wasn't natural territory for the organisation. That Microsoft is doing science – and in particular natural science – is the result of my convincing the people who run the organisation that science is set to become increasingly important to Microsoft, that Microsoft has the potential to make a significant contribution to the future of science, and that there are many potential benefits to Microsoft actually doing (in addition to just funding) science. The case I set out was as follows: Firstly, that there is every reason to believe that science (in particular natural science – or more accurately, a precise science of complex natural systems) is set to be the single most important driver of our times (especially in relation to environment, health, medicine, energy and the future of computing), the impact of which in the twenty-first century, from a societal and economic perspective, is likely to dwarf that of 'IT era' of the twentieth century. Secondly, that new kinds of software will power this science – enabling the realisation of unprecedented ability for predictive multi-scale models that permit 'Grand Challenges' in science to be tackled, large scale 'in-silico' experiments (e.g., future climate), highly novel data acquisition, analysis and visualisation techniques, and enhancing creative imagination in scientific discovery (interestingly, much in line with what Alan Kay originally

envisioned in the 1970s as the potential of computing). Thirdly, that science is where numerous developments have come from that have shaped the company's business and technical strategy: the World Wide Web, the Browser, Object Oriented Programming, Search – and science is likely to be where future such developments emerge from.

**C:** You have spoken of pursuing a 'new kind of science' – could you elaborate on what you mean by this, and how your vision of it relates to that of Stephen Wolfram?<sup>1</sup>

**SE:** The last century saw an increasing fractioning of science, and 'natural science' has suffered most severely as a consequence of this. Biology, for example, is a discipline that has become divided into (to name but a few) cell biology, developmental biology, genetics, genomics, metabolomics, proteomics, structural biology, microbiology, epidemiology, 'systems' biology, mathematical biology, theoretical biology, cancer biology, population biology, stem cell biology, evolutionary biology, plant biology, ecology, neuroscience and now even 'ageing science'. This has in part been an expected consequence of the increasing specialisation of each of these various branches of biology, but it has been at some cost, and may well be looked upon by future generations of scientists as highly deleterious. I think this century will demand a significant (re)unification of science if we have any hope of making the kinds of advances that are now urgently required and that will fundamentally shape our society and our future. This will require radically new thinking, radically new ideas and

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1. S. Wolfram, *A New Kind of Science* (Champaign, IL: Wolfram Media, 2002).

radically new approaches in science in order to overcome existing barriers to fundamental advances in natural science – and it is precisely this radically new thinking and these new approaches in science that my Lab is focused on.

As for Wolfram, when his book *A New Kind of Science* was published, both it and he were roundly criticised – unfairly in my view. I think this was because many focused on the narrow ‘example’ he focused on of Cellular Automata. I wouldn’t call CAs a ‘New Kind’ of science, but Wolfram was actually making a much more important argument: that nature may not obey or be explained by existing mathematics – the ‘rules’ that have been (arguably) successfully applied to physical systems, most notably calculus and in particular Ordinary Differential Equations; and that therefore there is a strong case to be made that we need a new kind of science that is based on new kinds of thinking and a new kind of computational ‘language’ or approach that is likely to be fundamentally, radically, different to that of the ‘first’ (so-called) Scientific Revolution of the late sixteenth and early seventeenth centuries, which continues to dominate science today.

**C:** In our interviews we have spoken with those in your team who are working on ecology and climate modelling. Why can the kind of approach you have described make a difference specifically in the area of ecology? And what other areas is the lab working in?

**SE:** Rather than ecology being a priority, it’s more accurate to say that the priority is to accelerate a precise, predictive science of complex natural systems – a new natural science – spanning biochemistry to the biosphere. The focus is

on both developing new theory about complex living systems as information processing systems (e.g., cells as information processing devices and biochemistry as information processing machinery), and on novel computational approaches that allow the testing of such novel theory – including a scientific, computational and software framework to enable ‘impossible’ (‘in-silico’) experiments to be conducted (especially about the interactions between climate and ecosystems, where such an approach is really the only way to conduct experiments, other than the biggest experiment on earth – the one anthropogenic activity is currently conducting). Drew, Rich and Greg eloquently expand in different ways upon why our approach might make a fundamental difference in this area so I shall not attempt to do so here.

**C:** You have attended global summits on climate change to present this work. What is your impression of what happens when science meets politics?

**SE:** Well, we’ve seen recently all too clearly what can happen – with the fiasco of the COP15 outcome, the stolen emails from UEA CRU, the (thankfully unrealised to date) H1N1 flu pandemic issue. The list is a long one – I highlight just a few. My first quarter of a century in science has led towards the increasing impression that politicians of all persuasions are to a great extent guilty of using science (or the statistical summaries of science) much as a drunk uses a lamp-post – for support rather than illumination. On the other hand, one can’t really blame politicians for doing so, since scientists are, on the whole, dreadfully poor at communicating science and its implications clearly and

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simply. Scientists need to do a much better job of informing the policy debate on just about every issue imaginable.

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### **DREW PURVES (RESEARCH SCIENTIST)**

**COLLAPSE:** It may be that some of the questions we are going to ask will seem naïve to a scientist ...

**DREW PURVES:** This makes me think of Stephen Pacala from Princeton, from whom I learned a lot of science, but who also shaped my thinking about how to be a scientist these days. And he's someone who's always had a lookout for things that other people weren't doing, or which were said to be impossible, and he would just stick his neck out – which is part of his natural character, he's a very confident kind of character. He would just go in with the default assumption that “my naïve thought might just be relevant – let's see”. And on several occasions, in the end he's been really listened to. Have you come across this ‘wedges’ approach to global climate change? It's the one where you say, over a given period of time, here's what we would emit if we were to carry on as we are, and here's what we can allow ourselves to emit if we want to avoid dangerous climate change. Then we look at the graph, and between the two there's this triangular difference. The area under that triangle is the total amount of carbon that we need to avert – the amount that we need to not emit. At the time, I think it turned out to be seven gigatons in total. So Pacala said, “well, let's visualise these seven

units as seven wedges that add up to that big triangle, and then let's look at technologies and see how many wedges different technologies can give us." So, you know, more efficient cars gives us two wedges, and so on. And it turns out we've got fourteen wedges of technology right now. If we didn't invent anything else, we've already got fourteen wedges, and we only need seven. So we've got twice the capacity to offset climate change up to 2050. Then it gets harder, because the what-we-would-have-done is getting ever bigger, whereas the what-we-can-do stays still, if you see what I mean. After 2050, he says, you might need some more radical technologies, but even so, to be honest, you still have the other seven left – maybe that will get you another twenty-five years! So you are saying there might be seventy-five years worth of technology in place to solve climate change right now. So he just wrote that down and he gave it to me and said, "what do you think?" I said, "Well, okay, I guess ... " And it is now a standard thing in policy – people talk in terms of wedges, and it featured in David Attenborough's TV show – it had Pacala in it and his graphic with the wedges. It just shows you, to my mind, that a lot of the challenges we are facing are sort of 'nobody's business'. Everyone always thinks it's someone else's business, everyone always thinks that someone else is an expert on it. The fact is, no-one's an expert on climate change, or on solving global resource problems. The economists think "we can't do it because we don't know anything about biology or conservation or agriculture", but the ecologists think "we don't know anything about economics", and so on. So actually, a naïve approach, firstly, is valuable, and secondly, might not be as naïve as you think. When you ask these questions, they are probably the same questions that everyone is asking in that field.

**C:** And so what do you think of as being, on the broadest level, your contribution to understanding the problems – if not solving them?

**DP:** There are two sides to it, you see. Going back to the ‘wedges’ idea for climate change, we firstly need to predict how big the problems are going to be under different kinds of actions of humans, one of which is ‘business as usual’, where we don’t think about it and just carry on; and then, knowing how bad the problems actually are, we need to find out, if we want to cap the problem at a certain level then how much do we need to do? So you are setting the size of the problem.

For instance, in climate change, what you want to know is, what is the relationship between the CO<sub>2</sub> emissions and climate change. You know, the way it is described in books sometimes makes it sound like a pretty simple process: you pour CO<sub>2</sub> into the atmosphere, and it’s like thickening the glass, it warms up the earth. There is some of that, but in fact half of the CO<sub>2</sub> we put in the atmosphere goes into either forests or oceans straight away, so only half of what you put in even stays up there. But because oceans and forests are highly responsive to climate, as we change the climate the oceans and forests themselves change – they might suck up either more or less carbon. So actually, at the moment we don’t know what the relationship is between the CO<sub>2</sub> that we put in the air and the CO<sub>2</sub> that stays in the air. We don’t even know the relationship between CO<sub>2</sub> emissions and atmospheric CO<sub>2</sub>. At first glance this seems almost ridiculous – surely you just put it in the air and it stays there; but it doesn’t. Secondly, we don’t know what the relationship is between whatever CO<sub>2</sub> stays up there



and the climate. That's where a lot of my work comes in, because the largest uncertainty at the moment is the forests.

**C:** Before we discuss your work, by now, readers may well already be wondering how it is that we are assaulted by terrifying predictions about climate change and by directives as to what we must do, if we haven't even determined these simple causal relationships.

**DP:** People are talking more and more about this now – that it is really hard to convey uncertainty to the public. Up until recently people have been very wary of even admitting there *is* any uncertainty because it was in the balance, you know: Are international governments going to believe or not believe there's going to be a problem? Whereas I think that's done now, and we can be a bit more honest about the uncertainty. So, for example, in principle it would be just about possible to put more CO<sub>2</sub> into the atmosphere and for the global system to react in such a way that the end result of that was *lower* atmospheric CO<sub>2</sub>. But frankly, that's extremely unlikely, it would be like a strange over-compensating mechanism. In reality, you can be sure about certain things: you can basically be sure that if you put more CO<sub>2</sub> into the atmosphere the atmospheric CO<sub>2</sub> is going to go up, even though it is not a one-to-one relationship. It is also very hard to imagine that the atmospheric CO<sub>2</sub> could go up without warming up the planet. So basically, you know that if we keep emitting CO<sub>2</sub>, then atmospheric CO<sub>2</sub> will keep going up, and the planet will warm, and there will be other climate effects. The uncertainty is about *how much* the climate will change, and how quickly. But even the minimal predictions are still slightly worrying

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– the minimal ones say maybe it will only be one or two degrees – but one degree, two degrees could be a big deal. So if you think about the spread of uncertainty it is really tricky, because if you just pay attention to the outer bounds of it, that could be really misleading. If you have a certain range, most of the predictions are going to say that it is somewhere between two and four, but some of the models will give you one and some of the models will give you six. It's quite hard to convey that sort of uncertainty. There are qualitative things we don't know about the subsystems, but I still think there are certain qualitative things that we *do* know, as near as you can know anything. It's very hard to imagine that the earth would overcompensate in some way.

The other debate that I think is really funny – I've had this debate with a relative who's really sceptical, and it's been really interesting bouncing things off him, and he said, "you know the atmospheric CO<sub>2</sub> is going up; how do you know this is caused by humans?" So, if you do an inventory of how much CO<sub>2</sub> humans are putting into the atmosphere and then how much the atmospheric CO<sub>2</sub> is going up, that's pretty suggestive; it's going up by less, not more, than it should, based on what we're emitting – that is, we are putting in more than enough in for it to be going up by the amount it goes up. So, imagine that it's not due to us: you would somehow have to imagine that all of our emissions are being perfectly soaked up by something, and then some other process is responsible ...

**C:** A very circuitous explanation!

**DP:** Exactly. So, I do almost have to have two heads when I think about it: If you blur your eyes to the system, it doesn't look all that complicated really – I mean, you've got the atmosphere, you put CO<sub>2</sub> into it, there's not that much to it. But in going from that to any more quantitative predictions, suddenly there's a massive break in the amount of complexity that you need to think about.

**C:** If that 'blurred', high-level view already tells us that we have to reduce CO<sub>2</sub>, what is the argument for even striving for a really detailed understanding of it? So that we can determine what's the least possible we need to do ...?

**DP:** The truth is that yes, that's been the argument. And I worry about this kind of stuff – about the role of this kind of science plays in the climate change debate – for those reasons. I think for a long time, essentially, you just had to persuade governments to worry and take it seriously. Now that job's done. If we could say, here is the exact response of the Earth's systems to different levels of CO<sub>2</sub>, that would be fantastic. I guess that's what we are heading towards, but we are a long way from it now. And yet the policy that's really going to matter is being set right now. So there is this question in my mind: you could say – if you ascribe this type of rationality to global government – “I'm spending a bit too much every month, I want to get back to balance, I've got to cut down ten percent, I'm going to stop buying wine.” And it's just like that: “you've got to reduce CO<sub>2</sub> by this much”; “Okay, we'll do it, thanks. We'll work out how to do it.” Like they are completely rational and in control of everything, right. But in fact, is that the amount of CO<sub>2</sub> that they're going to reduce by, or will the reductions be set

entirely by political and economic agendas? They may just want to do it as fast as they can, but ‘as fast as they can’ is determined by democracy and global economies, and all that kind of stuff. And if that’s the case, I mean, look at the UK saying they want a ninety-percent reduction by 2050 and that we’re going to carbon-neutral as fast as we can.

If that’s the situation, then where does the climate modelling prediction come in? Obviously, there’d be a kind of reactive role for it: You could say, let’s assume then that the world does do a ninety-percent reduction by 2050. Putting that into the model, let’s see how much climate change, and where, and what should we be worried about. Look, there’s a good chance that a chunk of Africa that is currently productive for agriculture would become a desert ... In which case it’s just giving us warnings of things to come, if you like. Not the old kind of warnings which were meant to shake someone by the shoulders and say “you have to worry,” but actually saying, “no, really, this is exactly what’s going to happen, so we better plan for this.” So it’s giving a different kind of message, I guess.

**C:** And do you believe your work will contribute in the future to specific warnings, and thus legislation, of this kind?

**DP:** I would be very much hope so. I would almost say that if it didn’t, I’d have failed. I used to think that the main role of my kind of work would be providing predictions of things that policy-makers care about, and how they would respond to different kinds of legislation. For example, if I ban GM crops, what does that do to agricultural productivity?

But more recently, I've come to realise that ecologists in particular have a big role to play in looking at global questions in a joined-up way, looking at all parts at once and what that means. For example, you encourage biofuel demand to offset fossil fuel emissions, but this increases the price of biofuels, which encourages Amazon deforestation in order to grow more biofuels, and that deforestation actually emits CO<sub>2</sub>. That kind of tracing of effects, comes naturally to ecologists, but not to many policy-makers, I now realise. Of course, building models of these problems serves a dual purpose – it provides predictions, but also, in describing the model, you describe the problem in way that can really help policy-makers.

But there is another part of me, when I think about myself longer term, and what I want to do with the sort of science I study – the science of complex reactive organisms, especially plants. It says, maybe we just move on to a different kind of scientific problem, like improving agriculture, where you are thinking about plants and their relationship to the environment. And whether we could have much more productive crops, in particular crops that use less inputs – so, even if they are not more productive, they use less water and less fertilizer and things like that. As well as larger questions, sometimes I see things about poverty and I think, “Blimey, maybe I should get on board on that one.” It's not like I come in every day and think, “Am I doing the right thing?” like some people do. I've got a lot of momentum. But I do worry sometimes about those things, and keep in mind that the science I'm doing has potential for those other problems too.

**C:** Returning to your current research, you said that the greatest uncertainty in modelling and prediction concerns the forests, and this is where your work is focussed.

**DP:** Most of my work at the moment is on forests, which dominate the global terrestrial carbon cycle. There are two projects, and they differ quite significantly in their complexity. One of them concerns the fact that, if you look at the carbon stock that is held in living trees, essentially, as the trees grow, they swell up and that carbon stock increases; what stops it increasing infinitely is that the trees die. So they die, fall over, and then it rots back into the soil and is emitted back out into the atmosphere. So let's consider the rate of tree death – or, to see it inversely, tree lifespans. Now, all the models assume that that lifespan is the same everywhere – that trees basically die one percent per year everywhere. Whereas if you take any kind of more detailed look at this, it will tell you quite the opposite. So, existing models have quite a nuanced approach to how growth depends on temperatures, and the same for rainfall, but the mortality is actually very fixed.

I've got a student at Leeds University who's been trying to get all these forest inventory datasets that have been taken for forestry purposes all over the world, knit them together in a database, and just basically observe the different rates of tree death in different climates, so as to replace that one constant with a function of climate and soil. By doing this we can genuinely help to constrain the future of the global carbon cycle.

**C:** What explanation can be given for the omission of that factor in the existing models? Is it simply a reflection of the history of scientific disciplines, what ecologists have been interested in (life rather than death)? Or did someone simply make that assumption at a given point and it was never questioned ...?

**DP:** One of the things I have really tried to do is to look at all the parts that are involved in answering one of these questions to do with climate change. Traditionally what we've been taught in science – and to a certain extent it's become the natural tendency – is to do a jump from something that's already been done. So scientists build on each other's work, which of course is good sometimes; but sometimes it just misses an entire area, because you are only ever writing on something that's already been done. So you end up with more and more people studying the physiology of tree growth, and nobody doing death.

This was one of the big benefits to me of the global climate models. Because I was really sceptical about them, like a lot of ecologists still are – “oh, come on, it's too complicated, we're not ready”. And it is kind of boring to put them together, because one hundred people have to work together, and it slows you down – I prefer me and a blackboard and a bit of paper – and we know the predictions aren't going to be reliable for a really long time, so you ask whether it's worth the effort ... but, as I say, one thing that it really has done is that it's made us question what ecology is about. Well, it's about understanding the biosphere – and these big global modelling efforts have really given a shape to that problem. And there are now entire groups of people doing research and publishing papers on systems that by

themselves just look so boring that no one wanted to know before. So people would go to the tropics and it was all the epiphytes, or the intricate relationships between ants and plants, and whatever else, whereas more often than not, they didn't measure the heights of the trees. And now we're doing climate change research, that really matters. In a lot of this work you are just hoping to have a balanced approach that in the future might help us to understand the whole thing. But along the way it opens up many new and very specific avenues of research.

**C:** A lot of the data that you have to work with was not gathered for the purposes for which you are modelling, which introduces a measure of historical dependence in the selection of the parameters and the setting up of the scientific problem. Consequently, as you're saying, this emphasises the need not to accept the legacy, but to reassess it at each stage.

**DP:** Yes, but we are just getting there. And in truth, it is partly a matter of time: You produce a lot of data for one purpose, and a bunch of other people say, "Hey, it's good for this different purpose." So there's a natural time-lag that operates through a sort of feedback. Another aspect of this is to do with different communities of people: By and large, NASA just loves putting satellites up, because they love building lasers and they love tracking satellites and doing new exciting things. So there's been a disconnect between the data-gathering and the use of the data; but I think now it is linking up a little bit more. I get the impression that NASA would realise now that they need to make some kind of rational argument – to President Obama, say –



for putting up a satellite to measure sea surface heights or something, and not just because, “Hey, we can do that, isn’t it cool” – that actually it matters in some way to people. Still, in the majority of cases, even when people do their own experiments they typically end up analysing the model and asking questions they didn’t anticipate when they designed their own experiment, so it even happens on a micro level.

Stephen [Emmott] talks about a ‘new kind of science’, and we’re trying to find the broadest way in which to describe this. But I think some of the activities that make it different – the more day-to-day aspects – include a kind of turning of the scientific process on its head: Traditionally, we start with simple observations, move on to some sort of quantitative measures, and at some point we assemble it into a model and then we make some kind of prediction. Whereas we’re now **thinking** that if you look into a problem for the first time, you might want to *start* by building a model, and then do virtual experiments on the model. We do statistics on the results of those virtual experiments, and then we ask at the end how well we did that virtual experiment. Then, we go and alter our virtual experiment – remember, at this point we are still not going into reality! – for example, we say, let’s fertilise the plants halfway through the experiment, does that give me an increased ability to tell my hypotheses apart or not? If so, I’ll retain that change to my virtual experiment. So there is this loop, an optimisation loop, and all I’m doing is optimising the design of an experiment, and it is only *after* all of that, that I actually go and do my experiment in reality. Whereas at the moment, even the people that do quite cutting-edge computational science in ecology still design their experiments based on ‘gut instinct’; at the end of it they come in with all sort of bells and whistles, computational analysis, but

typically they end up thinking, “I wish I had fertilised the plants half way through”! We’re now calling this – thanks to Greg [McInerny] – ‘joined-up ecology’, the idea being that we join up all stages of the scientific process and move up and down it seamlessly. Going back to your question, it means we’d never again gather data without having at least one model ready to use that data.

**C:** In the case of planetary ecology, how is such a ‘virtual world’ designed to start with?

**DP:** On a grand scale, what we should be doing with Earth system models is to make them take in the entire Earth system – so that running the model simulates everything. We don’t know how the real Earth system is built, but we have a sort of virtual Earth, which we build with our best guesses, to be realistic. Then we add a virtual sampling system, with virtual satellites and so on. We put that into the virtual model of the virtual earth and we ask, “How well does the virtual sampling scheme observe what we *know to be true*, within the virtual Earth?” We don’t cheat – we don’t tell the virtual sampling scheme anything about the virtual Earth, even though we know everything about it because we created it ourselves. Everything it knows has to come through the virtual data from the virtual sensors. Next, we can feed that data into a second virtual Earth model. Now we can ask how well the second model reproduces the behaviour of the first. Finally, we can alter the number of satellites and what they’re measuring in a way that gives the second virtual Earth the greatest fidelity to the first virtual Earth, and then this is the plan of satellites that NASA needs to build. The point being that this whole

(virtual) process is analogous to what we're trying to do in reality. We're trying to gather data, to make a virtual Earth that behaves like the real Earth.

**C:** People have a naïve idea that what scientists do is go out into the world measuring everything and then go home and write it all down and that's where they start. Whereas a scientific experiment is always constraining: you are always placing a frame over something and it can only tell you what you ask it. But to a certain extent you're saying that the naïve view has been true in the past – that there has been this process of sending satellites up, collecting data and not really knowing what's going to be useful.

**DP:** That's right, just as people would think. Then you look at all this data and you're trying to figure out what's going on.

I guess this is related to the use of Bayesian statistical methods: I pretty much just use Bayesian as a tool, but in ecology the philosophical implications have been much discussed. It's really a simple way to visualise the way science works: it's quite useful that you've got your current system of belief, and that really it is a sort of probability attached to any universe. So you can imagine a universe where tree death doesn't depend on temperature, but here there's a universe where it does, and here there's another universe where it depends even more on temperature. So you have all these different universes and each one's got a probability – how much do I believe that we're in universe *a* rather than universe *b*? Once you bring in your data it helps you make that decision about which universe you're in:

When I plot tree death against temperature I get this great big steep line, so I'm now really quite sure that I'm not living in tree-death-doesn't-depend-on-temperature universe. So you are continually updating where you think you are. If you knew it perfectly in the end you could say for sure exactly which universe you are in and then simulate your own universe perfectly. And that Bayesian process describes fairly well what scientists do.

**C:** Using that framework, then, what does your work tell us about the universe we are in that we didn't know before?

**DP:** The work that I've done that I'm proudest of is that I worked on a model of a forest that let you scale up from the rules that govern the growth and death of individuals to the long-term development of the forest itself – it was a scale-transition problem model. So the question is then examining that and finding a kind of model that works. That involved saying “I'm in the universe where that kind of model works against a real forest” – it was quite carefully tested to see whether it would actually work in a real forest. I've worked with a colleague at the University of Toronto on forestry, and he's looking at the problem of how you optimise any factor in a forest – whether it's yield, conservation value, carbon storing, biodiversity, or whatever. And we've looked at how the trees break up space in the canopy; whether you can understand how the trees' growth and mortality depend on the amount of canopy space that they capture and their size and age and so on. And so we found a lot of things out there: You get this U-shaped mortality rate where trees die quickly when they are young and old, but they die slowly when they are

middle-aged, which of course is kind of like what humans do. And we worked out that the reason that the mortality comes down when they are young is that they are moving up the light gradient, so the environment is getting better, whereas when they are old it is worsening. And it turns out that if you double the canopy area you don't double the growth rate for an individual tree, so you discover new relationships like that, which seem to be common across all forests.

All of that does in fact constrain the universe of possibilities, because we didn't know it was going to be like that. And I think that once you know that you can really say a lot more about how forests work in general and how best to manage them.

But the mortality thing I'm really excited about. Again, we really don't know the relationship between mortality and climate; once we've done this work I think we will approximately know what it is and we really will have taken what Bayesians call a 'flat prior' – we really had no prior belief about temperature and drought and their effects on mortality – and created a much more concentrated posterior – we now think that trees die in *this* way in response to climate change. That posterior then becomes the prior for the next piece of work. So the next piece of work starts off thinking we're probably in this one of the many possible universes.

**C:** Such flat priors correspond perhaps to the type of 'naïve questions' we were discussing – they are factors that we have no beliefs about, because they have not been thought of as significant in the past. As such, considering them introduces new variegations and differentiations in the domain of 'possible universes'.

**DP:** Actually, I do have some beliefs – which if they're confirmed show how this work on mortality is crucially important in climate change: If you take a gradient across the Earth from a load of places where it is wet, the real difference between wet, say, in the tropics, to wet up north, say the redwoods or somewhere like that, is the length of the growing season. So you've got a twelve-month growing season in the tropics and it gets shorter and shorter as you go up. But it seems that trees die primarily in the on-season. So in the winter, it's almost like pausing a videotape: All the inputs through growth stop, but all the outputs through mortality stop as well. If most of the mortality occurs through pathogens and so on, this makes sense – it gets freezing cold so the trees can't grow but the fungi can't attack them either, so everything just stops. So I actually think that in wet places tree mortality is relatively unresponsive to temperature as opposed to somewhere a little drier, where similar kinds of patterns suggest to me that when you reduce the productivity through drought you actually increase mortality. And that makes sense again: they literally die from the drought. Things like that, just knowing if that is true, could change our prior assumptions about the way that water and temperature interact, and give entirely different predictions. And that immediately impacts the understanding of biomass over the globe: It says that if you reduce productivity by cooling a place down, it doesn't really have much effect because the gains and losses balance each other out; but if you reduce productivity through drying it out, it really changes things as such – the gains come down but the losses actually go up. So you've got this completely different effect.

And that affects predictions, so that, under a given scenario, like ‘business as usual, anthropogenic emissions’, I’ve got a prediction for global temperature and one for rainfall – and knowing these things could change that distribution. So, depending on which universe you believe you are in here, now, you get a different trajectory in the future, and if we can constrain which universe we are in, then hopefully that prediction will be constrained and that’s what makes it more useful for forecasting climate change.

**C:** Understanding science ‘idealistically’ for a moment as being interested in the world for its own sake, it sounds like the advent of our understanding of climate change has opened up a whole new set of problems and questions which, as you were saying, were ‘flat priors’, which people didn’t even think were particularly important questions, or which hadn’t even been framed before. So has it opened up a lot of opportunities for studying what we didn’t even know we didn’t understand before?

**DP:** Yes, absolutely. You must have heard Donald Rumsfeld’s phrase ...

**C:** The unknown unknowns!

**DP:** I’ve been surprised how many emails I’ve had relating that to ecology, you know. People laughed at it at first, then they’ve started quoting it, thinking, “well actually ...”.

**C:** It's quite a profound statement, politicians have said far stupider things!

**DP:** Yeah, I think that's true. One of the things is that ... I don't know, maybe there is a residual feeling of guilt amongst ecologists, because the truth is that there are plenty of ecologists out there whose immediate emotional reaction to the issue of climate change has been "Great! Because I happen to be the kind of person who likes to study the sorts of thing that feed into our understanding of climate change, and who can take the kind of approach that is valuable." You know, I'm a bit like that myself, because no matter how much I try, I can't get that much into the individual biology of species and things like that. Somehow, I can't get into the details – I'm a systematiser, I always want to look at eco-systems as systems, I'm willing to make simple hypotheses and go out there and test roughly whether they are right or wrong. A lot of people don't like that kind of work, because they would say, for example, "how can you say tree mortality has a relation to temperature? Malaysia is roughly the same temperature as Brazil, but Malaysia has got dipterocarps and Brazil doesn't – that doesn't make any sense!" And I say, "well, so Malaysia has got dipterocarps ... we'll just have to find out if that matters at a later date."

So for me, there is a slightly guilty feeling of luck, in that my way of thinking is in many ways what is needed for tackling these issues; I think it's great to have a problem to go after, and then you can say, what do we need to do to answer that problem ...? You know, we've got this 'shape' for our science, and the 'unknown unknowns', and of course those unknowns are really sort of low-hanging fruit: If you are the first person to take them seriously, then



you can do something, you can feel good about it because its important, it feeds into this big issue. And I think that's why its important to have that 'other voice', like I said before, actually saying "erm ... no". It's relatively easy to convince yourself that anything you do on this 'map' of what's important to do for climate change scientifically, is really achieving something that's great for mankind. But there is another voice that says, actually, where is the debate right now with climate change – what matters? Is the climate debate finished, because the world has signed up to doing something about it? – Job done, move onto something else like food security or the global economy, poverty and inequality or some other kind of complex problem. Or do we need to do a different kind of science – rather than a science that feeds into the understanding of climate change, or reinforces the warnings that there is trouble coming, do we need to ask different questions: How are we going to cope with climate change? Which regions are going to go through a qualitative change, meaning that we have to start **thinking** about human migration ...?

So I'm sure I'm not the only one who is on the one hand essentially worried about climate change and thinks it would be great if we averted it; and on the other hand thinks it's exciting because it's given us a great thorny problem. I guess cancer biologists probably feel the same way, sometimes they probably get excited about understanding cancer then feel guilty because actually it's such a horrible thing!

**C:** As we understand it, the latest models produced have made the problem seem worse than it had previously thought to have been – by building in all these interactions

within the biosphere, the predictions for temperature rise look worse than in the simpler models.

**DP:** Yeah, that's right. With the forest ones, there was this famous result, it was one of the first Earth systems models to include truly reactive vegetation – before, they basically had the vegetation as a fixed thing. [Peter] Cox's team were the first people to say “hey, trees grow and die, and they might be taken over by grasses,” and so on; and they put that into the model and warmed up their virtual world. And everything was fine for about fifty years (fifty years into the future, that is) and then something switched in the Amazon and suddenly it very quickly turned into a savannah, and all of the carbon that was in this great big forest suddenly went up into the atmosphere – so it acts as this great big turbo-charge, and in the model it released the equivalent of about sixty years worth of anthropogenic emissions in about ten or twenty years. So this was almost like a ‘top-up’, you know: we put it in, and the forest will match our CO<sub>2</sub>. And that's the top line, if you look at the spread of the predictions which were in the IPCC report five or six years ago, their top line is exactly that, it's the Amazon collapse.

But then there is another model, to be honest equally believable, where as things warm up and the CO<sub>2</sub> increases, the Amazon trees just grow ever faster and store up ever more carbon.

Now, what I think is that, as we have added in these extra biotic feedbacks, there has been more freedom in the model – more things can happen, and one of those things is that there can be more disastrous results. And that has been an important warning, I think, not to treat the system like a bath where you pour carbon in here and it comes out

there. Actually, it's this non-linear thing, much more unpredictable. So that's been an important general message. But the question now is whether it's possible to constrain these feedbacks sufficiently to get back to a decent prediction! Or whether the only contribution from that work is a really general "hey, this is dangerous, you'd better ...". Are these feedbacks simple enough that we can understand them sufficiently well to say, "right, now here is the prediction, and sure, it's different to one that we had before, but this one is right", or is the general message that Earth's systems are so complicated that we should simply not expect to be able to predict them? That's the other conclusion isn't it? Because there are always more feedbacks we could put in.

**C:** To have a complex enough model we would have to build another Earth.

**DP:** Exactly! If we could build another Earth that we could run much faster than the real Earth, it would be a useful tool!

**C:** Firstly, there is a problem of abstraction – to know which parameters need not be considered within a model. But, given the interconnected nature of the biosphere, in doing so one always risks neglecting feedback effects, and therefore leaving 'unknown unknowns' out of the picture. What you were describing before, with the virtual worlds, seems to be an iterated methodology designed to avoid that.

**DP:** It's interesting to hear you take that very abstract, general view – talking about the Earth model like it's any

other complex system. I think that is actually very helpful when we're thinking how best to improve these models. Like you say, we can use general principles to help us. Sometimes, being deliberately blind to the reality, and the details, can be really helpful.

To be honest my instincts are: Yes, the feedbacks are there, but it shouldn't be that hard. We just need to do them correctly. There will be this initial chunk of effort, and we will bring the uncertainty down by about ninety percent, and then yes, you could spend the rest of your life doing the other ten percent. But I feel like, if we could approximately know the things that we need to know ...

There is a project now for instance, AMAZONICA,<sup>2</sup> which is a bunch of people, some of whom I know, who are all just focused on that one issue of 'will the Amazon collapse into a savannah or not under climate change?' If they answer that question, they will have taken the single biggest uncertainty out of the Earth system models overnight, really. And, you know, that's maybe a big fifty percent, and if you do fifty percent of what's left with a similar-sized project, you might get there. But then at the same time someone might say "hey, you haven't put in the boreal permafrost lichen feedback in there" ... So, while someone is constraining the Amazon, someone else might be increasing the uncertainty somewhere else!

**C:** All this might lead someone not conversant in the field to ask what kind of 'certainty' we are talking about here. It seems difficult to accept that we could ever reach the point of having any degree of confidence.

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2. See <http://www.geog.leeds.ac.uk/projects/amazonica/>.

**DP:** And we won't know for sure until it's either happened or not. People have said similar things elsewhere in the history of science, you know, 'why the guess?' 'why the prediction?'. And to be honest, I don't really believe it. I couldn't exactly prove it.

**C:** But to remain a scientist, you have to retain some faith in the predictability of nature!

**DP:** Exactly. So, here is an interesting example: there is a diagram that people often see. It's this chart that has temperature horizontally, rainfall vertically, and it's got zones drawn on it, and each zone corresponds to a different kind of vegetation. Now that basically applies all over the globe. So if you know the average temperature and the average precipitation, you can essentially say what kind of vegetation will live there: grassland, savannah, evergreen forest, deciduous forest, and so on. And that happens in South America, North America, Africa, Malaysia. By and large, all these different places have different plants that have evolved separately, but the relationship between climate and vegetation is the same.

Another example I really like which I find incredibly compelling is this weird kind of shrub: It's a bit like an aloe, and what it does is die off every year and the new vegetation grows back on top the old and it ends up looking like a great palm tree kind of thing about twelve feet tall. You find them in the high tropical Andes – cold, but on the equator. These are unusual places, they have huge diurnal swings of temperature. Now, if you go over to Mount Kilimanjaro, which is also a tropical, high mountain, you find shrubs that look exactly the same but they have no evolutionary

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history in common at all. Another example is succulents like cacti: you've got old and new world cacti, they look really similar, they do similar things, they have evolved similar tricks to do with water. You find them where you have two wet seasons a year, that's the rule. Wet-dry-wet-dry, every year. Not wet-dry once a year – that gives you something else, maybe grassland.

So the new world and old world cacti look really similar, but have no common evolutionary history. What this tells you is that there is predictability out there in ecology. For me, I see a lot of signs of determinism – if you know *a* you can predict *b*. Even if prediction does not work, we can simply observe that *a* and *b* are highly correlated in effect, so the shrubs are highly correlated with high tropical environments and so on. So for me, it says that nature isn't this unpredictable, wacky thing. And if that's true in this context, why shouldn't I be able to take something like a tropical forest and warm it up and dry it out, why shouldn't that be predictable too? So that's essentially what we are looking at when we look at these diagrams.

If I didn't see that kind of predictability in nature, I think I would be having major thoughts about being in ecology. You know, even if it was predictable on some micro level ... You must have thought about this whole Creationism/Darwinism thing, where a lot of people say Darwinism isn't scientific because it's not predictive, all it ever does is explain things after the fact. Whether or not that's true, I think that if there wasn't this sign of predictability in ecology that would be all that we were doing, we would be saying, well, we've got coalescent shrubs in the high tropical Andes, they are the only place on earth I'd find them, I'd like to find out why, and somehow with enough effort I would be able to unravel the fact that there was an

original aloe that didn't have a stem, and then one evolved that grew up on a stem, and so on. But to what end? That's literally just uncovering a story, a kind of archaeology, if you like, rather than ecology. Whereas to actually say there is this determinism, there is this pattern, *a* leads to *b* here, *a* leads to *b* here, so why is it in general that *a* leads to *b*? That's much more scientifically interesting.

**C:** If we simply deal with correlations, we ignore a large part of what is important for the operation of biological systems – which includes contingent things like contiguity, the fact that a certain species is separated from a habitable region by an ocean, and so on; but here you seem to be saying that it is valuable sometimes to abstract from the actual contingent conditions of the Earth, and look at the hard-and-fast rules in nature quite apart from the way in which they have, in evolutionary history, played out ...

**DP:** Sometimes, yes. More generally, I'd say it's a case of working out for which processes knowing the history helps you to predict the future, and for which processes working out the history is just a waste of effort.

**C:** You said that you can't get interested in biology on the level of species. But the relation of your work to biology seems an important question. What status does a *thinking* of these questions on a global scale have in relation to biology? Is it a kind of 'ecological physics' which abstracts entirely from biological knowledge?

Although your work combines high-level modelling and 'on-the-ground' research, because ecologists have to think on a global scale, it must be difficult to connect that back

to any of the things that we know deterministically on the biological scale: it's almost like there is a disconnect between the two things, that you are talking a different language.

**DP:** I think to some extent that is true. I think if you pushed most ecologists they would say the same thing, that's its really all about taking what we know about individuals and maybe less than that, like physiology, scaling up from there and working out what gives you these patterns. There are two ways that people talk about ecology: It's either the study of the interactions among organisms and their environment, or it's the study of the distribution and abundance of organisms. You really need both to define ecology, because what it should be doing is explaining and predicting the abundance and distribution of organisms *from* their interactions with each other or their environments, that's what it's about really.

I think that's what we want. I see the patterns at large scale and you are right, with some of the things that we do, like this work on mortality, we just find a pattern in mortality against climate, and use that pattern in a model. Everything in there happens from this kind of large-scale 'blur our eyes' standpoint. But really, more exciting for science is to ask, how do we get to this pattern from what we know about the way things interact? So, as I've explained, we would look at trees and how they interact with different species, how they put carbon into trunks and roots, and how from that we can explain why trees die more slowly when it's cold ...

**C:** As you've said, before the modelling process begins, before you do these global-scale models, you already have some intuitions of what might be the case and what is



important to look at, and those come from **thinking** about actual trees, individual trees, and their interactions.

**DP:** Yes. That's exactly right, you come from both directions really. Sometimes you'll look at the pattern and you will instantly have a little guess about what it is about the interactions that is causing that pattern, or sometimes the other way around, you know about the interactions and you have a guess as to the pattern. This comes back to 'joined-up science' again.

I'm working with Greg on this whole modelling effort looking into the distributions of organisms, which are highly correlated with the environment – it's another sign of determinism. So it implies that if you change the climate, this distribution is going to change. If you always find beeches when the annual temperature is between  $a$  and  $b$ , and, owing to climate change, that annual temperature band moves across the map, you'd expect the beeches to move, right? But a lot of the models people have used to predict that movement are simply incompatible with any of what we know about how organisms interact, and that just seems, to Greg and I, the wrong way to do the model.

Their models, for instance, say that if you removed all the tree species on earth except beech, the beech trees would just stay where they were. And any forest ecologist will tell you that no, of course if you remove all the other trees on earth, the beech trees will just spread into the vacated zones. They'd be pushed back through competition. And if your model doesn't do that, if it doesn't show that if you remove species then the remaining species move into the remaining space, then there is something wrong.

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So, Greg thinks a lot about these sorts of things, more deeply than I do, I tend to rush in and say 'let's see what we can do'. He really wants to get a set of models that are consistent with the theories about the way organisms interact or the theories about what really causes the distribution of particular species; he wants to work that kind of theory into this applied modelling which describes how they are going to respond to climate change.

So, firstly, I think there is a disconnect; but secondly, it's all about removing that disconnect ... as much as possible.

**C:** Do you sometimes have moments when you are absorbed in work, in the technical work of building these models, and suddenly have a flash of realisation that it is actually this planet, and all of our lives, that your work is talking about – or does the reality of what you're trying to model disappear beneath the process of doing the work? One would suppose that it would have to, otherwise your job would be extremely stressful!

**DP:** Yes, I very much do have those moments. It's been over ten years since I started my PhD, and in that period I've learned a bit about plant ecology, done a very few bits of new work, and have maybe sharpened my plans about what to do next. In the meantime CO<sub>2</sub> has risen a lot, there have been wars, people have starved to death, and a species of dolphin has gone extinct. We'll never get it back. So yes, it's a good job that most of the time, I'm lost in a much more abstract world.

**C:** Finally, if we were to run a model where humans actually achieve the ideal and become ‘carbon neutral’, do we know what ramifications that (unlikely) scenario would have?

**DP:** We have a range of emission ‘scenarios’, some of which are very optimistic. I’m not sure whether there is one where we achieve the ideal – but there should be. You would think of course that the result would be that on that great day when we stop emitting, everything stops changing. But there’s no way that would happen. The Earth system is so complex, has all these time-lagged effects, that it would keep changing for centuries anyway. And that’s before we consider the many other kinds of impacts human have on the Earth system, quite apart from carbon emissions. It really is, unfortunately, very very scary when you think about the next thousand years of the unremitting effects of humans. We’re going to be staving off one disaster after the next – hopefully.

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**GREG McINERNEY (POST-DOCTORAL RESEARCHER)**

**COLLAPSE:** Could you tell us what is involved in the work you are currently doing?

**GREG McINERNEY:** At the moment I’m working with what are called Species Distribution Models (also known as Bioclimate Models, Climate Envelope models or Niche Models). Basically, this involves trying to produce a

description of why populations occur where they do rather than elsewhere. For instance, an organism has tolerance limits for temperature, so we may be able to describe those in a model. The organisms may also have tolerance limits for light levels, so we can include that extra gradient in the model. And so on, with factors such as rainfall, the occurrence of frosts.

Because there is variation in the environment across the Earth (for example in temperature and availability of light) we can begin to get an approximation of where things can live across the globe. These are the basics of a Species Distribution Model – a mapping of a species' 'success' across variables that can describe its geographical distribution.

These are quantitative models developed from data using statistics, so there are lots of considerations with regard to how the statistical assumptions match up with the biological assumptions. The hope is that if you get the quantitative description right, you can use that model to make predictions – for instance, in relation to climate changes. If the spatial distribution of temperatures is going to change, we can make basic predictions about where organisms will be in the future. Will Britain have a Spanish Flora in a hundred years' time?

Up until now most of the models have been merely statistical descriptions, usually based on correlative relationships between observed presences and absences of a species, and the 'climate' variables that have been measured as part of that. However, when such models are used to make projections for climate change or for a different area of the earth, the results don't necessarily hold much weight.

This is because the assumptions of the statistics aren't explicitly biological, and in fact implicitly ignore most of our ecological understanding. So Drew and I are trying to create 'next-generation' Species Distribution Models where a bit more biological and ecological understanding goes in at the beginning – for instance, competition between species. The factors determining where species can occur include both abiotic and biotic factors.

I really got interested in climate change during my PhD because I was investigating what the important factors were for climate change responses and how those factors might interact. The simple conclusion was that more processes are important to describing climate change responses than we actually study now. And, importantly, that the novel interaction between these processes can lead us to new understanding. Climate changes have occurred in the past and these events could have had a large influence on why we have the biodiversity that we do today, and what we will have in the future. Once you accept the importance of these interactions between processes during climate changes, then you need to study things in a different way. A mechanistic way.

In the simplest sense, a statistical model just draws information from the raw data. So if you've got  $x$  variables and your observation data, you choose the ones that you are interested in and then you do some kind of regression looking for correlations between the variables and the observations. In that way, you discover a fact about the correlation between variables, but there is no causal information whatsoever in there. What we want is to include the causes – the important processes. Then the models will be valuable to the research community to

develop the knowledge and understanding that can really inform policy.

**C:** So, with a statistical model in physics, say – where the fundamental causal mechanisms are known – the predictions need to be supplemented with that knowledge in order to give a full understanding; but what has been lacking so far in biological computational models is knowledge of those causal mechanisms. Furthermore, one would assume that in the biological realm, such mechanisms may not scale smoothly, and may be subject to unexpected discontinuities under certain conditions – and indeed this is precisely what we need to know in order for the models to be useful: In effect, we need to define a kind of behavioural landscape that tells us where statistical correlations between variables remain constant, and where they break down and in what way. And that's precisely the task of 'eco-logy' here – supplying a logic of the living environment to supplement this raw data-processing.

**GM:** In principle yes, understanding the mechanism is the key to developing the most useful statistics. In ecology we know an incredible amount about the mechanisms but we don't necessarily go about developing models in the best way, based on this knowledge. We are a relatively young science compared to physics! We do know a lot but don't necessarily implement all of it.

But also we are very different from physics – dealing with units that are highly variable, that can change (through plasticity or evolution) to new forms, and that live within an environment that varies through space and time. That makes it far more interesting than physics!

If we could develop the ‘behavioural landscape’, that would be a good proximate solution to modelling. We would be able to make predictions based on those correlations. But that model may in turn be specific to correlations that occur in a certain set of conditions. If we change the climate then during climate change new processes may become more important in describing a new set of correlations. So a purely correlative model becomes a second choice.

That is where the methodology of Species Distribution Modelling begins to break down, because it was *descriptive*, and we need something that is actually *predictive*. And yes, that is exactly where the ecology should come in.

**C:** The model needs to account, not only for all of those different variables and their correlation, but for the causal interaction between variables as well.

**GM:** Yes – if you strictly follow a principle of parsimony when you are building your models, you would go for the simplest explanation. But there are a variety of ways in which you can judge that ‘simplicity’: Is it purely statistical simplicity, or simplicity with regard to the topic being studied?

Ockham’s razor would need to be used in a different way if you are to build a model that is applicable to a different set of conditions as well. So in the case of Species Distribution Models the data you have is from a ‘stable’ climate, but from that you want to build a model that is applicable in a changing climate. You have to begin with a set of requirements that are known to be important before you approach a problem – for instance a set of

important processes and their relationship to climate – rather than being a bad statistician and just looking for statistical interactions. If we take the challenge on appropriately and in a biologically-meaningful way then we could have a model that can cope better with situations such as climate change.

**C:** Is there a conflict between this attempt to build in all the complexity of the empirical biological world, and the need to build a model that is actually tractable, from which are going to be able to extract something of use? Is there a trade-off there?

**GM:** Totally. This generates conflict between what we might think occurs and what is actually tractable in a model in a rigorous way. We need models that are rigorous so that we can inform, but also tractable so that we can progress.

The trade-off comes in many forms. Firstly it is important to bear in mind that the set of requirements will depend on what the question is. At the moment the set of requirements is very large with respect to climate change prediction, because we haven't been able properly to explore what is actually important as we don't yet have the models. Once we have those models there may be some approximations or simplifications that can be made.

But if we were only interested in 'stable' climates then we could be less explicit about some processes. These are trade-offs involved in making models that are as simple as possible but as relevant as possible.

We also have to make models that are implementable and within which the statistics can actually work.



For instance, for each part of the model we are going to have parameters that control the strength of effects of different processes within a model. The more complicated the model, the more parameters we need to evaluate and the more combinations of parameters can potentially exist. Parameters can trade off against each other, so a high value in one can compensate for a low value in another and vice versa, so the interpretation of the theory has to acknowledge the statistical methods.

Also, the more complicated models get, the more difficult it becomes to analyse models so as to attribute cause and effect. We also have trade-offs defined by the amount of data we have: With low levels of data, as is generally the case in ecology, we are restricted in what we can actually parameterise.

A good way of exploring the challenges of model building is the generality/precision/reality trade-off described by Richard Levins.<sup>3</sup> A general model would apply to many species but would as a result be less realistic for specific species or situations. We could make highly precise models but that may come at the cost of generality as it becomes so specific. To build a realistic model might reduce your ability to be precise as we lack appropriate data for the realistic mechanisms and have to draw out information in a less precise way. This is one of the reasons why ecological science always challenges you and requires a bit of a philosophical bent.

One of the components of our Next Generation Species Distribution Models is investigating how you could incorporate competition into a model and make it tractable.

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3. R. Levins, 'The Strategy of Model Building in Population Biology', in *American Scientist* 54 (1966), 421–31.

### **C:** Competition for resources between species?

**GM:** Yes – So, say you have six species of grass, which are using reasonably similar sets of resources, then in your model you could have a matrix which statistically describes how strong the interaction between species A and species B is, between A and C, and so on until you have the full matrix. For all the species described, you will have a value for each of those pairwise interactions.

That can make considering large communities of species difficult because the matrix grows non-linearly. If I have two species the matrix would have two parameters, the effect of A on B and B on A. If I have three species we need the effect of A on B, A on C, B on A, B on C, C on A and finally C on B. That's six parameters. If it was describing interactions between ten species, the matrix would have to contain ninety parameters. You can see that the parameters don't scale linearly with number of species that you consider, as you would like them to.

What we've done is to use ecological theory to make that relationship between number of species and number of parameters linear. One way is to describe interactions in terms of effects and responses, so A has an effect on other species and a response to other species. Field experiments have shown that this can be a useful way of describing the competition and allows us to make the model more tractable.

We can add more detail by describing in the model species traits that define competition – for instance, a plant's rooting depth or its height might define competition for water or light. Then we can describe competition in terms

of the difference between traits. This is similar to an effect and response model, but the model includes description (and so assumptions) at a greater level of detail. We can go on to further levels of detail but we might need more data to do so.

In this case we find that ecological theory actually makes that model more tractable than the statistical interpretation of the problem. Our parameters scale.

The ecological theory reduces, not the amount of data, but the complexity of the model that you produce: To make it tractable, the amount of parameters in that model has to be as small as possible, really. So on the one side you've got knowledge of what you should be putting into the model, all of which you need; and on the other side you've got the practical nature of actually modelling so it has to be as small as possible; and this produces an appropriate solution for the task.

**C:** So, not only is the theoretical framework crucial to building models that answer to the complexity of the domain, but it can actually *reduce* complexity as compared to a purely statistical model. One could expect this, since the very notion of looking for statistical correlations involves a deliberately 'blind' approach to the data. Is this a novel approach because modellers have been unsure about the ecological theory they should employ? One could understand such a reticence, since ultimately the accuracy and the usefulness of a model would depend on the ecological-theoretical framework that you use.

**GM:** Yes, theory is crucial. Theory deconstructs the world into useful abstractions, general models of mechanism. Then, given the parameters that are realistic, we can make a prediction of the outcome. If we were only able to interpret the world in a correlative way humans wouldn't be able to accomplish all the amazing tasks that they do.

It's basically the power of explanation: We can say that lots of factors are important to an event, and give a precise answer that relies on complicated interdependence between the factors, or we can describe how those factors are mechanistically related to each other, in which case the interdependence may actually be smaller. We are reducing the problem through theory.

But explanation can be complicated, so some non-mechanistic correlations are very useful and may provide a simpler solution. The trade-offs in model building return and then we have to think about task-orientated solutions to the problems rather than an omnipotent model that reconstructs the entire world.

As to the second part of your question, about the selection of which theory to use, this is more about the human condition: Theory is sometime caricatured as the domain of the 'thinkers' – mathematicians, physicists – rather than the 'doers' – the people who apply models to practical situations. There is an incredible amount of theory out there but isn't necessarily applicable in practice. So we need to think in a joined-up way and develop ecological theory within the context of statistics, and statistics in the context of theory. This can be an unenviable task sometimes, as you may be less productive in doing so, and you may need to invest much more initial effort in being technically and conceptually literate in more techniques, ideas, skills, and so on.

Also, the theoretical and statistical communities can be separated socially – even at conferences theory sessions may be specialised and populated by theoreticians. We need more democratically-selected theory and we need to increase the interactions between increasingly specialised communities. So the short answer is that this reticence can exist because it is hard to mix theory and stats; but it should be recognised that we can shift the culture of our science to make it easier. We are all theoreticians whether we like it or not, so we need to increase the dialogue.

**C:** We're talking, then, about the effect of a contingent institutional history concerning the disconnect between computational science and ecological theory?

**GM:** From the more institutional and historical points of view there are choices that are made during science's development that are driven by the personality of individuals and groups and the natural growth of scientific communities. You only have to look at the names of models, theories and philosophies to see that individuals have had a large influence on a 'punctuated' development of science. This is especially so where a new scientific revolution occurs, such as that around computers, and when new sub-disciplines emerge. Personality can play a large part in how new groups engage with each other. There is some trade-off between establishing a new approach and not getting swamped by previous approaches, whilst also maintaining a useful dialogue.

But it is a 'disconnect' found more widely across ecology: Field ecologists use theory in a very direct way

but don't always recognise it as theory. There is a lot to be gained by extending our joined-up view of ecology, as it informs the generation of good experiments, which in turn inform better theory. In many cases, theoreticians are the most computer-literate and appreciate the value of this interaction. So the real challenge is to enable a larger dialogue with the broader community.

**C:** With this in mind, and to start again at the beginning, maybe you could explain what you understand by 'ecological theory'?

**GM:** Theory is a simplification of the world that allows its prediction, i.e. an explanation. This is a very broad interpretation and takes in mathematical or syntactic formulations, but also verbal and visual formulations.

'Life' is a complicated multi-scale system, so theory requires useful abstractions. For instance 'population growth rate' has got ecology a long way so far, but is an abstraction that takes in survival, growth and fecundity of a population. These abstractions may be useful in some cases but, again, more detail may be useful elsewhere. In this case a joined-up approach would consist of theory that is based in abstractions that are measurable in field or laboratory experiments, or that are retrievable from data.

Ecology doesn't really have laws like physics does in its construction of theory, so it's an understanding of the actual mechanics of how ecological interactions would work. You could go on all day and all night describing the processes of life in lots of detail. But there are certain things which field, laboratory, simulation and mathematical experiments have

shown to be useful simplifications of models, showing what is best left out.

**C:** So any *applied* ecological theory is essentially *not* a complete account of causal interaction in the domain, but involves primarily a principle of abstraction.

**GM:** Definitely, this is where the boundaries of scientific disciplines are usually formed. And in some cases these boundaries are useful – but in others we need to make cross-cutting abstractions. Population Ecology generally considers the world from the organism above. This obviously leaves out most of biology. Theory is a question of understanding the system in the appropriate way.

**C:** And you suggested that the level and nature of this abstraction is determined by experimentation – so experimentation on the ground sets the parameters for modelling?

**GM:** Yes and no. Not all experimentation is going to be directly applied in a quantitative model. It may highlight new facts, mechanisms, and so on. It is more about exploration. This might set the parameters and formulation of modelling, but modelling might reveal that more useful model formulations are available for that same process, and then experiments may need to address different questions and field observations may be ideally made in a different way. Then there needs to be feedback with experimentation.

It's just how science progresses, but we need to recognise that the feedback between the theory and experimentation comes from an appropriate dialogue between sub-disciplines. For instance the statistics used by an experimenter may not be useful to a theoretician, and the abstractions used by a theoretician may be useless to an experimenter. This is of course a caricature but the principle holds true.

**C:** This suggests that, short of a purely statistical approach, you can't have a mathematical model that doesn't somehow rely on some theory-based filtering of what goes into it, this filtering itself perhaps having been influenced by previous empirical experimentation ... A prior selection, an abstraction, always sets the scene for any scientific work – Philosophers will recall Immanuel Kant's famous comments about Galileo's 'inclined plane' experiment: 'reason has insight only into that which it produces after a plan of its own, and [...] it must not allow itself to be kept [...] in nature's leading-strings'.<sup>4</sup>

**GM:** The way I always think about it is with reference to 'population thinking'. Ernst Mayr said that an overlooked 'benefit' of Darwin's theory to science was the abstractions he made in thinking about the system. Darwin saw variation within populations and put that into his verbal model of how the populations worked and then ran his thought experiments.

Some variations could be more successful than others in surviving or reproducing, and so give rise to natural selection, a natural process. So Darwin showed that once

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4. *Critique of Pure Reason*, Bxiii



you've thought about the right sort of 'population' of variation, in this case very literally variation in a population, then the dynamics can come out of that system. In his case natural selection could occur, whereas it could not occur in previous models because the variation is abstracted out. A lot depends on abstractions.

'Population thinking' gives clarity about what you want to include in your model. A lot of the time it has a single form that you'd actually go for because you are interested in a certain kind of dynamics. For instance you might need to acknowledge that there is variation in ages within a population and so abstractions on age need to be assessed. The variation doesn't need to be heritable, you just need to get the correct units. For instance, using numbers of individuals within a population can give very different results to using numbers of individuals of certain age classes within a population.

In the case of natural selection, evolution wasn't possible theoretically until Darwin got the abstractions correct. Darwin's great innovation was to give importance to variation within the species. For instance, if there is variation in different grasses then the small ones might get selected in certain environments and the big ones might get selected in other environments, but if there is no variation, that population's going to have no change in its average no matter what environment you put it into. Now, you could easily think that some other trait was important in your model – it doesn't necessarily have to be variation – but, say, if you are creating a model of a species' whole geographic distribution, it isn't going to move through space in response to climate change unless there are parts of the model which actually incorporate movement or dispersal of organisms in some way. It's that basic and fundamental.

## COLLAPSE VI

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**C:** Obviously, there is a ‘selection’ at work within scientific ideas themselves, according to the insights they yield.

**GM:** That’s the progress of science! But it is important to recognise the correct form of selection. One of the best ways of putting it, I heard from Rich Williams: The ideas have to be agile.

**C:** So, the aim of Species Distribution Modelling is to try to understand why species end up in one place rather than another; and that’s going to be important to understand species’ reaction to climate change.

**GM:** Yes, indirectly – it is understanding abundance and distribution that is of fundamental importance: If you reduce down all ecological questions they would come down to ‘why is what where’: Why things occur where they do and in what amounts – which obviously requires understanding why they don’t occur where they don’t as well. If you can predict abundance of a species, then you’re doing pretty well – and, as ecologists, we can’t yet do that. In that sense Species Distribution Modelling encapsulates all of ecology. But, as we’ve discussed, the *current* models do not – because ecology is also fundamentally a science of interactions.

From the point of view of climate change, having appropriate Species Distribution Models would enable you to actually make predictions about what areas are important for future biodiversity: Living in the world where we live now, we need some sort of protected areas, but where would it be best to put those protected areas in

order to conserve everything that we've got now; how can we develop a network of protected areas that can safeguard the future of that biodiversity?

If we caricature climate change as an increase in temperatures across the globe and consider that populations have limits as to where they can live defined by temperature, we would expect geographic range shifts in those populations. At the hot end of their range populations will become less successful as the temperature warms, and so they will reduce in number; but at the cold end of their limits populations will become more successful as the local temperatures move towards the organism's optimum temperature. As populations colonise locations that were previously uninhabitable, a geographic range shift can be induced by climate change.

Now, one of the properties of a range shift is that there will be lags in the rate at which locations become available and the rate at which populations colonise these areas. Things aren't in all places all of the time selecting where to live, they are born in places and might seek new places from there, with a limited ability to move. It is through these lags that the shape of a population through space is generated.

If you think about the shape of a drop of water on a flat surface, that's a bit like the shape of a population along a gradient. Now if you tilt that surface, the water droplet changes shape. It becomes more like a teardrop. That's a reasonable analogy for the change in the spatial structure of populations under climate change.

A recent piece of theoretical work I did<sup>5</sup> looked at how that change in structure affects evolution.

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5. G. J. McNerny, J. R. G. Turner, H. Y. Wong, J. M. J. Travis and T. G. Benton, 'How range shifts induced by climate change affect neutral evolution', *Proceedings of the Royal Society B*. doi: 10.1098/rspb.2008.1567.

What this highlights is that, as soon as you start thinking about climate change, you are actually thinking about a whole new, different but predictable, part of ecology and biology. The lags create a new quasi-equilibrium with the environment during climate change. This alters who is most successful in a population through space and in relation to the environmental conditions they experience. Because the individuals colonising new habitats contribute far more to the next generation, whilst those at the rear of a range shift are contributing less to the next generation than they would have done without climate change. This means that a genetic revolution in a population could happen far more quickly during a range shift induced by climate change. The suggestion is that genetic changes and evolution could happen more rapidly during climate change. This might be very important to our understanding of how biodiversity is maintained and generated. Whilst the great focus has been on the extinction of species that couldn't survive, because of the way this frees up resources for other species, these spatial processes have been overlooked.

So we have the genetic changes occurring in a population; but also, populations are exposed to environmental conditions – such as temperature – in a different way. This alters how natural selection will act within populations: Individuals may be exposed to 'novel' temperatures. It's a new area of ecology and evolution really.

**C:** So this could alter significantly the type of issues we think are involved with climate change, and their impact on biodiversity.

**GM:** It's certainly interesting from the point of view of how we manage biodiversity in the future, but it also makes you think about how those processes have generated the biodiversity we see today. These processes are a bit like a phase transition from one form of dynamics in stable climates to another form of dynamics in a changing climate. The suggestion is that the forces change populations more quickly during climate change, and it takes a while to 'relax' after a range shift. So we might be able to understand how species are packed together through space – what are their niches, why are they a certain size – through this better understanding of climate change responses.

**C:** So attacking the specific problems of climate change uncovers new insights into the general problem of species distribution, the very framework in which that problem is posed.

**GM:** Yes, this could give us some insights into why there are the number of species there are, rather than ten times more or ten times less. *Niche* is the key term, because if you could model the niche more appropriately than you could have better Species Distribution Models; but then people get scared of saying that they are doing niche modelling, because the niche is a nightmare!

**C:** How has the niche been understood in ecology generally; and in your work how do you *mathematically* define it – what kind of space does it exist in?

**GM:** It's difficult, because different people use the word 'niche' for vastly different things. It started out as a description of where a species is likely to be found – a correlative description. The simple explanation of the niche is the set of conditions in which a species can survive. For instance the ranges of temperature, light, water availability, pH, and so on. [G.E.] Hutchinson defined the niche as an  $n$ -dimensional hyper-volume.

**C:** With, in each dimension, limits of tolerance?

**GM:** Yes, within this hyper-volume, everything's going to have some sort of limited range where its births and deaths are equal, another range where births are more, and so on. So long as deaths aren't greater than births, then the species can survive.

It gets a little bit more complicated, because species might also *augment* the environmental variables, for instance light may be reduced by a tree. If you think about these variables being used as resources, you get a different formulation of the niche than if you think of variables as merely defining tolerance. Light is directional, so if I'm a tree in an area with my favourite light level I might thrive. But through my growth, anything below me in height gets less light. So I've engineered my environment a little bit – it doesn't just affect me, it affects everyone else. And my presence affects my offspring as well, if they can't get far enough away from me.

From the resources that come in, you've altered the niche and created something else. So if a second species is present, it might do better in that altered light environment

if it prefers shade. Or it might do worse if it needs higher light levels than are possible with the presence of the tree.

**C:** If one species disappears from an environment, the niche ‘landscapes’ of other species change. Which is a crucial consideration in trying to predict species which are at risk of extinction.

**GM:** Totally. This is where facilitation and competition come into it. We generally conceptualise the niche in the absence of other species as the ‘fundamental niche’ and that in the presence of other species as the ‘realised niche’. And another species may in fact be a specific *requirement* of the fundamental niche, as a resource. Another species can make the realised niche bigger than the fundamental niche, through facilitation.

Of course, the realised niche is what we are generally able to observe in the real world. But the realised niche is context-dependent – that is, it might depend on what combination of species are present. There are in principle an infinite number of realisations of the niche possible based on species interactions alone. There are many other factors that determine the realised niche, such as the spatial arrangement of a variable and so how populations interact through immigration and emigration.

**C:** Not to get too caught up in voluntaristic language, but could we say that any species ‘tries’ to expand its niche, to simplify the world according to what is important to its survival, so that the environment is a kind of ‘interference pattern’ of each species’ monocultural ‘ideal world’

(a kind of organic niche-fundamentalism)? So the problems of biodiversity aren't limited to preservation – they also involve a consideration of how the evacuation of one niche will alter another, will allow another species to expand perhaps dangerously – in a 'cascade' effect.

**GM:** It is probably best to first consider why a species has a limited range in the first place – why it has a niche and why that niche is defined the way it is.

Everything has ranges, so there must be some trade-offs in the physiological engineering of life that means being good at something makes you less good at something else. Some species are more generalist than others, so there are differences between trade-offs at different points of a gradient, or different ways of doing that engineering that can overcome obstacles.

But there can also be barriers created by the structure of genes and their inter-relationships. Linkage between genes may mean that a change in one gene affects other genes, so evolution can be constrained if the other genes are affected negatively. This is an engineering problem as well. (Of course it is important to remember that this engineering is done in a passive way: Life doesn't see a problem and try to surmount it. It is done, beautifully, through natural selection.)

Then we can ask why niches are fairly stable and why they occur where they do in a space. For instance, if you think of a tree line on a mountain: Why hasn't the tree evolved to be a bit more tolerant of cold? Why don't things evolve a little bit more to be more 'successful'? Why can't species live at one degree more or one degree less than their



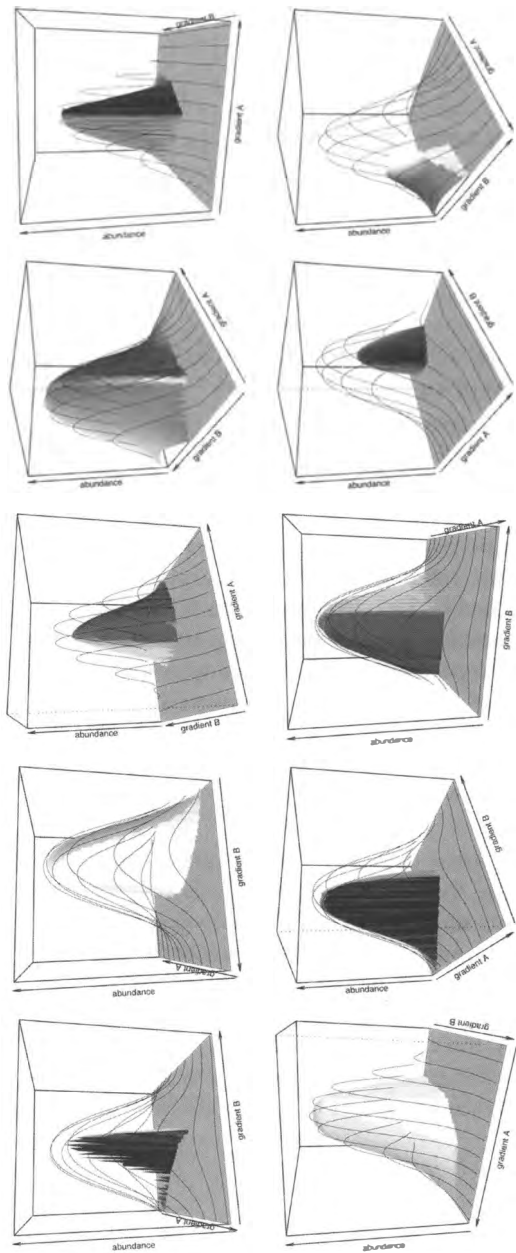


Fig 2: The effect of competition between species. These are the results of competition between a group of species in a computer simulation. There are two abstract environmental 'gradients'; e.g., gradient A = temperature and gradient B = rainfall. The species have restricted niches along these gradients (x and y axes). The black lines show the outline of the fundamental niche defined by the abundance of each species (the z axis). The grey surface shows the realised niche after competition between species has occurred. Species may not live everywhere they can because other species out-compete them. In the top left panel the species has been severely restricted by competition. Note that correlation between its realised niche and the gradients would tell us very little about where the species can actually live. The other species show varying levels of inequality between fundamental and realised niches, demonstrating that a 'correlative model' between the environmental conditions and abundance would give results erroneous to some degree depending on the species.

actual tolerance level is now? I see this as being one of the most interesting things that we don't actually know about – why aren't things more abundant, why don't they have wider distributions, what processes keep populations in check? Some of it is bound to be competition, but that's not all that is at work. Part of the answer must be in the physiological engineering. However some answers lie elsewhere and require an understanding of population dynamics and gene flow – an understanding of the system.

Sexual populations exchange genes during reproduction, so even if a new gene arose that could be more successful than everything that came before it, it could be swamped out of a population by all the rest of the genes that are floating around the gene pool. The probability of passing on a successful rare gene could be less than the probability of passing on a very common but potentially less successful gene. Genes have to *invade* a population. If a gene cannot invade because of the larger number of resident genes, this is called 'gene swamping'. The same thing can also happen across space, as immigration can swamp the gene pool with genes which were selected for in a different set of conditions. This is a really intriguing idea that is increasingly attracting interest.

A gene may also arise that the 'wrong' place in a population. For instance, the gene that gives greater success in a cold environment may have natural selection acting upon it in a warm environment, where that gene produces an unsuccessful individual. Also, the probability of that gene occurring will be linked to the variation in all genes within a population. At the edge of a population, where the gene could experience the conditions in which it would be selected for, population sizes may be low and so the genetic

variation is also low. This means that the probability of even getting a more successful gene is small ... You can see that there is a lot to consider here!

So the removal of one species could directly affect the realised niche of one species through competition – their fundamental niches overlap and so the remaining species would directly occupy a larger realised niche. This could happen quickly. But if those fundamental niches don't overlap then there isn't going to be any certainty that the now-vacant niche is going to become occupied any time soon. It will rely on evolution occurring, and there are lots of barriers to that potential evolutionary trajectory.

**C:** What this seems to emphasise is that whilst we can understand how an *individual* of the species interacts biologically with its environment, and what its tolerances are, we don't yet fully understand the tolerances of *populations* – why in certain cases a population may not be able to tolerate an environment which you would expect it to.

**GM:** Yes – to put it in the perfect context, if you did an experiment where you put lots of individuals in lots of different temperatures on their own and studied which ones survived, that wouldn't tell you anything about whether a *population* would be able to sustain itself at that temperature or not. Similarly if you had lots of populations evolving at lots of temperatures but all isolated from each other – without gene flow – then that wouldn't mean that was the possible niche of a population that wasn't isolated and which was actually exchanging individuals.

Some populations could supplement other populations that could not survive otherwise, through immigration. These are three ways to consider a fundamental niche – individual context, population context and spatial population context.

Because we have great variety between species, trying to generate laws that describe the processes that determine the size of niches and the conservation of those niches is very difficult. There is a large amount of contingency in any answer you get, because of the variety of life and the variety of circumstances in which that life finds itself.

**C:** So in that sense, that theoretical breakthrough of population thinking which you were talking about has yet to unfold all of its consequences for the way we understand the biological world; and it has massive importance for understanding changing conditions on the planet.

**GM:** An appreciation of how biological dynamics are played out when we accept all sources of variation across scales is in all likelihood not achievable. But I think we will start at least to appreciate how different sources of biological variation interact. New sub-disciplines pop up all the time. Each sub-discipline – based on understanding and not necessarily method – acknowledges that a different combination of variation is important in describing the world. For instance molecular ecology, population genetics, eco-physiology ... But these in turn are *scientific* niches – there are limits to where *they* can expand due to the trade-offs in model building and the fundamental engineering of personality and capability in humans.

When you have so many things that could be important, where do you start to build a model? It may not be at an objective place. You will start from the small set of personal knowledge developed during your education and experience. What units people start with depends on that.

Classically, ecology was about individuals as units. But now we know that it matters how you make abstractions about the different ages and different sizes between individuals. So we have changed the units. And then, we know that different genetics respond in different ways, so we have different units again. Then, we know that history has an effect – so even if you were the same age and genetics, it matters what you parents did. For example, say I was born from a really fat, well-resourced mother, she might have had lots of spare energy that she could use to provision for my egg; she might have looked after me in a different way because she had this relative extra energy, This might affect my success in the end and how ‘fat’ I was when I became a mother myself. This might mean that I would provision for my eggs in a different way from someone of the same age with similar genetics. This can drive different population dynamics.

**C:** Do you build in these trans-generational dynamic traits in your models?

**GM:** No, this kind of detail is only known about a tiny minority of all species and populations of those species. In my PhD I did some experiments in this area.

All of this isn't yet taking into account the effects of other species, spatial dynamics within ecological communities,

behavioural effects, genetic and evolutionary changes. There are so many ways to conceive a set of dynamics and the units of study, it is interesting to wonder how development of the details in these different sub-disciplines affects the prospect of a more holistic understanding. There are fundamental differences between the way our flagship ecological systems have been measured and studied, producing different messages for our science.

**C:** With these extremely complex problems you've been discussing, how in practice do you work towards an experimental outcome that's going to be useful towards addressing a particular problem? Or are you more interested in contributing to the general understanding?

**GM:** I think I used to be much more interested in contributing to a general understanding, and always used to feel a bit more comfortable when people would call it 'blue skies thinking' and to see that they attribute value to that; but I've now begun to feel a bit more confident that the general understanding should and could be formalised in a way that's a useful contribution.

Whilst we can stroke our beards over a cup of chamomile tea and wonder about the complexity of it all, there are some very straightforward things that would be immensely important contributions. Species Distribution Modelling is one instance: If we can do that better, we may be able to make better predictions for adaptive management in relation to climate change and habitat destruction. But also, we will have made a better job of quantifying the fundamental unit of the sciences of biogeography and macro-ecology. This would enable a whole set of new questions and understanding.

I think better Species Distribution Models could be an achievable and significant contribution.

Where I am now is much more about wanting to make a contribution that has potential practical application quite quickly, but I think what you find is that making something useful always implies making a contribution to the scientific understanding, so the two things aren't exclusive. I think it's a frequent mistake in the conservation world that people say, "we care about it, we are doing this", but if it isn't based on some kind of understanding of the system, you are merely doing what you *feel* is good ... in a lot of other things that's probably the right way to go, but not in science!

**C:** And do you feel that we are capable of bringing about that understanding in time to do anything about climate change?

**GM:** One constraint is obviously financial support, which is a political and social constraint. Even if we knew and could model all these things and could provide great advice, we'd still face the total nightmare of the inertia of human action.

On the other hand, one of the key *scientific* constraints is poor data: For instance with Species Distribution Modelling, the data is usually quite poor resolution – you can't see abundance clearly, you've just got sightings marked down on maps, grids, so then you are kind of working with the conventions of cartography that people chose to use, for entirely other reasons – ten kilometre by ten kilometre squares, or whatever. A lot of data we will end up using has not been collected with the express purpose of Species

Distribution Modelling in mind, or at least the specific kind of modelling that we are doing; and also there's just not enough data about distributions. We don't have data on every species, we don't even know every species that exists. We are working within constraints that are really skewed by the way humans have previously acted and the way in which generally they make decisions. These actions and decisions have shaped the exploration of the world, and to some degree, how we will be able to explore the world in the future.

**C:** This adds another dimension to the fact of working with a scientific legacy that determines how you abstract the empirical data: You are also working with a 'data legacy' that lags behind the kind of processing you would like to do with that information, and the resolution that processing demands. Each generation of ecologists works with the data of a previous generation, gathered according to other presuppositions as to what's important ...

**GM:** That's a really interesting thing about science. It's kind of a modern thing since the 1950s to actually rely on statistics, and before that, good statistics didn't really exist. A lot of scientific knowledge could be based on very different statistics than we use now.

People use very complex routines now; we know that in the seventies they might not have done, but we still use their findings. So our knowledge is contingent on whether they were right or not. When a new statistical method comes out or is popularised we don't go over every past experiment and see if that changes things!



Then there are various fads as to what people study – so, in ecology, people love to study mammals, birds, and butterflies and suchlike. Then your understanding of ecology comes from those taxa, an understanding based on human interest for a small part of biodiversity. The revolution in microbiology is fascinating from that standpoint – we get to see how ecology transfers to a significantly different type of organism in quite some detail. It already puts into question how we conceive species as a unit of study.

I guess when the first biologist went out they were just like, “Cool new species, cool new species,” and that was what drove them. Finding a new Orchid would have been far more exciting than a new moss. Nowadays, people are probably getting more pragmatic because of the environmental problems that society faces, and when they collect data, they realise that it has wider consequences. If everyone in the world had a good knowledge of what the organisms are that live in their proximity, and every time they walked to work they wrote down something and shared it, then we might have a lot less trouble with data!

**C:** So then everyone would be a spy for you!

**GM:** But people used to know so much more about their local environments in the past – I’m sure if you asked a hunter-gatherer what’s in his area and where it is he’d have been able to tell you. People depended on that knowledge. But there’s a disconnect between nature and modern life, so then it is a scientific enterprise – ideally being some kind of data forager rather than people who navigate the wild!

It is a serious point though, and there is great interest in 'citizen science' as a means to collect data and reconnect people with nature. The greatest hurdle is to engage those who are entirely disengaged: The more socially deprived aren't going to be as likely to carry around iPhones for which they could download applications that allow them to recognise leaf patterns or upload photographs of plants with location data. It isn't going to happen. We need to think about science education mediated through large-scale science. Collecting data on a tree can be part of a lesson about ecology and how trees work. But that data can actually support the harder research end of the science and so get people involved with science at multiple levels. Computation is inevitably the link between the data-gatherer and the application of science. It obviously needs more research into how it could work!

**C:** You said before that many people involved in climate 'activism' seem to be doing what makes them feel good, with little regard to understanding the reality of what's going on; and a part of that emotional commitment is the idea that if we just 'let it be', things would be okay. But the very idea that we could 'let nature be' just seems to be a complete fallacy. Human beings, like every other species, have never just let nature be – we are part of nature in the sense that our technologically-augmented niche overhangs and affects the niches of all these other creatures. So what's the position of the human in all of this, once the data is 'in'? Is it non-intervention or intervention that's important? Is it going to be the case that we need to intervene in order to actively engineer population distribution?

**GM:** From the point of view of letting things be, that isn't really an option. Our (human) influence is global, so even areas that are very far away from direct human activity are going to be affected by climate changes. The option of having nature reserves where biodiversity occurs now is maybe past. But at the very least we should aim for is protecting those places.

It would be great to think that we could reduce our human niche's influence and have the choice of letting things be. Humans are a nightmare for everything else. Our niche is tapped into a vast set of resources, we use resources that most life couldn't even contemplate, such as oil. Humans have developed an immense niche that had never existed before and that no other species had experienced in their evolutionary history. And just to note, that's an important thing about niches – they don't exist until something makes them exist because that thing exists. There wasn't a niche for dinosaurs until the dinosaurs actually made it.

**C:** And as a creature evolves its niche evolves along with it.

**GM:** Yes, because a creature defines its niche. There is a common misunderstanding here: Say I killed off the primrose – totally wiped it out – that doesn't mean that 'its' niche would be available for something else to come along and 'evolve into'. It just means that the resources it was using are available and the primrose isn't using them or affecting other species that lived around it. The niche is a description of the primrose. Something else can use those resources in a different way and that something else may require a different description for its niche. If something

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else evolved that used all of those resources that are now available, it doesn't mean that it would become another primrose.

So, when humans came along they didn't fill some niche that was there before. Niches aren't necessarily always in existence, although there may be a similarity in the niches between species. The niches of different species are different. That is part of why they are species.

The niche of humans has evolved into something incredibly novel and complex. It affects so many other things through its by-products and through the direct action of humans. From fishing and habitat destruction to pollution and eutrophication, to the creation of novel habitats and the movement of species around the world, we have quite an influence on biodiversity.

Another thing I should bring up is density dependence. As a population gets bigger, it can't go on growing forever. As populations get bigger and bigger there's going to be some constraint on resources that will develop and alter growth and survival of individuals; or maybe diseases and parasites become more easily passed between individuals when a population is dense and so diseases can become more prevalent at higher population densities.

At some stage a population will encounter population regulation, through density dependence, so the numbers of births and deaths will start evening out and that population will achieve an equilibrium of sorts. The entities you will compete against are most likely to be things that are very similar to yourself – organisms which require the same resources as you. This is more likely to be your brothers and sisters and the rest of your species. Populations have to be regulated in our finite world – you can't just go on and on.

But humankind aims to work in a density-*independent* way: technological innovation allows us to exploit resources in a new way and become more efficient in exploiting them. Or technology allows new resources to be exploited. This allows new population growth and new lifestyles. Our lifestyles are probably incredibly different when an innovation is first employed, compared to the later part of an innovation's history, when the population size that innovation supports has increased and approaches equilibrium. As we approach equilibrium there would be a different sharing of the resources that technology yields.

**C:** Are you saying that no matter how much we've augmented our niche, it still retains the tendency to return to a natural equilibrium?

**GM:** In some sense it should do, but equilibrium is a tricky concept!

However if we as a society understood density dependence a bit better, and (in some weird parallel universe) if we were actually willing to act upon it and manage ourselves based on that understanding, then we would probably be doing better. But we don't, and each innovation changes the rules of the game.

Technology also changes how the population would actually be regulated: Say you had two populations that had exactly the same amount of agricultural fields as each other and those fields were of the same quality, but one population had 'normal' crops and the other one had GM crops which produced more food. Then the GM crops would probably be able to sustain a larger population for

the same unit area. In that kind of way, technology separates and changes the rules of the game of nature. Having more people means you produce more waste, you are also putting more pressure on the land and other resources such as water. That population is regulated very differently.

Once you up the stakes and develop technology that's better at acquiring resources, you will change where density-dependence kicks in. In effect, technology keeps on changing the nature of the actual processes that define the human's niche.

In our hypothetical case of populations with GM crops, a population may be now constrained by water, or by their higher population density engendering conflict. Whilst in the populations with normal crops, they will be regulated by the actual productivity of the crops, because no other resource is being pushed to its limit.

In some ways humans have had an amazing run of it really: Each time natural constraints bring the population to equilibrium or breaking-point, actually to the point where regulation takes hold, further innovations have been made – necessity is the mother of invention – so technology has augmented the niche further. Presently we humans have taken this so far that everything we do affects the rest of the world and other species, and we are pushing its limits as a sustainable, self regulating system.

I don't usually engage in these kind of dialogues much though, and some of these arguments are a crude driver of anti-capitalist politics, which I'm not a part of. But if you treat the dialogue properly then there are some suggestions that the ecology of everything can inform a reasonable kind of capitalism and usage of the earth.

**C:** ‘Reasonable capitalism’ – a contradiction in terms? Is it possible for us to moderate that tendency to create new problems and new solutions that create new problems?

**GM:** To me it seems that in some way the human race thrives upon and celebrates itself for this activity. We love the history of our own development and labelling societies with technological descriptions. In some ways it is an enjoyable part of the ride of being human. It’s that interest in problem-solving. It would be quite an innovation that could quell problem innovations! We are on a super innovation snowball, especially with the ‘birth’ of modern biology. We are innovating technologies to tackle problems generated by our previous innovations. It doesn’t seem like we are in balance does it?

**C:** If we make this assumption that the augmented human niche has this massive effect on all these other niches, and that this is not suddenly going to stop, then we have to confront the difficult questions of biodiversity: Are all species sacred qua life-forms, so that they must be kept alive; is it that we are looking to keep the species we know to be important for *our* survival; or is it that we need to understand all the interactions between them so can know which ones we can let go and which ones not? What *is* the question of biodiversity?

**GM:** Everyone will tell you something different. It is an incredibly hard question and depends on how you define biodiversity and how you value biodiversity. My own personal take on it is that the population is no good if it can’t reproduce enough to sustain itself.

**C:** Even if it's the fault of humans? ... was the Dodo's population 'no good'?!

**GM:** What I really mean is that the point of populations is that they produce new generations. That's nature's take on it as well. If you don't, you don't survive.

How far are we willing to take the conservation and management of biodiversity if we produce a world in which a natural population can't maintain itself? That is, how far are we willing to change the earth and create the situation where there are value judgements to be made?

Making value judgements on species is an interesting exercise, but the point is that we shouldn't be addressing the symptoms. It is a deeper-level change in global society that is needed, then we wouldn't need to think about those judgments as much! There are root causes, and conservation doesn't always tackle them appropriately. It is beyond the conservation remit.

And in a similar way, biodiversity needs to be in a good condition itself – it needs enough components of biodiversity for it to maintain itself. From a few billion years ago until now, biodiversity has been pretty good at breeding more biodiversity. Despite an immense meteor strike that killed off vast quantities of species, we have still ended up with a lot of biological variation. What happens if we change all that? What if we reduce the system that produces biodiversity too much?

I think things do have a sacred intrinsic value, that they are totally amazing phenomena of the universe, which we should be custodians of; but then it's intensely difficult to know how to actually do it when our own human



population grows, spews and expands. I think the most operational thing we can do is to assign value, then you can relate it to policy and then it becomes something functional. The level of our effects will have to equilibrate with the levels that biodiversity can withstand.

**C:** You mean that, whatever our feelings about preserving the great spectacle of life on earth, in pragmatic terms – convincing government leaders to take action, and so on – we have to take on this task of assigning differential value to lifeforms. Once again, the question is whether ultimately we do so in terms of their value to the thriving of humans?

**GM:** I think the ‘sacred nature’ line is useless in a pragmatic situation. Of course, I get a spiritual benefit, if you want to put it in those terms. But if you can quantify a harder value for things it makes it a lot easier, rather than setting rules that rely on people’s respect for sacred things, rules which people aren’t very good at observing. I can’t see the earth being ‘managed’ well unless it is hardwired into society that activities that exploit the earth badly are of less value than those that exploit wisely. Humans respond to hard currency.

These days people have to make decisions like, we’ve got  $x$  amount of resources so what are we really going to save. It sounds harsh to say that it’s a mistake, but with the panda, for instance, it’s become this feeble mammal that can’t manage for itself apart from in this weird old people’s home for species, where it’s nursed and they help it reproduce. They do some phenomenally ridiculous things to help it reproduce, like the males produce better quality

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ejaculate by having a degree of anal stimulation. So they do it! And then you are 'saving the species'! At that point, it all becomes quite comical. Is that a good population? Do we want that principle to be our flagship of conservation?

**C:** And why this particular species? Because it's cute! We wouldn't put that much effort into saving a tapeworm.

**GM:** Yeah, completely. [Laughs] We should be thinking about what components of diversity we want to save and the ability of those species to save themselves. We only have limited resources for conservation and we need to do a good job of developing an education that produces a society that understands nature and its management. Not saying, 'we're saving this weird bear thing in China that can't do anything for itself, but look at its cute face ...'

**C:** It's somewhat contradictory anyway, because there's no link to biodiversity there if the species has already been removed from its environment and is being kept alive in an artificially-augmented technological environment that is really an outgrowth of the human niche. It's already extinct as far as the biosphere is concerned, isn't it?

**GM:** That's a really good way of putting it. If you start drawing lines around everything in the form of nature reserves, then you make certain populations extinct *to other populations*. The interactions across space are hugely important.

It all comes down to a bit of gardening. That's a bit of a caricature maybe, but if during climate change organisms can't actually reach the places that would permit their persistence, then you have to kind of pick and choose who you want to survive: Do you do assisted migration, where you would take things to new areas? This is potentially very large-scale gardening. What's natural about it?

**C:** From the point of view of nature being intrinsically worthy, and its having to be treated with respect and saved, the criticism against your work – quantification and computation – would be that you are merely participating in the technological manipulation and management of the world. Therefore ecology just becomes an extension of human's despoiling of nature. Is that necessarily where your work is going to lead – more manipulation?

**GM:** I don't necessarily agree. You can see what has resulted *without* the science: Precisely the uniform despoiling of nature. It's better to think about it as the technological manipulation and management of the choices humans make. It's providing the information for choices, and ecology's suggestions are always bound to lie on the less destructive side of what would otherwise happen without ecology.

We don't really have the luxury of doing manipulations for the sake of understanding at the largest scales. We are living in the one biodiversity experiment we know of. We can't really manipulate the system to find out what will happen, and then inform ourselves that it wasn't a good idea. We have one set of experimental material and we don't

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want to do an experiment that loses all that experimental material. There is one Earth, one instance of an experiment – no repetition possible, no replications. So you are set apart from your system differently than in other areas of science. This means you have different ethics about it.

People can find a way of abusing the information that they find out, but if we can act on that information and monitor the situation then we can become better managers. Again, can people be trusted to let things be?

**C:** But, again, what would be the ultimate outcome in terms of policy change or actual action in the environment of what you are doing? Will it take the form of further manipulation of the environment?

**GM:** The worst thing that could happen if we had a perfect model is that we could just give a really good description of when everything is going to die off. And that in itself would just end up being some sort of political tool.

You can step back at this stage and say, “Can we do some sort of management associated with those models?” But it becomes quite tricky because are you assisting in migrations, are you moving things around, you are deciding, “no, the bears are far too abundant in our model at the moment so there should be ten less this year.” Do we start killing stuff off?

**C:** Exactly, because the one rigid ecological law of life on Earth is that there are limited resources, so if you are talking about that kind of manipulation then one population has to be thinned down for another population to get to a size where it is going to be viable for the next generation.

**GM:** And that will always come back to some sort of value judgement. I'm interested in assisted migration, and the fact that it has evolutionary consequences. You might take away some kind of bird and populate Scotland with it because you think the climate there is going to become more and more to its liking, and the population isn't going to get there by itself. But then you have essentially created an invasion. There were a whole set of reasons why that environment didn't have them in the first place, and so all the other species which are there weren't exposed to that species. Most experiments of that kind show that it actually has a negative effect. About two years ago everyone thought it was a great idea and now everyone's come back to a more cautionary principle in the literature: "We don't know what's going to happen so we can't do it." So you are caught between the best of our ecological knowledge – well, a certain portion of our ecological knowledge – that might say that assisted migration is the best thing to do, and the fact that we just don't know.

**C:** This seems to echo the basic problem, where environmental action is caught in the same potential technological positive-feedback loop of capitalism that we discussed earlier. We know humans have intervened in harmful ways, but the only way we can do anything about it is by intervening more. And that presents the risk of creating even more problems.

**GM:** Totally. People got quite into the idea of 'wilding', making areas wild, so for a lot of situations you can see that that's a good thing, but then people will also say we want wilding but we want to return it to a pre-human natural state.

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So then they're saying we want a wild area, in a wild state, through human management. Are these areas really big enough for the large wild mammals they might have supported?

**C:** And again, it's essentially the concept of the reserve – a walled-off space.

**GM:** And people don't necessarily want to live alongside biodiversity. I would say that biodiversity isn't appreciated enough really. It's only when it's too late. People don't appreciate its importance until they exactly know its value. Like all the fuss over the declines in pollinators – the declines in bees, and flies, and whatnot – is only put in context once they realise that  $x$  million pounds of crops aren't going to be fertilised and produce the grain. Then the pollinators' services have value and their decline becomes a 'problem' to society.

**C:** Again the same paradox: The earth has to become entirely capitalised and technicised in order that it become desirable to preserve it as 'natural'.

**GM:** We are going to end up with a world where the most 'natural' of populations are found in the most inhospitable places. I daresay the inhabitants of deep-sea vents are probably going to be fine for quite some time. Well, until people start tapping that energy source and so destroying those habitats.

To be honest, conservation is slightly removed from what I do, generally. I am an ecologist but I have my opinions. Saving the planet is a big job and it isn't going to be solved solely by the science. It's not like I'm actually here to save the planet!

**C:** We didn't mean to imply that it was your responsibility to save the world ...!

**GM:** I know, but a lot of my friends and family assume that is what I do and why I do it. The word 'ecology' is used in many ways and people are frequently more likely to associate it with recycling plastic bottles and providing compost heaps than they are to associate ecology with the science. People expect me to be a tree hugger, and wear tie-dye.

What you have been saying ultimately points to two (caricatured) options: You could maintain the Earth as some sacred place – get on spaceships, go somewhere else. We could take some species and samples, creating synthetic natural communities which provide resources and can support our lives, but lives not on Earth. Then everyone sits on their new planets and looks back at the earth thinking, "that's very natural, you know".

Or, as looks most likely, humans can be part of nature, understand it, and be managers rather than custodians. Human influence on the Earth has already had its effects. So either we leave now and manage nature on our space colonies. Or we stay and manage nature on our Earth. I think we are in the position that we don't have any choice.

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**RICH WILLIAMS** (HEAD OF THE COMPUTATIONAL ECOLOGY AND ENVIRONMENTAL SCIENCE GROUP)

**COLLAPSE:** In the discourse on the environment and climate change, we often hear invoked the complexity, interconnectedness and diversity of the ‘web of life’; but your work seeks to determine quantitatively the degree to which these factors affect the sensitivity or robustness of species considered in their interrelation with others. Thus we would be able to understand how the depletion or extinction of one species might have further ramifications or lead to ‘extinction crises’.

Aside from the difficulties involved in decision-making and the triage involved with ‘promoting biodiversity’ – Can we even define biodiversity (and the related terms ‘stability’, ‘richness’) in a way that is not determined by human interests?

**RICH WILLIAMS:** I think we probably can. I don’t think the traditional species definition is particularly oriented towards human interests, so a measure of biodiversity that is simply a count of the number of species isn’t particularly ‘about’ human interests. I don’t think the issue is whether defining biodiversity involves human interests or not, but whether constructing an argument for conserving or protecting biodiversity involves human interests.

**C:** Okay, so does the *promotion* of biodiversity merely index value for humans, or is it to be regarded as something valuable in itself – so that a more biodiverse area should attract investment regardless of how its thriving affects us?



**RW:** Firstly, to question the question, why use the word ‘merely’? And what does ‘valuable in itself’ mean? Isn’t valuable always qualified (even if not explicitly) with ‘to whom or what’?

Biodiversity is an interesting concept to me. Consider the species richness, for example, in a tropical rainforest as compared to a temperate deciduous forest: The tropical forest is far more biodiverse. If you decide that species richness is a useful measure of biodiversity and that biodiversity is important to conserve, this points towards deciding that it is more important to conserve the tropical forest than the temperate one. I don’t want to be the one making that argument!

The history of biodiversity as an idea needs to be looked at closely. It entered the literature and the public discourse quite recently – during the 1980s – and while always defined more broadly, has tended to focus on the existence of species. It seems to have been a concept put forward to argue for habitat conservation because it is easy to grasp and has strong emotional appeal. Ever since its introduction, scientists have been trying to rigorously define the term and develop a strong scientific justification for its conservation.

**C:** Interesting that it should exist as a ‘marketing term’ in advance of its scientific definition ...

**RW:** I wouldn’t say that the term preceded its scientific definition, more that it preceded a clear scientific argument for the importance of its preservation. (This is not to say that there are not very good non-scientific arguments that have been made). In ecology, the debate has shifted over time,

from a concern with the role of biodiversity in the stability and robustness of ecosystems to a more recent framework that tries to link biodiversity with ecosystem function and argues that we need to preserve the function of ecosystems, which in turn justifies preserving biodiversity. Even more recently, particularly in the policy arena, biodiversity is linked, through ecosystem functioning, to ecosystem services, an attempt to define the goods or services that societies gain from ecosystems, thereby connecting the science to economics.

You can see the difficulties by returning to my earlier example and asking: Does a unit of area of tropical rainforest provide more or less ecosystem services than the same area of temperate deciduous forest? This is obviously a very difficult question to try to answer, and one that is likely to depend heavily on the perspective of the person trying to answer the question. But I think we can put aside a lot of these difficult and value-laden questions and realize that we – individuals and societies – are dependent on other living things for a wide range of both physically necessary and psychologically desirable things and that we are all active participants in ecosystems. It is also clear that human activities around the planet have drastically altered ecosystems, particularly in the last century as the number of people has expanded so rapidly and technology has greatly increased our ability to affect natural systems, and these alterations have often had negative effects on human well-being or are stop-gap measures that are not sustainable. Finally, our understanding of the ecosystems we all depend on is limited, as is our understanding of the ecological consequences of our actions. Putting all of this together, it seems sensible to develop a deeper understanding of

how ecosystems function so that our interactions within them can be better informed. I don't think you need to be a conservationist to think that it is sensible to want to better understand, predict and perhaps eventually manage ecosystems.

**C:** Admitting, then, that it should be the focus of this search for a deeper understanding, it seems that up until recently, this complex interconnectedness, although acknowledged, has been bracketed as being topologically intractable. But you suggest that we may be able to discover a 'simplicity on the other side of complexity' (in the words of Oliver Wendell Holmes which serve as an epigram for one of your recent papers).<sup>6</sup> Specifically, you argue that the catastrophic 'web collapse' that may result from one species' extinction may be amenable to prediction.

Could you tell us a little about the fundamental theoretical model you are using here – that is, what kind of 'ethological ontology' are you working with?

**RW:** When I or most other people look at the natural world, we see a large number of separate interacting organisms. This is probably one of the most basic simplifying abstractions most humans apply to the world. It is, however, just that – a human-created simplifying abstraction – and like all such abstractions, it persists because of its utility, not its truth. To further organize the natural world, scientists have grouped individual organisms together in various ways. One of the more common ways of grouping organisms, and the one

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6. E. L. Berlow, J. A. Dunne, N. D. Martinez, P. B. Stark, R. J. Williams and U. Brose, 'Simple prediction of interaction strengths in complex food webs', *Proceedings of the National Academy of Sciences*, 106:1 (January 6, 2009), 187-91.

we use in our models, is to group organisms into species, isolated breeding groups. With this assumption, we collapse any notion of space. Instead of a lot of individual organisms living on a landscape, we average across the landscape to get a much smaller number of species with abundances.

The network is another basic abstraction we use – we look at how different species interact and construct a network of interactions. There are many ways in which species interact, and we choose to consider only one, one that we believe to be quite fundamental to the functioning of ecosystems. Looking at ecosystems as thermodynamic systems, we track energy flow – its capture by plants, its dissipation in all living organisms through metabolic processes and its transfer from one organism to another, in our case abstracted to its transfer from one species to another, through the consumption of one organism by another. In summary, it is an energetic null model, one that supposes that energy availability and energy transfer are the processes constraining the functioning of the system.

**C:** What justification is there for this contention that the idea of individual organisms is just a pragmatic fiction or a simplifying abstraction? This has obviously been a topic of hot debate in evolutionary theory, and begs the question, fundamental to biology since the collapse of the Aristotelian taxonomical model, of the independent existence (beyond our convenient categorizations) of biological entities. One can easily accept that models that have their origin in our own evolutionary utility have ‘leaked’ into the concepts of science; however are you suggesting that there could be ways to finally surmount this obstacle – for example, as you suggest, by abstracting over space and using a stochastic

model – and that we thereby get closer to the real ‘essence’ of what is life on earth is (an essence which most people would find hard to accept)? Or is it simply an alternative abstraction which highlights different properties?

**RW:** Are you an individual organism? I think it depends on the question you’re trying to answer. For some questions, you’re best viewed as a member of a population, for other questions you’re an individual organism, for others you’re a community of organisms (there are after all far more bacterial cells on and in you than there are cells in your body, and so on). I’m much too pragmatic to be going after the ‘real essence of life on earth’ – I don’t think I know what that means. Any scientific model involves abstractions – we need to find both abstractions and a model using those abstractions that gives useful predictions of the much more complex underlying system for particular questions, which usually means for phenomena occurring in a constrained range of temporal and spatial scales.

**C:** Your preliminary hypothesis ‘that most aspects of structural integrity in the face of species loss of webs with niche structure generally increases with [species richness]’<sup>7</sup> seems to confirm the widely-held but vague sense of interconnectedness we mentioned earlier. What additional force does the computational model lend to this intuition?

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7. J. A. Dunne and R. J. Williams, ‘Cascading extinctions and community collapse in model food webs’, *Philosophical Transactions of the Royal Society B*. doi: 10.1098/rstb.2008.0219

**RW:** Decades ago, some highly influential work in mathematical ecology challenged the widely-held idea that increased diversity generally led to some kind of increased stability or robustness. Rather than being a general result, our new results are in part a consequence of constraints on the system's topology and the thermodynamic constraint imposed by larger organisms consuming smaller ones. The idea that complex ecosystems develop robust regularities in their behaviour as a consequence of their complexity is in fact borne out by these models, which are constrained to have ecologically plausible structure. These results give me hope that a more general theory and increased predictability of responses is possible. Like complexity theorists, I think about the possibility of a kind of statistical mechanics of complex systems composed of many interacting entities, a theory where the details of the complex behaviour of each entity are blurred by the abundance and multiplicity of their interactions, and this in turn leads to the occurrence of predictable system-level behaviours.

**C:** You are discussing models taken from statistical or stochastic physics and thermodynamics; does your work always 'borrow' models from elsewhere?

**RW:** I wouldn't say I always take models from elsewhere, but when useful ideas have been developed elsewhere, I look to them rather than trying to reinvent the wheel. Even with the simplification of aggregating individuals into species or other functional groups, the interaction networks, commonly referred to as 'food webs', are quite complex. Despite the apparent complexity, modelling and analysis of the empirical data has revealed regularities in

the structure of empirically-observed food webs. One of the important regularities is that feeding relationships are lumped into quite constrained niches. The original writing on niches conceived of an  $n$ -dimensional space, where a species' niche occupied an  $n$ -dimensional hypervolume of that space (here I'm using an idea from ecology ...). There's lots more to the niche idea, but in the spirit of simplicity, my and other's work on food webs has shown, quite remarkably, that these complex networks can often approximately be collapsed onto a single dimension, a line, with a diet niche being a finite section of the niche line.

A large fraction of the connections in many of the observed food webs can be predicted with a model that assumes that all species lie on a single axis, each species' diet being a nearly-contiguous interval on that axis; species tending to fall below their consumer's position on the axis. This then opens up the question as to what that axis means, whether it is correlated with ecological or evolutionary traits of the organisms. In many systems, the leading candidate for a trait which explains the ordering of the species is body size – simply stated, organisms tend to eat things from a constrained range of sizes, and those things tend to be smaller than the consumer. It is surprising to many ecologists that diet choices could be explained so simply, and of course it is not always that simple. Some of the success of these simple models of food web structure could be due to limitations in the data. For example, the available data sets typically don't include parasites, and when parasites are included, the one-dimensional models don't work very well – but at least in a few cases I've looked at recently, adding a second dimension greatly improves the performance of the model (which then of course raises the

question of what is the biological meaning of that second dimension). But even with this, it is remarkable that much of the structure of many food webs can be explained so easily.

**C:** What shortcomings in previous models are you seeking to correct?

**RW:** Previous models of multi-species interactions have typically exhibited one of two drastic simplifications: If the behaviour of the species was at all complex, the network the species interacted on was drastically simple, often consisting of a two or three species food chain; If the model contained a large number of interacting species, their behaviour was drastically simplified and the topology of the multi-species network was usually also highly unrealistic. Our models have some greater level of ecological realism in the way species are allowed to interact (though they still leave out many potentially important biological processes); the models also contain more species, though certainly not as many as in most ecosystems, and the interaction network topology is generated by a model that captures many, though certainly not all, features seen in empirical networks.

**C:** How would these shortcomings of previous models have affected our current view as to the dynamics of anthropogenic species loss and climate change?



**RW:** The ecology included in climate change models is very simple – we are just beginning to develop models with somewhat realistic numbers of tree species in the forests. Explicit representation of animals, so obviously vital to many processes in plant communities – controlling seed dispersal, browsing and consuming seeds and so limiting establishment of new plants and growth of both juveniles and adults, diseases and pests affecting mortality rates to name a few important processes – is entirely absent.

Similarly, our ability to model the ecosystem effects of anthropogenic disturbances is very limited. There are well-established empirically-derived species area rules, so that if you chop a chunk of habitat in half, we can estimate what fraction of species is likely to die out. Predicting *which* species will die out is another matter. Another common human disturbance, the introduction of species from one ecosystem to another as our high mobility leads us to unintentionally homogenize life on the planet, leads to the problem of predicting whether a species will be invasive. Again the science cannot usefully predict invasiveness.

This is a long way of saying that ecology is a young science, dealing with enormously complex problems and systems. We are developing the science that in the future will lead to better-informed answers to these pressing policy questions, but I think that an honest assessment of the science is that reliable predictions of many important policy-relevant questions are still far away.

**C:** What is the wise path in terms of policy now, while this work is pending, if there is a gap between the perceived urgency of the problem and the youth of ecology as a science?

**RW:** I don't know what the wise path is, though like many other I have my opinions. One thing I do see going on is that while some people feel that this is an urgent problem, the resources put into the science are actually quite small. Perhaps this is because the problem is often so disconnected from individuals' lives, given that it is distributed across the globe and occurring on relatively long time scales. Some amount of caution in activities which have large effects on the natural environment would seem wise, but history doesn't offer much hope of wise decisions being made.

**C:** And what could the consequences of your own work be for our understanding of these issues and the future direction of research?

**RW:** My work develops basic theory about complex ecological networks. I hope this theory will one day lead to better decision making, but recognize that this is probably fairly far off. I see much ecological decision-making today as being done with a triage mentality: A severe problem is addressed with the best current knowledge, but the underlying science is often quite weak, extrapolated from a small body of empirical data with little underpinning general theory. Despite the urgency of many ecological problems, I think taking a more long-range approach to the science is an important contribution. I hope that by working to develop more general theory, the science will in the future be able to provide more robust advice when presented with the latest crisis, and perhaps also be convincing enough to allow policies to be put in place so we aren't constantly lurching from crisis to crisis.

That said, there is a very long way to go – the models we're using are certainly more sophisticated than past models but still contain huge numbers of simplifications and approximations. This is not a bad thing – scientific understanding comes from simplifying and approximating, from distilling the essential processes that capture a large fraction of a system's behaviour. The problem is that, unlike models of physical systems, ecological models are not constructed by simplifying and approximating an exact model. Instead, they are built by making an assumption about what processes the scientist thinks are important, building a model that captures those processes and then seeing how that model behaves. Then typically more pieces are added to try and make the model capture more of perceived biological reality and therefore perform better. There is typically a lack of a rigorous sensitivity analysis of the model, either to alterations in its constituent components or to the addition of other components. If it all sounds rather ad hoc, that's because it is.

Steps are being taken to build a more general theory and to understand the basic constraints imposed on ecosystems by thermodynamics (energy flow and non-equilibrium entropy dynamics), stoichiometry (nutrient dynamics) and information theory (genetics and evolution). There's a lot to do, no shortage of things to think about!

**C:** Can ecology ever aspire to the status of a mathematical science, or is the gap between the low-level (genetics) and high-level (ecosystems) too prohibitive?

**RW:** I don't think anyone would argue that the goal is for the biological sciences to be mathematical sciences. Like any science, the goal is to better understand the processes occurring and develop models to better predict the behaviour of the system. Ecology has been compartmentalized, with behavioural, population, community and ecosystem ecology being the main, quite separate subdisciplines. As the science develops, I think it will be re-integrated, so that we will better understand how the behaviours exhibited by individual organisms affect the overall functioning of the ecosystem. Behaviours of course have a strong genetic component, and so it seems inevitable that integrating across scales and connecting traditionally separate ideas, from DNA to ecosystems, is going to be part of a predictive ecological science of the future.

**C:** How is it possible to evaluate mathematical models' adequacy to a complex biological reality? This seems to be an important issue with such predictions: Not only for the general public, who in order to remain in denial often like to invoke the radical uncertainty and underdetermination of scientific models; but also at the level of governmental agencies who are called to act upon models which, as you have readily admitted, involve a choice of 'simplifications', and whose experimental confirmation is impossible or (at least!) unethical. There seems no apparent way to close this gap so as to deny governmental agencies any 'get-out clause' and ensure action. What is your experience of this phenomena of 'cognitive dissonance' and how do scientists such as yourselves think about and deal with the margin of uncertainty involved in these matters?

**RW:** A thorny issue indeed! On a technical level, there has been an awareness of the need to have tools for dealing with uncertainty, whether stochastic or intrinsic to the system's dynamics, for a long time. Dealing with the huge mismatch between the kinds of answers the science currently provides and the kinds of answers policy-makers and the general public want is much more tricky. Even today, the way that uncertainty in climate change models is dealt with in the public debate is incredibly primitive. In ecology and biodiversity science, we are decades behind climate change science in the kinds of predictions of system response to anthropogenic disturbance we can provide, and so the uncertainties are correspondingly larger. (This with the disclaimer that uncertainties in modelling the biosphere drive a huge amount of the uncertainty in the current Earth system models, but this is in the realm of unknown uncertainty in those models). With such uncertainty an inevitable part of the science for the foreseeable future, the science will be able to provide guidance and suggest future scenarios but ultimately decision-making must be based on more than science.

The cognitive dissonance you mention is related to more than the uncertainty in the prediction the science can make. It is also strongly tied up in the very different timescales of the processes involved – you mention the impossibility of experimental confirmation – this is sometimes true, but sometimes just not possible on a typical human timescale.

**C:** Are you concerned with the problem, endemic to scientific ecology, of 'formalization indeterminacy' – that is to say, the problem of multiple possible formalisations for one informal theory?

**RW:** Definitely, and with a host of other problems related to both how one creates a useful abstraction of the system of interest, how one goes about testing the model based on that abstraction against the often sparse data, and how one goes about specifying observational and experimental programmes that are driven by the data requirements of the emerging theory. In general, I find informal theory very frustrating. When you dig into problems of formalisation indeterminacy, you often find multiple meanings for the terms used in describing an informal theory, and these multiple meanings drive the multiple formalisations. Terms like ‘stability’ or ‘interaction strength’, widely used in community ecology, suffer greatly from this. This can be a great source of argument in the literature, but the arguments often hinge on semantics rather than significant scientific points.

**C:** Have any unanticipated conclusions been revealed by the dynamics yielded by your model, and if so how are these being pursued?

**RW:** I think all our conclusions were unanticipated. We really didn’t work in a traditional ‘formulate a hypothesis and test it’ mode. I actually don’t think much science does – papers get written as if that were the process, but in fact it is usually far more flexible and exploratory.

Our approach was really driven by the fact that Eric Berlow was a traditionally trained ecologist with a strong background in field experimentation. He approached the computational system as he would a field system, performed manipulations similar to those performed in the field and analysed the data like he would analyse

manipulative experimental data. (With the advantage that the experimental manipulations were easy to perform so we could perform a lot of experiments and collect a lot of data!) One of the interesting findings is that the models could do a good job of predicting the results of the field experiments when it was clear that the interactions in those experiments were dominated by predator-prey interactions; but when there were obvious non-trophic (energy flow) interactions in the field system, the model, which only models energy flow, failed to predict the field system's response. This points to the importance of expanding these models to include more biological/ecological processes and interactions than the simple consumption interactions they are currently based on.

**C:** If your work confirms the assumption that diversity is positively correlated with stability, does that necessarily mean that the preservation or promotion of biodiversity is a suitable principle upon which to make environmental decisions? Is stability the goal of policy?

**RW:** As far as I can tell, policies don't have such abstract goals. They often don't seem to have a single, well-defined goal. Even if policies were set using some more abstract and scientifically defined goals, I don't think stability would be an appropriate goal, particularly given the environmental stresses on ecosystems. Given the importance of functioning ecosystems for so many of our material and psychological needs, preserving or maintaining ecosystem function seems to make sense as a policy goal, but this whole discussion quickly gets pretty far from science and into personal and societal values.

**C:** Your models suggest that ‘increased robustness and decreased levels of web collapse are associated with increased diversity’.<sup>8</sup> Can one make a comparison in terms of food web stability between a cyclical biotic system of complex ecological communities that produce sufficient overall abundance to support human life without putting the integrity of the system in jeopardy, and the (comparatively less diverse) system of modern agriculture that produces output as a result of reliance on extracted mineral deposits from the Carboniferous Period? In other words, can the practice of industrial agriculture be called a food web at all? Or more generally, what is the status of anthropogenic systems within the biosphere – could they in principle be modelled in the same way as ‘natural’ systems?

**RW:** In principle, yes, modelling agricultural and ‘natural’ systems might be similar. In both systems there will be commonalities such as constraints due to limited amounts of energy, nutrients and water. When you build a model, you make assumptions (hopefully based on things that have been observed about the system of interest but sometimes based on convenience or your conceptual biases) about the processes that are important in the system and therefore need to be represented in the model. I suspect that the processes constraining industrial agricultural systems are so different than in ‘natural’ systems that the basic modelling framework would end up looking quite different.

**C:** Finally, is it a condition of ‘ecological thought’ that we reject anthropocentrism? The very idea of humans’ ‘destroying the planet’ is an artefact of the limitations

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8. Dunne and Williams, ‘Cascading extinctions’.



innate to human thinking (inability to think in terms of larger time-spans). From a truly non-anthropocentric perspective, there is little possibility of such an anthropogenic apocalypse – biological life will re-emerge in one form or another, after humans disappear; on the other hand, on a larger timescale, the extinction of the sun will take all life with it! Is ‘non-anthropocentric thinking’ a chimerical goal?

**RW:** I’m sceptical that humans can be ‘non-anthropocentric’, and not even sure what it would mean; and from what I do understand of the idea I’m not sure that it’s particularly desirable. When people try to develop ideas that are ‘non-anthropocentric’, for me it often ends up being either selfish or misanthropic. It’s obvious and not very interesting that sooner than later humans will go extinct, that life will continue to evolve, that the earth will support life for a very long time after humans have disappeared. More interesting and I think more important, are the shorter-term questions about how to maintain not just livability but quality of life for the eventual nine billion and more people on the planet, all of whom are active participants in the biosphere, continuously interacting with a myriad of other organisms. Understanding how ecosystems function is just one of the many areas of human knowledge that must develop significantly if we are to succeed in this.



## Thinking Ecology: The Mesh, The Strange Stranger, and the Beautiful Soul

Timothy Morton

I shall investigate what ecological interdependence means, philosophically and theoretically. We may then specify the beings with whom we are interdependent. As we proceed, we shall descend from seeming logical abstraction, through deconstruction, into an unbearable intimacy with others. Ecological thinking – what I call *the ecological thought* – is precisely this ‘humiliating’ descent, towards what is rather abstractly called ‘the Earth’. Ecology is the latest in a series of great humiliations of the human, humiliations that might even constitute the human as such (in its humility, at least, if any). From Copernicus through Marx, Darwin and Freud, we learn we are decentred beings, inhabiting a Universe of processes that happen whether we are aware of them or not, whether we name those processes ‘astrophysics’,

‘economic relations’, ‘the unconscious’ or ‘evolution’. The correct but surprising conclusion to draw from ecological humiliation, however, is not some form of nominalism or nihilism, but a politicised intimacy with other beings.

What is interdependence? Let’s imagine a theorem called the Interdependence Theorem. It contains two simple axioms:

Axiom (1):  $\forall a: \exists a: a = \sim(\sim a)$

Axiom (2):  $\forall a: \exists a: a \supset \sim a$

Axiom 1 states that for every *a*, the existence of *a* is such that *a* consists of things that are *not not a*. Thus *a* is made of *not-a*’s, so the only way to define it is negatively and differentially. Thus *a* is *a* because it isn’t *not-a*, while *not-a* is only *not-a* because it is *not a – a* and *not-a* are mutually determining. Axiom 1 states that things are only what they are in relation to other things.

Axiom 2 states that things derive from other things. While Axiom 1 is concerned with how things are (synchronically), Axiom 2 talks about origins (diachrony). In every case, things like *a* only exist such that a *not-a* exists. Nothing exists by itself and nothing comes from nothing.

Axioms 1 and 2 define interdependence across a range of phenomena. They summarise structural linguistics, for instance, because structuralism models signs as completely interdependent. The Interdependence Theorem also describes life forms. Diachronically, no life form exists that didn’t arise from another one. And synchronically, life forms are different from each other in arbitrarily negative ways: there’s no human-flavoured DNA as opposed to daffodil-flavoured DNA, for instance (the human genome

is 35 percent daffodil). Since life forms are expressions of DNA, they differ from each other negatively rather than positively, since DNA is a language.

Since life forms depend upon each other the way signs depend upon each other, the system of life forms is isomorphic with the system of language. Since language is subject to deconstruction, the system of life forms must also be subject to deconstruction. What happens when we subject the system of life forms to deconstruction?

Derrida describes deconstruction as thinking 'the structurality of structure'. What type of structure? It's open ended: it has no centre and no edge. Because language is an arbitrary system of negative difference, there is no sign that stands somehow outside the system to guarantee the meaning and stability of the other signs. This means language is infinite, in the strong sense that we can never fully account for its meanings or effects. It also means that meaning depends upon meaninglessness. And that language as a system is not a thing, not an object, but a strange infinite network without inside or outside. The process that makes signs manifest as appearance and meaning is *différance*: the process of difference (synchronic) and deferment (diachronic). The meaning of a word is another word, and strings of signs only gain significance retroactively. The meaning of a sentence is a moving target. You will never be able to know exactly when the end of this sentence is until after you've read it elephant. Coherence, in order to be coherence, must contain some incoherence.

The same view applies to the system of life forms. They are made up of other life forms (the theory of symbiosis). And life forms derive from other life forms (evolution).

## COLLAPSE VI

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Because of the ecological emergency we have entered, we are now compelled to take account of this mind-changing view.

The implications of a deconstructive view of life forms are manifold:

- (1) Life forms constitute a *mesh* that is infinite and beyond concept – unthinkable as such.
- (2) Tracing the origins of life to a moment prior to life will result in paradoxes.
- (3) Drawing distinctions between life and non-life is strictly impossible, yet unavoidable.
- (4) Differentiating between one species and another is never absolute.
- (5) There is no ‘outside’ of the system of life forms.
- (6) The Interdependence Theorem is part of the system of interdependence and thus subject to deconstruction!
- (7) Since we cannot know in advance what the effects of the system will be, all life forms are theorisable as *strange strangers*.

Let’s sift through these implications.

- (1) *Life forms constitute a mesh that is infinite and beyond concept – unthinkable as such.* This is not just because the mesh is too ‘large’ but also because it is also infinitesimally small. Differentiation goes down to the genomic level. There is no human-flavoured DNA, no daffodil-flavoured DNA.

Most of the terms I considered were compromised by references to the Internet – ‘network’, for example. Either that, or they were compromised by vitalism, the belief in a living substance. Web is a little bit too vitalist, and a little bit Internet-ish, so I guess it loses on both counts.

‘Mesh’ can mean both the holes in a network, and the threading between them. It suggests both hardness and delicacy. It has uses in biology, mathematics and engineering, and in weaving and computing – think stockings and graphic design, metals and fabrics. It has antecedents in *mask* and *mass*, suggesting both density and deception.<sup>1</sup> By extension, ‘mesh’ can mean ‘a complex situation or series of events in which a person is entangled; a concatenation of constraining or restricting forces or circumstances; a snare’.<sup>2</sup> In other words, it’s perfect.

If everything is interconnected, then there is no definite background and therefore no definite foreground. Charles Darwin sensed it in thinking through the implications of the theory of natural selection. His amazement is palpable:

It is a truly wonderful fact – the wonder of which we are apt to overlook through familiarity – that all animals and all plants throughout all time and space should be related to each other in group subordinate to group, in the manner which we everywhere behold – namely, varieties of the same species most closely related together, species of the same genus less closely and unequally related together, forming sections and sub-genera, species of distinct genera much less closely related, and genera related in different degrees, forming sub-families, families, orders, sub-classes, and classes. The several subordinate groups in any class cannot be ranked in a single file, but seem rather to be clustered round points, and these round other points, and so on in almost endless cycles.<sup>3</sup>

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1. *Oxford English Dictionary*, ‘mesh’, n.1.a–c.

2. *Oxford English Dictionary*, ‘mesh’, n.2.

3. C. Darwin, *The Origin of Species*, ed. G. Beer (Oxford and New York: Oxford University Press, 1996), 105–6.

Every single life form is literally familiar, in that we are genetically descended from them. Darwin imagines an endlessly branching tree; 'mesh' doesn't suggest a clear starting point, and those 'clusters' of 'subordinate groups' in the quotation above are far from linear (they 'cannot be ranked in a single file'). Each point of the mesh is both the centre and edge of a system of points, so there is no absolute centre or edge. Still, the tree image marvellously closes out Darwin's chapter on natural selection, with its evocation of 'the Great Tree of Life, which fills with its dead and broken branches the crust of the earth, and covers the surface with its ever branching and beautiful ramifications'.<sup>4</sup> A 'ramification' is a branch and an implication, a branching thought.

(2) *Tracing the origins of life to a moment prior to life will result in paradoxes.* Sol Spiegelman's discoveries concerning RNA show how you can't draw a rigid narrow boundary between 'life' and 'non-life'. In order for life forms to begin, there had to be a strange, paradoxical 'pre-living life' made of RNA and self-replicating crystals such as a silicate (strange that silicon may be the element in question).

'RNA World' abolishes the idea of a palpable, fetishised life substance, the sort Naturephilosophy imagines as *Urschleim*, a sentient gel.<sup>5</sup> Curiously, the fantasy thing of idealist biology turns out to be this existential substance, as if idealism depended for its coherence on some metaphysical materiality. RNA World, by contrast, is structured like a language. At bottom, it is a set of empty formal relationships. This is the basis of a genuinely materialist biology.

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4. Darwin, *Origin*, 107.

5. See I. H. Grant, 'Being and Slime: The Mathematics of Protoplasm in Lorenz Oken's "Physio-Philosophy"', *COLLAPSE V*, 287-321.



Do you think a virus is alive? A virus is a macromolecular crystal that contains some RNA code. It doesn't reproduce as such, it only tells your cells to make copies of it. The cold virus is a huge twenty-sided crystal. If you think the rhinovirus is alive, then you probably should admit that a computer virus is also alive, to all intents and purposes. A computer virus also tells other pieces of code to make copies of itself. The life–non-life boundary is not thin and it is not rigid.

(3) *Drawing distinctions between life and non-life is strictly impossible, yet unavoidable.* This brings us to our third paradox. If 'pre-living life' is necessary for imagining the origins of life, then it is also the case that in the present moment, the moment of 'life' as such, the life–non-life distinction is also untenable. When we start to think about life, we worry away at the distinction between nature and artifice. Only consider the beings called viroids: Ten times smaller than virus, they are little circles of RNA code (Figure 1). They invade the transcription, rather than translation, parts of the host's reproductive machinery. Viroids are very ancient beings, dating back to RNA World.

1	CGGAACUAAA	CUCGUGGUUC	CUGUGGUUCA	CACCUGACCU	CCUGAGCAGA	AAAGAAAAAA
61	GAAGGCGGCU	CGGAGGAGCG	CUUCAGGGAU	CCCCGGGGAA	ACCUGGAGCG	AACUGGCAAA
121	AAAGGACGGU	GGGGAGUGCC	CAGCGGCCGA	CAGGAGUAAU	UCCCCGCCAA	ACAGGGUUUU
181	CACCCUUCU	UUCUUCGGU	GUCCUUCUC	GCGCCCGCAG	GACCACCCU	CGCCCCUUU
241	GCGCUGUCG	UUCGGCUACU	ACCCGGUGGA	AACAACUGAA	GCUCCCGAGA	ACCGCUUUUU
301	CUCUAUCUUA	CUUGCUUCGG	GGCGAGGGUG	UUUAGCCCUU	GGAACCGCAG	UUGGUUCCU

Figure 1: Genome of PSTV (Potato Spindle Tuber Viroid)

(4) *Differentiating between one species and another is never absolute.* This is the lesson of Darwinism. 'Species' is a label that must be applied retroactively to life forms. There are

no species as such, no species-to-be, no point in evolutionary history to which we can point and say, 'Here is the origin of (say) *Homo Sapiens*'. *The Origin of Species* has a cheeky title, for it's one of the least teleological books ever written. Darwin demonstrates that all the categories of the life sciences – species, variation, monstrosity – collapse into one another.

(5) *There is no 'outside' of the system of life forms.* Once life 'begins' – and thinking this origin is practically impossible – everything else becomes linked with it. This is what most of us mean when we think ecologically: Everything is connected to everything else. There are strong metaphysical versions of this consequence (such as Gaian holism), and weak reductionist ones. I'm on the weak reductionist side.

This implication profoundly implies that there is no environment as such. Your DNA doesn't stop expressing itself at the ends of your fingers. A beaver's DNA doesn't stop at the ends of its whiskers, but at the end of its dam.<sup>6</sup> A spider's DNA is expressed in its web. From the perspective of the life sciences, the environment is nothing but the phenotypical expression of DNA code. This includes oxygen (anaerobic bacterial excrement). And it includes iron ore (a byproduct of archaic metabolic processes). You drive and fly using crushed liquefied dinosaur bones. You are walking on top of hills and mountains of fossilised animal bits. Most of your house dust is your skin. The *environment* looks like not a very successful upgrade of the old-fashioned term *nature*.

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6. See R. Dawkins, *The Extended Phenotype: The Long Reach of the Gene* (Oxford and New York: Oxford University Press, 1999).

(6) *The Interdependence Theorem is part of the system of interdependence and thus subject to deconstruction!* Since the Interdependence Theorem is only possible to state in language, and since it describes language itself, the Theorem recursively falls prey to its own premises.

The First Axiom states, ‘Things are made of other things’. The Second Axiom states that ‘Things come from other things’. Implication 4 asserts that we cannot rigorously differentiate between one species and another. Yet in order for Axiom Two to be valid, we must be able to distinguish one species from another! Since ‘Things come from other things’, there must be a distinction between one thing and another thing. Yet if we draw this distinction – if we think the word ‘distinction’ means something – there is no way one species can arise from another species. A dinosaur, a bird: there are continuities between them. And yet a dinosaur is not a bird. This is Zeno’s paradox.

Axiom 2 is in still more trouble. Consider a candle and its flame. If there were no difference between the candle and its flame, then the flame could not arise, distinct from the candle. But if the candle is indeed different from the flame, then there is no way the flame can arise from it!<sup>7</sup> Thus ‘different from’ and ‘comes from’ are now reduced to something meagre. The very terms of Axiom 2 have shrunk. They are themselves subject to Axiom 2!

Now consider Axiom 1, ‘Things are made up of other things’. Think of a car: it’s made of wheels, chassis, steering wheel, windows, and so on. Where is the car-ness in these components? Nowhere. Yet we can’t say that just

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7. I am adapting a Buddhist argument about emptiness. Nagarjuna, *The Fundamental Wisdom of the Middle Way*, tr. and commentary J. L. Garfield (Oxford and New York: Oxford University Press, 1995), 4, 44, 110–11, 160–1, 177, 190–1, 231–44.

any old thing will do to put a car together: a car is made of just these components, not other ones. We have reduced Axiom 1 to bareness, by using Axiom 1 itself!

Human beings are made up of arms, legs, heads, brains, and so on. So are birds, duck-billed platypuses, and sharks. These organs are made up of cells. So are plants, fungi, amoebae and bacteria. These cells contain organelles. These organelles are modified bacteria such as mitochondria and chloroplasts. They themselves contain DNA. This DNA is a hybrid fusion of bacterial DNA and viral insertions. DNA has no species flavour; moreover it has no intrinsic flavour at all. At the DNA level it becomes impossible to decide which sequence is a 'genuine' one and which is a viral insertion. In bacteria there exist plasmids that are like pieces of viral code. Plasmids resemble parasites within the bacterial host, but at this level, the host-parasite duality becomes impracticable. It becomes impossible to tell which being is a parasite, and which a host.<sup>8</sup> We have discovered components without a device of which they are the components – organs without bodies.<sup>9</sup> Indeed, the human genome contains endogenous retrovirus-derived sequences, and one of these, ERV-3, may confer immunosuppressive properties to the placenta, thus allowing embryos to coexist with the mother's body. You may only be reading this because a virus in your mum's DNA prevented her from spontaneously aborting you.<sup>10</sup>

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8. Dawkins, *Extended Phenotype*, 200–23, 226.

9. I am inverting Deleuze and Guattari's phrase 'the body without organs'. See S. Zizek, *Organs without Bodies: Deleuze and Consequences* (New York and London: Routledge, 2003).

10. M. T. Boyd, C. M. R. Bax, B. E. Bax, D. L. Bloxam, and R. A. Weiss, 'The Human Endogenous Retrovirus ERV-3 is Upregulated in Differentiating Placental Trophoblast Cells', *Virology* 196 (1993), 905–9.

At the DNA level, the whole biosphere is highly permeable and boundariless. There is less substance: ‘Organisms and genomes may [...] be regarded as compartments of the biosphere through which genes in general circulate.’<sup>11</sup> How do we know we haven’t learnt how to sneeze because rhinoviral DNA codes directly for sneezing as a means to propagate itself? Yet we have bodies with arms, legs, and so on, and we see all kinds of life forms floating and scuttling around, as if they were independent. It isn’t an undifferentiated goo.

(7) *Since we cannot know in advance what the effects of the system will be, all life forms are theorisable as ‘strange strangers’.* The Interdependence Theorem does not reduce everything to sameness. The way things appear is like an illusion or magical display. They exist, but not that much.

I use the phrase ‘strange stranger’ because Derrida’s notion of the *arrivant* is the closest we have as yet to a theory of how the mesh appears up close and personal.<sup>12</sup> The *arrivant* is a being whose being we can’t predict, whose arrival is utterly unexpected and unexpectedly unexpected to boot. The strange stranger is not only strange, but strangely so. They could be us. They are us.

## STRANGE STRANGERS

Our encounter with other beings – and with our being as other – is *strange strangeness*. And with this we should drop the disastrous term *animal*. Haeckel’s drawings of

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11. K.W. Jeon and J.F. Danielli, ‘Micrurgical Studies with Large Free-Living Amebas,’ *International Reviews of Cytology*, 30 (1971), 49–89, quoted in Dawkins, *Extended Phenotype*, 160.

12. J. Derrida, ‘Hospitality,’ *Acts of Religion*, ed., tr. G. Anidjar (London and New York: Routledge, 2002), 356–420.



Figure 2: Ernst Haeckel, *Phaeodaria*, from *Kunstformen der Natur* (1904)

radiolarians show beings that look like geometrical plots rather than squishy organisms (Figure 2). That's because they are. The trouble with animals is that on some level they're vegetables, beings that just grow – isn't this the governing theme of many a horror story? And the trouble with vegetables is that they're algorithms. Consider *The Algorithmic Beauty of Plants*, a beautifully illustrated text readily available online.<sup>13</sup> Instead of illustrating plants, you can generate algorithms that plot them. Plant scientists now model plant growth using software like this. If an algorithm can plot a rose, surely the thing itself is a map of its genome, a three-dimensional expression of the algorithm's unfolding? I can only conclude that I, a supposedly sentient life form, am also subject to these rules.

Strange strangers are uncanny in the precise Freudian sense that they are familiar and strange simultaneously. Indeed, their familiarity is strange, and their strangeness is familiar. Strange strangers are unique, utterly singular. They cannot be thought as part of a series (such as species or genus) without violence. Yet their uniqueness is not such that they are utterly independent. They are composites of other strange strangers. We share their DNA, their cell structure, subroutines in the software of their brains. They are absolutely unique and so capable of forming a collective of life forms, rather than a *community*. *Community* is a holistic concept that is greater than the sum of its parts. Since the Interdependence Theorem implies that there is no whole (such as 'animals', Nature and so on), *community* can only ever be a conceptual construct.

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13. P. Prusinkiewicz and A. Lindenmayer, *The Algorithmic Beauty of Plants*, with J. S. Hanan, F. D. Fracchia, D. Fowler, M. J. M. de Boer, and L. Mercer (Przemysław Prusinkiewicz, 2004); available at <http://algorithmicbotany.org/papers/>.

## COLLAPSE VI

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By contrast, *collectivity* signifies the conscious choosing of a coexistence that already exists whether we think it or not. Yet because of strange strangeness, this choosing cannot be a totalising grip, or final pinning-down. Collectivity is 'to come', in the sense that it addresses the *arrivant*, who is necessarily to come, evanescent and melting to the exact same extent as she, he or it (how can we tell for sure?) is disturbingly 'there'.

These are the precise coordinates of the global warming crisis. We are faced with the ability to choose our coexistence with other life forms and accept responsibility for global warming; or reactively to wait for 'the market' to sort it out. (Funny how we can imagine the end of the world as we know it, but not so well the end of capitalism.) The discourse of community cannot help us to jump across this open historical moment into the future, because it is intrinsically conservative, if not reactionary, if not, at times, fascist. Community implies a boundary between inside and outside, which implies inclusion and exclusion: scapegoating. The antagonistic energy of the community is pasted onto the scapegoat, who is then sent outside the community to purge it of its contradictions. Collectivity posits that the antagonisms are directly a feature of coexistence as such. Thus these antagonisms have to do with an inadequate politics of collectivity itself, which must henceforth be revised to address them. The two models are deeply asymmetrical. It is not that collectivity embraces more life forms: it is not just a bigger, 'new and improved' community.

If we are to achieve a radical ecological politics, then we must acknowledge the difficulty of the strange stranger. We are faced with an apparent paradox: materialism and what mistakenly goes under the sign of 'mysticism' are



inextricably interlinked. Our ecological existence is 'nearer than breathing, closer than hands and feet'.<sup>14</sup> We've got others – rather, others have got us – literally under our skin.

## FURTHER IMPLICATIONS

What conclusions can we draw?

*There is no nature, never was, never will be.* There is therefore no 'world' as such. Indeed, there is no ontology – no ontology is possible without a violent forgetting of the intrinsically incomplete, 'less than' level we have been describing. Thus no phenomenology is truly grounded in reality. Ecophenomenology therefore contains an internal limit caused by the humiliating paucity of the 'incomplete' ontic level.

Science and capitalism have ensured that we are now directly responsible for what we used to see outside ourselves as Nature, if only in the negative. It is now the task of philosophy and politics to catch up with, and I hope surpass, this state of affairs. What has been called Nature (I capitalise it precisely to 'denature' it) is now on 'this' side of history and politics. That's the difference between *weather*, which just happens to us, and *climate*. We can't see climate directly, but we can take direct responsibility for it, bring it on 'this' side of history. Walter Benjamin asserts that when weather becomes a topic for collective action (as now), it stops being that thing 'over yonder' called the weather. It 'stand[s] in the cycle of the eternally selfsame, until the collective seizes upon [it] in politics and history emerges'.<sup>15</sup>

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14. George Morrison, *The Weaving of Glory* (Grand Rapids, MI: Kregel Publications, 1994), 106.

15. I develop this in *Ecology without Nature: Rethinking Environmental Aesthetics* (Cambridge, Mass. and London: Harvard University Press, 2007), 160–9.

The same goes for the strange stranger as opposed to 'the animal'. We shall soon regard the phrase 'the animal question' with as much queasy horror as 'the Jewish question' – and for the same reasons.

*'Let it be' is over.* Heideggerian environmentalism fails at a fundamental level. Since being itself is in question, there is not much to 'let be' in the first place. We are faced with a Romantic irony in which we cannot rid ourselves of our conscious implication in the interconnected Universe. Our minds, in short, are part of the interdependence. There is no 'reality' in which we are 'embedded' separate from our awareness of this reality. And yet, and at the very same time, there is not nothing at all. The Interdependence Theorem is not nominalism, let alone nihilism.

For Heidegger, Being lets things be. Poetry gives us unique access to this letting-be quality of Being. Cue a thousand environmental maxims, poems, attitudes. But what do we let be? When letting-be becomes a political question, the Being really hits the fan. Do we let Exxon be? Do we let global warming be? Do we let the Sixth Mass Extinction Event (for which we ourselves are responsible) be? The Interdependence Theorem means that Nature becomes historical, and therefore political. Letting be therefore becomes a tacit choice to maintain the status quo.

There are Heideggerians who seriously suggest this. Interventions into the substance of reality are seen as inevitably failed attempts to not let be. The ideological language of immersion in the lifeworld – profoundly environmentalist language, derived from Heidegger – is complicit with current social and ecological conditions. This sounds counterintuitive, but it's no different than

driving past what looks like two separate buildings that turn out to be part of the same structure, a type of parallax. Insisting on our embeddedness (like Iraq War reporters) in the ‘world’ is – shocking thought – part of the problem. In particular, this is because ideas come bundled with attitudes. While the language of embeddedness insists that we are up close and personal with reality, the attitude it codes for is cosy, vicarious, aesthetic distance.

‘Leave no trace’ was a slogan from an environmentalist movement about picking up after yourself when you go hiking. ‘Leave no trace’ is a translation of ‘Let it be’. Imagine Heidegger in a hide: the stupefied, plangent hush of his prose tells of a huntsman waiting for Being, with a gun or binoculars – even if the gun is only the gun of the fascinated gaze. “Be vewy vewy quiet,” as Elmer Fudd says, on the hunt for Bugs Bunny.<sup>16</sup> Letting-be conjures the ‘meditative’ quiet of the forest. Here is a Buddhist lama writing what I hold to be the definitive passage on the affinity between contemplativeness and violence. The lama is recounting the words of a visitor from the city of Birmingham to his monastery in southern Scotland. The visitor was a little hesitant to do any actual meditation:

Well, it’s nice you people are meditating, but I feel much better if I walk out in the woods with my gun and shoot animals. I feel very meditative walking through the woods and listening to the sharp, subtle sounds of animals jumping forth, and I can shoot at them. I feel I am doing something worthwhile at the same time. I can bring back venison, cook it, and feed my family. I feel good about that.<sup>17</sup>

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16. See E. Levinas, *Otherwise than Being: Or Beyond Essence*, tr. A. Lingis (Pittsburgh: Duquesne University Press, 1998), 182.

17. Chögyam Trungpa, Rinpoche, *Training the Mind and Cultivating Loving-Kindness* (Boston: Shambhala, 1993), 35–6.

## COLLAPSE VI

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Let it be! Pull! Bang! What a fantastic sight! Shhh, quiet, I'm trying to kill this rabbit. Quietly, meditatively, I insert my knife gently and smoothly into its neck, mindfully and meditatively I slit its throat ... In the rabbit's blood I can smell the quiet of the fields, the 'toilsome tread' of the paws on their daily round, the search for something to nibble ... this rabbit corpse is a moving environmental poem, like a pair of old shoes in a Van Gogh painting ... mmm ...

From the dark opening of the worn insides of the shoes the toilsome tread of the worker stares forth. In the stiffly rugged heaviness of the shoes there is the accumulated tenacity of her slow trudge through the far-spreading and ever-uniform furrows of the field swept by a raw wind. On the leather lie the dampness and richness of the soil. Under the soles slides the loneliness of the field-path as evening falls. In the shoes vibrates the silent call of the earth, its quiet gift of the ripening grain and its unexplained self-refusal in the fallow desolation of the wintry field. This equipment is pervaded by uncomplaining anxiety as to the certainty of bread, the wordless joy of having once more withstood want, the trembling before the impending childbed and shivering at the surrounding menace of death.<sup>18</sup>

I have recently been accused of not knowing what Nature is because I have never killed an animal that I've subsequently eaten. This is a criterion that I am happy not to have fulfilled. Heideggerianism, the quintessence of the contemplative ecophenomenological mode in which a lot of Nature-speak now addresses us, is marked by a trace of violence, an unspeakable violence towards the world it so lovingly appears to reveal to us. The very worn insides

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18. M. Heidegger, 'The Origin of the Work of Art', in *Poetry, Language, Thought*. Trans. A. Hofstadter (New York: Harper and Row, 1971) 15-87 (33-4).

of the peasant shoes about which Heidegger rhapsodises so beautifully in his essay on the origin of the work of art are made from leather, which is animal skin. A certain kind of intellectuality revels in the anti-intellectualism afforded by Heidegger's language, which demands a passive submission almost taboo elsewhere in the modern Humanities. This passivity finds its virtual analogue in the happy, servile authenticity of the peasant woman, which Heidegger deduces from Van Gogh's shoes. Contemplation here appears deep but not genuinely disturbing: it is a superficial vicarious experience of an imaginary other's suffering. Substitute a gas chamber or Hiroshima human shadow, or a simple pair of Nikes, for the shoes, and this supposed contemplativeness becomes unnerving. You can imagine committing a murder in a beautiful, mindful, Heideggerian way. Aesthetically powerful descriptions of the natural world, then, are not only a waste of time, but might unwittingly aid the 'other side' of the contemporary coin, which sees the world as an exploitable resource or as objects of instrumental reason (the difference between a cow and beef would be the application of this instrumentality).

Heidegger's contemplative language is so seductive that in countless ecocritical and ecotheoretical texts, he is often the sole representative of a noninstrumental point of view. We cannot ignore this rhetorical mode, and not just because there are many adaptations of it. The Heidegger meme is seductive because it speaks to something profound, something often called spiritual. In order to get over Heidegger, we have to go underneath him.

*Ecology is about intimacy.* Instead of insisting on being part of something bigger, ecological thinking leads

to a different framework: intimacy, not holism. Thus organicism is no longer a workable mode of aesthetics and politics. Organicism believes that form can fit content like an invisible glove, leaving no trace. Organic form is greater than the sum of its parts. Most environmentalisms – including systems theories – are organicist. World fits mind and mind fits world, as William Wordsworth asserted. In the margins of his copy of the poem where Wordsworth laid this out, William Blake wrote: ‘You shall not bring me down to believe such fitting & fitted ... & please your lordship’.<sup>19</sup>

Desire is inescapable in ecological coexistence. Yet environmentalism as currently formulated tries to transcend the contingency of desire, claiming that its desires if any are natural. Organicism partakes of environmentalist chastity. ‘Nature loving’ is supposedly chaste (impossible formula! like courtly love, or Neoplatonic love), and is thus slave to masculine heteronormativity, a performance that erases the trace of performance.<sup>20</sup> ‘Leave no trace’. If you look like you are ‘acting’ masculine, you aren’t. Masculine is Natural. Natural is masculine.

Organicism is a performance of no-performance. It is ‘un-perversion’, with all the ambiguity a double negative can muster, a desire that erases its trace as soon as it appears. Organicism articulates desire as erasure, erasure-desire. The curtain rises on a pre-given holistic world. But interdependence is not organic: it’s differential. Things only look like they fit, because we don’t perceive them on an evolutionary or geological time scale. SpheX wasps

19. W. Blake, *The Complete Poetry and Prose of William Blake*, ed. D.V. Erdman (New York: Doubleday, 1988), 667.

20. See T. Morton, ‘Queer Ecology,’ (PMLA, forthcoming).

paralyse crickets to feed to their young. If you move a paralysed cricket away from in front of the burrow that the Sphex wasp who paralysed her is inspecting (for the presence of grubs), the wasp will repeat the same behaviour, moving the cricket back meaninglessly to the entrance of the hole, without dragging her in.<sup>21</sup> 'Nature' dissolves when we look directly at it, into assemblages of behaviours, congeries of organs without bodies. Nature looks natural because it keeps going, and going, and going ... like the undead. And because we keep on looking away, keeping our distance, framing it, sizing it up.

Blake heard the voice of authority in organicism. Authoritarian organicism gains its power by naturalising difference. Nature is unmarked ('leave no trace'). It is established by exclusion, and then by the exclusion of exclusion. We must rediscover what has been excluded from the book of Nature. Ecology must unthink *ecologocentrism*. I mean precisely a version of what Derrida calls logocentrism, the creation of a metaphysical scheme that sets up a sign as a Master signifier that magically stands outside the system of meaning, and guarantees the meaning and coherence of all the other signs.<sup>22</sup> Once this is established, we know what's in and what's out, what's up and what's down, what's marked and what's unmarked. The Interdependence Theorem does not allow this knowledge to congeal.

Perhaps we could give ecologocentrism the slip by saying that Nature is beyond concept. Beyond concept, Nature is, a Nature for which there are no words. But we

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21. Hofstadter, *Gödel, Escher, Bach*, 360–1, 613–14.

22. For further discussion see T. Morton, 'Ecologocentrism: Unworking Animals', *SubStance* 37.3 (2008), 37–61.

are already using words to describe this wordless Nature. Thus a negative theology of the environment must fall prey to the deadly logos it wishes to transcend.<sup>23</sup> Thinking you can escape metaphysics by outlining a hyperessential being beyond being only repeats the problem.<sup>24</sup> 'Nature is not unnatural.' A negative theology of the environment is the ultimate chastity – it refuses even to name the non-name, refuses even to non-name it.

### NO MORE BEAUTIFUL SOUL

Intimacy means we are caught in desire. Hegel held that philosophy wasn't just about ideas, it was about attitudes towards ideas. These attitudes were as yet unthought ideas, ideas that hadn't yet been realised consciously. If, as Donald Rumsfeld has claimed, there are known knowns, known unknowns, and unknown unknowns, there are also, as Žižek adds, unknown knowns – things that we know, but we don't know that we know them: the unconscious, if you like psychoanalysis. Once you realise what your attitude towards an idea is, that attitude itself becomes an idea, towards which you have yet another attitude, which you'll need to figure out – and so on in a progression that Hegel calls the phenomenology of spirit.

Like a vanishing point in a perspective picture, ideas select for certain ways of being understood. Some call this strange feature ideology. Ideology is not well understood, because we think it means belief, which we think means an idea you are holding onto tightly – these two assumptions

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23. See K. Rigby, 'Earth, World, Text: On the (Im)possibility of Ecopoiesis,' *New Literary History* 35.3 (2004): 427–42.

24. J. Derrida, 'How to Avoid Speaking: Denials,' in H. Coward and T. Foshay (eds.), *Derrida and Negative Philosophy* (Albany: State University of New York Press, 1992), 74.



are themselves ideological, and obscure what ideology is. Attitudes are automated features of ideas – they just pop up when you have them. They aren't subjective states independent of ideas. That's why attitudes are hard to get rid of: they're hardwired into 'that' side of reality, rather than 'this' one. If it were just a matter of prejudice, we'd all have grown up long ago. But as Marx saw, the attitude that sees attitude as prejudice (we call it the Enlightenment) suffers from its own blind spots, having to do with illusions of freedom and autonomy.

Nature seems incontestably 'there' – as many have reminded me, because what I need, as a theory guy, is a good strong dose of it to set me straight. In *Environmental Literary Criticism*, Karl Kroeber says that what 'postmodern theorists' need is a night out in a Midwestern thunderstorm, a ritual hazing that now sounds horribly like waterboarding.<sup>25</sup> But is the 'thereness' – more like the 'overthereness' – of nature a lie in the form of the truth? What attitude is this truth enabling?

Hegel gave the attitude a name: the Beautiful Soul, which he found typified in Romanticism.<sup>26</sup> The Beautiful Soul suffers from seeing reality as an evil thing 'over yonder'. Is this not precisely the attitude of many forms of environmentalism? Ironically, the attitude that *nature* enables is the dreaded dualism, Cartesian and otherwise, from which nature-speak from Romanticism to environmentalism has sought to extricate itself. Nature is 'over yonder'; the subject is 'over here'. Nature is separated from us by an

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25. K. Kroeber, *Ecological Literary Criticism: Romantic Imagining and the Biology of Mind* (New York: Columbia University Press, 1994), 42.

26. G. W. F. Hegel, *Hegel's Phenomenology of Spirit*, trans. A. V. Miller (Oxford: Oxford University Press, 1977), 383–409.

unbridgeable ontological wall, like a plate glass window – plate glass was the Romantic-period invention that enabled shops to display their wares as if they were in a picture frame, and therefore belonged to another order of reality. Plate glass is a physical byproduct of a quintessentially Romantic production, the consumerist. Not the consumer, but the consumerist: someone who's aware that she is a consumer, someone for whom the object of consumption defines her identity, along the lines of that great Romantic phrase, invented once by the gourmand Brillat-Savarin and once again by Feuerbach: 'You are what you eat'.<sup>27</sup>

This phrase implies that the subject is caught in a dialectic of desire with an object with which it is never fully identical, just as Wile E. Coyote never catches up with Roadrunner in the cartoon. If Wile E. Coyote ever did catch Roadrunner, he would eat Roadrunner, at which point Roadrunner would cease to be Roadrunner and would become Wile E. Coyote. There is in effect a radical separation between subject and object. Yet consumerism implies an identity that can be collapsed into its object, so we can talk of vegetarians, hip-hop fans, opium eaters, and so on.

One style stands out, a meta-style that Campbell calls bohemianism and I call Romantic consumerism.<sup>28</sup>

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27. L. Feuerbach, *Gesammelte Werke II, Kleinere Schriften*, ed. W. Schuffenhauer (Berlin: Akademie-Verlag, 1972), 4.27; J.-A. Brillat-Savarin, *The Physiology of Taste*, trans. A. Drayton (Harmondsworth: Penguin, 1970), 13.

28. C. Campbell, *The Romantic Ethic and the Spirit of Modern Consumerism* (Oxford: Basil Blackwell, 1987); 'Understanding Traditional and Modern Patterns of Consumption in Eighteenth-Century England: A Character-Action Approach,' in J. Brewer and R. Porter (eds.), *Consumption and the World of Goods* (London and New York: Routledge, 1993), 40-57. T. Morton, *The Poetics of Spice: Romantic Consumerism and the Exotic* (Cambridge and New York: Cambridge University Press, 2000), 5, 9, 50-1, 57, 107-8; 'Consumption as Performance: The Emergence of the Consumer in the Romantic

This type of consumerism is at one remove from regular consumerism. It is 'consumerism-ism', the realisation that the true object of desire is desire as such. Romantic consumerism is window-shopping, enabled by plate glass, and now by browsing online, not consuming anything but wondering what we would be like if we did. In the Romantic period, reflexive consumerism was limited to a few avant-garde types: the Romantics themselves. To this extent Wordsworth and De Quincey are only superficially different. Wordsworth figured out that he could stroll forever in the mountains; De Quincey figured out that you didn't need mountains, if you could consume a drug that gave you the feeling of strolling in the mountains (sublime contemplative calm, and so on). Nowadays we are all De Quinceys, *flâneurs* in the shopping mall of life. This performance is ever more pervasive: we haven't really exited the Romantic period.

Romantic consumerism can go one step higher than the Kantian aesthetic purposelessness of window-shopping, when it decides to refrain from consumerism as such. This is the attitude of the boycotter, who emerges as a type in the proto-feminism of the Bluestocking circle in the 1780s and 1790s, an attitude which Percy and Mary Shelley, and many others, practiced. The product boycotted was sugar, which was sentimentally described as the crystallised blood of slaves. The boycotter transmuted objects of pleasure into objects of disgust. To display good taste, you have to know how to feel appropriate disgust, how to turn your nose up at something. The zero degree performance of taste would be spitting out something disgusting, or vomiting.

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Period,' in T. Morton (ed.), *Cultures of Taste / Theories of Appetite: Eating Romanticism* (New York and London: Palgrave, 2004), 1–17.

## COLLAPSE VI

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The height of good taste is abstaining from sugar, and spice if you are one of the Shelleys, who held correctly that spice was a product of colonialism.

The attitude of the boycotter is that she has exited consumerism, but this attitude is itself a form of consumerism. It's a performance of a certain style of aesthetic judgment. Believing you've exited consumerism might be the most quintessentially consumerist attitude of all. In large part this is because you see that the world of consumerism is an evil world. 'Over yonder' is the evil object, which you shun or seek to eliminate. 'Over here' is the good subject, who feels good precisely insofar as she has separated from the evil world.

Hegel's Beautiful Soul claims precisely to have exited the evil world. Hegel doesn't claim that the world may or may not be evil – what is wrong with the Beautiful Soul is not that it's prejudiced and rigid. The world is not some object about which we can have different opinions. The problem is far subtler than that. It's that the gaze that constitutes the world as a thing 'over yonder' is evil as such. The environmental fundamentalism that sees the world as an essential, living Earth that must be saved from evil, viral humans is the very type of the Beautiful Soul's evil gaze. Ironically then, this environmentalism is not spiritual, if by spiritual we mean transcending the material world, but deeply committed to a materialistic view that sees evil as a concrete thing that must be eliminated.

This environmentalism is a form of anti-consumerism, which puts it at the summit of consumerism, not beyond it. It is the most rarefied and pure form of consumerism. Beautiful Soul Syndrome (BS) plagues it, because it sees consumer objects, and consumerisms (the various styles),

as so many reified things ‘over yonder’, from which it distances itself with disdain. How do we truly exit from the Beautiful Soul? By taking responsibility for our attitude, for our gaze. On the ground this looks like forgiveness. We are fully responsible for the present environmental catastrophe, simply because we are aware of it. No further evidence, such as a causal link that says humans brought it about, should be required. Looking for a causal link only impedes us from assuming the direct responsibility that is the only sane, ethical response to global warming and the Sixth Mass Extinction Event. It’s worse than a waste of time to keep trying to convince people that environmentalism is a right way of thinking – a right attitude. The current ecological emergency should have proved to us that the environmentalist attitude – that there is a ‘world’ that is separate from me, that nature exists apart from human society – is not only wrong, but also dangerously part of the problem, if only because it provides a good alibi while impeding us from doing anything about our dilemma. The message of ecological awareness should not be ‘We Are the World’ (that awful charity song) but rather, ‘We Aren’t the World’. And never were: letting go of a fantasy is even harder than letting go of a reality.

Beautiful Soul Syndrome wants to induce the correct aesthetic appreciation of the world. But this aesthetic attitude can never truly become an ethical one. Kierkegaard terrifyingly showed how insidious Beautiful Soul Syndrome is, in his narrative of the seducer in *Either/Or*.<sup>29</sup> Aestheticisation is synonymous with evil because it holds the world at a distance from which to size it up. Thus the attitude

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29. S. Kierkegaard, *Either/Or: A Fragment of Life*, tr. and intro. A. Hannay (Harmondsworth: Penguin, 1992), 243–376.

that says, 'We need more evidence on global warming before we act' ironically joins the attitude that says, 'If only you could experience nature in the raw, you wouldn't have these evil beliefs about destroying it.' In both cases, violence hides beneath projections of innocence. Both statements come bundled with attitudes of awaiting some compelling, unmediated aesthetic experience issuing from beyond the subject. They are both examples of Beautiful Soul Syndrome: both require a certain aesthetic distance, an evaluative, pseudo-contemplative, 'meditative' stance.

If you beat up the Beautiful Soul, however, and leave it bleeding to death in the street, aren't you also a victim of Beautiful Soul Syndrome? However much you try to slough off the aesthetic dimension, doesn't it stick to you ever more tightly? At a certain limit, transcending Beautiful Soul Syndrome means forgiving the Beautiful Soul, recognising that we are responsible for this Syndrome, whether we picture ourselves that way or not. The only way out of the problem is further in: jumping into our hypocrisy rather than pretending to be disillusioned and beyond ideology, without attitudes. This is a test case for our ability to progress in social collectivity. It means dropping various supporting concepts that provide the background against which regular thinking takes place: *nature, environment, world, life*. We can't have our cake and eat it too: that's consumerism, which is Beautiful Soul Syndrome. The only way out is in and down, which is why I call my approach *dark ecology*.

Dark ecology realises that we are hopelessly entangled in the mesh. Dark ecology finds itself fully responsible for all life forms: like a detective in a noir movie, it discovers it's complicit in the crime. Dark ecology is melancholic:

melancholy is the Earth humour, and the residuum of our unbreakable psychic connection to our mother's body, which stands metonymically for our connection with all life forms. The irony of dark ecology is like being caught in your own shadow. Hegel disliked Romantic art because its ironies reminded him of the Beautiful Soul. He describes it in hauntingly environmental terms in his lectures on aesthetics.<sup>30</sup> Environmental awareness is, finally, a sense of irony, because it is through irony that we realise that we might be wrong, that identity might not be as solid as we think, that our own gaze might be the evil that we see.

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30. G. W. F. Hegel, *Aesthetics: Lectures on Fine Art*, tr. T.M. Knox, 2 vols. (Oxford: Clarendon Press, 1975), vol. 1, 527.





## How Many Slugs Maketh the Man?

FIELDCLUB

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pp226–229. *Bound Excess Diagram*

pp230–233. *Slug'o'metric Series: How many Slugs Maketh the Man?*

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299,950,000  
years

Carboniferous  
Period

Homo  
Sapiens

Stratifying cut of Agriculture, and  
resulting positive feedback loop  
(necessity coupled with extravagance).

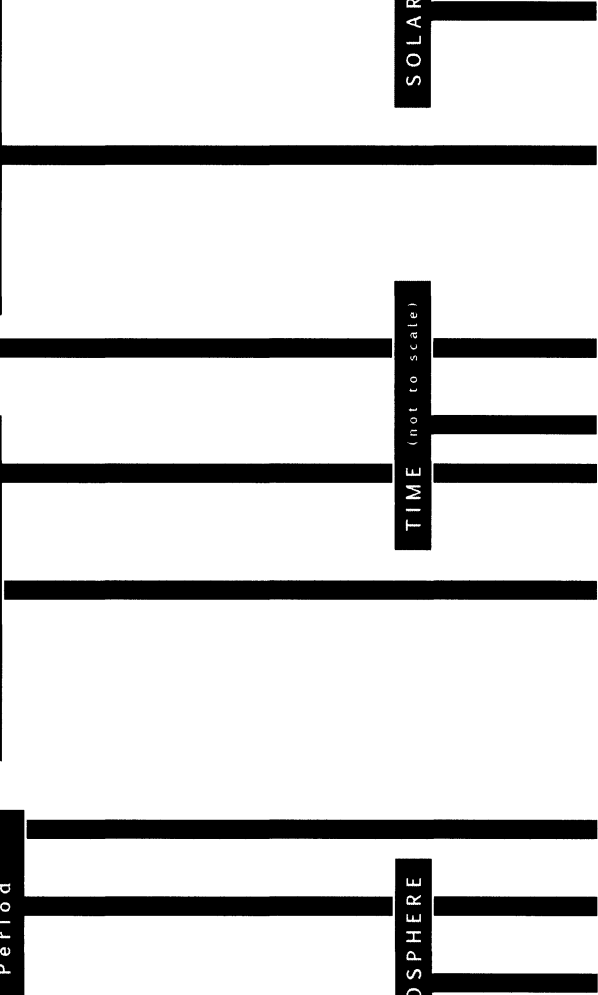
BOUND EXCESS (CO<sub>2</sub>)

ANTHROPIC TECHNOSPHERE

BIOSPHERE

TIME (not to scale)

SOLAR INPUT



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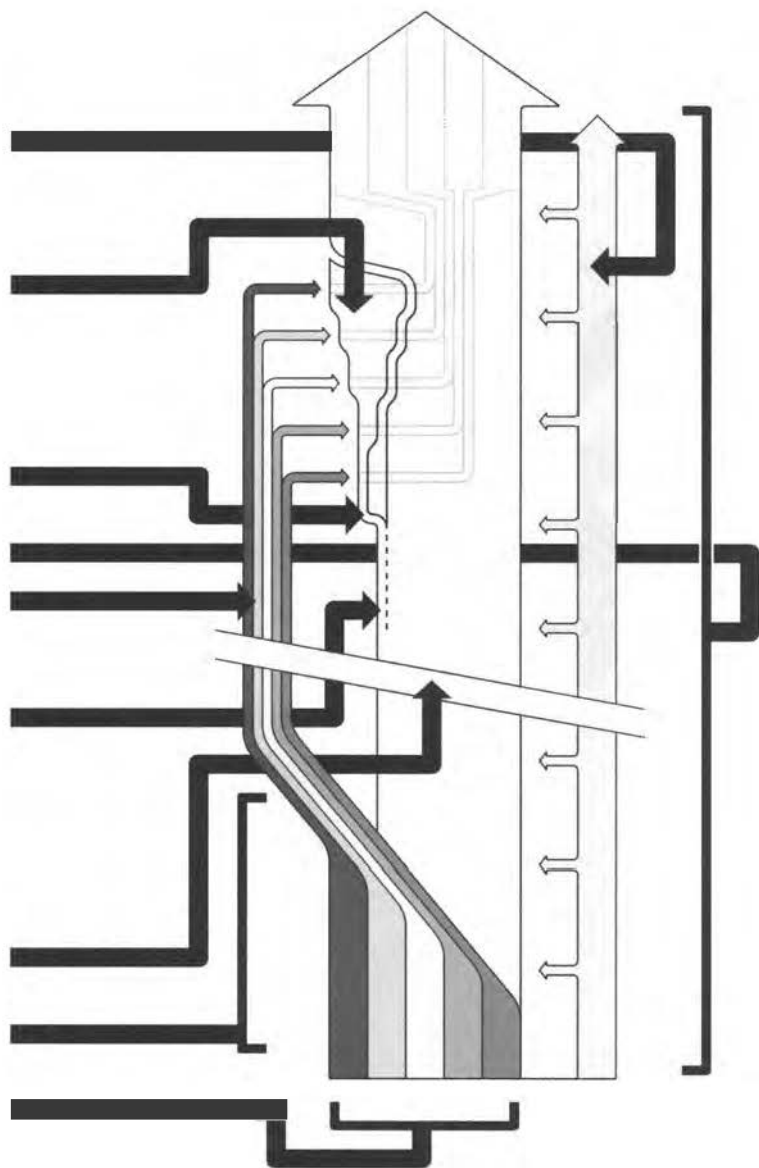
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SLUG U METRIC I  
2007 - TOTAL 1581



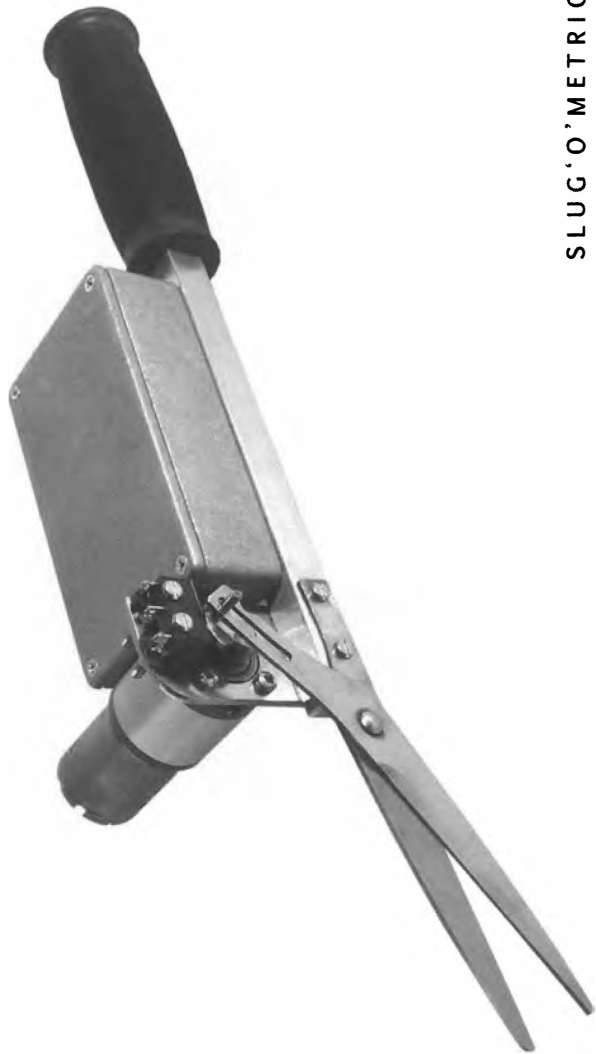


SLUG'O'METRIC II  
2008 - TOTAL 968



SLUG'O'METRIC III  
REMOTE ACTUATOR  
2009 - TOTAL 456





SLUG'O'METRIC III  
TRIGGERLESS [NON]COMPLICITOR  
2009



The 'Odeon' on Alderney, part of the Atlantic Wall.  
Photograph © Howard Stanbury 2006

## Fossils of Time Future: Bunkers and Buildings from the Atlantic Wall to the South Bank

Owen Hatherley

### **HOMELAND PROTECTION STYLE**

A couple of years before his death, J.G. Ballard wrote an essay for the *Guardian* on Modern architecture, as part of a tie-in with the highly successful *Modernism – Designing a New World* exhibition at the Victoria and Albert Museum. This exhibition can be seen as the moment where the British middle class fully reclaimed modern architecture and design, after an interregnum of post-modernist eclecticism – but, in much the same way that a Labour government was no longer meaningfully a Labour government, this was not the same modernism. Accordingly, a line was established where modernism, as a purist, clean and hygienic aesthetic developed in the 1920s, leapt over the dissonant, mutated, megastructural, ‘Brutalist’ modernism of council housing and ‘comprehensive redevelopment’ that occurred after 1945, picking up

the thread again in the 1990s, with the Blairite tasteful style of architects like Allies and Morrison or property developers such as Urban Splash, with (this time a more brightly coloured) minimalism once again the reigning aesthetic. Of the many articles in the press celebrating the V&A exhibition, a Modernism that didn't fit the rubric of 'sweetness and light' was explained away briefly as a perversion, a parody, of the original idea. In the process, Modernism was denuded too of its attachment to left-wing politics, and of its close relation to the technological acceleration enabled by total war.

In contrast, Ballard concentrated on a warped Modernism, one that can barely even be described as architecture – the Atlantic Wall that was designed to protect against the inevitable 'second front' in the Second World War, a gigantic construction project designed by the Organisation Todt, the Nazi engineering force that had been responsible for the Autobahn network, and built by thousands of slave labourers. There has long been an urge to find the totalitarian smoking gun in discussions of Modernism, the missing link that connects unfashionable aesthetics and unpleasant politics. So, while the official architecture of Nazism eschewed Modernism for a mixture of monumental classicism and the Teutonic vernacular they called the *Heimatschutzstil* ('homeland protection style'), the suppressed aesthetics of expressionism and functionalism broke out in 1942, in the form of these completely utilitarian structures for the protection of the doomed thousand-year Reich. Built by slave labourers from reinforced concrete and placed along the French coast, these bunkers, blockhouses, observation posts, submarine bases and gun placements were largely forgotten by the 1960s.

It was at this point that Ballard became obsessed with them. He writes, retrospectively:

Walking along the beach some years ago, I noticed a dark structure emerging from the mist ahead of me. Three storeys high, and larger than a parish church, it was one of the huge blockhouses that formed Hitler's Atlantic wall, the chain of fortifications that ran from the French coast all the way to Denmark and Norway. This blockhouse, as indifferent to time as the pyramids, was a mass of black concrete once poured by the slave labourers of the Todt Organisation, pockmarked by the shellfire of the attacking allied warships.

Rather than eliciting a feeling of relief that the blockhouses were an unoccupied remnant of a finished conflict, they seem instead to be 'waiting for the next war', and appear moreover to have developed outgrowths into the rebuilt British cities, those that were in some cases destroyed by V2s shot from these very bunkers:

The scattered rubbish and tang of urine made me think of structures closer to home in England – run-down tower blocks and motorway exit ramps, pedestrian underpasses sprung from the drawing boards of enlightened planners who would never have to live in or near them, and who were careful never to stray too far from their Georgian squares in the heart of heritage London [...] Whenever I came across these grim fortifications along France's Channel coast and German border, I realised I was exploring a set of concrete tombs whose dark ghosts haunted the brutalist architecture so popular in Britain in the 1950s. Out of favour now, modernism survives in every high-rise sink estate of the time, in the Barbican development and the Hayward Gallery in London, in new towns such as Cumbernauld and the ziggurat residential blocks at the University of East Anglia.

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This list was an roll-call of what Modernism had come to after World War Two, seeing as its 'heroic' era had allegedly died when the Atlantic Wall was built – and more convincingly, when the possibility of a belief in progress had been irrevocably shaken, after the white-walled, antiseptic aesthetics of the 1920s had failed to prevent the atavism and brutality of the 1940s – an 'architecture of death', where thin, smooth rendered walls were replaced by thickly abrasive concrete surfaces. Ballard writes regretfully, almost as an admission of defeat, that this project for the transformation of life was finally capable only of erecting funerary structures, as the transformation in life that it aimed for was not achieved. Seeing as Ballard is on record as loathing postmodernist architecture and the fantasies of old England embodied in Barratt Homes and Poundbury, we should read the following as the lament of someone disappointed in our failure to live up to the modernist ideal:

I have always admired modernism and wish the whole of London could be rebuilt in the style of Michael Manser's brilliant Heathrow Hilton. But I know that most people, myself included, find it difficult to be clear-eyed at all times and rise to the demands of a pure and unadorned geometry. Architecture supplies us with camouflage, and I regret that no one could fall in love inside the Heathrow Hilton. By contrast, people are forever falling in love inside the Louvre and the National Gallery.

This rather peculiar essay ruminates inconclusively, but it pulls together all the elements of modernism which are most uncomfortable to the shiny Ikea Modernism of riverside luxury flats and glass trading floors. In the process it reminds us of the atavism in modernism itself,

the places where, at the fringes of the modern movement, primal impulses and prehistoric building forms recur. The Atlantic Wall is a project as ancient as it is modern, whose forms evoke pyramids, hill forts, and, like Denys Lasdun's Halls of Residence for UEA, where the concrete has a similarly verdant, semi-rural setting, 'ziggurats'. This is an hieratic architecture, one where rationalism is forced into the service of the irrational. Ballard first traversed this landscape fictionally in the mid-1960s, in the short story *The Terminal Beach*. Although the landscape of bunkers and beaches is here rescheduled to the aftermath of a Third World War, Ballard's descriptions are clearly informed by his exploration of the Atlantic Wall. *The Terminal Beach* is what happened when, after lying in wait, the bunkers regained their functions, with the later forms of Cape Kennedy or Eniwetok transplanted onto the Normandy coast. The protagonist, Traven, treats the post-catastrophe landscape as a kind of mental experiment, as if researching the psychic processes that led to the apocalypse, only to find the structures taking him back far further:

The desolation and emptiness of the island, and the absence of any local fauna, were emphasised by the huge sculptural forms of the target basins set into its surface [...] roadways, camera towers and isolated blockhouses, together forming a continuous concrete cap upon the island, a functional, megalithic architecture as grey and minatory (and apparently as ancient, in its projection into, and from, time future) as any of Assyria and Babylon [...] Here, the key to the present lay in the future. This island was a fossil of time future, its bunkers and blockhouses illustrating the principle that the fossil record of life was one of armour and the exoskeleton.

The bunkers recur in the psychic landscapes of *The Atrocity Exhibition* a few years later, where a similar protagonist fuses them with advertising hoardings, television, skyscrapers, the interiors of laboratories, and the prospect of 'sodomising the Festival Hall'. The Atlantic Wall becomes a pop landscape, another part of the media storm that the novel's researcher subjects himself to:

Partly concealed by the sunlight, the camouflage patterns across the complex of towers and bunkers four hundred yards away revealed half-familiar contours – the model of a face, a posture, a neural interval. A unique event would take place here. Without thinking, Travis murmured 'Elizabeth Taylor'. Abruptly there was a blare of sound above the trees.

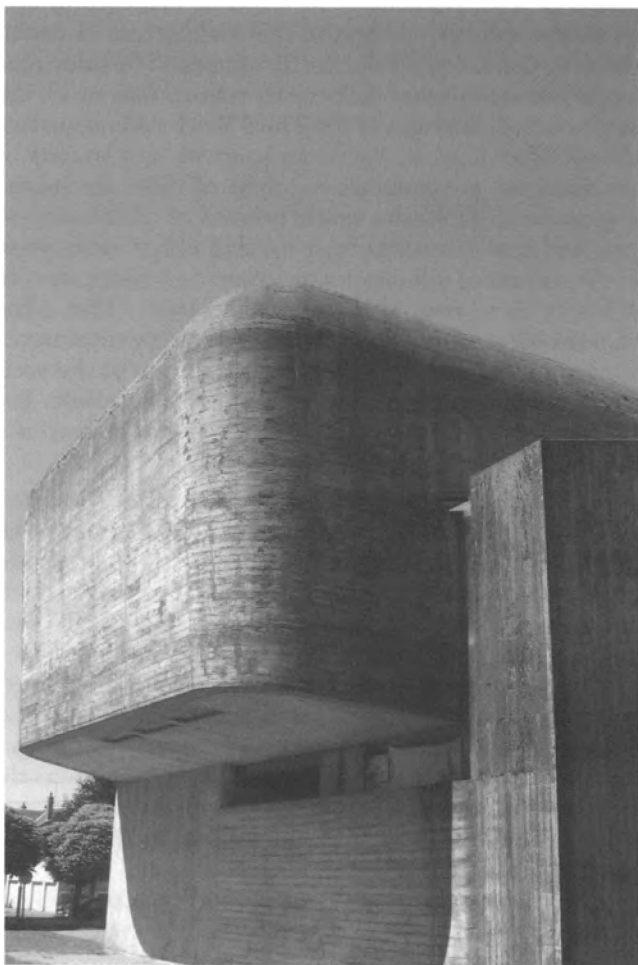
### **BUNKERS AS ALTARS**

It's difficult to establish direct links between the Atlantic Wall and the Modern architecture that followed the Second World War, but there is one example where the influence was clear and publicly stated. Ballard's notion of the Atlantic Wall as an ancient formation, something primitive and monumental, was paralleled at exactly the same point by the researches of the (then) young architect Paul Virilio. In 1958, Virilio began a project to collate and catalogue the structures which would be pulled together into the 1975 book and exhibition *Bunker Archaeology*. This book was the first outside the field of military history to give these extraordinary places an extended, historical examination, in a mix of philosophical meditation on their 'meaning' and political investigation of their purpose. Virilio's account was divided under headings in which expected subjects such as 'Military Space' or 'The Fortress' were interspersed with a chapter on the



notion of 'The Monument', in which he managed to find an almost spiritual element to this architecture of death, claiming that it could fulfil the 'monumental function that modernist architecture deliberately refused (but which the monumental classicism of the Third Reich had no qualms about)'. Elsewhere, he has as an epigraph to a chapter of his haunting, gorgeous photographs of these structures, a quote from Hölderlin much beloved of phenomenologists and sentimentalists, here making rather more sense in the context of military architecture: 'but where danger is found, there rises also that which saves'. This takes on a double-meaning, in that these seemingly monstrous, ferocious objects are formally dictated mostly by the need for protection, in their attempt to 'save' those inside; but Virilio takes it literally, in that the Atlantic Wall becomes a model for a new religious architecture.

In this he was preceded, perhaps, by Le Corbusier, whose post-war buildings for the Catholic Church – the chapel at Ronchamp, La Tourette monastery – use a bare, shuttered, 'crumbly' and searingly tactile concrete which has more in common with the material of these Nazi bunkers than that which he rendered and smoothed-over into the streamlined perfection of his 1920s 'Purist Villas'. This was little more than coincidence, spurred by Le Corbusier's accidental 'discovery' of *beton brut* after budget cuts in the Marseilles *Unité d'Habitation*, inadvertently creating 'Brutalism'. Virilio traces from this an elective affinity, bringing the latent connections to the surface, heightening their apparently religious aura and their extreme modernity, particularly in the case of bunkers surviving in small towns, which unlike the 'wall' on the beach, could gradually become accepted, quotidian:



Virilio's 'Bunker Church'. Photograph © Jorge Ayala.

... the sky playing between the embrasure and the entrance, as if each vast casemate were a little ark, or an empty temple minus the cult [...] these concrete altars built to face the void of the oceanic horizon [...] these solid masses in the hollows of urban spaces, next to the local schoolhouse or bar, shed new light on what 'contemporary' has come to mean. Why continue to be surprised at Le Corbusier's forms of modern architecture? Why speak of 'Brutalism'?

Unlike the post-war rebuilding of blitzed cities along rationalist lines, the Atlantic Wall provided an architectural model for a shattered, traumatised world, and for Virilio at least, a possible model for salvation from this fragmentation and psychosis.

Their very method of construction, to the design of engineers such as Fritz Todt or Ulrich Finsterwalder, suggested the modernity of total war, a science of compaction and impact, where the concrete structure is not a frame, not built from the ground up, but a poured mound, where 'the centre of gravity replaces the foundation'. It is the manner in which the bunker is tailored to protect the human being against modern arms that is the source of its appropriateness for modern design. Far from being an aggressive architecture, for Virilio it is defensive: 'the imposing forms are the consequence of the adversaries' arms, of the fire power of those who rescued us, of our own armies.' The photographs show an architecture which, owing in part to the exigencies of camouflage, manages to be alternately extremely jarring and, in conservative architectural parlance, 'contextual'. While some of the structures seem to be a grotesque metamorphosis of the architecture of the twenties – especially the work of Erich Mendelsohn, with the expressionist curves recalling his

Einstein Tower and the gun emplacements an accidental parody of the ribbon windows of his department stores – others are more archaic. One bunker is disguised as a chapel, another insinuates itself into a barrow, evoking the ceremonial burial grounds of Mycenaean Greece; ‘the continuance of the site’, notes Virilio, ‘conflates funerary architecture with military architecture.’ Finally, in ‘The Aesthetics of Disappearance’, Virilio’s photographs show the bunkers overcome by nature, sinking into the beach, overgrown with grass and lichen, gradually becoming earthworks.

The atavism of the Wall is most obviously associated with its part in the Nazi project, with its use of advanced technology in the service of the primal lunacy of blood and soil – but Virilio would adopt its forms for an atavism even more ancient than that of the thousand-year Reich. These bunkers became the model for the best-known of Virilio’s architectural works with Claude Parent, in the firm Architecture Principe: the church of Saint Bernadette du Banlay. Make no mistake, this was a direct imitation of the forms of the Atlantic Wall, specifically of the curved observation posts which were some of the most striking of those documented in *Bunker Archaeology*. Designed in 1964, it’s an incredibly puritan structure for the Catholic Church, with its bare concrete walls and an unreadable military exterior; but the interior makes Virilio’s point about the spiritualisation of the bunker, in that the thin slivers of light which once came through the observation strips, originally just narrow enough to fit the tip of a machine gun, this time illuminate the church in appropriately pathetic fashion, with strips of what becomes in the crepuscular context an especially vivid light, offsetting

a concrete which is left without detailing, without any obvious kind of architectural treatment. This church marks the culmination of a bizarre metamorphosis: From a utilitarian, instant architecture designed for emergency into something still, ponderous and seemingly eternal. It is especially extraordinary, then, that another more famous example of the Atlantic Wall making its way into mainstream architecture took place at the hands of architects best known for changeability, in-built obsolescence and bright, jolly optimism – the Archigram group.

### **MOUND AND GROUND**

Archigram was a journal that ran from the early 60s to the 70s, written and edited by a group of architects, many of whom practised for the Greater London Council, and some of whom later went on to design wilfully spectacular ‘blobitecture’ in the 00s: Warren Chalk, Dennis Crompton, Peter Cook, David Greene, Ron Herron and Mike Webb. Archigram is usually described in terms of what Sam Jacob derisively calls ‘1960s grooviness: loon pants, lava lamps, men with moustaches and birds in miniskirts’. The journal, and the increasingly megalomaniacal projects featured inside it, are the antithesis of sober, sombre Brutalism – a cornucopia of bright colours and whimsical hypertechnology. The Plug-In City, The Instant City, the Walking City, the Bottery and the Electric Tomato – all of them imagining an architecture of inbuilt obsolescence, where buildings could be used and then discarded like any other consumer good, but where new networks and frameworks could provide a new mobility free from the earthbound mundanities of serious architecture. Now that we are secure in the knowledge that cities will not walk or

float (something by no means certain in the late 1960s), Archigram are indulged and enjoyed as sixties 'icons' – The architectural equivalent of Terry Gilliam's animations for Monty Python or (former architectural student) Nick Mason's cover for Pink Floyd's *Relics*, their work (in the words of Sam Jacob) 'beautiful and meaningless like fantasy art. It combined traditional Victorian engineering and Heath Robinson mechanics with a naive trust in megastructures ... Architects look at this frightening vision, smile and think "how crazy, how fun!"'. The possibility that Archigram might have anything to do with something as menacing and unnerving as Nazi defensive structures would seem inconceivable.

Their built work as a collective never extended further than a playground in Milton Keynes and a swimming pool for Rod Stewart (neither of which are extant). However, in the early 1960s half of the group were the principal designers of the South Bank Complex, the Brutalist riposte to the bright, optimistic modernism of the Royal Festival Hall and the remains of the 1951 Festival of Britain. The original festival showed a celebratory, instant modernism which would seem to be a precursor to the seaside jollity of many Archigram projects; yet when the Festival site was prepared for new buildings, the plans were very different. Ron Herron, Warren Chalk and Dennis Crompton, along with John Attenborough, for group leader Norman Engleback, were the 'hairiest' of the many design groups of the Greater London Council. Their South Bank scheme, largely designed in 1960 but worked on until 1967-8, was a combination of the interest in pedestrian circulation and a certain 'anti-architectural' approach – both taken from the 'New Brutalism' of Alison and Peter Smithson – along

with a windowless harshness which appears to owe a great deal to the Atlantic Wall. Brutalism was an idea developed in the 1950s by British architects and theorists which involved overturning the purist, rationalist aesthetics that informed post-war rebuilding in favour of a fragmented, impacted approach to building and planning. At first, the material with which it would become synonymous – reinforced concrete – was irrelevant, and its earliest instance, the Smithdon School in Hunstanton, was a work of steel and glass. Brutalism made an architectural fetish of services (water towers, pipes, etc), structural ‘honesty’ and stark, immediately memorable images – and, in planning, a focus not on towers in parkland, but on walkways, multiple levels, the famous ‘streets in the sky’ that ran through Brutalist housing schemes. It was an architecture based on a contradiction between designing for people, for sociability and interaction, and a stylishness based on the photogenic, imposing image. The South Bank development certainly featured plenty of walkways and public spaces – the undercroft now used by skateboarders, the many levels now partly closed to the public – but it took the image-making tendency to an extremely stark level: A dissonant, mute form where functions were unreadable from the exterior, without light or the intimation of (internal) human activity. The plan, cutely dubbed ‘crumbly’, actually involved exploding the usual building form, leaving it as a series of broken shards linked together by the pedestrian spaces – the ‘crumbliness’ seemed to refer more to the porous, tactile surfaces.

The head of the GLC architects’ department, Hubert Bennett, was aghast at the Centre’s extremism and added a grid of precast concrete panels in a desperate attempt to

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give the buildings a ‘face’ of some sort, leading to Herron, Chalk, Crompton and Attenborough’s resignation (they were reinstated after a *Guardian* campaign). On completion the militaristic metaphors of the concrete



The South Bank Centre, London. Photograph © Anne Ward.

forms (not to mention the glass spikes atop the Hayward Gallery) were immediately noted – the review in *Casabella* lamented ‘the idea is as exquisite as the deck of a battleship [...] but on closer inspection, it turns out to be rather a sad collection of Second World War bunkers’. Even its defenders have managed to find the structure threatening and redolent of the emergency architecture of the Second World War: Simon Sadler in *Archigram – Architecture*



*Without Architecture* compares the glinting window of the Hayward Gallery to the slit of a 'pillbox', but claims 'the aggressive imagery of a gun emplacement is tempered by reminiscences of dinosaur movies and comic books'. The latter observation brings us closer to exactly why the Art Galleries and Concert Halls of London's South Bank have such a formal kinship with the Atlantic Wall. Certainly the 'pillbox' gun emplacements constructed in 1940 in Britain lacked the strangeness and complexity of the Nazi structures, so they seem a less likely source. Archigram had always been based on a 'toys for boys' aesthetic of fabulous machines, terrible monsters and available women, one where the science fiction comics they excerpted and reproduced in the Archigram journal could easily be of a piece with World War Two adventures, their horror dissipated by time and commercialism. Nazism might have been just another source of fantastic, malevolent machines to add to the walking cities and mobile homes. There was undeniably an influence from military technology at work in Archigram's imaginary architecture. In *Archigram* 6, a special issue on the 1940s, an editorial by South Bank architect Warren Chalk noted:

The first half of the forties saw a great inventive leap made out of necessity for survival, advancing technology and mass-production techniques and demonstrating man's ingenuity, courage and investment under the stress and pressure of war. Out of this period came a strange social idealism. The idealism was to fade, but not the technology ...

The technology Chalk was referring to was largely 'dry' types of building technique, the easily assembled 'Meccano' architecture which they were trying to continue in the '60s: 'prefabricated housing types [...] part

of the 'clip-on/plugin' heritage'. But what he says could equally be applied to the messier, 'wet' technologies of poured concrete, the heaping of which – whether by slave labourers or contractors – was the common factor in the Atlantic Wall and the South Bank Centre.

Visited today, the South Bank Centre looks distinctly odd in the context of a largely 'regenerated' riverfront. The Royal Festival Hall, into which reaches one of Chalk/Crompton/Herron/Attenborough's walkways, has been given an expensive facelift; the National Theatre which followed the SBC was cleaned up, making its relative classicism all the more clear; and a glass pavilion has been added to the Hayward Gallery. The buildings themselves are as rough as they ever were, however – the precast panels imposed on the complex appear to be rotting, and stalactites hang from the canopies and jutting extrusions; compared with the light modernism of the surrounding area, and the new buildings by Allies and Morrison, it appears ever more strange and ferocious, even down to the heavy, sculpted and weirdly organic metal doors, seemingly escaped from HR Geiger's work for *Alien*. It is in its desuetude that the anti-architectural, extremist ambitiousness of the South Bank complex truly reveals itself. The main reference to the complex in Archigram's written work is in their 1972 *Archigram Annual*, where it is included in a section entitled 'Mound, Ground, and Hidden Delights'. Here the inspiration for the scheme is claimed to be the 'Mappin Terraces', the artificial mountains of London Zoo. Rather than 'buildings', what we have here is a mound, a geological formation rather than a discrete work of architectural design – 'the aggregation of the unlike to the unlike in some amorphous, polyglot organism

that is beyond single buildings, the notion of place and ground and artefacts as transient plantings'. The implosive concrete mound of the South Bank Centre seems designed not so much to be clipped on or clipped off, plugged in or unplugged, as to be abandoned to the mercies of nature, to be left as a series of crags which, as in Ballard or Virilio's descriptions of the Atlantic Wall, are ancient and primal expressions of advanced military technology. The similarity between this and Archigram's more famous projects is that they both represent an end-point of architecture. Here it secedes not to mobility or expendability, but instead to geological formations which hardly seem to have been 'designed' as such. Rather than the Instant City, this is the Instant Ruin.

#### DESIGN BY DESTRUCTION

The resuscitated Modernism of the last fifteen years, though it has a certain amount in common with Archigram's positivistic, high-tech side, excises along with their utopian politics the more troubling elements of their thought. Concrete mounds become the 'sustainable design' of green roofs, walking cities are grounded, becoming PFI hospitals, and the pulp modernism of science fiction and war comics becomes an object for distant nostalgia rather than a similar attention to the apocalyptic pulp of our own time. And although it too may be an object for nostalgia, a complex such as the South Bank, with its series of fragments linked by walkways and cast in a concussive, tactile concrete, is all but unimaginable – in a building with no front or back, where would the tourists point their cameras? Accordingly, the chain of associations which links Nazi fortifications, avant-garde Catholic

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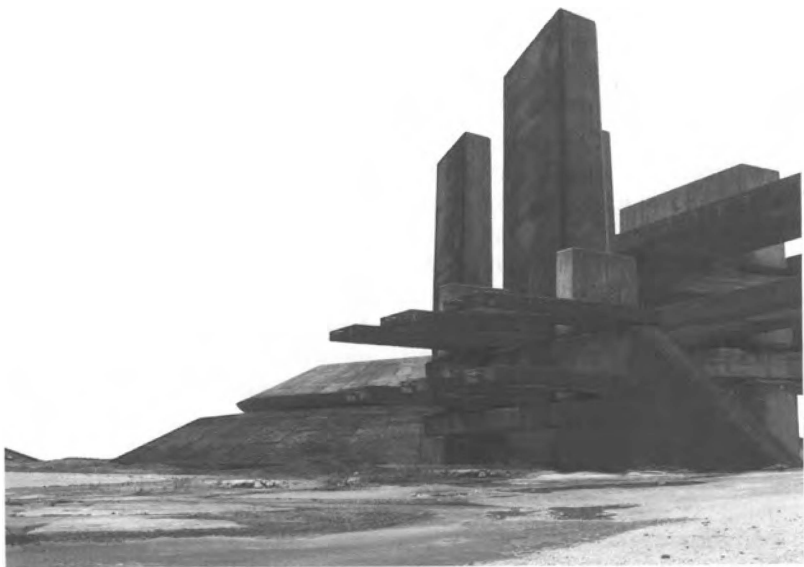
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churches and 1960s arts centres has not continued into contemporary architecture. The fortified landscapes of the 1940s have an obvious commonality with the urban environment created by the War on Terror, whether the buffers in front of the Houses of Parliament, the concrete walls and watchtowers that divide Shia and Sunni areas of Baghdad, or the bunkers and emplacements of the Israeli Defence Force. But little of this spills over into architecture, and finds its continuation more in artistic and political speculation than in buildings.

A particularly troubling example of the former is the work of Nicholas Moulin, who creates exhilarating aestheticisations of blasted, apocalyptic landscapes. Moulin's images of paranoid cities and impossible industrial



structures are a kind of hard surrealism, a singularly unnerving re-imagining of urban space. In 2009 an exhibition of his work in Sheffield showed the inspiration of that city's Brutalist buildings, removed from their historical context and fused together, so that a windowless, militaristic structure such as the city's Electricity Substation is smashed together into the utopian socialist architecture of the Park Hill flats. Three photomontages were produced from components taken from local architecture, under the title *Wenluderwind*. Brutalist architecture was essentially optimistic, an attempt to create an open, socialist city. Yet the only other buildings in Britain to have ever employed so much reinforced concrete were pillboxes and bunkers. In Moulin's images, the difference



Nicolas Moulin, *Wenluderwind 2*, digital print, 2009. Courtesy the artist.

between these two kinds of concrete structure disappears, and the end result is a horrifying but thrilling unarchitecture made up of non-functional, barely even structural planes and fragments, thrown together to create aggressive agglomerations. While the open walkways and pedestrian levels of Brutalist buildings tried to engender community and solidarity, Moulin presents a city without people. The architectural site-spotter might recognise individual components of these compacted forms – the ‘free and anonymous’ planes of Victor Pasmore’s Apollo Pavilion, the ‘acoustic mirrors’ of World War One, the walkways of Park Hill, the cast concrete patterns of Sheffield’s underpasses, the obligatory bunkers – but they become irrelevant in these ferocious landscapes. Here, walkways go nowhere, blocks of flats transform into sheer, faceless walls, formerly functional components become hieratic monuments, girders are topped with spikes, objects are buried in the concrete while weeds crack the surface.

For those of us who admire the spirit of Brutalist architecture, there’s something unnerving in the conflation of its pedestrian spaces with the bunkers of the Organisation Todt. The concrete of social-democratic city planning is here part of the same horrifying rubble as Nazi bunkers, or today’s concrete security walls. Yet another of Moulin’s works, used as the promotional photo for the exhibition, suggests why the utopian and dystopian elements in modernism can be so easily fused. This is an unaltered image of Park Hill, once one of Europe’s most famous public housing estates. In the midst of a gentrification project to make it as shiny and unthreatening as any other piece of regeneration architecture, one wing of the complex has been stripped bare, leaving

nothing but the concrete frame, and something intended to be teeming with life now appears to have been the victim of a bombing raid. Denuded of its function and its people, this very real structure suddenly looks like one of Moulin's paranoid fictions.

While Moulin presents an amoral view of a modern city become atavistic, there are some architects who have tried to imagine a re-use of military architecture for ends other than awed aesthetic appreciation. For instance, the project *Decolonising Architecture*, by Alessandro Petti, Sandi Hilal and Eyal Weizman, envisages the transformation of Israeli military buildings in occupied Palestine (mostly, the abandoned Oush Grab complex near Bethlehem) into a variety of different forms. A bunker becomes a bingo centre, with a watchtower used as the till, severely confusing the IDF patrol. In another proposal, the bunkers are allowed, as with Archigram's mounds and the disappearing, reclaimed bunkers documented by Virilio, to be taken over by nature. This is done for specific political reasons, in order to prevent the re-use of the structures by the Israeli army or by settlers. One idea entails part-burying them in rubble, another advocates puncturing the bunkers with holes so that they can be used for roosting by the migratory birds that converge on the hilltops. The architects call this 'design by destruction.'





### Political Plastic

#### Interview with Eyal Weizman

*In 2003, architect Eyal Weizman co-curated the exhibition A Civilian Occupation<sup>1</sup> in which work by photographers, journalists and architects was combined to present a revealing account of the role of architecture in the Israeli occupation of Palestine. Censored by the Association of Israeli Architects, the exhibition demonstrated the potential of this provocative new perspective for shifting debate on the occupation from interminable moral polarisation to forensic examination.*

*Cutting through the endemic euphemisms and evasions surrounding the debate on Israel/Palestine with a carefully-calibrated assemblage of theoretical analysis, interdisciplinary research and reportage, Weizman's book Hollow Land<sup>2</sup> expands this project, traversing material and historical cross-sections of the occupation and its territorialities to reveal how the governance of space meshes with disturbing new modes of political and military power.*

*Weizman's architectural practice with Sandi Hilal and Allesandro Petti, Decolonizing Architecture, now proposes direct interventions into formerly colonized spaces with a view to defusing their political charge.*

*In our interview with Weizman we discuss Hollow Land, Decolonizing Architecture and his recent work which extends and develops 'forensic architecture', the evolving theoretical framework that has emerged from his research and practice.*

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1. See R. Segal and E. Weizman (eds.) *A Civilian Occupation: The Politics of Israeli Architecture* (London: Verso, 2003).

2. E. Weizman *Hollow Land: Israel's Architecture of Occupation* (London: Verso, 2007).

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**COLLAPSE:** In *Hollow Land* you speak of two distinct senses of the word 'architecture': Firstly you demonstrate that a reading of even the apparently mundane details of architectural projects under the Israeli occupation, reveals political investments, and the use of architecture as part of an extra-military arsenal. But this materiality of architectural structures *per se* embodies, develops and sustains the novel political structures which give the second sense of 'architecture': that of the architecture of the occupation itself, the political process seen as an enterprise of architecture – the construction, partition and organisation of (geographical, municipal, domestic ...) volumes.

We have long known that in being attentive to the practices of architecture and the way that they construct space, we can shed light on aspects of political life; how would you define your distinctive theoretical approach to this problem?

**EYAL WEIZMAN:** In terms of the second sense, perhaps – in a rather abstract way – it is probably best to think about this question as bearing on the relation between *forces* and *forms*. The assumption is that – although in a nondirect and complicated manner – historical events are registered in material organisation. Therefore we might be able to glean from a forensic investigation of material spaces and traces the history that produced them, that is folded into them. The question is: How are histories inscribed in spatial products? And how can we make the object 'speak' them? So this meaning of architecture is a tuning in to the complicated reciprocal relationship between forces and forms.

The term *forensics* is really important here: Forensics, from the latin source, means *in front of the forum*: it is the

art and skill of speaking on behalf of objects – narrating convincing histories from objects, convincing enough to become what we call evidence – to a forum of citizens or judges. Forensics is one of the methods that allows objects (or things) to speak, or a way of listening to them. So there are in this sense two interrelated sets of spatial relations folded into the term ‘forensics’: one is the relation between an event (or histories) and the spaces in which it is registered, and the other is the relation between the *spatial representation* of history and the forums within which it resonates or which it creates. This forensic dimension of architecture can be understood as an act both of claim-making and forum-building.

And it is the methods for exposing this that I was concerned with in *HL*: A process of ‘forensic architecture’ that is different from but analogous to, say, ‘forensic archaeology’, where one engages in a reading of how historical processes become form, and how, therefore, forms or material organisations are diagrams of the spatial, political and military relationships within them.

‘Forensic architecture’ thus aspires to reconstruct and narrate undecided or controversial events through a close study of the material properties of the spatial/urban realities in which these events are registered; to turn mute spatial products into active material witnesses that can be interrogated (and cross-examined). In this sense, the ‘architecture’ in ‘forensic architecture’ designates, not the product of building design, but an expanded field of spatial investigation and enquiry. On the other hand, the adjective ‘forensic’ can be understood as the very condition that enables architecture to become a diagnostic technique, whereby immaterial forces are made manifest and thus proclaim themselves.

But this process is elusive and contingent. Rather than assuming any straightforward mechanical materialisation of time, or a conclusive, transparent, objective apparatus of truth claims, its reading is inclined towards complex, sometimes unstable, even contradictory, accounts of events. It's more like the murky ground of a 'fuzzy' forensics of probabilities, possibilities and interpretations.

Nevertheless, there is a very simple mechanical way to imagine this relation – and I think that the Wall is a good example, because it could be read as one of the clearest mechanical manifestations of the relation of forces to form.

**C:** This is the Separation Wall, which serves as an emblem for one of the fundamental contentions of *HL*: that frontiers and borders can no longer be understood as rigid cartographical boundaries separating territories in two dimensions, but must be understood in three dimensions and as elastic and dynamic. Following Danny Tirza, you describe the Wall as a 'political seismograph gone mad', registering not only state and international intervention, but also micropolitical actions.

**EW:** Yes, you have a construction line of fortification that is elastic, and you have the politics of the Israeli-Palestinian-international political system, on the micro and macro levels: The international community, Palestinian resistance actions, and to some degree the residents of the Wall Zone – Palestinians, represented by human rights lawyers – are all constantly pushing and pulling at the path of this line as it is being built, routing and rerouting it. So that when it 'dries out' – which is the term human rights lawyers give to its state after all conflicts have been registered in its layout

– when it ‘solidifies’, you can see in every twist, turn and detail of the route itself the material imprint of forces, as they are applied within a particular human and topographical terrain. Now, that’s a rather clear way of imagining the relation between forms and forces, but there are many other different ways in which forces are mediated into form, in what is always a complex process, that I hope also to capture or at least to note. Whether or not it achieves it in finished form, the book sets itself the task of thinking this materialisation of time, and it sees matter not only as an imprint of relations, but as itself an agent within the conflict.

The wall is initially a media space. Walls really do not stop flows. They modulate flows across them – differentiating them: money, people, electricity, sewage, water ... it’s a system of filters and modulations. And the act of crossing is also always registration, recording, etc. Ultimately, if you want to cross the wall, if you’re determined to cross it, you can; there may be a delay but it can be crossed. If not I wouldn’t be able to go to work, which is on the Palestinian controlled side of the wall. So its path is seismograph of political forces, and also it registers all things that pass it.

**C:** An actor as well as a register.

**EW:** Yes, the Wall is an archive in these two senses of the term: it’s an archive of all movements or flows across it, and its own movement (its constant transforming path) is an archive of the formative force fields surrounding it. Because the Wall is one of the objects that registers its environment, environmental forcefield – political environment – it can read this in a forensic sense.

So, you can see the politics in things, politics as it is articulated in the relationship between processes, agents, etc. across the territory. Consequently, if we dare to look at politics as a material politics, then architectural methodology is useful to analyse it. Politics can't, of course, simply be reduced to it; but it is incredibly useful to take it seriously, in terms of that kind of forensic relation.

**C:** If we refrain from saying that this second sense of 'architecture' is 'more profound' it is because of your refusal to treat 'empirical' architectural details as semiotic epiphenomena, mere *representations* or *signs* of supposedly 'deeper' infrastructural determinants. This seems to provide the key to your conception of the relation between the material practices of architecture and the idea of an 'architecture of the political'. You write of the wall that 'The logic of the late occupation is not represented by but *embedded* and *saturated* within these structures. The Wall itself *reiterates* some of these built physiognomies.'<sup>3</sup> The two senses of architecture, therefore, are intertwined in a variety of ways, through the multiple examples of embedding, saturation, reiteration, that *HL* exposes.

**EW:** Each material, in each example I'm writing of, has its own characteristics with regard to the way in which it invites politics to participate in it. So on one hand you could say the Wall is equivalent to a sensitive photographic film. But not in the sense that it is a representation. Things are printed, not on it (in a symbolic politics of graffiti) but *in* it; its form is a snapshot of certain changing relations.

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3. *HL* 153, our emphasis.

But this has to do with the way it is constructed: the modular units which allow certain kinds of transformation, the way in which some material characteristics determine how it sits on the topography itself. So there are so many features through which politics traverses an object. Some of them are underground in the porosity of rock, the flow of water, in what kinds of plants grow on western side slopes, because the rain clouds come from the west, and drain back to the west. Ultimately, what goes into that kind of layout are so many natural, political, artificial, micropolitical forcefields, influences in which the Wall itself participates as an agent, in this kind of complex ecology of things. We must find the language to open up political process to these fields of knowledge. I find that otherwise politics is too often reduced to a kind of intentionality – you always need a culprit ... in whose mind an ‘evil scheme’ is emerging.

**C:** Then the heroic task of resistance becomes that of unveiling the ultimate centre, the face of power behind the complexity ...

**EW:** Yes, so a lot of the time accounts of the wall are just boringly simple – Ariel Sharon drawing a line, Israel wants to do this, and so on ... but they leave out everything to do with material characteristics. Also the problem of the path of the Wall has to do with the negotiation between security and agriculture: Agriculture is what forms the basis of the Israeli High Court of Justice’s calculations of proportionality, i.e. the amount of wheat or olives that can acceptably be traded for security. This kind of negotiation is interesting politically, because it means that the Israeli structures are designed not according to their

explicit political rhetoric, but through actual self-imposed moderations that are the only way they can achieve success. The moderation process of the occupation is more interesting than its naked application of power, because it is in this moderation that *calculations* take place: life versus security, water versus control, and, beyond these simple binaries, a whole field of calculations through which the occupation takes shape. This disturbs the simple logic of security, which is very politically determined. The minute this logic is enacted, it becomes a matter of counterbalances – all sorts of other agencies come into the picture: farmers, but also underground water, land consistency, real estate interests, community leaders, topography, environment and environmentalists, latitude, height, old graves – all these things, all these agents.

**C:** This vision of the multiple agencies involved seems to minimise the role of the state: its agency need no longer be central to understanding the process of colonization. Nevertheless isn't the rhetoric of naturalisation – the notion that the process is in some sense the natural outcome of multiple intersecting forces – precisely that invoked by the State to dissimulate its power behind an 'appearance of disappearance'?

**EW:** Yes I agree, but it's not a case of disappearance, it's more a case of the *strategic withdrawal* of the state: it appears and disappears. There's a real strong state form, constantly balancing these forces, and then acting visibly and declaring their suspension. Gaza is evacuated – we could say, it's worse, it's still occupied. Nevertheless, something has been done – Israeli settlers, by an act of



state, immediately lost the right to live there, their lease on the ground was terminated. So, the power of the state is that it is withdrawn and then reappears. The interplay between chaos and order is extremely useful to it. This might be a particular feature of this colonization: the withdrawal of the state, the appearance of a 'weak state', the creation of a degree of chaos, are necessary means for having acts done outside and despite the law (international law and Israel's own) and outside state agreements and obligations. The complexity of multiple agents and the chaos of the frontier is very much manipulated by this state power. The paradox is that the state must suspend its own laws and rules so as to expand the territory, to land grab and kill, in order to create what it calls 'pacification', upon which its laws can again be applied. That is, the law has to be disregarded (not suspended) to be later enacted only when the frontier is pacified. Think about the American frontier with its genocides – which make way for the 'normal' rules of democracy to apply. This is the reciprocal relation between the frontier and the centre: the centre provides the means, the infrastructure, and when necessary the military support, and the groups are allowed to operate outside state purview.

But the frontier also demands things of the centre – politics as material reality is undertaken in the frontier. The state, which likes to think it's in control of this process, is also more or less dragged behind these processes. It imagines it can control these forces, and sometimes it can, but often the facts on the ground completely steer and shape its politics.

So this poses an historiographical problem: whether the settlement geography was planned or whether it emerged out of this interaction, without any kind of top-down planning and clear political will. This historiographical

problem is similar to that of the ethnic cleansing of Palestine in '47-8. How did it happen that at the end of the war there were 750,000 Palestinians outside of state borders – by design or through a collection of contingent singularities?

These debates mirror the *historikerstreit* – the ‘battle of historians’ – over the Jewish genocide in Europe: To what extent was Hitler a weak dictator – Kershaw’s thesis – and the beginning of extermination a process of cumulative radicalisation born out of chaos? Mommsen Bozart and Kershaw’s model is that, although we imagine the Nazi state as very organised, bureaucratic, and so on, what happened was born out of bureaucratic and operational chaos: partly through the fact that the people who could manage state affairs – the Prussian state’s highly-trained bureaucrats – were replaced by the Nazis, who had no experience of government, and who started competing for the attention of Hitler; and partly through the nature of Nazi organization, which was kept deliberately overlapping, with internal conflicts and lack of clarity so that each will have a clear relation only to the top rather than laterally.

According to this model, when the killings start in 1940 in Poland, there is a level of ambiguity in the orders to the killing groups, the *Einsatzgruppe*. Each one takes initiatives, tries to outflank the other, tries to out-radicalise to get the attention of the Nazi commanders, and from within this chaos a project starts emerging, before it is fully theorised.

And the same discussion happens around the aforementioned problem of 1948: There is no question that the Zionists pushed the Palestinians, the Arabs, out of the country; the question is how this reality was created. And military historians such as Benny Morris say, in fact it starts with the battle over the roads – certain tactical necessities,

some commanders needed to secure roads and didn't want people and houses by the side of the road, and they start expelling some and later they realise that people leave easily, and that they can make them leave ... and then slowly that tactic is mimicked by others, until it emerges as a state project of ethnic cleansing and expulsion. On the other hand there are people like Ilan Pappé, who looks for the decision and the organisation in all this, arguing that from 1919 on there was a planned Zionist project of expulsion that was prepared in advance and carried out under orders, from the top down.

Now, the 'cumulative radicalisation' theory is nourished by functionalist approaches to history. And although I do not fully subscribe to that approach, I can see how it might be useful in describing the emergence of the elastic and ever-changing forms of the occupation. This is not to exonerate Zionism – to say that it's a kind of 'natural process' of expulsion. On the contrary. It *diffuses* responsibility, meaning that every unit or cell in the military knows exactly what to do – *without an order*, it internalises ideology, allowing every single soldier or commander to know what is expected of him *without* getting the order, or every member of settlement youth to know what to do. So that in fact, if you want to discuss it in terms of responsibility, of liability, it creates a wide diffusion. It's not a matter of separating decisions and their executors – the politics runs through the body of every soldier on the ground, the decision runs through them. So ultimately, we can think through functional analysis without making this very easy correlation between naturalisation and exoneration. When ideology operates thus, there's no need for speech. But it's not ideology in the modernist sense that we usually understand ...

**C:** And, to go back to *HL*, what part does architecture (in the ‘first sense’) play in this ideological diffusion?

**EW:** In the organisation of space that we discussed: how does space emerge, how are the networks of settlements formed, what dictates the path of the wall ... ?

Space is not a representation of a politics that would already otherwise exist in the abstract. Politics operates and flows *through* and *in* spatial practice. The architects are only part of a widely-diffused set of spatial practitioners, but without the architectural discourse and practice that was developed around the problem of building in mountain terrain, without the development of serial modes of construction, and without the complex principles that I describe in the book as ‘optical urbanism’, much of the aggregation of construction would not have been able to take place as it has.

**C:** There are however also rather straightforward examples of the ideological (in the usual sense) charge held by architecture – for instance the question of the use of nativism as an aesthetics in settlement architecture. In *HL* you describe the construction of dwellings that sustain ‘national narratives of belonging’,<sup>4</sup> with the cladding of Israeli dwellings with ‘Jerusalem Stone’ and the omnipresent red roofs. This indicates how strongly such imaginary ‘authenticity’ can (at least for those who have an investment in it) outweigh historical and geographical fact, thus allowing an architectural cosmetics to speed along the process of naturalising occupation. You emphasise the

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4. *HL*, 26.

way in which, with the reducing thickness of the ‘facing’ required, this became increasingly admission that this was cosmetic signifier that bolstered the ‘sacred identity’ of ‘Israeliness’, retrospectively creating historical authentication and a biblically-supported sense of permanence.<sup>5</sup> – this being one way in which political exigencies influenced and promoted debates within Israeli architecture. Another aspect of this which you discuss is the merging of archaeology into architecture, with new buildings being supposedly only renewed expressions of a rootedness in the earth, and thus guaranteeing the discovery of a ‘meaning of the earth’.<sup>6</sup>

**EW:** In the latter case there is a kind of literalness in which what is archaeologically preserved is extruded into a volume, and that is very much to do with a directly Heideggerian influence, or variations on Heideggerian theory, which become apparent in architectural discourse throughout the seventies and eighties; and if you think of it, it makes a lot of sense. Dwelling replaces living ... meaning is brought back into the anonymous environments of modernism, national causes of ‘solutions’ replace housing solutions. Here a variation of this discourse comes to resolve the embarrassing paradox of Zionism: In a sense, what could be more unrooted than the early architecture of Zionism, the white boxes, the international (often mistakenly called Bauhaus) style, the kibbutz – whose construction on ubiquitous pilotis seem to hover over the surface. So much of the architecture of the colonies around Jerusalem is one of the earliest playgrounds of postmodernism worldwide.

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5. *HL*, 28-37.

6. *HL*, 41-5.

## COLLAPSE VI

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Which is what brought to Palestine such luminaries as Louis Kahn and Isaiah Berlin. But I don't know if now the answer to that is a return to abstract modernism ...

**C:** As we have discussed, you see the occupation developing less as the carrying out of a top-down Zionist state project, which would organise space according to a set of pre-given principles, and more through a selective 'laissez-faire' policy, exploiting the 'structural advantages' that chaos presents, that has allowed a multiplicity of agencies – commercial, religious, communicational, infrastructural, economic, pressure-group, legal, etc. – to produce a complex interaction, enacted in part through the organization of space, that tends to justify the processes of occupation.

Much of what you do in *HL* is to try to balance the description of the Occupied Territories as a sort of 'political plastic' which does not respond to a 'single source of power' with simultaneously trying not to yield to the temptation to vindicate this strategy of naturalisation. Can we detect here an isomorphism with Capitalism, which, as we have repeatedly seen, can hardly be combated through a head-on refusal or attack on any set of hardwired ideological principles, but employs and absorbs whatever is available, through a similar sort of 'structured chaos', until it seems there is no alternative to its 'second nature'?

**EW:** I would say yes – I think that, let's say, postmodern capitalism and the postmodern occupation are close relatives. We just need to historicise this: It is significant that the occupation occurs in '67 – which Chris Marker called 'the real '68' – a time of antistatism, political

complexification and fragmentation, and of the introduction of new modes of technological and organisational networks. That mode of capitalism and this mode of occupation are both historical products, and being historical products, are prone to transformation. There is no eternity in any of them. There is a way in which the hysteria of the loss of any ideological alternative articulated by political power has led to this vision of capitalism as eternity – i.e. as nature, outside of history. But I don't see how this idea may survives five seconds of thinking.

**C:** Isn't the problem vis-à-vis capitalism rather how to overcome its *apparent* natural status and the resignation that it invites?

**EW:** 'Natural' is being outside history, in a way that came from nowhere, goes nowhere, will remain the same. I think that what we perceive now is a very distinct stage in the history of articulated class, labour relations, trade relations, that articulated this period in that way. There is no historical necessity in that historical product; it is political practice that can make it transform or do away with it.

**C:** Very well, but another aspect of this isomorphism might be as follows: You have spoken of 1967-8 as a turning point for an understanding of the occupation. How would the shifts happening in this time tie together the emergence of what we might broadly call 'postmodern' philosophy, and the movements that you track in *HL*?

**EW:** As I said, I agree with Chris Marker on one thing: that '67 is the real '68 – he wasn't referring to the occupation, of course, but it's true, one bleeds into the other, in all sorts of military practices and architectural styles. Part of the settlement project is initiated by Jewish communities from the States that come with a strong tradition of civil disobedience, of protest movements; and they protest against the state, they fight against this ossified labour-run state, their ideal is to break the state apart, and they do it with the zeal and some of the style of the sixties generation. Sharon is a state agent who breaks the state – the frontier man who despises state order and replaces it with action that legislates in retrospect. Sharon appears as, and behaves like, a 68er – with his raids, his kind of trip is going on unauthorised attacks to the desert, shutting off communication, killing, moving, swimming in the sea, you know, whatever, killing hostages, he's in this wild violent orgy. That's the violent face of the antistatism of the sixties and seventies.

**C:** He inhabits 'smooth space' ...!

**EW:** He's one of the embodiments of '68. So again, it's not like a secondary manifestation of '68, like maybe '68 wouldn't have happened without this world ... The other project that exists is third-worldism, which is broken in '67. So okay, I don't want to put Israel at the centre of everything – yes, it's Prague, we saw the tanks coming, we understood the Soviets weren't so good ... but the other project – *tiermondism*, that is broken. So, you become NGOs, you become Green, this or that. But this is a moment where those histories are like engines moving each other.



You can't see that kind of face of capitalism as if it's the 'background' to the occupation, or the years of Israel of very significant prosperity at the end of the sixties, which is actually partly the motor of the transformation of the left. I'm going back to what we said at the beginning: It's not something on which it's registered, it's *part* of it, it's creating that. What collapses in '67 is not the West Bank, that's a minor story. Pan-arabism collapse with '67, and this is the loss, Nasser goes – his project is dead, America enters the Middle East and there is huge capitalization – an immediate undoing of political relations in a way that creates a hugely complex market. So again, it's not only what happened in the West Bank – the whole Middle East transformed in '67. Pan-arabism, the utopian social semi-communist nationalism that Nasser invented, was replaced with what only now becomes apparent as liberal pan-arabism, on other kinds of networks. So in effect it's a moment of cultural, economic, technological transformation, and we absolutely have to see the occupation as happening in that moment.

**C:** Further considering your 'forensic' approach, I wonder whether we ought to try to distinguish it from something like an imagined 'geo-psychoanalysis', aiming to excavate the unconscious material forces at work behind symptoms such as "separation walls", "barriers", "blockades", "closures", "road blocks", "checkpoints", "sterile areas", "special security zones", "closed military areas" and "killing zones".<sup>7</sup> Chiefly because the latter might begin to sound like a species of 'psychogeography'. And indeed you begin *Hollow Land* with a quote from Patrick Keiller's *London*,

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7. *HL*, 6.

a film dear to that group of writers that developed this now-popular set of ideas and practices concerning the relation of thought to place. However, the account given in *HL* seems to tell in very important ways against the tenets of this literary creed. Psychogeography often seems to suggest that merely by reconceptualising the spaces around us, by (in the words of your Keiller epigraph) 'revealing the molecular basis of [...] events', we can effect some sort of transformation – and to this extent is essentially a form of magical thinking. But even if understanding the past can help us to 'see into the future', no such kind of interpretive magic is going to transform the circumstances of the Palestinian people. What is the key to preventing psychogeographical insights from descending into a kind of literary indulgence, and transforming the results of research such as yours into pointers for concrete action in the present?

**EW:** Yes, I think the book is written very much as a polemic against this and Lefebvrian theory, which situationists and psychogeographers refer to, and which really dominates very much critical spatial and geographical discourse on Palestine. For me, the really big problem with this type of literature is that it perceives space as simultaneously too soft and too hard. It is too hard in the sense that the built realities – the work of planners and architects and builders – is solid, fixed and unchangeable. It is too soft because often it sees the possibility of agency existing in the mere literal subversion of the existing, like a de Certeau kind of walking-is-reading-is-writing ...

So you have the domain of planners, those evil guys who designed Paris top-down. Paris is always the conceptual

framework with which this discourse works, and in the West Bank this makes no sense! A hard city, with planners who make straight lines, Paris as a material/political reality has dominated critical post structural discourse, but in applying the spatial theory of Paris to a dynamic frontier you miss its essence of interplay and a certain levelling of agency that operates within it. You cannot solve the problems of Paris on the hills of Palestine! ... And then you have the domain of subversion and resistance, where what is left for our citizens to do is to reimagine, to exist in a playful manner, to walk different paths, and so on. For me this is too soft, and the perception of the planners is too hard. What you do by melting them into each other, by seeing a kind of continuity, an elastic space, you basically put all action on the same level. This levelling is something very important: The Palestinian resistant, the militant, the Israeli planner, the human rights activist, the corporation – the interaction between them is very multivalented, very complex – call it a forcefield, but it is also an *interaction* that produces and reproduces space, and for this you need the constant presence of all these actors. Basically, you have to imagine a different consistency of space: rather than space that is paradoxically too hard and too soft – which can only mean resistance that ends up soft and oppression that is too hard – you need to imagine a common plane, gelatine-like, on which those forces are simultaneously existing and interacting.

Of course, this raises another problem, which we have to acknowledge, a political question: how to think resistance when it becomes one of many formative forces of the making of the spaces of the occupation, playing in this arena and according to these parameters.

## COLLAPSE VI

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Are oppositionary actions merely another formative force in the making of the realities of the occupation, and if so, how can we differentiate between this and effective, meaningful resistance?

I will give you an example of weak oppositionary action that ends up reproducing the spaces of occupation. Recently I went to meet a representative of the Quartet in Palestine. You know, the US decided it doesn't have enough power to influence Israel, so they joined with the EU, the UN and the Russians – they formed the Quartet. These are four powers that could destroy Earth four times over; and they have put Tony Blair at the head of this joint organisation. And this guy is Tony Blair's representative – he is based in the American Colony Hotel of Jerusalem, has a entire floor there. So he invited my partner and I, and we start drawing up visions, and I talk and talk, and at some point I realize that he is somewhere else – he's saying, this is all good and fine but actually ... listen, what we can do now is to propose architectural plans to improve the checkpoints, to make them more comfortable. This is what he wanted to talk to us about.

**C:** The problem is posed exclusively in terms of amelioration.

**EW:** Exactly, so where is the moment of transformation? The other day the former Israeli Chief of Staff said something really derogatory about Zionist leftwing organisations and human rights groups, said they are traitors or something similar, and the current Chief of Staff said no, without these organisations there would be complete chaos! Which we

can understand as meaning that the occupied areas would be ungovernable; and that therefore these groups are also part of the government of the occupation, these organisations are most important for the Israeli project ... so at this point you just send back your membership card ...!

**C:** So once you've conceptualised these agencies as interacting on the same plane, how *can* you define resistance *except* as participation in the same game?

**EW:** If resistance is not complete withdrawal, if it is articulated through some form of action, the question is whether there is a mode of action that might contain the possibility of a break rather than the constant elasticity of material organisation and political evolutions. This becomes a philosophical question which I can only attempt tentatively to deal with. We must think of it in terms of the question of the Lesser Evil, which is the subject of my new book.<sup>8</sup> I here try to engage in philosophical and theological concepts, but only insofar as they emerge spontaneously from the problem of how this interaction on the same plane can actually create a new plane, can lead to a transformation, or a phase transition – that is, something beyond the rules of the game that already exists.

**C:** The problem recalls the polarisation on the question of the 'event' that we find between Badiou and Deleuze: Very schematically, Badiou excludes the possibility of novelty emerging from the actualised 'situation' or state of things,

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8. *Il male minore* (Rome: Edizioni Nottetempo, 2009); *The Lesser Evil* (London: Verso, forthcoming 2010).

since the event is precisely something that cannot be read in any of the terms of the situation, and which is drawn out through a *subjective* fidelity to a universal truth that cannot but be seen as 'impossible' in those terms. Whereas Deleuze seems to suggest that an effort made against our spontaneous acceptance of the terms of representation or actuality (the 'image of thought'), might enable one to read the 'landscape' of virtuality itself, and prospect within the infinite resource of the virtual for intense singular points or 'lines of flight' that can be actualised.

Of course, the charges which advocates of these positions make against each other are respectively, that of waiting, militating, for nothing less than a decisive miracle; and that of resigning oneself to a piecemeal re-engineering, re-formation, of the existing world.

**EW:** This bears a lot on the problem; if one is limited to either of these respective 'camps', it is rather clear where it places me, as it seems to me that the necessary transformative event could only emerge out of our political practice. There is thus a double problem, one of waiting for the arrival of a new political field, as the condition of a new life, the other that everything one might do would be already in the name of the occupation, because it is carried out under the occupation, in its endlessness. So we need to wait, or to pray, maybe a god can save us ...

I guess one of the ways to complicate this further is to think of the idea of political action in relation to the end, which is embodied in the term that everybody uses, that of the *solution* – the two-state 'solution', the one-state 'solution'. Yes, in fact, these days the politics of Palestine – or the politics on Palestine – is indeed locked between two

positions – end versus endlessness – one demanding the ‘end of occupation’ and the other claiming that no end is in sight and that there is a certain endlessness of conflict. This latter point of view is not about what solution to take – ‘this one is *good* and this one is *not good*,’ or the details of a solution, but rather about the idea of whether or not a solution is possible at all.

If a solution is not possible, this position goes, we are trapped in an ‘endless present’, a historical process without culmination. And without a solution we have to be able constantly to manage the conflict. The question then becomes that of finding *means of government* and the technology – much of it spatial technology – with which to manage this ‘endless present’ ...

But we should make it clear that the search for the end was itself always part of the mechanism of the occupation. Every form that the occupation has taken since 1967 has been presented as an attempt to end the occupation. Perhaps the only constant thing about the occupation is that there are always attempts to end it. The geography of the occupation is thus physically shaped by the attempts to end the occupation, or to put it differently, to give shape – territorially, economically, and politically – to its never-ending end. We are constantly on the brink of having the occupation finished (another small push, another initiative...) and all actions on the ground (building settlements/evacuating settlements in Gaza, building outposts/removing the outposts, erecting the Wall/changing the path of the Wall) are undertaken in relation to this impending end (‘why don’t they let us end it?’). Each of the specific constructs that *HL* unpacks could be understood in relation to the concept of the politics of the (impending) end.

When discussing the end and looking at the ground, we tend to see yet another layer of physical apparati added to the growing piles of destruction. The occupation is finally nothing but its constant end ... Therefore we need be suspicious of anyone that runs under the slogan 'end the occupation' – they must have yet another spatial apparatus in mind.

So this is how I would approach your question: It is by changing the frames of this 'end', this 'solution', replacing its terms with others, that we can give rise to another political reality and physical reality. And so, in the context of the research office I co-direct with Sandi Hilal and Alessandro Petti, what we have done is to replace that word 'solution' with a slightly old-fashioned, very banal word, but one we think is right: *decolonization*.<sup>9</sup> Which in fact refers to principles, to values, to a process rather than to an end-state. Decolonization doesn't mean people need to be moved from one place to another, but it rather means a system of inequalities must be undone, and the rest follows. The system in question is related to the land, to the law, to the military, to anything that's structured by colonialism.

In *Hollow Land* I presented *Decolonizing Architecture* as a chapter that deals with a project for the Palestinian ministry. Prior to the evacuation of the ground settlements in Gaza in 2005 I was part of a team speculating on different uses for these colonies/suburbs when in Palestinian hands. Issues of architecture were then at the centre of geopolitical debate, with the main question being how to understand and reuse the single family suburban home. The Americans saw its subjectivation potential, with Condoleeza Rice suggesting that its being inhabited as a suburban home by Palestinians

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9. See the *Decolonizing Architecture* project, at <http://www.decolonizing.ps/>.



would befit an American agenda that seeks to civilize Gaza by creating a broad-based middle class. In the end, the Israelis opted for destruction, part of the reason being the wish to deny an image of Palestinians living in homes of Jews (demonstrating a certain reversal and thus reversibility of a Zionist project otherwise typified by the opposite). In 2007, I joined together with Alessandro Petti and Sandi Hilal, with a grant from the Hodenschild Foundation, to form a new version of the project, this time on the West Bank. We decided we did not want to work with the Palestinian ministry, which since 2006 is no longer an elected body. So we formed our own organization, which is independent, and we have an office in a house in Beit Sahour, a little town just east of Bethlehem, on the edge of the desert. Initially, we had to change the way that architectural practice works – we turned the office into a residency. There are many volunteers: architects from Palestine, and internationals. And we run it also as a seminar, with readings and lectures. We hope that, and in some cases see how, our designs start to help in setting the stakes: Politicians or NGOs are using it to claim for land or to make a legal suit for various things. Architecture can become a tool in the political process.

To explain the thinking behind this project, let's look at 'decolonization', and the other concept that might start to guide an egalitarian future in the context of Palestine: 'return' (of refugees). Every 'return' of refugees from where they have been expelled is already a return to the (over) built, a displacement from the rural that will seek a return to the urban; there is no longer a virgin landscape to return to, or else the search for the original landscape will entail horrific violence. Like 'decolonization', 'return' suggests a relation of deactivation and reversal, a relation to the past

and the future simultaneously; but there is no return to what has been lost, there is only a return to the built, and this return has also an explosive potential to articulate egalitarianism when one thinks about the transformation of realities on the ground.

Therefore, by articulating our political action vis-à-vis that kind of principle, the principle of equality between Israelis and Palestinians across this area, I think this is a much better frame than talking about this state, that state, four states, or whatever. Ultimately that's not what is important. And therefore we think that there are moments of possibility in the present where one can start articulating the idea of equality, seeking to open another trajectory. And these are those moments of the real transformation of the structure of the system itself. But one needs not wait for a miracle to start acting. You show that a relatively small part of the system – say a settlement – can be liberated, even as part of a compromised political process in relation to the politics of the present; when such a colony is unplugged from the political forces that charge it – one may say that it becomes a banal suburb ... whereas right now such a suburb or colony is charged with the people who live in it, travel to it, come on the roads to it, the soldiers around it, electronics, and so on. It had power – does the power that exists in the architecture of colonial exclusion remain in it like a residue, when it is unplugged? The problem is also how to use it in a way that does not reproduce, that really breaks, this relationship of power and form. So: articulated differently, inhabited differently. Not in a kind of soft way – 'let's imagine we're in a different world' – but 'how do you build something else from it that is real?'

This action could be accused of being part of the contemporary politics of oppression, but the question is whether there could be something in excess of this order; what is this excess? What other trajectory is it possible to open by refashioning the colonies, and why is it important? We maintain that by operating with the term ‘decolonization’, by demonstrating the possible other life that could exist within these moments of liberation, one might open a way to operate in the present in relation to a future that is much further away than the one-state/two-state thing. So it’s both immediate and very far.

**C:** So the spaces despoiled by power represent an opportunity in so far as they become depotentiated in terms of the existing politics, and operate within this new political temporality. But does your speaking of ‘excess’ reflect a kind of materialist principle of hope (immanent, and set against both the hopelessness of the endless present and the redemptive hope of a solution): That (geographical, architectural) matter is ultimately innocent, that matter, at some level, can be decoupled from power? Isn’t that a dangerous assumption? Is matter ever possessed of that kind of divine neutrality, beyond temporal political power?

**EW:** I like your suggestion of a materialist notion of hope. The issue is of course about the residue that is left after this unplugging. This lingering residue is different in each case, with each building and/or military base. The task is to identify this power that remains, this charge, and to attempt to reorient it.

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**C:** The occupation seems to have continually identified geographical and topological contingencies, accentuating amplifying and exploiting them through architectural intervention. *DA* employs similar tactics, but in order to defuse colonial power.

**EW:** Again, I think you can say that our aim throughout the project is not to simply undo the power and techniques of the occupation but to reorient them.

For instance, we have permission from the Mayor of Beit Sahour to redesign a military base that was evacuated two years ago.<sup>10</sup> It is a beautiful area overlooking the town (obviously) and the desert – horrible but also beautiful. It's like a big fortress where soldiers piled earth continuously into ramparts until the top of the hill started looking like the crater of a volcano. And in there, in this place, by some



10. [http://www.decolonizing.ps/site/?page\\_id=210](http://www.decolonizing.ps/site/?page_id=210)

fluke of nature – you know migrating birds travel through Palestine on the way from Siberia to Africa, because they all travel through what is called the Syrian African crack; it's a kind of navigation and migration route for them. And every year they return to specific hilltops. This is a fantastic spectacle of nature, where for several weeks in fall and spring you have tens, maybe hundreds of thousands of birds circulating in swarms in the air, and somehow landing on those points. One of them is this military base – the Palestinians joke that the Israelis abandoned it because of a kind of 'Hitchcock effect'! And in a sense our claim, the legal issue that we participate in because we designed that site, is not on behalf of people but on behalf of nature. We almost want to say, human rights, its claims and its regime is ridiculous here, it's too late, and anyway it's become part of the language of the occupation itself. So we use birds as the subject of rights in court, something that has rather confused the Israeli authorities. But as you know, this refers to the courts in mediaeval times where animals were standing trial. Our articulation of the idea of return here was a 'return to nature.'

**C:** An example of real naturalization ...!

**EW:** Or rather, using nature politically ... We're claiming it back for nature, and designing it simply to be abandoned and used by birds. We design not for a construction but for the controlled disintegration of the building, we accelerate or intervene in the process of its disintegration: Decay as a process of form-making in architecture.

My partner Alessandro Petti is a student and a friend of Giorgio Agamben, and the latter is sometimes involved in

our discussions. He introduced his concept of 'profanation' as a way of thinking the deactivation of the spatial apparatus of exclusion. Sacralisation follows the spatial logic of the separation of the sacred, when a system of exclusion simply moves down from the order of the divine. If the sacred, as a spatial practice, separates and secludes things out of common use, profanation is the undoing of this process. The dismantling of the power that exists. 'To profane' signified a restoration of things to the common use. For example, one of the main interventions was in the grounds of the settlement P'sagot, where our intervention sought to transform parts of this suburban colony into a nucleus of public institutions.

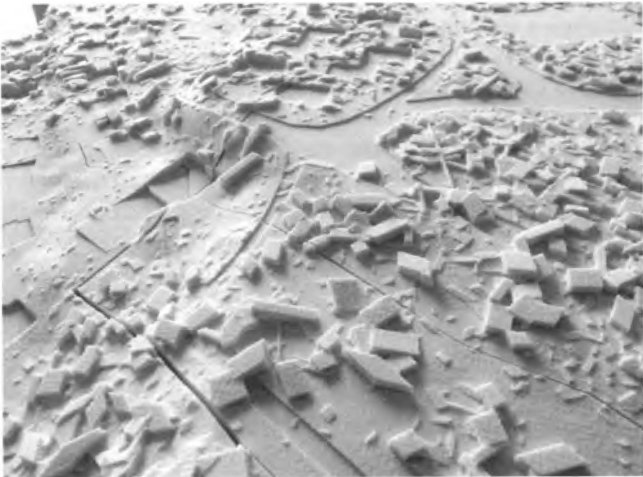
We think that at present, our task as architects must be that of transformation of the existing; and in relation to the ground, it must be articulated in relation to the question of *ungrounding*, a form of construction that creates a different gestalt, a different figure-ground relation, between construction and the landscape.

The question of ungrounding is really that the ground is a certain code, both at the operational and symbolic levels: the code of the city – its operational logic and its ideology is in the first fifteen centimetres. We are not concerned with the changing of the buildings themselves. Architecture has dealt successfully with the problem of this transformation – we know since the sixties that every structure is adaptable to any use – the question that remains, however, is that of the surface itself. It is a 'thick surface' in which occurs the designation of private and public, walk/drive/no walk, the relation between figure and ground, between the object and the surface on which it relies. So that is the challenge architecture is facing. And this is where *DA* intervenes.

**C:** When you come to rebuild these first five centimeters, what models do you rely on to avoid simply creating new problems by unilaterally imposing a new ‘plan’? Which agencies would be involved in the re-territorialisation?

**EW:** In some parts of the areas we deal with, the regrounding is undertaken in a way that allows for multiple uses. We called it – with situ studio in New York – a ‘smart surface’ – a single ground surface area that could be used for driving, walking, growing. This is achieved by a variable density of paving elements produced from rubble.

**C:** This is interesting in relation to the philosophical discourse on the search for grounds, the Kantian task of properly grounding philosophy, followed by Nietzsche and others’ repudiation of this architectonic ambition.



Reversing Kant's use of ground as a metaphor for philosophical security, could we say that it is in fact, this very concrete sense, the ground – the 'first five centimetres' – that furnishes us with certain – political, social – certainties?

**EW:** Yes, as I mentioned before, the city is not spatially governed so much by its structures and buildings but rather by the way it organises and divides the surface. This is why is it essential to seek transformation not only in the buildings but rather in the ground itself; ungrounding is a certain 'liberation', we feel, from the prescribed order of planning – at least part of it ...

**C:** A key to the nature of the strategy of the occupation is given in one of the epigraphs to *HL*, where Mourid Barghouti speaks of 'the duality of intelligence and stupidity'. This is a proposition with a double-sense, it describes a double obfuscation: You note throughout *HL* that the use of sophisticated theory has been a camouflage acting to evade responsibility for what are, at base, brutal and murderous processes – so that complexity provides cover for stupidity; at the same time, a wilful strategic stupidity and slowness in reacting has also proved useful for allowing irreversible processes to become 'locked-in' which then must be retrospectively recognised (naturalisation). These things take place through very complex processes but, as you show, these processes are quite amenable to a theoretical analysis: so here again, the status of theory is ambivalent – the insufficiency of thought is professed at in order to resist a theoretical purchase on the complex reality of the situation, but theory is used where convenient to provide a sophisticated façade for brutal actions on the



ground. Was the application of ‘postmodern theory’ by the Israeli military ever more than an alibi?

**EW:** I don’t think this question of theory is particular to the military. The people who most often apply theory, at least around me, are artists and architects. And I think sometimes theory does open up new sensibilities, without being translated literally. But theory, in the context of your question, belongs to a shift in sensibility; and military practice and theory produce, they go on producing – in an oblique way, they move in relation to each other. Along with the technological possibilities that were opening up, and the organisational innovations, there were philosophical innovations coming from other sources – early network culture for example. So they find echoes in each other, one language gives rise to a term that starts reorganising things in another system, but usually according to the latter’s inner necessities and dynamics. So I think the answer is not to say, this or that manoeuvre is ‘rhizomatic’ – and that because military academies read about ‘smooth space’, they started walking through walls – but rather that the necessity to walk through walls, arriving out of military developments, finds the language with which it can be articulated, explained, and thus extended.

Incidentally, I thought I had found the first manuscript about walking through walls in a nineteenth-century military manual of counter-revolutionary practices, but a colleague showed me recently that in Roman siege manuals, this system already existed – In fact, it’s a natural thing to do if you’re a soldier and you’re moving through the city. But obviously, what I think happened in this case is, the question was how you co-ordinate thousands of people that

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are walking through the solid bulk of the city. To do this you need technology, not just theory; but to *imagine* that possibility is a leap.

On the other hand, I write in *HL* that the language of theory was not necessarily used against the Palestinians, but was used in the internal conflicts of the military itself – that some groups within the military created a language that helped them to define a common interest group within the military hierarchy, which then moved into a prominent position, with its disciples being promoted and gaining power; and then fell – just like in academia: It's an organisation – an organisation that kills; but with a similar 'sociology' to any other organisation.

**C:** Nevertheless, theory was used to sanitise, to bolster the illusion of precision and sophistication.

**EW:** Of course. In a sense what is otherwise a brutal act against indefensible people, part of the mechanism of oppression, becomes a 'sexy', cool thing. But this is not all that is at stake. I did not appreciate to what degree that article would have an effect in Israel. The officer – Aviv Kokhavi – who was talking about 'the room is your interpretation'<sup>11</sup> threatened to sue myself and the journal that was to publish a translation of this chapter. He cited three alleged mistakes in the article, he took on the biggest law firm in Israel – the one that deals with libel issues for the Haaretz Daily – that the military could afford him, asking that we remove his name from the article. I really wanted to go to court, because I would have liked to have 'interviewed' him again

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11. See *HL*, Chapter 7.

in this context, on issues – the events of that morning – whose exposure might contribute to a better understanding of the history of the occupation. So I wanted to go ahead, but he finally backed off.

Now, his demand was that I take *his name* out, and the editor of the journal – a very important journal in Israel, *Theory and Criticism* – who wanted to publish the piece suggested we might take the name out, and even that it would be better for the critique if the name were not mentioned. But here we realised something very important: although there's an existing group of very good academics and writers, a structural analysis, or a post-humanistic attitude still prevails, where individuals and individual responsibility don't matter, where names are not mentioned. So that in fact you can say practically anything 'radical' in academic organs without censorship, but the problem starts when you marry a kind of investigatory journalism with theory. You can find many theoretical writings on the occupation that mention hardly any names! My work, I think, has these two machines in them, journalism and theory, and I name names.

So this started a whole debate about how to write theory into a political event, as a resistance. When one writes into the event and when one investigates a particular scenario, one must write about people that are still acting, about a crime at the moment it is undertaken, exposing and analysing simultaneously. In this sense, libel suits are in fact the indication as to the effect that this writing is having – nobody cares when you write against 'Zionism' in general, but naming names and places and units and actions intervenes within the system itself.

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However, whereas newspapers, obviously, have the means to defend against libel suits, academic journals do not. So we must find new platforms and new ways of writing or ways to secure the legal backing to allow us to write the way that is necessary; otherwise we'd always be put off by the threat of libel. We need to change the way of writing criticism into the event, and for that you need to combine a certain journalistic forensics with theory; to do it differently, you need a different technology of writing opposition. There needs to be an invention of a different way of doing things. Who needs this journal, if they can't take the risk, if they back down at any threat.

**C:** There's perhaps the illusion that theory can 'intervene' without taking any of the risk that's involved.

**EW:** Yes, speaking to other academics we are rather immune. We must face the risks, and this involves all sorts of state retaliation and also of course the financial risk of libel. At first, I was willing to go and represent myself, but the journal said, we are also cited on the legal suit, so we have a lot to lose. It's the journalism *plus* the theoretical frame that did it, it was the journalism *in* the theory, and this is what I think is important, that there is something that moves the theory along with it, and it does two different kinds of work simultaneously.

**C:** In order to be effective and transformative theory needs to rethink the relation between the abstract and the singular – actually-existing objects and people – it's not enough to position 'theory' on a higher plane, leaving it to 'the reader' to apply it themselves.

**EW:** Yes, it leaves open questions – critical work sometimes tends to assume another convinced agency that will be called to action, rather than taking the action itself.

**C:** You suggest that even if Israel/Palestine presents us with ‘a unique type of political space’,<sup>12</sup> nevertheless ‘[t]he architecture of Israeli occupation could [...] be seen as an accelerator and an acceleration of other global political processes, a worst-case scenario of capitalist globalization and its spatial fall-out’.<sup>13</sup> As you write: ‘Exported globally [...] Israeli practices and technologies have connected the uniqueness of the conflict with worldwide predilections to address security anxieties through “circulation management”’<sup>14</sup> Not forgetting, of course, that the situation in Israel/Palestine has had a premier role in stimulating the events that created this climate of fear in the first place. Could you pick apart for us these two terms – *accelerator* and *acceleration*: In what ways can the occupation be read as an augury for our future, and in what ways has it materially contributed to actually effecting and accelerating that future?

**EW:** It’s now an established dogma to say that Israel/Palestine is a laboratory for weapons, technologies of population control, software wars, and so on. But the question is *how* does it proliferate: How is it that we’ve seen bits that look like the Wall in Iraq – exactly the same section – and similarly with checkpoints, etc.

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12. *HL*, 15.

13. *HL*, 9-10.

14. *HL*, 154.

Does a company go out there and sell it? Not always, or not exactly. Sometimes there is a direct transfer, a corporate or military transfer. But most often, actors in distinct places all draw from a single pool of images that exist through the media. Israel/Palestine is, in bytes per square metre or words per square meter, one of the densest places in the world. It has become a formation of the global consciousness. And very often, security officers and resistance borrow through mimicry – it's not necessarily that he was trained by an Israeli, he just exists in the same culture of which those images are part, and which they form. And then again there are other institutional ecologies, in which various levels of relations and ideas are exchanged; ecologies in which the Israeli military is only one of the nodes.

Now what I realised recently, in the next piece that I wrote, 'Legislative Attack',<sup>15</sup> is that the important laboratory here is not necessarily the technological development of weapons, how to kill, how to attack. There's a much more important front where intervention is meaningful and influential. And that is intervention on the level that affects our *perception of what is tolerable*, what is acceptable. And I think from one conflict to another, we push it, it's an elastic line. There is an elastic line that is constantly being drawn with every action undertaken, the line between what is and is not tolerable, what we will tolerate being done to *other* people. The momentary state of (also elastic) International Law is a diagram of the tolerable in this context. I feel that the Gaza attack is now redefining these limits. And the question is really how Israeli attacks themselves legislate laws in space. In a sense violence directed at a gray area of the law shifts the elastic limits of the law, so violence

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15. At <http://www.opendemocracy.net/article/legislative-attack>.

itself legislates. Given an undecided legal issue, if it can be attacked with enough guns, you produce a precedent that might shift the terms of the law. So the violence is directed simultaneously against the Palestinians and against the law. And I think that this is the most significant aspect of the 'laboratory'. People now can tolerate a situation where one state puts barbed wire around a million and a half people and counts the calories in food trucks as they enter and exit, arguing about how many calories a Palestinian man needs and therefore how much potatoes, rice, milk they should let in – basing this on the very minimum that would account for them staying alive. So this is the laboratory. It's like the Milgram experiment, where they asked people to send an electric shock – How much pain do you allow yourself to inflict? How much will be still tolerable – not by the victims, of course, but by others who are watching.

**C:** The law conceived as a drawing of the line gives way to something more like the Wall; International Law can be pushed and pulled by the same forces and events that shape the Wall.

**EW:** Yes, it belongs to the same elasticity that is the hallmark of this occupation.

**C:** And you take up this question of the 'tolerable' in *The Lesser Evil*, where you discuss the transformation of political questions into matters of accounting in which the justification offered for actions is not intrinsic, but appeals to a 'calculus of harm' in which, a quantitative line having been drawn as to what is 'unacceptable', anything one

notch below this (which you satirically symbolize with the number '665', just one short of 666 ...) becomes, given the supposed constraints of the situation, unquestioningly accepted.

**EW:** In *LE*, I'm much more interested in the very techniques of forensics itself. Here, the relationship between space and law – what constitutes an evidence, how in the last few years a transformation has occurred by which evidence takes a central place, turning into what might be called a material witness – will be unpacked through very detailed and intense case studies. And all this around the background discussion of the moderation of harm.

Addressing the notion and dilemmas of the Lesser Evil emerges out of a set of problems encountered in *HL*. As we discussed at the start of our conversation, *HL* developed a distinct spatial imaginary in which, via the category of elasticity, space is understood as a 'political plastic' – the sum total of forces that operate on and within it – which forces could thus, to some extent, be read by examining it. But within these fields of conflicts, there grew another powerful agency. Besides the military and other state agencies, the wider field of contemporary conflicts includes corporations, the media and, significantly, independent organisations and humanitarian and human rights NGOs. So the immediate question is: What is their role in the production and maintenance of the spaces of colonisation and their mechanisms of control? Furthermore, this was a personal question, since my own work was produced through interaction with various agents within this conflict, including an (already rather cautious) engagement with the human rights organization B'tselem. So a discussion about



the notion of the moderation of harm, through the culture of human rights and humanitarianism, was in place. Some theoretical propositions on this issue that were only outlined in *Hollow Land*, and some relatively marginal characters in the spatial drama it unpacked, have been expanded in *LE*. These issues and characters have stepped forward to take centre stage. It is as if the footnotes of a previous work have climbed above the line, to make a new book.

This idiom of the Lesser Evil captures much that goes beyond the issue of human rights and humanitarianism; but for them the idiom functions as a sort of vernacular. It seemed to me that, as a form of political expression, the Lesser Evil has become so deeply naturalised in political speech and culture that it seems to occupy the place previously reserved for the term ‘good’. The problem of the Lesser Evil is famously concerned with a necessity for a choice of action in situations where the available options are or *seem to be* limited. The condition by which this choice is articulated affirms an economic model embedded at the heart of ethics – one according to which various form of misfortune can be calculated as if they were mathematical algorithms, evaluated, and acted upon. The problem of the Lesser Evil presents a closed economy, in which one cannot question the system that produces and distributed its evils – it’s a system that presents itself as one with no outside. Under its aegis, politics appears as a mathematical minimum problem: how to reduce to minimum the ‘evils’ generated as the collateral effect of ‘necessary’ actions.

Of course, the problem of the Lesser Evil has its origin in the classical philosophy of ethics and in early Christian theology. In the latter the problem was articulated through the concept of the ‘tolerated sin’. But the question still casts

a long shadow on the politics of the present. Recently, it has been continually invoked in the state's effort to govern the economics of violence in the context of the 'War on Terror', and in private organisations' attempt to manouevre through the paradoxes and complicities of opposition action and humanitarian aid.

**C:** How do these developments relate back to the spatial and architectural concerns of *HL*?

**EW:** Within these fields, the politics and culture of the Lesser Evil has engendered its own technologies. These 'technologies of lesser evil' are technologies with a distinct spatial dimension, an 'architecture' – that is articulated in the mobilisation and production of new types of spaces, spatial apparatuses and means of spatial analysis.

**C:** And how has your methodology developed from *HL* to *LE*?

**EW:** In *LE* I seek to investigate the politics, ideology and culture of the Lesser Evil, both theoretically and empirically, through micro-scale intense forensic probes of three controversies, each of which is also a spatial controversy. Each is concerned with a specific spatial apparatus, technique, or a set of spatial problems, where humanitarian and military logics intersect; and each is narrated through a protagonist (the relief camp as a media space in 'Arendt in Ethiopia', the topographical model as an architectural/legal representation through which a certain legal/spatial interaction takes place in 'Best of all Possible Walls', and the question of the

forensics of rubble in ‘Only The Criminal can Solve the Crime’).

**C:** These ‘protagonists’ recall what you were saying about the importance of the embeddedness of journalism within theory, and the importance of ‘naming names’. The use of ‘protagonists’ seems to take this a step further; the purchase of theoretical concepts on the real is secured by their demonstrable ‘incorporation’ into actual people.

**EW:** Yes, the new work takes the idea of embodied theory further I hope: three controversies that are each a moment of changing practices around the problems of the Lesser Evil. Perhaps the most interesting one concerns Marc Garlasco, who is Human Rights Watch’s ‘Expert on Battle Damage Assessment’ – their forensic analyst.

His work demonstrates a certain transformation of the methodologies of Human Rights thinking: A shift from a close reliance on survivors to material forensics, a shift from empathy to science. As you know, empathy or testimony were the main trademarks of HR work as this suited an ideology that sought to position individual versus state.

What Garlasco does is to try and read a certain system or order in the chaos of destruction. He is looking at ruins, discussed their form, looking at ways of destruction; he tries to differentiate between bulldozer destruction and controlled blast by engineers, aerial attack, tank fire. He says “I needed to paste together the battle story ... to recreate the chaos of ‘battle’ minute by minute ...”.

Now, Garlasco mentioned to me, in full frankness, that “when hiring me in 2003 [HRW] must have known that I

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was already involved in the killing of about 250 civilians in Iraq.” Because before joining HRW as military analyst, Garlasco worked for seven years at the Pentagon. During the Iraq War in 2003 he became ‘Chief of High-Value Targeting’, which essentially meant he was a military target assassin – for instance, in charge of killing Saddam Hussein and his leadership! A central part of planning these missions was to do with a calculus known as ‘Collateral Damage Estimate’, which establishes the ‘right balance of civilian casualties in relations to the military value of a mission’. “The magic number was thirty,” Garlasco explained to me when I met him. “That means that if the computer came up with thirty anticipated civilians killed, the air-strike had to go to Rumsfeld or Bush personally to sign off. Anything less than thirty could simply go ahead.” This estimation of civilian deaths was done using software called *Bug Splat*, that synthesised environmental factors such as the size of the building, its construction materials and techniques, the percentage of steel and glass in its envelope, the population density within and around it (varying according to the time of day), weather condition, and so on. These were calculated against factors such as the size and type of the bomb, its fuse and the direction of the attack. So, Garlasco had to study architecture, structural-engineering, and urbanism; the killings he planned were to be undertaken in people’s homes. If the aim is to use the minimum sized bomb to achieve the required effect, designing a bombing mission resembles a mathematical minimum problem. Such calculations are part of the very logic of this weapon – a weapon that hits *and* legitimises, a weapon that kills legally.

Garlasco stayed in the war although he didn’t agree with it: “Whether you agree with the aim of war or not it is

going to happen,” he said, “so I wanted to do it in the best way I could ... I had a responsibility to the pilots and the civilians.” *Responsibility towards the civilians!* “I didn’t try to kill civilians,” he continues, “I focused on military targets and tried my very best every day to minimise civilian casualties – as required by the Geneva Convention.” The question is, of course: Minimised in relation to what? Reduced from what number?

After Baghdad fell, Garlasco left the Pentagon to take the job with HRW. HRW was the organisation that sent him to Iraq for the first time. He had previously only seen the place on military screens. Garlasco’s credibility as a former Pentagon expert was used extensively in its press releases and the media, where he was often referred to as ‘former Pentagon officer’. And he has become the celebrity HR analyst. He has also been an extremely effective one: in Iraq, on torture, he helped McCain on the anti-torture regulations; he was in Lebanon during Israel’s attack, in Georgia during the Russian one, in Afghanistan again and again; his work led to UN to ratify the agreement on cluster bomb ban.

Now, paradoxically or not, it was his military past that gained him the visibility and credibility he enjoyed as a HR analyst. The Washington Post called him ‘the man on both sides of the air war debate’ and he was often asked about ‘crossing the lines’. *But did Garlasco really cross any lines?* This metaphor might be misleading. Although Garlasco’s move from the Pentagon to a human rights organisation was understood by many according to the popular narrative models of a ‘redemption story’ – like a St. Paul whose sainthood is only as great as his sin – this misses the extent to which, at present, humanitarians and militaries are intertwined in their methods and aims.

Perhaps a better model to consider is the detective genre: like Professor Moriarty in Sherlock Holmes or Dr. Hannibal Lecter – the psychotic killer in whose mind lies the clue to solving and stopping ruthless murders. A genre in which a crime can only be solved by those that can think like criminals, by those that have been criminals.

This was reflected also in his forensic works: the collapse of buildings was the method by which he planned the assassination of the Iraqi leadership, and buildings rubble was also the means by which he would reconstruct the story of an attack for HRW. As he said to me, “my forensics is a reverse engineering of the process of military destruction”.

**C:** With this example of ‘embodied theory’ it seems we are close to the state of affairs Deleuze described in suggesting that a book of philosophy should be ‘like a detective story’ (perhaps, in view of your forensic approach, *CSI: Jerusalem!*); and that your protagonists are something like the ‘conceptual personae’ who, he insisted, inhabit the ‘theatre of philosophy’ and are necessary to the very functioning of conceptual thought. Only in the theatre of twenty-first century warfare, the *dramatis personae* are real people who are the avatars of stranger conceptual formations than could be invented by any philosopher, and who reveal the sometimes grotesque structural assumptions within which this warfare is carried out.

**EW:** But wait, there is more to the story ... Finally, although his work has really transformed the capabilities of HRW, on September 15 2009, the very same day of the release of the Goldstone report, HRW announced Garlasco’s suspension. A few days earlier some pro-Israel blogs publicised that

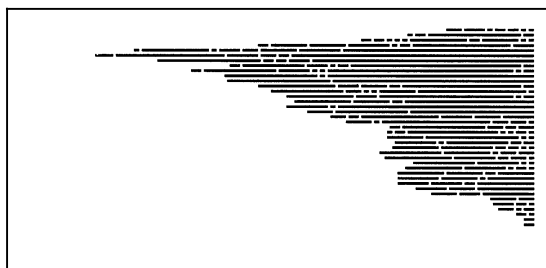
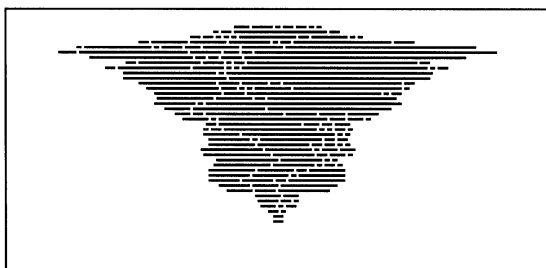
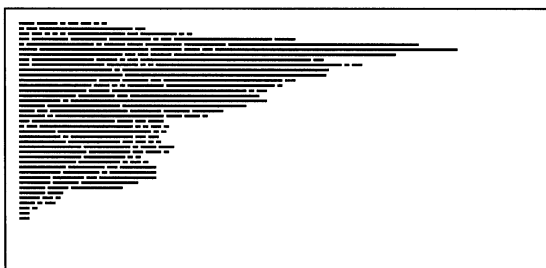
Garlasco collected Nazi-era memorabilia, and accused him of fetishism. Garlasco explained amongst other things that his geeky fascination with militaria (his fetish) only substantiates the fact he is a good forensic analyst. And I think he is right – that forensics is itself a kind of fetish – Fetish not in a Marxist or psychoanalytical sense, but in the sense that reading the event from an object always involves the excess that is within the object. The personal story of Garlasco stands behind the power of his forensics ...

**C:** Finally, in the postscript to *HL*, you ask how architecture as a professional practice can be expected to 'learn from' Israel/Palestine. Do you see any indications that architecture, in general, is beginning to take its political responsibility seriously – everywhere, not just in highly-heated zones such as Israel/Palestine?

**EW:** This is an architectural reference, of course – *Learning from Las Vegas*. So it's this moment of postmodernism where architecture needs to break the disciplinary barriers and learn from other things. But yes: I don't say it's because of this book, but there is increased involvement of architects in territorial-political issues, yes. I don't know if that's a good thing yet ...

**C:** If Las Vegas (as well as being the original location for *CSI*) is the theme park of late capitalism, is Israel/Palestine the darkside Las Vegas ... ?

**EW:** Interesting, Maybe the light side! The new Las Vegas ...





## A Given Time / A Given Place

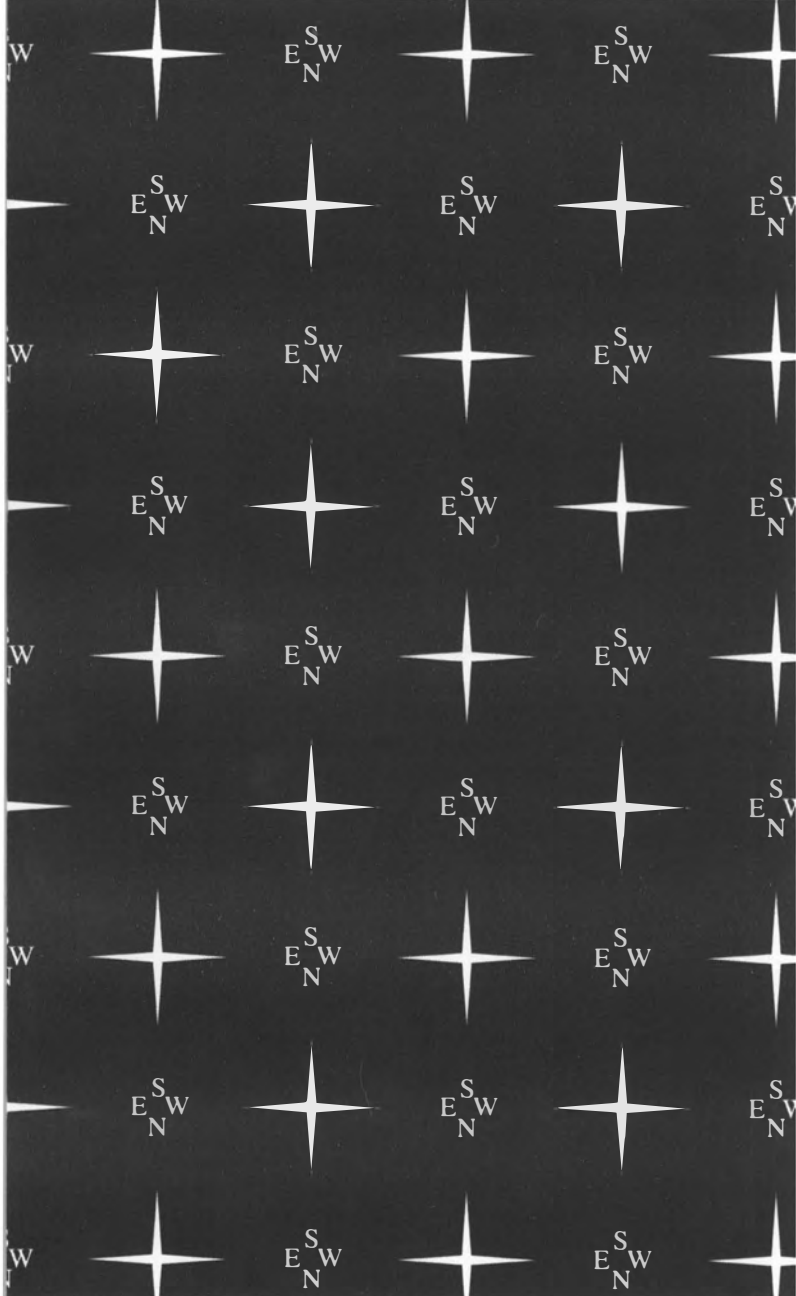
Angela Detanico & Rafael Lain

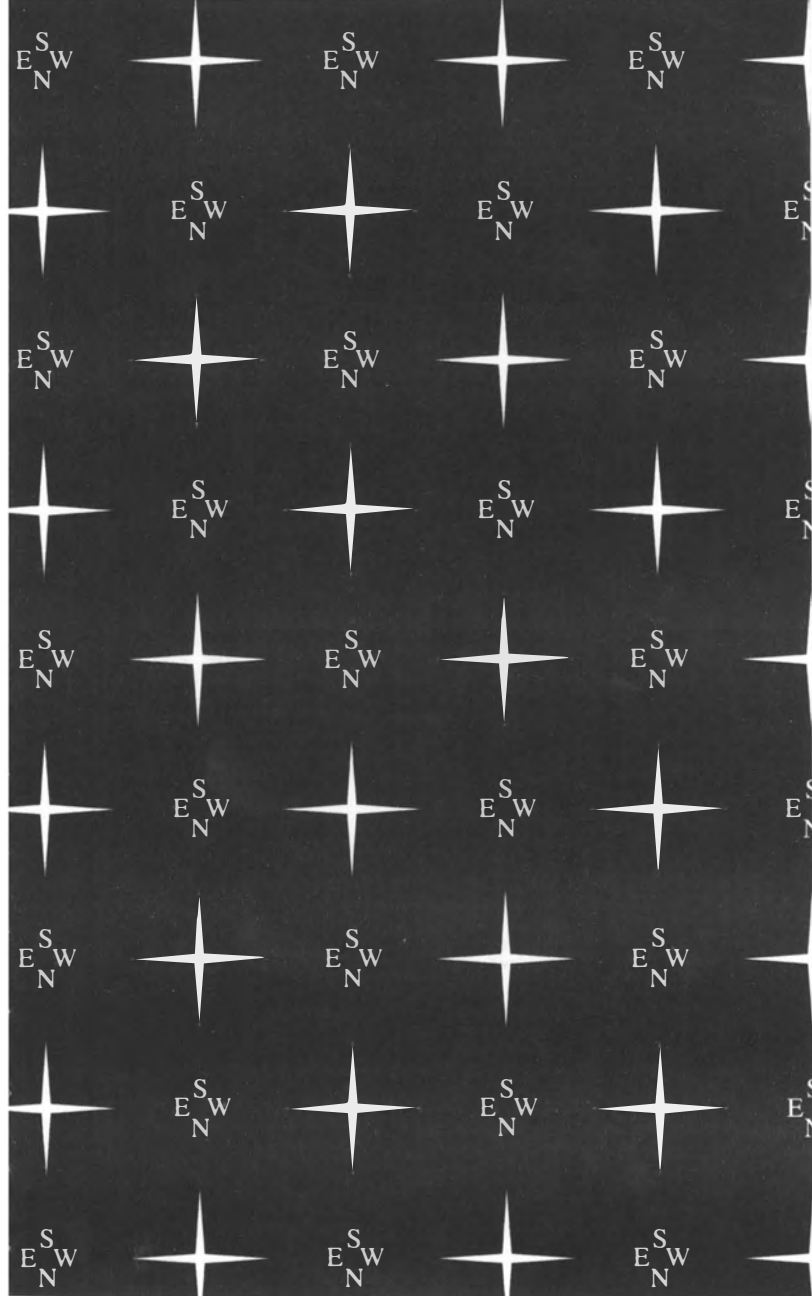
p304. *The World Justified*

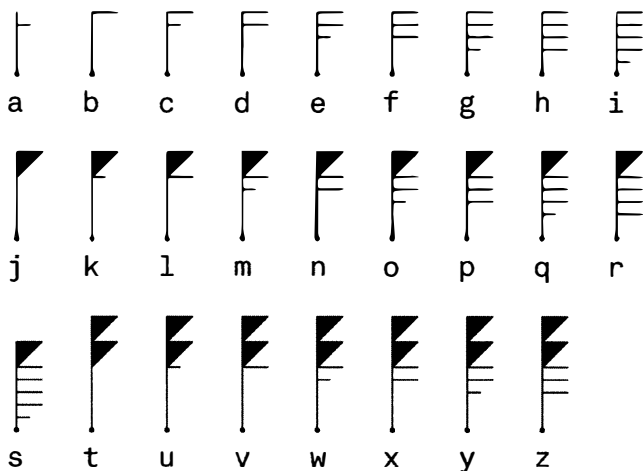
pp306-7. *Disorientation Pattern*

pp308-17. *Ventania*

pp318-21. *Zulu Time*







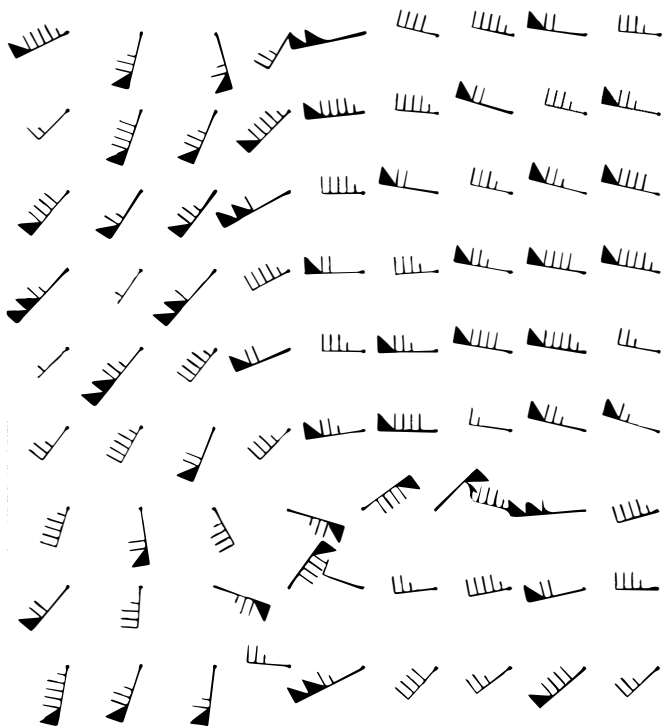
the wind barb system is used in navigation to indicate wind direction and speed on a 5 knots scale

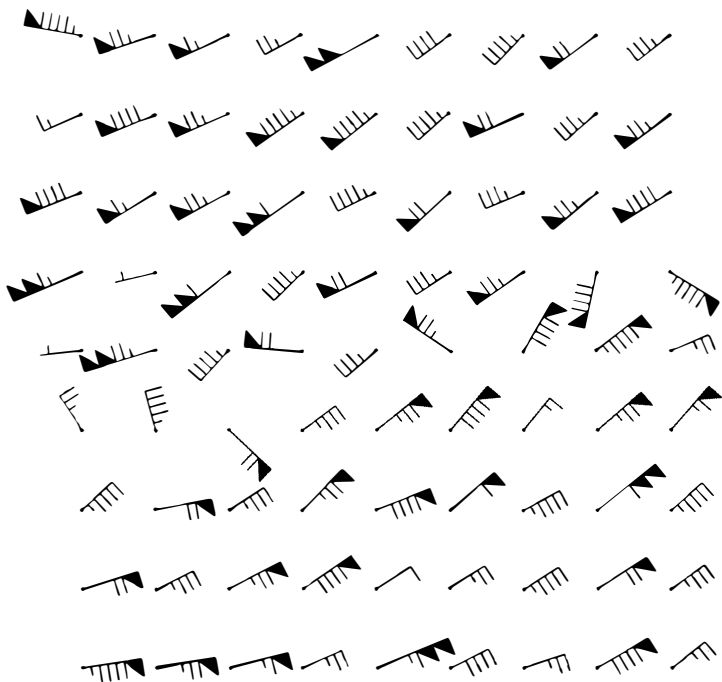
VENTANIA is a typeface that correlates the wind barb notation to the alphabetical order

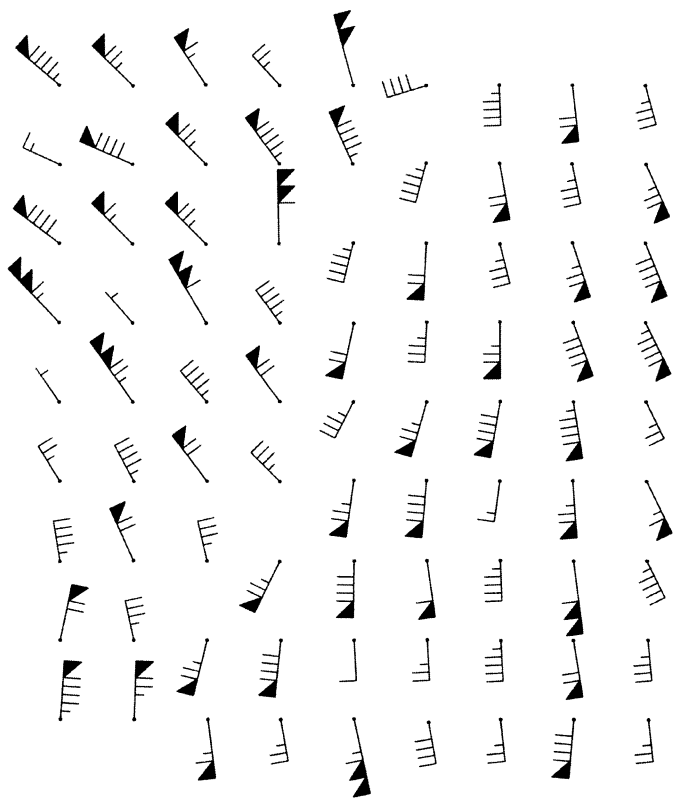
a written text was arranged in a 9x9 grid corresponding to a given position in the middle of the atlantic ocean

the direction of the wind barbs is updated daily according to the weather forecast for the region

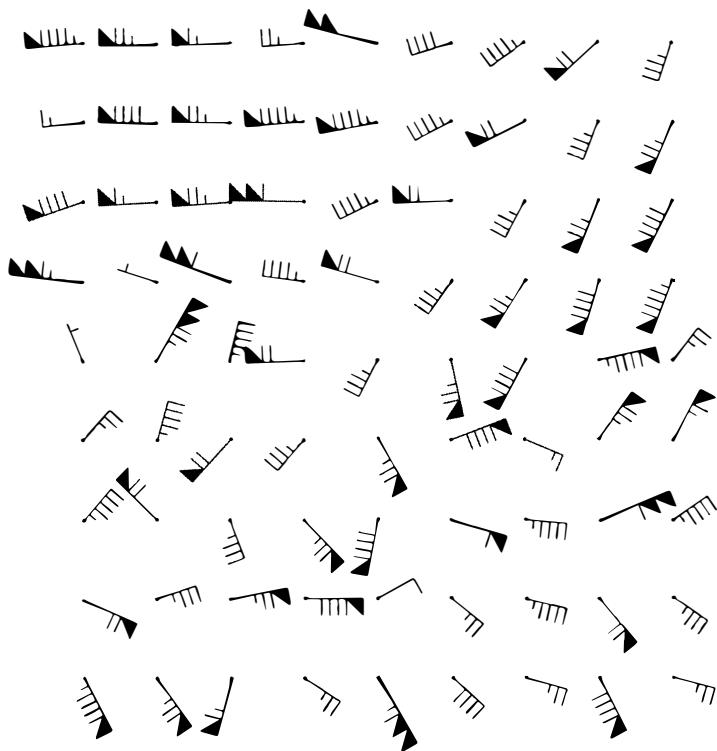
s o m e t h i n g  
c r o s s i n g o  
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w a v i n g o r s  
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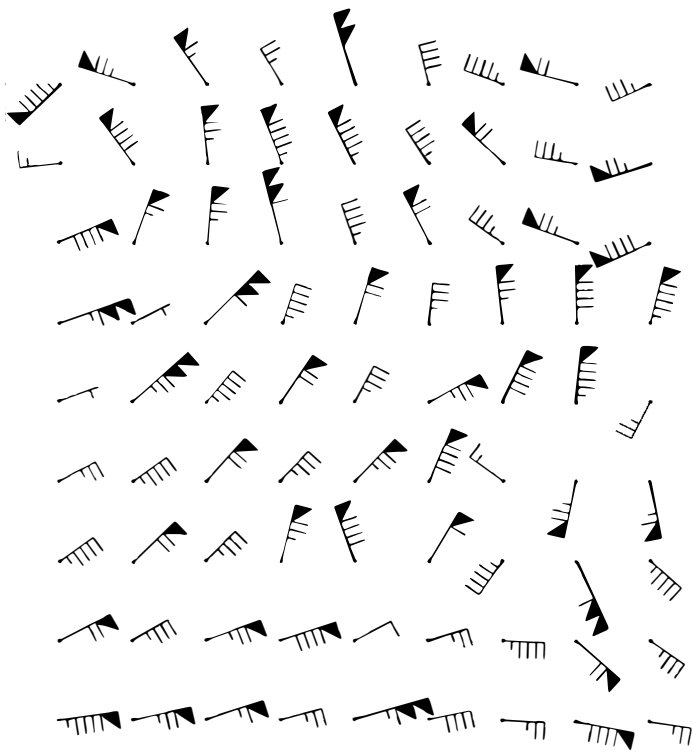


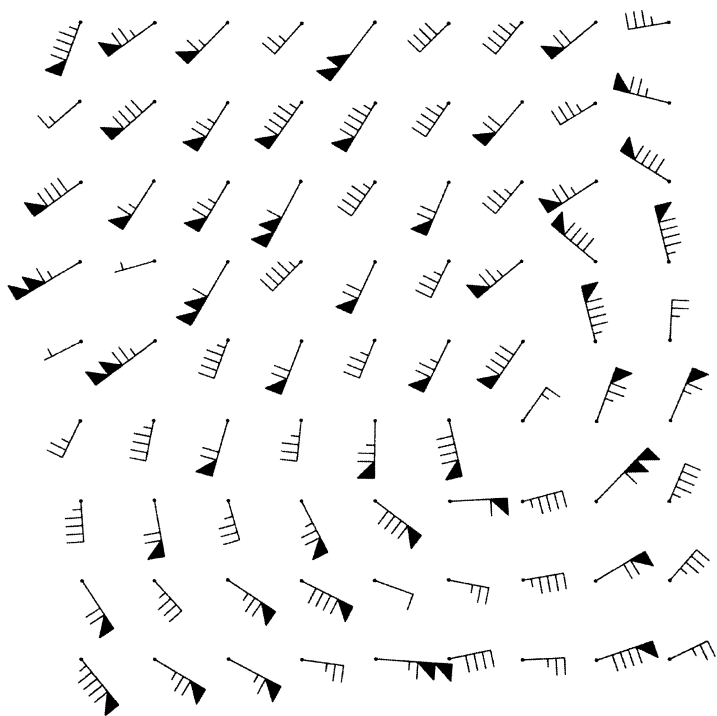


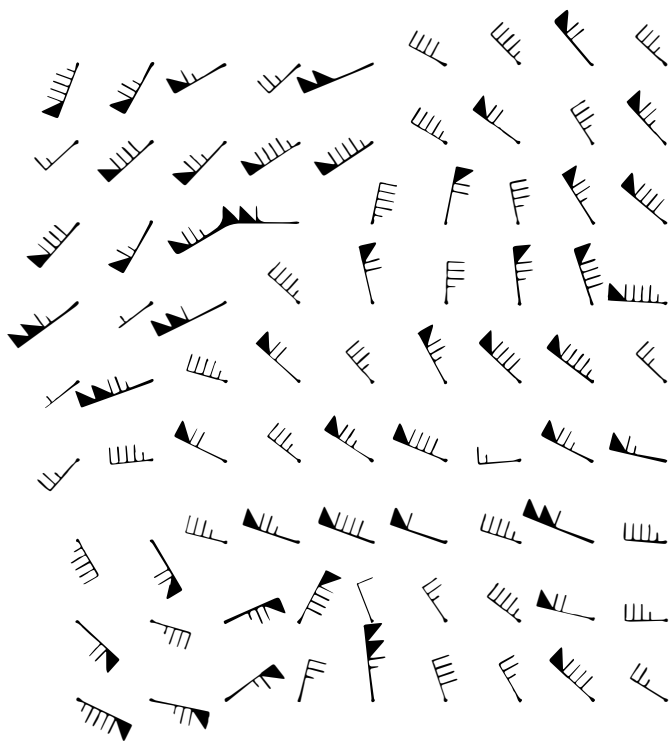


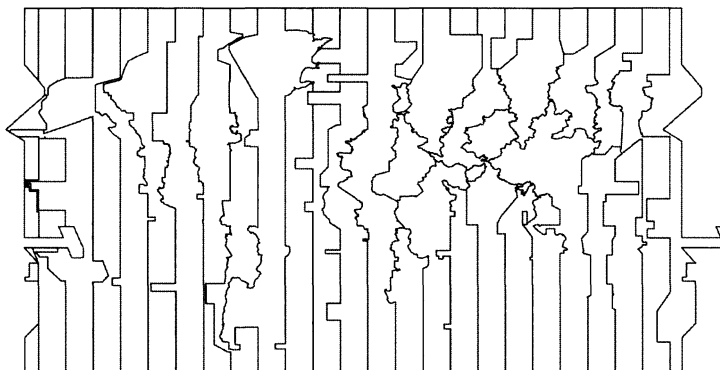






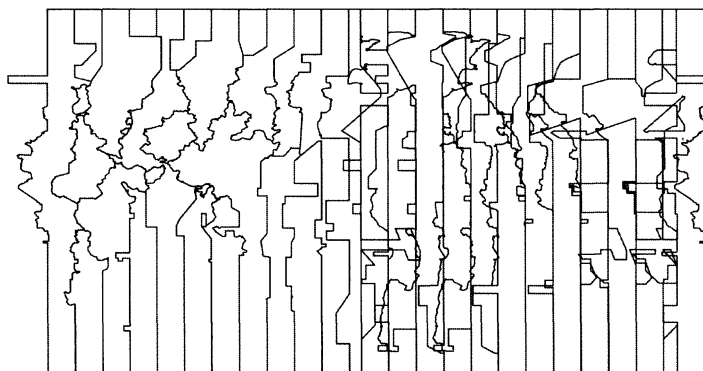






Y X W V U T S R Q P O N Z A B C D E F G H I K L M

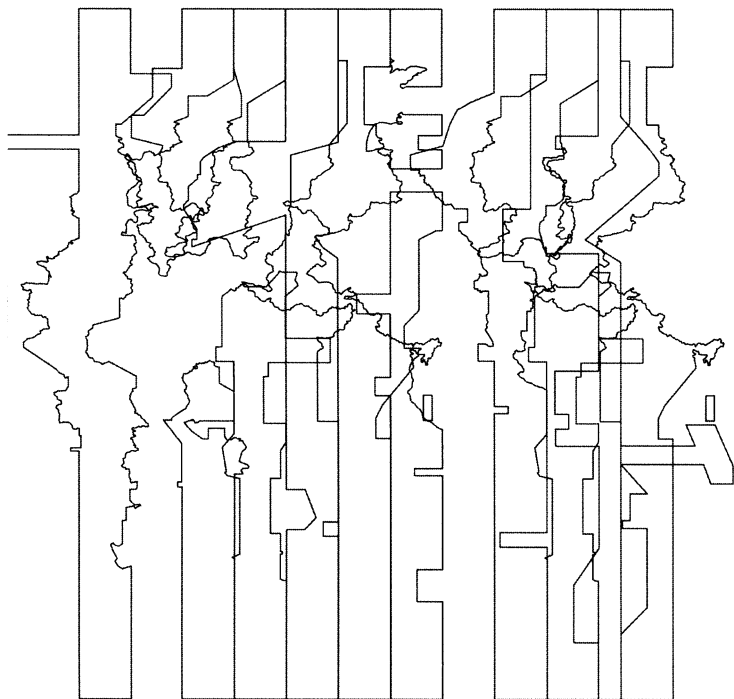
- cartographical order -



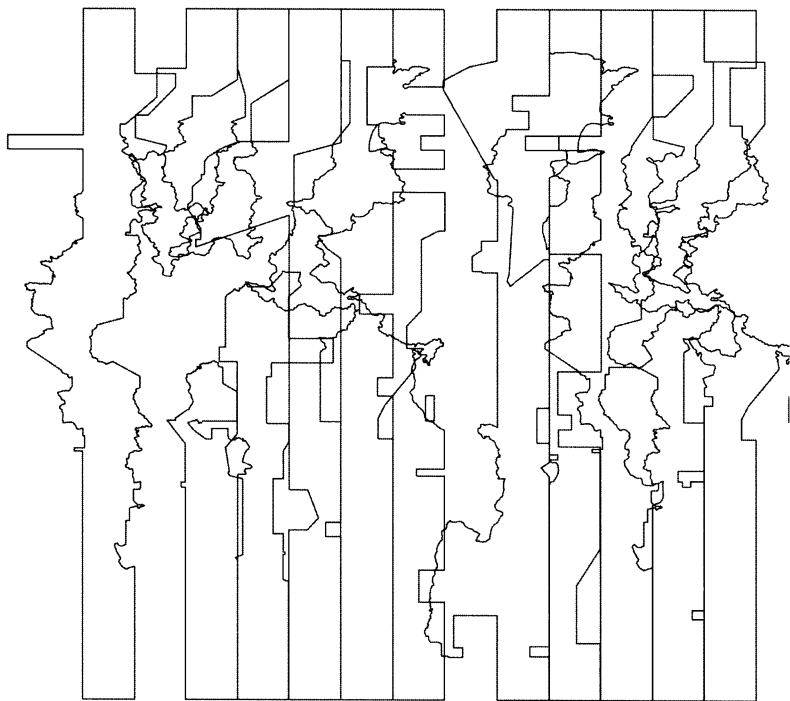
A B C D E F G H I K L M N O P Q R S T U V W X Y Z

- alphabetical order -

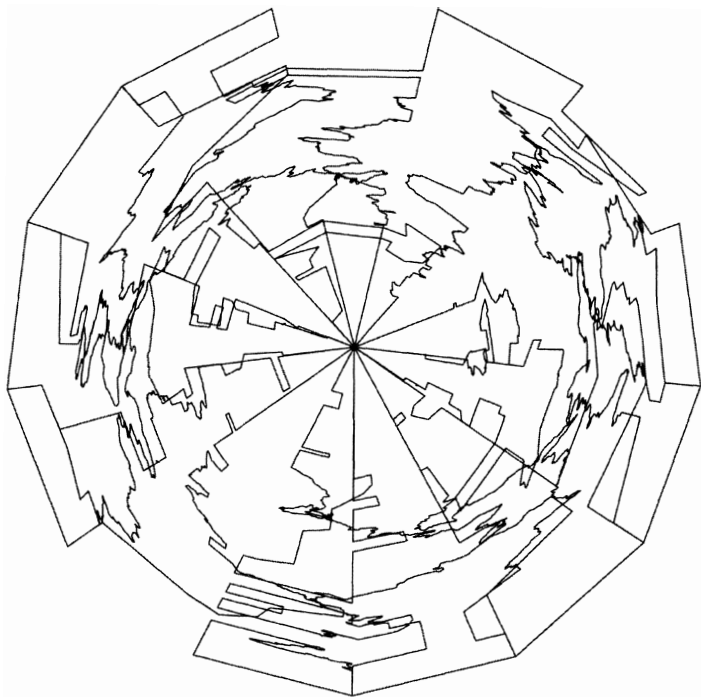
North American astronomer and mathematician Nathaniel Bowditch correlated the letters of the alphabet with the twenty-four timezones dividing the terrestrial globe. In 'The New American Practical Navigator', published in 1802, he associated the letters A to M with the timezones situated east of the Greenwich Meridian, and N to Y with the timezones to the west. The zone corresponding to the  $180^{\circ}$  meridian, through which the international dateline passes, is shared between the letters M and Y, so as to indicate the same hour one day apart. The letter Z, attributed to the Greenwich timezone, the  $0^{\circ}$  meridian, gave its name to the system, known as Zulu Time, in reference to the phonetic alphabet used in radio transmissions.



- A GIVEN TIME -

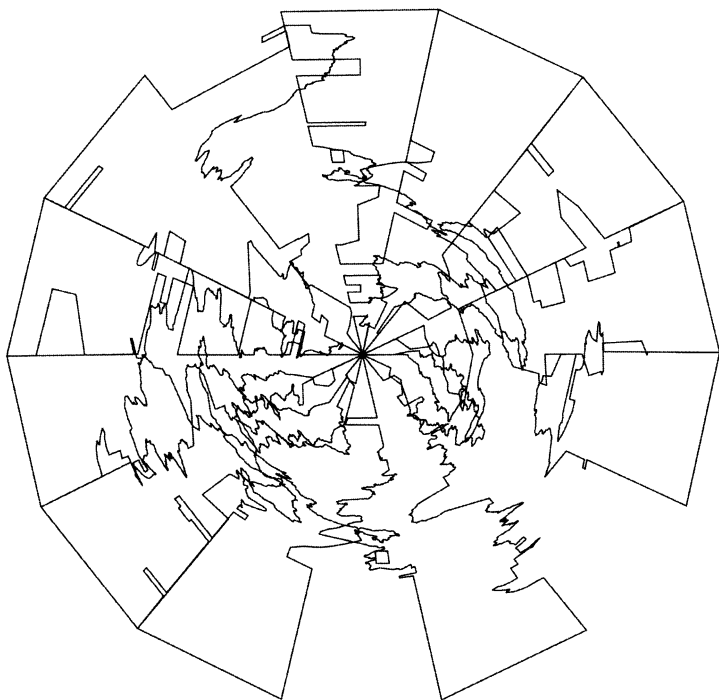


- A GIVEN PLACE -



- A GIVEN TIME (south pole projection) -





- A GIVEN PLACE (north pole projection) -



# Introduction to SIMADology: *Polemos* in the 21st Century

Manabrata Guha

... *a fine enough mesh, at some epsilon, can catch anything* ...  
Martin Libicki, *The Mesh and the Net*<sup>1</sup>

*War is not a theatre, you infidels* ...  
Abdu-Salam Faraj, *Jihad: The Absent Obligation*<sup>2</sup>

... *Terror is not a means of imposing decision upon the enemy; it is the decision we wish to impose upon him* ...  
Brig. S. K. Malik, *The Quranic Concept of War* (1979)<sup>3</sup>

## INTRODUCTION

Clausewitz is accorded the honour of being the pre-eminent theorist of war for, with him, the project of theorising war was so comprehensively enframed that what has since followed have been mere footnotes – the addition of details – that only serve to fill in the gaps that Clausewitz's theory did not address. But this reification of the paradigmatic Clausewitzian theory of war also carries with it the implication that the regime of thought that guides

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1. M. Libicki, *The Mesh and the Net: Speculations on Armed Conflict in a Time of Free Silicon* (Washington, DC: National Defence University), 30-1.

2. A.-S. Faraj, *Jihad: The Absent Obligation*. Quoted in Reza Negarestani's 'The Militarization of Peace: Absence of Terror or Terror of Absence?', *COLLAPSE* I, 53-91: 60.

3. Brig. S. K. Malik, *The Quranic Concept of War* (Dehra Dun: Natraj Publishers, 1999), 59.

our current theorisations on and of war is an archaic one. It is archaic not because one can trace its genealogy to at least the Age of Enlightenment, but because, in effect, its evolution had already come to an end with Clausewitz' pioneering theorisation of war.<sup>4</sup> In more recent times, this state of affairs has been reiterated in a positive light, with the assertion that, while the character of war may change over time, the principles of war are eternal.

Thus, when questions are posed such as: Are developments in the emerging fields of Information and Communication Technologies and the 'new sciences' rendering the Clausewitzian regime of thought irrelevant? Are the growing experiences in the emerging net-centric battlespace rendering the Clausewitzian depictions of war and combat unrecognisable? Has the so-called Global War on Terror(ism) (GWOT) fractured, irreparably, the Clausewitzian paradigm of war?, more often than not, they are dismissed without a second thought.<sup>5</sup> The principal reason for such a summary dismissal is that, for the most part, they are regarded as fanciful speculations that not only run against the grain of the study of war and its conduct, but also against the fundamental principles that underwrite our conceptualisation and understanding of International Relations and of what it means 'to be political'. But there is no avoiding the fact that such questions

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4. See M. Guha, *Re-Imagining War in the 21st Century: From Clausewitz to Network-centric War* (London: Routledge, forthcoming 2010).

5. See, for example, C. Gray, *Modern Strategy* (Oxford: OUP, 1999) and *Another Bloody Century: Future War* (London: Weidenfeld & Nicholson, 2005), who suggests that nothing like this is likely to occur; C. Coker, *Future of War* (Oxford: Blackwell Publishing, 2004) and R. Leonard, *Principles of War in the Information Age* (New York, NY: Presido Press, 1998), who implicitly and, at other times, explicitly question the continuing relevance of the Clausewitzian paradigm.

are being asked and such doubts are being expressed. These are indicative of the growing uneasiness in some quarters that the integrity of the Clausewitzian theory of war may be increasingly becoming suspect not simply because the character of war has changed, but because, increasingly, our understanding of war, indeed our very imagination of war, is being shaken to its core, and is falling short of our experiences of war.<sup>6</sup>

Our cue for this essay is taken from a recent assertion made in the context of ‘surprise and terrorism’, which states that ‘[s]urprise is only one tactical principle of the terrorist operation but it is nonetheless an essential one. Without it, terrorism would not only be foolishly impractical as a method, but virtually inconceivable as a strategy.’<sup>7</sup> This is an example of how the insistence on employing the well-worn analytical framework of the Clausewitzian martial architectonic to enframe the so-called ‘problem of terrorism’ leads to a tragic misreading of the emerging turbulent martial landscape. Our central concern in this essay is with the revitalised, and in many ways ‘(re)new(ed)’, emergence of the ‘terror-operation’ which, to put the matter plainly, has not only cast a corrosive shadow over the Clausewitzian theory of war, but has also allowed us a rare glimpse into a very strange and little-understood battlespace. In keeping with this, given that the current and emergent global security ecology is being increasingly enframed within the context of the GWOT and/or in terms of hyper-violent planetary-scale insurgencies, the *principle*

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6. See, for example, Arquilla and Ronfeldt, *In Athena's Camp: Preparing for Conflict in the Information Age* (Santa Monica: RAND, National Defence Research Institute, 1997). See also Leonard, *Principles of War in the Information Age*.

7. Morris, ‘Surprise and Terror: A Conceptual Framework’, in *The Journal of Strategic Studies*, Vol. 32, No. 1, 1–27, February 2009, 6.

of operations that are invoked to address the problematic of the ‘terror-operation’, particularly in the wake of the events of 9/11, is called into question. In this way, we draw attention to how the regime of thought that governs the understanding and imagination of war bequeathed to us by Clausewitz – that of a collection of battles tethered within a ‘political space’ – may be seen to have reached its ideational limit.

As an alternative, it is suggested that if we can indeed continue to talk about war and its conduct in the twenty-first century, then perhaps the discussion should be reconstructed in terms of a *polemos* – organised around four protocols – which manifests itself as a violent and searing rash of virally-proliferating clusters of intensive eruptions, ruptures and lesions that irreparably wreck the dominant spatio-temporal and ideational paradigms within which the State’s monopoly over the exercise of organised violence has traditionally found its subjective affirmation. This emergent condition, which necessitates a different regime of thought when thinking ‘war’, we further argue, entails thinking of – and in terms of – alternate modes of martial operabilities – *pure tacticities* – which are mechano-in-organic insinuations of terror, surprise and havoc which, while seemingly event-specific, remain indifferent to, but complicit with/in, the very medium in which they are actuated.<sup>8</sup> The emergent embodiment of such insinuations is the SIMAD – a Singularly Intensive Mobile Agency of Decay – whose primary counter-tactical principle of operation is ‘hypercamouflage’.<sup>9</sup> We will have occasion to

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8. Thanks to Reza Negarestani for first suggesting the ‘mechano-in-organic’ formulation (email exchange).

9. For a detailed account of ‘hypercamouflage’ see Negarestani, ‘ Militarization of Peace’. The acronym SIMAD appears in the work of the futurologist Jerome Glenn.

discuss the outlines of this counter-tactical principle and the implications that its operationalisation has for our state-centric war-machines.

As we will see, the encounter with the SIMAD takes place in an *intermezzo* – a counter-intuitive and unfamiliar battlespace wherein the standard geo-political map is contorted out of recognition by an always emergent geo-philosophical diagram which, by being radically open to the attractive and densifying magneto-gravitational forces of the Earth, does not adhere to Nietzsche's weightless affirmation of 'being true to the Earth'.<sup>10</sup> Contrarily, such a geo-philosophical diagram plunges headlong into the flows and counter-flows of the earth's forces, thereby stretching them to the edges of their conceptual envelope by 'sounding' the depths of the Earth's surface on which fragile ontopolitical structures – geophysical and geopolitical edifices – rest. In this sense, the emerging battlespace – the *intermezzo* where/in we make contact with the SIMAD – is a locale in which an ungrounding of the Earth is in process and, as such, is a vertiginous soft spot on the surface of the Earth. In this battlespace, onto-privileges that sustain the traditional geopolitical difference-engines<sup>11</sup> through the logic of their presence corrode, decay and collapse, leading to terrifying

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For Glenn, the acronym stands for Single Individual Massively Destructive. See J. C. Glenn and T. Gordon, 2007: *The State of the Future* (NY: World Federation of UN Associations, 2007), 80.

10. *Intermezzo* means an 'in-between'. In music, particularly in operatic music, it is a 'filler' that fills the space between two acts. In chess, 'intermezzo' is better known by the German word, 'zwischenzug', which is translated as an 'intermediate move' that a player makes in lieu of an expected move, after playing which the expected move is made. This generally results in disorienting the opponent, and is geared to create the conditions for dominating the board.

11. State Actors, Non-State Actions, Actor-Networks, friends, enemies, allies and levels of analysis are illustrative examples of what I refer to as 'traditional geopolitical difference-engines'.

‘envoidings’ that fracture, weaken, and turn into sludge the material consistency of the conventional battlespace.

Of course, the ‘canon’ of military thought asserts that there exists an inextricable relation between thinking (strategically *on* war) and the earth (or alternatively, the coding of territory); this is a central, indeed defining, feature of the Clausewitzian theory of war, say, since the seventeenth century. We will see how the SIMAD distorts, twists and undoes this specific relation between thinking and earth/coding in geo-logical terms. In such cases, even the Deleuze-Guattarian ‘nomadic war-machine’ fails to gain traction. ‘Territory’ and the earth become ‘slime’, which defies the efforts of the post-modern military – a rabidly becoming-out-of-control war-machine that was originally captured and re-deployed as a pliable instrument of the State – to cast its striating and strategising net-centric grids in a bid to establish an era of ‘terrifying peace’. This calls for a different way to think about war, thereby signalling the advent of the SIMAD’s *polemos*.

### I. FRACTURED FRAMEWORKS/ DISTORTED ANALYSES

#### *INSIDE/OUTSIDE THE CLAUSEWITZIAN LEGACY*

When Clausewitz wrote his *magnum opus*, he openly registered his desire to write a treatise on war that would serve a dual purpose. Firstly, he wanted to establish a theoretical ground for the study and analysis of war which would ‘not be forgotten after two or three years, and that possibly might be picked up more than once by those who are interested in the subject’;<sup>12</sup> and secondly, he wanted to ‘bring about a revolution in the theory of war’.<sup>13</sup> It is worth

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12. Clausewitz, *On War*, Ed. & Trans. M. Howard and P. Paret (Princeton, N.J.; Princeton University Press, 1984), 58, 63.

13. *Ibid.*, 70.



noting that on both these counts Clausewitz was largely successful. But the import of Clausewitz's efforts, while long recognised and much appreciated, remains undervalued. This is principally because we fail fully to appreciate what the Clausewitzian theory of war aims to *defend* and instead focus on that which it tries to *explicate*. In other words, to fully register the import of Clausewitz's theoretical efforts, it is necessary to recognise that Clausewitz, quite early in his theoretical exercise, was fully cognisant with the disjunction of thought when considered in the context of war, which he identified as 'chaos on the battlefield'. It is for this reason that we are led to suggest that Clausewitz's principal theoretical and philosophical effort to create and sustain a 'theory of war' was a defensive gesture against this state of affairs. To appreciate this, however, we need to re-visit the Clausewitzian category of Absolute War.

As is well known, Clausewitz discussed war in two guises – Absolute and Real War. Early in *On War*, he presented the 'essence of war [...] as an eruption of force and violence',<sup>14</sup> which he understood as 'true war, or *absolute war*'.<sup>15</sup> For Clausewitz, this 'true war, or absolute war' was nothing but 'a struggle for life and death – a struggle, that is, in which at least one of the parties is determined to gain a decision.'<sup>16</sup> The implicit annihilation that awaited the participants of Absolute War – abiding by its logic of strikes and counter-strikes – was a fact that was not underestimated by Clausewitz. Indeed, he frequently cited the example of the campaigns of Napoleon as being

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14. A. Gat, *A History of Military Thought – From the Enlightenment to the Cold War* (Oxford, UK: Oxford University Press, 2001), 225.

15. Clausewitz, *On War*, 488-9.

16. *Ibid.*, 488.

a proximal condition of Absolute War in Real terms. In other words, for Clausewitz, Absolute War – presuming no external influence – was the maximum effort, applied repeatedly, at a decisive point, for a decisive decision, *with a single logical object*: Absolute defeat of an enemy. This ‘logic’, was in Clausewitz’s words, war’s ‘... *natural tendency* [...] *in its philosophical and strict logical sense alone and does not refer to the tendencies of the forces* [...] *including* [...] *the morale and emotions of the combatants*.’<sup>17</sup> Clausewitz further asserted that this logic remained true regardless of whether war was a duel between two contestants, or a hostile engagement between coalitions of nations. Based on the above, it could then be said that Absolute War displays two characteristics: (1) by virtue of being, at the least, co-constituted by ‘blind natural force’, it is, to some measure, independent of the political because as a pure expression of blind natural force, the ‘succession of blows and counter-blows’ need have no basis in the political. (2) When this blind natural force does manifest itself within the political, it can potentially ‘usurp the place of policy the moment policy had brought it into being; it would then drive policy out of office and *rule by the laws of its own nature*.’<sup>18</sup>

Thus, we find Clausewitz insisting that ‘in the field of abstract thought [...] it [i.e., war] reaches the extreme, for here it is dealing with an extreme: *a clash of forces freely operating and obedient to no law but their own* [...] *an almost invisible sequence of logical subtleties*.’<sup>19</sup> Clausewitz absolutely insists

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17. Ibid., 89 (All emphasis mine) Note that Clausewitz, elsewhere in *On War*, insists that ‘war has no logic, it only has a grammar’. This is, to say the least, a most curious statement for Clausewitz is claiming that a ‘grammar’ is bereft of logic.

18. Ibid., 87 (My emphasis).

19. Ibid., 78 (My emphasis).

that this ‘logic’ of war that determines the ‘succession of blows and counter-blows’ is not simply an in-human logic, but also a non-human one. It is equally critical that we recognise Clausewitz’s subtle but simultaneous assignment of two versions of Absolute War – as the ‘logic of war’ independent of the political *and* as ‘the logic of war’ at the disposal/service of the political. But Clausewitz’s initial assessment of the dangers posed by Absolute War ‘in the field of abstract thought’ – that is, regardless of whether or not it is subject to the political – remained unchanged. He contended that the logic of war, in the Absolute sense – devoid of emotion, morale and feelings – was marked by *its desire* for the annihilation or absolute defeat of the enemy and thus was dangerous and destructive.<sup>20</sup> Indeed, he also added the corollary that in its ‘true’ state, this logic – even when manifested within the political – was equally (and more to the point, materially) destructive and, therefore, dangerous – as, Clausewitz claimed, it was in the hands of Napoleon.<sup>21</sup> Thus, it is not surprising to find Clausewitz insisting that any theory of war *must* make room for Absolute War. Indeed, according to Clausewitz, Absolute War *must* be the principle that is invoked to ‘form a general point of reference, so that he who wants to learn from theory becomes accustomed to keeping that in view constantly, to measuring all his hopes and fears by it, and to approximating it *when he can* or *when he must*.’<sup>22</sup>

Clausewitz’ recognition of Absolute War as a non-human/inhuman condition also brought in its wake

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20. Nb. Clausewitz, as this study suggests, implies a non-human conception of the ‘logic of war’. In this sense, it is outside the framework of Reason. But, as we will see, this is also strictly not the case.

21. Clausewitz, *On War*, 529-30.

22. Ibid., 581 (Emphasis in original).

the discomfiting knowledge that, in war, the strategic ensemble that thought or thinking forms breaks down into fragments, thereby shattering the logic of sense and sensibility that lends consistency to thinking as a strategic act. Hence the fact – in Field Marshall Moltke’s words – that ‘no plan survives contact’. This was obvious to Clausewitz as he sifted through history, both ancient and contemporary to him. In other words, Clausewitz realised that while the Realness of Absolute War could not be wished away, Real War was merely a partial manifestation of Absolute War within a geopolitical space, and always prone to morph into Absolute War, especially when in the hands of a ‘genius’. Not only did this realisation prove sobering for Clausewitz’s theoretical ambitions, it also posed a fundamental problem of ontological proportions: If, as Clausewitz discovered, war is essentially violent, chaotic, an instance where the logic of Reason potentially comes to a standstill, and which is only marginally subject to the space of the political as an instrument, then it remains essentially outside the field of circumscription laid down by Reason. It is at this point that Clausewitz displays his Kantian roots and opts to strategise war itself – a martial version of the Kantian manoeuvre to strategise Reason. To this end, Clausewitz presented Absolute War as a transcendental category grounded, not only on three critical a prioris – blind passion, hatred, and being amenable to control by Reason in the form of the State – but also on one categorical imperative: ‘[a]ct only according to that maxim whereby you can at the same time will that it should become a universal law.’<sup>23</sup> These allowed Clausewitz to develop an innovative theory of war which, while remaining true to the surface of the

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23. I. Kant, *Grounding for the Metaphysics of Morals* [1785], 3rd ed., trans. J. W. Ellington, (London: Hackett, 1993), 30.

earth (for Clausewitzian war does play itself out on the surface of the earth), remained outside the specificity of any geospatial territory.

Thus, by positing an *ex-terra* space inhabited by universal laws, Clausewitz made the operative concept of war, while terrestrially linked, extra-terrestrial. In this way, he was able to strategise the phenomenon of war using universal laws that, while grounded in the concept of Absolute War, prioritised the historical and real-time *experience* of Real War – that is to say, war as experienced by privileged ontological objects like the human, the state, the citizen, and the subject. But Clausewitz remained aware of the potency of Absolute War and cautioned his readers that Absolute War was the ‘absolute’ and ‘real’ referent when thinking about war, and that Real War was a fragile construct easily disturbed by the intensity of Absolute War. Thus, for Clausewitz, the key strategic question was: How to keep the disturbances caused by the intensity of Absolute War at bay? Clausewitz’s little-mentioned ontological question, of course, remained: How to think when thinking is chaotic at its core?

Following Clausewitz’s lead, we have, particularly since the seventeenth century, studied war and its conduct as a command and control problem – both at the geo-politico-strategic level and at the operational and tactical levels. The ground on which these levels stand is the earth, or more precisely, the surface crust of the Earth – the base geophysical material on which Real War is actualised and experienced. Thus, while the uneven surface of the earth may throw up from time to time shadows that interrupt, subvert and dislocate the transcendental logic of Clausewitz’s theory of war, the rationally-designed, technologically-enhanced and constantly transforming command and

control assemblages that confront such chaoplexic conditions are – especially in the Information Age – well-equipped to penetrate these shadows and hidden spaces and bring ‘war to Reason’. Thus, we find that in the context of the emerging theories and doctrines of Network-centric Warfare (NCW) (and their attendant technical modes of being martial) and of the GWOT, especially in the post 9/11 timeframe, we still tend to explain the experience of Real War (unexpected ‘terror-attacks’ as signatures of planetary-scale insurgencies) in command and control terms. In other words, the most recent ‘revolution in military affairs’ – which, arguably, is increasingly transforming how combat operations are conceptualised and executed – while introducing us to the haptically-diverse experience of war, nevertheless, has not abandoned its Clausewitzian roots, which lie not on or in the Earth but at some distance from it, but which effectively dominate the surface-area of the earth without accessing its depths. This is most evident when we consider how terror-operations (as the emerging signature of war) are conceptually enframed by mainstream military theorists and strategy thinkers in the twenty-first century.

### *TERROR-OPERATIONS THROUGH A CLAUSEWITZIAN LENS*

In a recent essay, ‘Surprise and Terrorism: A Conceptual Framework’, Morris advises us that ‘[i]n the domain of war, adversaries have sought to capitalise on the enemy’s surprise and fear since time immemorial.’<sup>24</sup> He further suggests that the element of ‘surprise’, which he distinguishes from the ‘strategic and tactical surprise’ that occupies so central a position in State-centric models

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24. Morris, ‘Surprise and Terror’, 2.

of war, is the critical tactical enabler of terrorist operations which, when coupled with 'fear', occupies a 'central place in the tactical and strategic repertoire of the terrorist.'<sup>25</sup> Further, Morris asserts, 'terrorists use the gun and the bomb as delivery systems for the real coercive instruments in their arsenal: surprise and shock. Used in this way, surprise itself becomes a potent weapon.' Thus, he claims that:

[i]t [surprise] has enabled relatively small groups of sub-state actors to compel entire governments to action and ultimately change the course of history. Whether terrorists have been strategically successful in this regard is debatable, especially if we define success narrowly as the full realisation of professed political aims. However, their ability to alter the landscape of our security environment and change the way people think and behave is undeniable.<sup>26</sup>

While one cannot fault the operative logic that drives these observations, it is, however, obvious that Morris's effort is geared to render the act of the 'terrorist' into terms that would be recognisable, and ultimately combatable, by State-centric forces. But this is a counterproductive gesture for, while in the first instance it restricts us to thinking about war and 'acts of terror' within the dominant Clausewitzian framework, ultimately it only serves to distract us from the potency and essential indifference of the forces embodied in the 'terrorist'. Before we proceed to direct our attention to these anomalous 'terroristic' forces and the means by which they establish their counter-flows, it is necessary carefully to extract the finer implications of Morris's suggestions. Not only will this help us to establish the limits of the martial imagination within which, we suggest, Morris and much of

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25. Ibid.

26. Ibid.

the strategy and policy-making community is being held captive; it will also help set the stage to discuss the key elements of what we contend is the emergent condition of the SIMAD's *polemos*.

What is immediately evident from Morris's analysis is that, though he professes to lay a great deal of importance on the element of surprise and valorises it – albeit for analytical purposes – to the point of asserting its central importance as a key weapon of choice in the terrorist's arsenal, he also remains curiously ambivalent about the sustainability of this 'weapon'. This should not be surprising because the regime of thought from within which Morris discusses 'surprise as a weapon' is constrained to consider 'surprise' as a singular instantiation of a 'terrible', or more prosaically, of a 'dramatic' Event, which is engineered to create a temporary condition of strategic, operational and tactical asymmetry between opposing forces thereby conferring the advantage of an operational initiative on the side that 'creates' the element of surprise. In other words, surprise, which is a function of 'time' or, more precisely, of 'timing', is taken to be an extremely fluid and vicarious element which, by definition, remains only transiently viable as an instrument of war.

While in passing we note that this, curiously, applies as much to the dynamics of the conventional battlefield as it does to terroristic operations,<sup>27</sup> the major problem in the

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27. Thus, for example, the Nazi invasion of the Soviet Union was a 'surprise' – tactically and strategically – though as Morris suggests the 'strategic surprise' was more a function of Stalin's unwillingness to consider intelligence inputs from various sources – most famously from Richard Sorge – seriously. More pertinent is the 'tactical surprise' that the Wehrmacht achieved at various points (but not at every point) along the invasion front. See, for example, Paul Carell, *Hitler Moves East* (New Delhi: Natraj Publishers, 2008).



consideration of ‘surprise’ as a ‘weapon’ is that if we (here following the thread of Morris’s argument) are cognisant with the unreliability – in terms of its sustainability – of such an instrument, then surely those who launch and conduct terror-operations would also be aware of such a limitation of this ‘key weapon’. And, if this is so, then would it not make sense to ask if our (and, according to Morris, the ‘terrorist’s’) strategy of considering ‘surprise’ as a weapon – in however transient a form – is indeed valid? In other words, would the ‘terrorist’, who appreciates (according to Morris) the key tactically-enabling properties of surprise as a weapon – as much as we do – not be aware of the implicit limitations of this ‘weapon’? Would not the ‘terrorist’ also recognise the ‘use it *and* lose it’ characteristic of ‘surprise’ as a tactical enabler? And if so, then why would the ‘terrorist’ consider ‘surprise’ as a *key* weapon in his or her arsenal in the first place? Thus, despite Morris’s exegesis, this assertion – that surprise is a critically coercive weapon of terror – remains unconvincing. But this is not because Morris’s insight about the criticality of surprise is flawed: indeed, as an insight into terror-operations in the twenty-first century it is of great value. Yet the framework within which he chooses (or is compelled) to discuss it detracts from its merits.

While we should avoid falling into the conceptual restrictions within which Morris’s exegesis is trapped, we should also not be too hasty to dismiss outright his insight into the role and importance of ‘surprise’ in the context of terror-operations, especially when referring to the emergent martial landscape. Indeed, if we leave aside the constricted conceptual space from within which Morris conducts his discussion, his identification of the

element of 'surprise' should be applauded, for, among other things, it allows us to highlight an alternative version (and consequent implications) of 'surprise', whose vector runs along a completely different path than that which Morris places as a central feature of his 'conceptual framework'. As we will see, there are other ways to think about 'surprise' in the context of terror-operations that – while refusing to be subsumed under the notion of 'surprise' that Morris draws on and which is grounded, for the most part, within our traditional martial imagination – provide a sustainable substrate from which the four protocols of the SIMAD's *polemos* draw their materiality. As we shall see, it is only when considered in this way that 'surprise' truly becomes a lethal weapon, or more precisely, achieves a lethal state of latent weaponization which not only is sustainable, but also forms the kernel of a radically counter-tactical 'concept of operations' for the battlefields of the twenty-first century.

Further, it also appears that Morris remains ambivalent about how to define 'success' in the context of terror-operations. Predictably, Morris seeks to understand 'success' in state-centric terms, which leads him to offer, in this instance, a 'narrow' understanding of the word in terms of the realisation of professed political aims. Inexplicably, however, Morris fails to consider seriously the epigraph – that which opens both his essay and the present one – taken from Brig. Malik's rendition of the *Quranic Concept of War*, which states that '[t]error is not a means of imposing decision upon the enemy; it is the decision we wish to impose upon him'. It is precisely here not only that the weakness of Morris's 'conceptual framework' is exposed; but also that terror operations – especially in the twenty-first century – pose two insuperable challenges to the Clausewitzian paradigm

of thought under which Morris labours and which he leaves unaccounted for.

First, the primacy given to the achievement of political aims and objectives, which drives the teleological engine of the Clausewitzian theoretical framework – the coordination and deployment of a variety of (often state-mandated violent) means towards the achievement of specific political ends – is markedly absent, at least in what Malik has to say about the Quranic Concept of War. Of course, it may be argued that ‘terrorist’ entities – Al Qaida being one of the recent and foremost examples – have a number of identifiable and specific geo-political objectives such as the ousting of foreign (primarily American) troops from the land of Mecca and Medina; the establishment of Sharia (possibly on a global scale); the establishment of a Caliphate-mode of Islamic governance; addressing of the Palestinian, Kashmiri and other such-like questions – which resonate, albeit tangentially, with state-centric geopolitical aims and objectives.<sup>28</sup> But the suggestion to take these overt ‘political announcements’ as central defining features that render and explain – particularly in terms of their operational signatures – entities and agencies such as Al Qaida and their more local and particularised affiliates, is not simply misleading, but also dangerous. It is misleading because it is grounded on the premise that the use of terror-operations is the means by which such ends may be achieved. In other words, among other things, the implicit suggestion

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28. Kilcullen discusses these and other political considerations in his four models of enframing the 21st Century Security environment – Globalisation Backlash, Globalised Insurgency, Islamic Civil War, Asymmetric Warfare. The alleged political goals of what is termed as Islamo-fascistic terrorism fall primarily within the first three models. See D. Kilcullen, *The Accidental Guerilla: Fighting Small Wars in the Midst of a Big One* (London: Hurst and Company, 2009), 7-28.

is that once such goals and objectives are achieved, such entities and agencies would (or may be expected to) call a halt to their operations. Malik, of course, disabuses us of such fantasies by clearly identifying the 'objective' of terror-operations: '*[o]nce a condition of terror into the opponent's heart is obtained, hardly anything is left to be achieved*'. From this it should be evident that terror-operations, which may either masquerade or be misconstrued as essentially an extreme form of political action, are in reality, *or more precisely, in the reality of the terror-operatives*, outside the context of the political. Thus, while overtly political objectives may be identified and advertised in the context of terror-operations, the primal motive for such operations is not held hostage by and to any kind of political framework.<sup>29</sup> To us, operating from within a patently sub-political Clausewitzian framework, such a posture is bound to seem either incomprehensible or, at best, a lethal manifestation of an irrational, 'other-worldly', anarcho-nihilistic, hyper-violent militant *mode of operability* which breaks the link between 'cause' and 'effect', thereby defying any reason and logic that we may be familiar with. In the face of such a 'reality' our traditional acts of strategising deconstruct, often violently.

Additionally, 'strategic thinking' of the kind indulged in by Morris is also dangerous because to attempt to construe (post)modern terror-operations as being politically motivated (which, by extension, implies that they may be addressed by conventional military means and/or by dialogue or diplomacy) fosters the illusion that 'terror-operations' are necessarily organised around an exploitative principle which, given its shock-value, offers the greatest return at a

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29. We can see one potent example of this in Faraj's text.

minimal cost. If we continue to think along these lines we remain susceptible to believing that, when considered in military terms, neutralising the element of surprise would effectively stunt the proliferation of terror-operations, which is effectively what Morris implicitly suggests. Thus, our exegetical and analytical exercises – such as the one authored by Morris – in remaining within the confines of the Clausewitzian universe, tend to ignore the stark warning that Malik issues to us – for, in that one sentence, he disabuses us of our propensity to read terror-operations from within the Clausewitzian regime of thought. It is not surprising, therefore, as Negarestani points out, that Faraj would thunder at us: *'war is not a theatre, you infidels'*!

Secondly, we should not hesitate to recognise that 'surprise' in the context of the terror-operations of the twenty-first century refuses to be separated either from 'terror' or from 'fear'. Morris implicitly avoids addressing this when he suggests that the 'shock' element of a 'surprise' is the prime generator of the conditions of 'terror' and 'fear', thereby drawing a distinction between 'surprise' as a 'means', and 'terror' and 'fear' as a transient stage, towards the attainment of identifiable political ends.<sup>30</sup> What Morris seems to be suggesting is that 'surprise' is one of the key, indeed indispensable, 'tactical enablers' that allows the condition of 'terror' and 'fear' to be imposed on the enemy for the purpose of some political gain. To support this, Morris quotes from Abu Sa'd al-Amili's work, 'Learning Lessons from the Raids on New York and Washington', wherein the latter suggests that '[t]he blow came as a *surprise* to everyone. This is the essence of the Prophet's wisdom and the soundest application of his advice:

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30. Morris, 'Surprise and Terror', 5-10.

“*War is deception*”.<sup>31</sup> Further, Morris quotes from Ayman al-Zawahiri’s text ‘Knights under the Prophet’s Banner’, wherein al-Zawahiri explains that ‘[t]he targets as well as the type and method of weapons used must be chosen to have an impact on the structure of the enemy ...’.<sup>32</sup> From examples like these, Morris draws the questionable conclusion that ‘... the *manner* in which the enemy is attacked is important in itself ...’.<sup>33</sup> Yet it is curious that he does not recognise or acknowledge that by suggesting this, he blurs the very distinction that he draws between the ‘strategic and tactical surprise’ that is often effected on the conventional battlefield and the element of ‘surprise’ involved in the Al Qaida attacks on 9/11.

Morris’s distinction between ‘surprise on the battlefield’ and ‘surprise’ as employed by ‘terror-operators’ pivots around the fact that on the conventional battlefield, ‘surprise’ is a means of throwing an enemy off balance, whereas in the context of terrorist activities, it is a weapon of choice, with which to conduct ‘psychological warfare’. But this distinction is at best dubious for if, as Clausewitz noted, ‘surprise’ is ‘... not only the means to the attainment of numerical superiority; *but it is also to be regarded as a substantive principle in itself, on account of its moral effect* [...] [and] when it is successful in a high degree, confusion and broken courage in the enemy’s ranks are the consequences ...’.<sup>34</sup> then the difference between the ‘surprise’ that Clausewitz refers to and that engineered by Al Qaida on 9/11 is

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31. Ibid., 15. See also al-Amili, Abu Sa’d, ‘Learning Lessons from the Raids on New York and Washington’, in *Essays on the September 11th Raid* (orig. pub. in Arabic by Majallat al-Ansar, English trans. Provided by OSC, 2002). My emphasis.

32. See Morris, ‘Surprise and Terror’, 16.

33. Ibid. Emphasis in original.

34. Clausewitz, *On War*, 269. My emphasis.

minimal or non-existent: Both point to the same object – creating a debilitating psychological impact on the enemy. Thus we could say that ‘surprise’ is as much of a ‘tactical enabler’ for Clausewitz as it is for terror-operators like Al Qaida. But if we say this, then we would be in danger of misunderstanding not only the grounds from which terror-operations, particularly in the twenty-first century, operate, but also the existential grounds or condition that they seek to establish.

## II. THE SIMAD’S *POLEMOS*: A BRIEF OVERVIEW

Accounts that purport to depict the evolution of warfare – from the seventeenth century onwards – generally do so by identifying various ‘generations’ of warfare. Thus, the First Generation was characterised by static or positional warfare; the Second Generation, also known as ‘firepower/ attrition warfare’, was characterised by an hierarchical command and control system wherein decision-making was centralised and bureaucratised; the Third Generation, known as ‘manoeuvre warfare’, was characterised by an increasing de-centralisation of command and control – the principle of *Auftrags-taktik* or ‘mission command’ is the key defining feature of this ‘generation’ of warfare, which was raised to an operational art-form in the Second World War by the armoured formations of the Wehrmacht; finally, the Fourth Generation of warfare is characterised by an increasing and intense focus on the chaos and complexity of the battlespace. In Fourth-Generation Warfare, the operative ‘concept of operations’ is organised around the exploitation of the ‘fog of war’. The most visible emergent manifestation of this is highlighted in the theories of network-centric warfare (NCW) and in

the associated doctrines of 'swarming on the battlefield'.<sup>35</sup> A more recent, and in many ways innovative, account describes the evolution of warfare – within the same timeframe – by organising itself around the metaphors of the clock, the steam-engine, the computer and the network, thereby speaking of the evolution of war as transiting through the mechanistic, thermodynamic, cybernetic and chaoplexic stages.<sup>36</sup> Yet both these accounts remain firmly within the circumscription of the political. In other words, regardless of how descriptive and innovative these accounts are with regard to the history of the evolution of warfare, they do not deviate from the core Clausewitzian principle which instrumentalises war as a tool of politics and a means by which political objectives, in extreme circumstances, may be achieved.

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35. W. S. Lind, *The Four Generations of Warfare*, at <http://lewrockwell.com/lind/lind26.html>. Accessed on July 23, 2009. Apparently, there is now some talk of a Fifth Generation of Warfare that works around the following concepts: close-coupled systems, self-organisation, emergent properties (particularly 'intelligence'), stigmergy, and the concept of complexity arising from simple processes. See J. Robb, *Brave New War: The Next Stage of Terrorism and the End of Globalization* (John Wiley: Hoboken, New Jersey, 2007). Of course, the same problem that afflicts the previous accounts of the evolution of war reappears here, albeit in different terms. Regardless of how the 'solution' is framed, Robb's account remains enmeshed with the classical Clausewitzian framework, which subordinates war to the political. It seems that Robb's account is focused on the problems associated with 'globalisation' and sources the 'threat' to global malcontents (mis)using the benefits of globalisation. Thus he recommends the withdrawal of the nation-state from 'national security' activities and letting private individuals and corporations take over that function. Robb apparently does not see the paradox implicit in his recommendations – for all that he is doing is to replace the nation-state system with a corporatism of sorts, which would function in place of the nation-state. It is a classic case of replacing one institution with another, albeit more flexible, institution.

36. See A. Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (London: Hurst, 2009).



It is perhaps the allegiance to this foundational principle of modern International Relations, indeed of the concept of the political, which blinds Morris and other like-minded analysts to the existential threat that the nation-state system faces from the terror-operations that we are increasingly becoming familiar with today. In other words, while terror-operations, as Morris suggests, do and have changed the security environment in the twenty-first century, they have also done much more. They have terminally infected the fabric of the nation-state system and, in turn, are compelling nation-states themselves to morph in strange and unexpected ways. While such a change is underway, it should be appreciated that the means by which this change is taking place are not at all revolutionary. In fact, terror-operations in the twenty-first century do not have 'revolution' as an objective, which is also what sets them apart from the traditional and historical theorists and practitioners of anarcho-terrorism.<sup>37</sup> Additionally, this change is imperceptibly gradual and is not, as is commonly (mis) understood, an intervention from an 'outside'. Rather, it is a productive, indeed creative, albeit *intensive*, operation whereby the very fabric of the modern Western industrialised and informationalised state and society (and that of its clones outside the geo-territorial western world) is gradually becoming un-done. As such, therefore, this emergent battlespace is radically different from that which is showcased by the Clausewitzian sub-political category of Real War from which we have thus far derived the analytical and operational principles and tools by which we attempt to understand and contend with terror-operations.

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37. Some of the more prominent practitioners were François-Claudius Ravachol, Auguste Vaillant, Émile Henry, who, among others, were inspired by the revolutionary and counter-revolutionary theories and doctrines of the Kropotkin/Malatesta/Nechayev/Bakunin-inspired school of anarchism.

## COLLAPSE VI

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### *PRECURSOR TO THE SIMAD: THE NOMADIC WAR-MACHINE*

In the context of mainstream International Relations, 'threats' to the nation-state are generally alleged to originate from two distinct locales: (1) from outside the State, and (2) from within it. From the 'outside', 'threats' to the nation-state are either posed by other nation-states or by non-State actors, while in the latter case, the threats are local, that is to say, they are systemic in origin. Yet to say that threats to the nation-state originate from the 'outside' would be a misnomer, for the perception and consequent contextualisation of the threat takes place from within the confines of the nation-state, thereby establishing the originary limits of the threat. This is reflected in the Clausewitzian consideration of war as an instrument of politics, which is also how 'Absolute War' is brought to Reason. By contrast, the original Deleuze-Guattarian formulation of the nomadic war-machine, which they placed at a locale external to the State, allows us to (re)consider war from a non-Clausewitzian point of view. In other words, it allows us to engage with war from a site outside the circumscription of the nation-state and its transcendently-generated geo-territorial map of materiality. In this exteriority, the Deleuze-Guattarian war-machine is 'irreducible to the State [...] outside its sovereignty [...] prior to its law: it comes from elsewhere.'<sup>38</sup> As such, therefore, the Deleuze-Guattarian war-machine is '... of another species, of another nature, of another origin.'<sup>39</sup>

The key to understanding the Deleuze-Guattarian formulation of the war-machine is to understand its

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38. G. Deleuze and F. Guattari, *Nomadology: The War Machine*, tr. Brian Massumi (New York: Semiotext(c), 1986), 2.

39. *Ibid.*, 3.

‘nomadic’ nature while at the same time keeping in mind that ‘war’ (political war), for the nomadic war-machine, is only of secondary importance. To draw our attention to the ‘exteriority’ of the nomadic war-machine, Deleuze-Guattari insist that we pay close attention to the ‘nomad’, who, they assert, has ‘a territory’. In other words, we are meant to recognise that the nomad traverses ‘paths’ which are defined by points or nodes – watering holes, dwelling points, and points of dispersal. These points and nodes are mere transit points which are temporary locales of assembly and dispersion for the nomad. The nomad, unlike other sedentary or even migratory entities, is not attracted permanently to such points or nodes. As Deleuze-Guattari put it, ‘the life of a nomad is *intermezzo*’.<sup>40</sup> In this way, Deleuze-Guattari distinguish the nomad not only from the sedentary, but also from the migrant: Unlike the nomad, the migrant, who is also a ‘mover’, travels along a path determined between two points. In the migrant’s case, however, the points determine the path and the points are the *telos* of the movement that the migrant undertakes. This is *contra* the nomad, whose movement is in itself the *telos*, with the points or nodes being transient points of rest and refreshment. The paradox that the nomad presents, however, is that – according to Deleuze-Guattari – although the defining nature of the nomad may seem to be movement, as Toynbee points out, the nomad actually does not move. Rather, Deleuze-Guattari say, the nomad occupies ‘space’.<sup>41</sup> Thus, in Deleuze-Guattari’s words, ‘the nomad is one who does not depart, does not want to depart, who clings to smooth space left by the receding forest, where the steppe

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40. Ibid., 50.

41. Ibid., 51.

or the desert advance ...'.<sup>42</sup> In Toynbee's words, nomads fling '... themselves upon the Steppe, not to escape beyond its bounds but to make themselves at home on it.'<sup>43</sup>

Deleuze-Guattari's theorisation of the nomad and of the nomadic war-machine is, of course, more complex and extensive than the above may suggest. However, for our purposes, it is only necessary to recognise that the Deleuze-Guattarian model of 'nomadology' brings into sharp relief the functioning of nomadic war-machines and the nature of their relationship with the nation-state and its instruments of war. In summary, the diagram that they draw of this relationship may be sketched out in the following way: (1) War-machines (which are nomadic assemblages) are external to the State; (2) Since the nomad, essentially, occupies 'space', it is the State which intrudes into this 'space' of the nomad, which is where and how the State comes into conflict with the nomadic war-machine; (3) Thus, under specific circumstances, the State is able to 'capture' such war-machines and internalise them. In other words, the State is able to instrumentalise these nomadic war-machines and use them for its imperial purposes; (4) As such, therefore, the State is always predisposed to assume a pre-emptively offensive stance to seek the 'unknown unknowns', for the latter pose the greatest threat to the systemic health of the State; (5) However, in the process of doing so, the State also runs the risk of being enveloped by the war-machine, in which case the State ends up being a mere assemblage of the war-machine. In this form, the war-machine assumes global proportions and is able to create a condition of terrifying peace;

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42. Ibid.

43. A. Toynbee, *A Study of History* (New York: Oxford University Press, 1947), Abridged by D.C. Somerville, 168.

(6) This peace is a function of the constabulary role that the global war-machine plays by integrating within itself what were originally the policing and juridical functions of the State into a panoptical device of control and discipline; (7) The principal concern of such a worldwide war-machine is to exercise systemic control of, among other things, the State. In other words, the worldwide war-machine looks to identify any sign or activity that may disturb the systemic balance of the State/war-machine. In Bousquet's terms, the worldwide war-machine seeks to contain, but also to sustain, a chaoplexic condition that carefully calibrates the degree of turbulence allowable within the system. In this way, the worldwide war-machine is able to maintain the productive health of the system by monitoring the productivity (and, one could also add, the vitality) of the constituents of the system. This Deleuze-Guattarian model of the nomadic war-machine which, when captured and re-deployed by the State, assumes the terrifying model of a worldwide war-machine that has run amok, is not merely a piece of speculative theory. In the context of the emerging theories and doctrines of network-centric warfare, their model of the instrumentalised war-machine has taken on a very real materiality. Thus, for example, we can find an uncanny resemblance between the doctrine of battleswarms and the Deleuze-Guattarian model of the worldwide war-machine, both of which – at least in theory – are envisioned not simply in global terms, but on a planetary scale.

In the context of twenty-first-century terror-operations, therefore, if the terror-operator is assumed to be a 'nomadic war-machine', then the State's counter-terror (and counter-insurgency) doctrines are signatures of the domestication

of the nomadic war-machine.<sup>44</sup> Of course, there is a viable case to be made that post-modern terror-operators like Al Qaida are not nomadic war-machines. Yet, their operational signatures lead us to suggest that, at the least, they simulate the operational modes of nomadic war-machines. However, this does not negate the State's ability to capture this extra-State war, which it makes its own. Given this, the following question arises: Is there 'a war' that remains outside the ability of the State to make its own – thereby precluding its ability to bring war to a 'reason' comprehensible by the State?

### *SIMADology*

Given that most discussions on terror-operations – within the current geo-politico-philosophical regime of thought with all its attendant anthropocentric socio-political and psychological biases – sink steadily into the morass of an anthropocentric notion of 'terrorism', our intention, as we clarified at the outset of this essay, was to explore the possibility of an alternative regime of thought within which we contend that the SIMAD's *polemos* is gradually unfolding. But to do this, merely asserting the emergence of this polemical condition is not enough. We cannot begin to speak of the SIMAD's *polemos* without explicating the vicious circle that binds the diachronic relationship between

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44. One example of the State's capture of the war-machine and its redeployment in the service of the State and its subsequent running amok is the U.S. support for the Afghan Mujaheddin to fight the Soviet Occupation of Afghanistan. After the defeat and withdrawal of the Soviets, these same Mujaheddin engineered a machinic assemblage which turned upon their erstwhile benefactors and locked them into a battle that rages on to this day. See M. Kakar, *Afghanistan: The Soviet Invasion and the Afghan Response, 1979-1982* (London: Univ. of California Press, 1997). See also Steve Coll, *Ghost Wars: The Secret History of the CIA, Afghanistan, and Bin Laden, from the Soviet Invasion to September 10, 2001* (London: Penguin Press, 2004).

the Terror-Operator, and its anterior/prospective actions, which are only retrospectively recognisable as the Event-Terror. Thus, in the context of the SIMAD's *polemos*, we begin by positing nothing less than an absolute annihilation of any residual interstices that may have kept apart the Terror-Operator and the Event-Terror – thereby collapsing them into and onto each other. This, in turn, requires us to direct our attention to an alternate martial space – let us refer to this as a 'chthonic battlespace'.<sup>45</sup>

Engaging with the chthonic battlespace – which is marked by a tension characterised by flows and counter-flows of forces of intensification and torsional disintensification (envoiding)<sup>46</sup> – is but the first step in articulating an alternate regime of thought wherein the Clausewitzian paradigm of War loses its subjective anchor and objective reality. When considered in the context of the chthonic battlespace, the Clausewitzian 'concept' of Absolute War breaks free from its ideational limits (imposed on it by the experience of Real War) and freely colludes with any and all counter-resistant media to creatively produce a differential calculus of itself, which infects and re-infects not only the resisting medium, but all machinic assemblages that (per)form with/in that medium, while at the same time – with clinical and excessive precision – virally proliferating itself, thereby creatively generating 'milieus of terror' far in

45. The word 'chthonic' is derived from the Greek *χθόνιος* – *chthonios*, 'in, under, or beneath the earth', and from *χθών* – *chthōn* 'earth'; pertaining to the Earth; earthy; subterranean. Further, the Greek word *khthon* is one of several words for 'earth' which, typically, refers to the 'interior of the soil', rather than 'the living surface' of the land (as *Gaia* or *Ge* does); or the 'land as territory' (as *khora* [χώρα] does). Our use of the word 'chthonic' invokes the reference to the 'interior of the soil' that the word *khthon* involves.

46. Thanks to Reza Negarestani who formulated this excellent phrase (email exchange, July 18, 2009).

excess of any geopolitical sources and levels of terror that we may be familiar with. In this way, the SIMAD's *polemos* assumes a chasmic<sup>47</sup> pertinence, which is both endemic to the regime of thought that generates it, and which is, more terrifyingly, in excess of it.

In the context of this essay, therefore, the SIMAD's *polemos* is an un-grounding that destabilises any and all territorial limits, including those 'territories' inhabited by the Deleuze-Guattarian 'nomad'. By positing this, we are also suggesting that the SIMAD's *polemos* is 'the ripping of the ultimate horizon of materiality which poses a posterior disjunction to thought and enacts the anterior submission of originary ontological difference to the non-belonging

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47. In this context, the urge to use the word 'cosmos' or 'cosmic', was very compelling. However, etymologically, it would have been impossible to support. In Ancient Greek, the word 'kosmos' refers to an 'orderly arrangement' (cf. Homeric 'kosmeo', used of 'the act of marshaling troops'), with an important secondary sense of 'ornament, decoration, dress'. Pythagoras is said to have been the first to apply this word to 'the universe', perhaps originally meaning 'the starry firmament', but later it was extended to the whole physical world, including the earth (see <http://www.etymonline.com/index.php?search=cosmos&searchmode=none>). In this essay, the use of the word 'chasmic' is made keeping in mind the following: (1) It is a derivative of 'chaos', which is itself derived from the Gk. *khaos* 'abyss, that which gapes wide open, is vast and empty,' from \**khnwos*, from PIE base \**gheu-*, \**gh(e)i-* 'to gape' (cf. Gk *khaino* 'I yawn,' O.E. *ginian*, O.N. *ginnunga-gap*); (2) Hesiod ('Theogony'), describes 'khaos' as the primeval emptiness of the Universe, begetter of Erebus and Nyx ('Night'), which is much closer to what we intend to convey in this essay, as opposed to, say, how Ovid (*Metamorphoses*) – who opposes *Khaos* to *Kosmos*, 'the ordered Universe' – uses the word. Further, the Greek word 'tarakhe' stands for disorder, which may be posited as the opposite of the word 'kosmos'. We have chosen to use the word 'chasmic' derived from Hesiod's use of the word 'khaos', rather than from Ovid because (1) the latter's use of the word pits it directly against 'kosmos' and thus may be considered to be closer to 'tarakhe' or 'disorder', and (2) when derived from Hesiod, the word conveys a more open-ended sense. Of course, we also contend, contra Hesiod that chaos is not a signature of 'pure emptiness of the Universe, rather that it is a 'force-plane' that is anterior to even matter, which is also our provisional explanation of Hesiod's assertion regarding the 'primeval emptiness of the Universe' as the begetter of Erebus and Nyx. (see <http://www.etymonline.com/index.php?search=chaos>).



principle of the void.<sup>48</sup> It is in this sense that the SIMAD's *polemos* is the signature of an ultimate dissolution of materiality. Chasmic Terror, in the context of the SIMAD's *polemos*, then, is in the first instance the disjunction of thought – for in such a theatre of dissolution, thought loses its traction. Thought, in these conditions, is wrecked by a torsional movement that not only contorts it beyond recognition, but also, more importantly, first disinters and then dissolves it, thereby bringing into sharp relief the possibility of a chasmic immaterialisation with its attendant annulment of all ontological privileges.

Given this, the SIMAD is therefore the point or locus where this ripping of the ultimate horizon of materiality is tangibly 'visible'; for it is at that site and in that instant that the curvature of a radically open-ended exteriority – the chasmic – exhibits itself while simultaneously generating an anomalous field or milieu wherein the vastness of the chasmic non-belonging exteriority is expressed by means of a distinct tellurian-originated difference. This expression of tellurian difference is nothing but the signature of an ill-fated, that is to say tragic, complicity of interiorised tellurian energetico-structures – that produces, by means of difference-engines, a spatio-temporal materiality – with chasmic non-belonging exteriority. It is critical to note that this complicity, though tellurian in origin, is abysmally virulent – indeed this is what makes the SIMAD and its ensuing *polemos* so hard to pin down, yet so very real. The SIMAD is a passage, a traversing, an emergence, an eruption, which involves – indeed, compels – a tragic but essentially indifferent complicity between tellurian structures and chasmic dissolutions, resulting in the

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48. Reza Negarestani (email exchange, Jun 23, 2009).

disintegration of all ontological privileges. It is for this reason that even when we speak of 'acts of terrorism', which are instances of tellurian 'terror-events', we cannot do so without reference to breakage, dismemberment, dissolution, incomprehension, stunning affectivity, and ultimately, to death. But, lurking behind our tellurian-specific explanations, what we are actually referring to is this breakdown and dissolution of patently tellurian ontological privileges, caused by seemingly abrupt interventions and of their scattering into the darkest recesses of a chasmic void of non-belonging-ness.

The question that begs our attention at this point concerns the implicit difference that emerges as a consequence of our reference to the *tellurian* and *chthonic*. Etymologically, the tellurian refers to surfaces that presume a *terra firma*. It is a material surface, albeit without any depth and, interestingly, it is the implicit plane on which, it is theorised, advanced war machines, such as those proposed by Deleuze-Guattari, express their so-called rhizomatic martial tendencies. But it is important to note that the mobile assembling and dis-assembling that the Deleuze-Guattarian war machines revel in, while seemingly liquid in their movements, are nevertheless restricted to the 'matter' of the tellurian surface; for the '*firma*', in the tellurian context, guarantees the ontological structural integrity of 'matter', which blocks off access to 'depth', that is to say, to the Abyss of non-belonging-ness, and which, while being 'smooth', also retains the potential of 'striation'. The chthonic, on the other hand, is the substrate of the tellurian. It is a liquidly intensive and interiorised chasmic force-plane, which is smooth, free-flowing and open-ended. The chthonic plane is thus an interiorised chasmic

horizon – an ‘inscape’ of chasmic non-belonging-ness. In this sense, it is anterior to matter itself (and thus to all ontological attributes that lend structural integrity) and therefore precludes the possibility of any kind of striation. On this plane, which is seething with unrestrained forces, transitorial assemblages such as Deleuze-Guattarian war machines are irrelevant. They gain no traction. They are unable to maintain their integrity of assembly, however fleetingly. Thus, the Deleuze-Guattarian *concept* of rhizomes, presuming that it is a prelude to the formation of difference-engines, is effectively only possible on these chthonic planes, for the latter allow for a free play not simply on surfaces, but also in terms of a chasmic depth. Given this, therefore, it can be said that tellurian surfaces and structures have as their conditions of possibility the chthonic, but chthonic planes remain without any such preconditions. Indeed, the chthonic chasmic forces, while instrumental in creating the conditions of possibility of matter (and the consequent ontological privileges), are also always-already dissolving such conditions on the tellurian non-planar surface. In other words, the chthonic chasmic forces are always subversive forces which, while engendering differential engines that populate the tellurian surfaces, also continually spike them.

Now, these terrifying chasmic interventions, which in the tellurian context are akin to ‘eruptions’, cannot be plotted against and within a tellurian matrix, because they are the unfolding of always-already interiorisations of a chasmic exteriority that lurks as a substrate to the tellurian surface and that takes place along and across the continuum of tellurian space-time. Thus, to say that the SIMAD ‘intervenes’ is not to suggest that it is an invasion from an ‘outside’; rather, it is to suggest that the

rupture of the tellurian space-time continuum is akin to a cross-sectional cut which, while slicing through the non-planar tellurian surface of exteriority, nevertheless envelopes the tellurian exterior, thereby interiorising it within the chasmic exteriority. There is something very excessive and disturbing about this, for the buckling and contortion that takes place in this envelopment results in a compression and an ultimate collapse of the tellurian space-time continuum into a site and locale of immeasurable density; while equally, and more importantly, it is also a shattering and a scattering of all energetico-structures beyond all tellurian confines. This is the site of the SIMAD's battlespace – the martial *intermezzo* in which strategy decomposes into pure tacticities and where combat has less to do with destruction, and more to do with the alchemy of decay. Thus, it becomes impossible to capture – let alone domesticate – the SIMAD. It is only possible to be complicit with/in it – but on the non-negotiable condition that we also share its non-linear and cross-register movements, which spiral away chaotically beyond any tellurian boundaries into a chasm of non-belongingness. The paradox is that while we are swept up and along by this terrible intervention, equally, we cannot help but contribute to it: in the process, we – as tellurian-specific energetico-structures – become un-done!

When considered from the perspective of the tellurian non-planar surface, the 'intervention' that we have just described is indeed paradoxical: For it is inconceivable that we are both the site wherein the affectivity of the SIMAD is exhibited and a co-constitutive element of the SIMAD itself. However, the paradox becomes, literally, immaterial if we posit that what is played out on this chthonic surface

is the liquidity of the SIMAD's *polemos* on and in which we are no longer discrete and resistant energetico-structures negotiating the flows of the molten surface of the chthonic plane, fighting the insinuations of havoc that the SIMAD brings with it. Rather, we are discontinuous ensembles drawing our localised tactical consistencies from the very medium that constitutes the chthonic planar surface. In this way, while we are consumed by the SIMAD's *polemos*, we co-constitute it as well. It also follows, then, that when considered in the context of such chthonic planar surfaces, there are no discrete interstices wherein the politics normatively attributed to terrorism can be played out. Of course, this does not mean that the politics of terror are absent. They are certainly present, but only on the tellurian non-planar site to which we, operating on and within the liquid chthonic plane, are indifferent. But if this is so, then how can we account for the difference between the non-planar tellurian surface and the chthonic planar substrate? Is there not a sharp and distinctive originary difference between them?

To presume a difference between the tellurian and the chthonic is to reinscribe the presence and uninterrupted operation of a difference-engine which produces difference *qua* matter in the first instance. We have already suggested that such difference-engines only exist on the tellurian surface, which provides them with enough traction to be able to produce and proliferate difference *qua* matter. But equally, chasmic interventions subvert the output of these tellurian difference-engines (difference *qua* difference and, by implication, difference *qua* matter). Thus, while in the tellurian context, matter is indestructible, or irreducible, in the chthonic context, its (that is to say, matter/difference's)

production is always-already a signature of its dissolution. As a pertinent aside, it is this force, on whose vector the dissolution of matter/difference is contingent, that Ferenczi indicates when he speaks of 'the complete dissolution of connexions and a terrible vertigo' in the context of the Ego.<sup>49</sup>

This vertigo, which is one of the signatures of an asymmetric dismantling of difference-engines, is a terrifying indicator of the SIMAD's passage involving chthonically interiorised chasmic forces through and beyond tellurian surfaces (and the implicit exposure of the interiorised chasmic horizon of a non-belonging exteriority, or that which we have referred to as the 'inscape' in the chthonic context) carrying along with them shattered tellurian energetico-structures (difference-engines), which rapidly decompose into ever receding fragments and grains within the chasmic void of non-belonging-ness. As a consequence, these interventions, by spiking the tellurian-specific difference-engines, bring about an ungrounding of the non-planar tellurian surface while remaining faithful to the creation of a 'new earth'. This is the passage of the SIMAD.

Considered in this way, then, it is tempting to understand the SIMAD as a very distinct and specific kind of a difference-engine – one that, while traversing along and across the tellurian surface, only plays the role of dis-integrating it. In light of our discussion thus far, it would appear that the SIMAD is a difference-engine engineered and empowered by chthonically-interiorised chasmic forces that arrive from unidentifiable locales of non-belonging and transit through to other such locales of non-belonging.

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49. S. Ferenczi, *Final contributions to the problems and methods of psychoanalysis* [1930] (London: Karnac Books, 1994), 222-3.

This would also account for our inability positively and effectively to enframe the SIMAD within a matrix of comprehensibility and would confirm the essential indistinguishability that we have previously attributed to it. If we give in to this temptation, however, we would be grossly misunderstanding the SIMAD.

The SIMAD is not a difference-engine, though it can masquerade as one when in hypercamouflage mode. Instead, the SIMAD is an *intensive mechano-in-organic insinuation (pre-shock and after-shock) of the passage of chasmic forces that riddles any battlespace constructed on the tellurian surface with 'hotspots' – sites or locales of eruption and escape (Levinas would undoubtedly refer to these as sites and instances of 'excedence')*.<sup>50</sup> It is *intensive* because, while on the tellurian surface, it appears as a pure and transparent spatio-temporal dynamism originating from within the enveloped void hidden within the surface of the earth. It is *mechano-in-organic* because, identified in the tellurian context as a fleeting agency originating from a locale of non-belonging-ness, it is primordially machinic but also takes on a progressively solid and organic form as its evolutionary cycle cuts through the tellurian surface. It is an *insinuation* because, on the tellurian surface, it leaves nothing more than an aftershock as traces of its terrifying passage. As such, therefore, the SIMAD brings into sharp relief the post-vital, that is to say the post-Evental, status of tellurian battlespaces.

Now, the theory of NCW which, when considered in its abstract – albeit perversely grotesque – form closely approximates the Deleuze-Guattarian conception of a 'worldwide war machine that has run amok', posits that the key to its

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50. Acknowledgment to Reza Negarestani for the phrase 'mechanorganic insinuations of sheer havoc', which I have slightly modified to read 'mechano-in-organic' (email exchange, Jun 23, 2009).

efficient operability is its ability to ‘sense and respond’. This it proposes to do by progressively collapsing the links between the ‘sensor’ and the ‘shooter’. The ideal condition, implicit in the theory of battleswarms, is the meshing of the ‘sensor’ and the ‘shooter’, which allows for the prosecution of what is termed Just-in-Time (JIT) Warfare. Indeed, it is precisely this lack of distance between the general’s map-table (screen) and the battle that, in the first instance, allows Just-in-Time War to be imagined. In other words, the viability of the JIT concept of operations rests on the ability to operate in Real Time. But, as we have seen, when played out on a tellurian surface, the map-table is a ‘map’ that plots the Event-Terror *after* its instantiation – that is to say, retrospectively. In other words, what is reflected on the general’s map-table is a trace (or alternatively, an after-shock) of the Event-Terror – it is, in this sense, behind Real Time.

The strategic ensemble that the theory of NCW assembles is the most recent – that is to say, a postmodern – difference-engine that has emerged on the tellurian surface. Little wonder, therefore, that some of the leading theorists of NCW who lay a great deal of emphasis on the theory and emerging doctrine of ‘battleswarms’ would choose to understand the doctrine in terms of a ‘seemingly amorphous, but [...] deliberately structured, coordinated, strategic way to strike from all directions, by means of a sustainable pulsing of force.’<sup>51</sup> There are two implicit assumptions underwriting this emergent ‘concept of operations’: Firstly, that battleswarms – comprised of myriads of small, dispersed, networked and highly lethal

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51. Arquilla and Ronfeldt, *Swarming and the Future of Conflict*, (Santa Monica: RAND Corporation), (PDF version available at [http://rand.org/pubs/documentedbriefings/2005/RAND\\_DB311.pdf](http://rand.org/pubs/documentedbriefings/2005/RAND_DB311.pdf)), vii.



mobile units – would disintegrate in battle; but also that they should be able to speedily reform to co-constitute a fresh battleswarm to deal with a ‘new’ threat. And, secondly, that under ideal conditions, the ‘seemingly amorphous, but deliberately structured’ form is held together by a ‘sustainable pulsing of force’. The latter assumption is an interesting one, for it in turn presumes that these post-modern theorists of war have not only recognised the high intensity and multi-varied forces that their technophilic battleswarms would have to contend with – that which we have previously identified as chthonically interiorised chasmic forces – but also that, eventually, there would arise the possibility to halt and effectively combat these ‘unknown’ forces.<sup>52</sup> The reference to the ‘sustainable pulsing of force’ is even more interesting, as it points to the implicit difference-engine that is operative within this net-centric ‘concept of operations’, which is designed (or perhaps destined) to function as the organising principle of battleswarms. This latter aspiration, we should not fail to recognise, is in keeping with the Clausewitzian tradition. Whereas Clausewitz attempted to contend with chaos and uncertainty in the context of war, and particularly on the battlefield, by instrumentalising (or alternatively, strategising) the genius, chance and uncertainty, and by theorising the very concept of war in a very specific way, his post-modern disciples, it would seem, are opting for a more technologically-grounded method to achieve the same end. In the latter case, the only way this can be achieved is if they somehow succeed in effectively sealing off the tellurian surface from the terrifying chasmic forces, which would entail a scenario that eerily echoes the

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52. The most recent attempt to articulate this has been Bousquet’s *The Scientific Way of War*, wherein he used the term ‘chaoplexic’ to highlight the emerging model that such efforts of containment would deploy.

## COLLAPSE VI

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Deleuze-Guattarian vision of a ‘worldwide war machine, which [...] reforms smooth space [and] [...] claims to control, to surround the entire earth.’<sup>53</sup>

What remains unaccounted for by and in this post-modern battlespace, which is possible to construct only on tellurian surfaces and which maintains its ideal objective in terms of spanning the entire tellurian surface, is the subversiveness of the chasmic forces – represented by the SIMAD – that confront it. This subversion – the dissolution of the materiality of the tellurian surface and of all associated energetico-structures – then, is the counter-tactical ‘concept of operations’, which is fleetingly instantiated by and as the SIMAD. Recognising this, albeit perhaps not in these specific terms, the tellurian-specific project of net-centric militarization attempts to ‘humanise’ the SIMAD (as a ‘terrorist’ or a ‘terror-operator’) thereby creating a distance (difference) between ‘it’ and the Event-Terror such that, to paraphrase Libicki, ‘a fine enough mesh can be cast to catch “it”, or indeed, anything’. The failure to do so, as is evident from our more recent experience of war in the twenty-first century, is becoming increasingly terrifying and, as such, it heralds the polemological condition that the SIMAD brings in its wake.

### III. THE FOUR PROTOCOLS OF SIMADOLOGY

Based on the above, we are now in a position to articulate a rudimentary set of protocols by which the SIMAD operates:

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53. Gilles Deleuze and Felix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, Trans. Brian Massumi, (London: Continuum, 2003), 421.

*First Protocol: The object of the SIMAD's polemos lies not in the perpetuation of war, but in the instantiation of a creative chemistry of decay.*

Under the Clausewitzian model, war – which has been the exclusive preserve of the nation-state – has two critical centres of gravity: a geo-spatial locale and a psycho-social locale. Thus, Clausewitz was able to say that if either of these two centres of gravity of an enemy is dislocated, it is possible to impose our 'will' onto the enemy. Counter-intuitively and paradoxically, SIMADs work to sustain *and* decay both the geo-spatial and psycho-social centres of gravity of their targets of interest. Indeed, the continued presence and maintenance of such centres of gravity is critical for the SIMAD for, paradoxically, they are the very sources of nourishment of the 'agenticities' of the SIMAD. The first principle of SIMADology, therefore, suggests that the most conducive environment for the efficient conduct of operations is a state or condition of an 'uneasy' peace, which can be calibrated by the SIMAD between greater or lesser degrees of fear, surprise and terror which involves a weaponization of the chemistry of decay and dissolution. In this way, SIMADs seek to retain the ability to calibrate the condition of peace, thereby keeping the target's systemic health in a state of perpetual decay and consequent perturbation.

*Second Protocol: SIMADology eschews the 'theory' of strategy and wholly focuses on pure tacticity.*

SIMADs refuse to engage in operations that are strategically constructed and developed. Rather, they seek micro-local and vermicular opportunities wherein they exhibit their purely tactical stance. This suggests that there is a very high degree of contingency in the SIMAD's *polemos*

and that the ecology within which SIMADs operate is a critical co-constituting element that determines the nature of operations that are engaged in. Thus, all attempts to strategise the SIMAD's *polemos* are always externally imposed onto the 'agenticity' of the SIMAD. In other words, while the agenticities of the SIMAD do not strategise, the resistant environment that they operate in seeks to strategise their actions – generally, by attempting to 'profile' such activities. It is interesting to note that this foundational principle in itself plays a key role in dislocating our attempts to deal with the polemological condition that the SIMAD creates. In other words, while we, from the outside, may strategise the SIMAD's actions, SIMADs themselves are astrategic. Thus, whatever strategic pattern-creating tools we use, the 'maps' they generate are always 'fictions' for they are only artificial overlays that we create over patterns that we draw, which are always post-Evental. As a consequence, they lend us no further insight into how and in what manner the SIMAD's *polemos* unfolds. The occasional successes we may enjoy serve only to further delude us into believing the 'full-ness' of what is, in reality, our own vacuous construct.

*Third Protocol: All damage, however small and seemingly insignificant, is considered primary damage.*

In the context of the SIMAD's *polemos*, all damage is primary and no damage is collateral. This implies that the operating environment of the SIMAD is an omni-dimensional field of targets and that all shapes, forms, structures, ideas and matter that constitute that environment, regardless of their normatively assigned value, are targets of equal value for the SIMAD. Thus, there is no distinction made between a 'higher value' target and a 'lower value' target. When considered in the context of geo-spatial targets and

psycho-social targets, therefore, everything is ‘fair game’. Targets are identified not in terms of ‘value’ but in terms of their ability to generate ‘fear’, ‘terror’ and ‘surprise’ that can sustain and prolong the chemistry of decay that the SIMAD fosters. Moreover, the operations that rely on such a targeting principle are not graded in greater or lesser degrees; nor do they necessarily have to be violent, though they always exhibit a latency of violence.

*Fourth Protocol: SIMADs don’t inflict (damage), they infect.*

SIMADs infect systems and structures rather than inflicting damage on them. As noted above, chasmic chthonic forces – embodied as the SIMAD – work to dis-inter the materiality of the tellurian surfaces by continually spiking the difference-engines that populate the tellurian surface. This spiking of difference-engines by the SIMAD, however, is rarely, if ever, revolutionary. Rather, it is evolutionary. This is primarily because SIMADs insist on reducing the ‘matter’ of tellurian-based structures by deploying a ‘decaying’ mechanism – a kind of *necrosis* that brings to mind the Aristotelian description of the torture methods employed by the Etruscan pirates, which involved tying up an offender to a rotting and blackening corpse. What followed such a practice was an almost philosophical chemistry of decay by which a living body was turned inside/out at a vermicular, albeit infinitesimal, level.<sup>54</sup> The reported outcome of such a procedure involved the living body becoming progressively blackened, or negrified, and rotten, to the point where both ‘bodies’ were eventually reduced to a dark mass of slime. This, as Negarestani puts it, ‘signaled an ontological exposition of the decaying process

54. Reza Negarestani, ‘The Corpse Bride: Thinking with *Nigredo*’, *COLLAPSE IV* 129-60: 131; See also Negarestani’s ‘Undercover Softness’, present volume.

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which had already started within.’<sup>55</sup> In a startlingly similar fashion, the SIMAD is a signature of the ontological decay of the tellurian surface for the SIMAD performs an almost vermicular function as it rends the tellurian landscape. The slow and imperceptible reworking of the ontological chemistry of the tellurian surface by the SIMAD thus spreads like a rash or a lesion which slowly tears away at, or more precisely, de-materialises, the fabric of the tellurian surface thus exposing the liquid-like substrate of the chasmic chthonic forces on which the tellurian surface rests. In this way, the SIMAD – by invoking the principle of decay – undermines the tellurian surface and all structures and difference-engines that exist and operate on it. If, as we contend, this is the nature of the emerging *polemos* of the SIMAD, then the problems associated with developing a counter-terror strategy and doctrine for the State (which, we should not forget, is a patently tellurian structure) increase exponentially for the problem associated with the fourth protocol of the SIMADology is nothing less than the following – how to contain (and reverse) a process of ontological decay?

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55. Ibid., 169.

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#### IV. THE SIMAD's COUNTER-TACTICS OF HYPERCAMOUFLAGE<sup>56</sup>

Morris is right on the mark when he points out that despite his implicit doubts about the sustainability of the 'weapon of surprise', the security landscape has changed, thereby leading him to assert that there has been a concomitant change in the way how people think and behave.<sup>57</sup> Yet, based on how Morris sets up the space of confrontation – sub-state actors versus 'entire governments' – in this 'changed' security landscape, his 'conceptual framework' does not convey the radical changes that have taken place in the global security environment.<sup>58</sup> Thus, it remains for us to ask: how and in what way has the security landscape so radically changed and, more importantly, what are the counter-tactical principles that the SIMAD brings to the foreground?

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56. The term 'hypercamouflage', to the best of my knowledge, was first coined by Reza Negarestani in his essay, 'Militarization of Peace' in **COLLAPSE I**. It should be noted, however, that the Soviets did have an operational principle that they termed 'maskirovka' (literally: camouflage, concealment), which was most effectively used at the Battle of Kursk against the Wehrmacht in July-August, 1943. It is also alleged that the principle of 'maskirovka' was used, under Russian guidance, to conceal Saddam Hussein's air-defence system in and around the Baghdad area. Of course, there have been other famous instances of the use of the principle of 'deception' and 'concealment' in warfare. The Allied deception of the full extent and deployment plans during the Normandy landings in 1944 is a case in point.

57. Morris, 'Surprise and Terror', 2.

58. If we follow Kilcullen's analysis of the accidental guerrilla, we find that one of the key issues at stake, which make the prosecution of the GWOT a problem is that nation-states find themselves in confrontation with groups and actors who reside within nation-states that are allies and friends. In some cases, this hosting of such groups is fully supported by the State in which they reside. The prime example in this instance is the case of Pakistan, which is both an ally to the United States, but has also – via its intelligence agencies (the ISI) – supported, funded and facilitated various groups that have carried out terror-operations directly and indirectly against American interests within and outside the American 'homeland'. See Kilcullen, *The Accidental Guerilla*.

Reza Negarestani's reading of Faraj's polemical terroristic text, *Jihad: The Absent Obligation*, provides us with a valuable insight into a radically post-modern counter-tactical principle of martial operability – 'hypercamouflage' – which, we contend, is the key defining feature of the martial operability that the SIMAD exhibits.<sup>59</sup> Negarestani suggests that Faraj's notion of *Taqfiri*-ism – set in the context of a version of militant and subversive Islamism, which counts among its proponents Sa'id Qutb, the Egyptian theorist of Islamic Revivalism – is supplemented by the doctrine of *Taqiyya*, which is contorted out of 'its [...] defensive and devout function in the dawn of Islam [...] [which originally was] a justified concealment of true beliefs in situations where harm or death will definitely be encountered if true beliefs are declared (the wider meaning of *Taqiyya* being "to avoid or shun any kind of danger")'.<sup>60</sup> Faraj's militant and subversive bent, in Negarestani's reading, takes this notion of *Taqiyya*, weaponizes it, and recommends its deployment as a supplementary mode of operability to the already militant terroristic *Takfiri* system. The consequence of this exercise is the emergence of the 'shadow terrorist', whose principle weapon of choice then would be a latent state of weaponization, but which would remain indiscernible to the keenest of eyes. Thus, as Negarestani puts it:

... the cover of camouflage can never be penetrated or disrupted, and...[t]he Takfiri's favoured mode of warfare is to program a new type of tactical line which totally blends with the enemy's lines in such a configuration that it introduces radical instability and eventually violent fissions into the system from within.<sup>61</sup>

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59. See Negarestani, 'The Militarization of Peace'.

60. Negarestani, 'Militarization of Peace', 57-8.

61. Ibid., 55.



It will be evident at once that this vision of a battlespace, or in our context, of war, is radically different from the one that draws its inspiration from Clausewitz. There are a number of inferences that we can draw from this description of the battlespace of war. Firstly, the act of disappearing into the enemy is not a strategic act, rather it is pure tactical. It is eminently evasive and it is geared to meld (*melt + weld*) with the systemic elements of the enemy. This melding, ideally, is so refined that it becomes difficult, indeed impossible, to extricate the entities that have so fully merged within the system of the enemy. Secondly, as a consequence of this, the tactical principle of ‘surprise’, which plays such a critical role in Morris’s ‘conceptual framework’, transforms itself into a systemic principle, which draws its sustenance from the very system within which the entities merge. Third, ‘surprise’ then is not an intervention from the ‘outside’. Rather, it is, as Negarestani puts it, more akin to ‘violent fissions into the system from within’. What ensues, therefore, is a radical destabilisation of the system, whose structural disabling is calibrated not by those elements legitimated to control the system, but by these mysterious entities that have disappeared within the system. The outcome of this, of course, is that the tactical initiative shifts from the system and its controllers (those who regulate and monitor the system’s stability) towards the invisible malcontents that have infected the system. This calibration does not necessarily have to take the shape and form of ‘visible’ and ‘public’ Event-Terrors such as 9/11, the bombings in Khobar, Bali, London and Madrid, or the most recent indiscriminate shootings in Mumbai; it can even take place by mere insinuations. Thus, the deliberate leaking of (false) information pertaining to possible terror-strikes, the deliberate and calculated betrayal of the

foot-soldiers – the raw recruits – to the keepers of the system, are all methods by which the calibration of the system takes place. Moreover, as a consequence of this, when the system attempts to correct itself, more often than not, by overcalibrating itself – the shooting of the Brazilian national in London is a stark example of this – it only serves to create further fertile conditions for the anomalous infectious agents to virally proliferate their infection of the system.

The policing of such an infected system, therefore, becomes a problem of gigantic proportions, for the key question that the policing agencies have to ask themselves is not simply: Who is the agent that is infecting the system?, but also: What does this agent look like? And, since the question is posed in this way, the technophilic response of the system is to reduce its constituents – individuals – to a computable and calculable entity, as is gradually being achieved by means of biometric identification cards, chips and passports. The objective of the system, therefore, is to create periodic pan-sensorial ‘snapshots’ of itself, by means of increasingly intricately-linked biometric databases, such that the health of the system may be monitored, and ‘infections’ that can or may destabilise the system contained, isolated and/or destroyed. Further, although the point is not central to our concern in this essay, it is worth pointing out that the key flaw in such an approach to security is that its operative assumption is that the infectious entities within the system have as their objective the collapse of the system. This is a tragic misreading of this security problematic given that for the infectious agents, the objective is to keep the system at a very precise tipping point which hovers between self-destruction and absolute consolidation –

a ‘chaoplexic’ condition – which is paralysing and terrifying. It is precisely in this way that ‘surprise’ and ‘terror’ come not only to be weaponized within the system, rather than at a locale outside it, but also to form the substrate on which the biopolitical model of the post-modern state manages itself. In other words, ‘surprise’, ‘fear’ and ‘terror’ become hypercamouflaged by being indiscernable elements of the system.

As discussed above, the passage of the SIMAD from among and between us is a process by which the dismantling of ontological privileges takes place. This dismantling and disintegrating of ontological privileges may seem paradoxical since the SIMAD, as an insinuation of havoc and disaster, tears down such privileges and throws ‘matter’ into the darkest recesses of the chasmic void, but at the same time engenders difference-engines on the tellurian surface. But we should be careful to recognise that this paradox is only apparent, because we, as tellurian-specific energetico-structures, are only able to discern (or, more commonly, insist on discerning) the passage of the SIMAD from within a tellurian-specific perspective, while not recognising and realising our essential complicity with and as the SIMAD. And, it is precisely in this way that the SIMAD executes its counter-tactical principle of ‘hypercamouflage’. For it – that is to say, the SIMAD – rests within the tellurian difference-engines and energetico-structures. *In other words, SIMADs, in the first instance, reside in us.* Thus, to appropriate the Deleuze-Guattarian phraseology, the more arborescent the tellurian structures, the greater is the degree or revolutionary impact of the violence that the passage of the SIMAD entails, while by the same token, the more flattened or rhizomatic and assemblage-like the tellurian structures, the more evolutionary and less violent is their fate.

## COLLAPSE VI

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In the context of our discussion of the SIMAD and the chthonic battlefield, then, these mysterious ‘agencies’ are signatures of the passage of chasmic forces that relentlessly tear apart the tellurian structures with which we are more familiar and which, tragically, determine the mode and manner of how our state-centric counter-terror operational plans are conceived and deployed. In light of our discussion thus far, it will be evident that our attempts to deal with this emergent situation are worse than inadequate. Even the principles and doctrines of NCW which – despite Peter Singer’s contention that they miss the point of ‘future war’<sup>62</sup> – constitute perhaps the most advanced theory of war and combat that has seen the light of day since Clausewitz, suddenly finds itself unable to come to grips with the SIMAD and the *polemos* that it brings in its wake. Ultimately, however, this failure is one of imagination rather than of our capabilities. In other words, not only does our current imagination of war fall short; we repeatedly fail to comprehend the existential threats that our more familiar tellurian structures – the nation-state being the most visible example – are increasingly beginning to contend with.

### CONCLUSION

As can be expected, insinuations such as these reside outside the pale of the martial imaginations that are deployed on tellurian battlespaces, which is also why we have yet to find an effective counter-tactic to the SIMAD. Instead, and at the cost of repeating ourselves, what we have proceeded to do is to step up the production and proliferation of difference-engines, thereby developing a model of global security governance by which means we

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62. P. Singer, *Wired For War* (London: Penguin Books, 2009).

strive to harden the tellurian battlespace to a degree that we assume can withstand such chasmic interventions.

In a recent study of the ‘accidental guerilla’, David Kilcullen marks precisely such an effort. While the ethnographic descriptions in Kilcullen’s study are interesting enough, nevertheless, when he begins by seeking to understand the GWOT as ‘a form of globalised insurgency, with a vanguard of hypermodern, internationally oriented terrorists [...] making use of all the tools of globalisation [while at the same time seeking] [...] to organise, aggregate, and exploit the local, particular, long-standing grievances of diverse [...] social groups’,<sup>63</sup> we already know (1) the nature of the terrain on which he is seeking to operate and (2) the strategic remedies that he will eventually offer at the end of his study. It is clear what Kilcullen is attempting. Firstly, he is intent on establishing a global tellurian battlespace, which is the space in which the GWOT is fought. Therein he proposes to establish smaller discrete battlespaces which, when considered in net-centric terms, are high-resolution magnifications of sections of the much larger and wider global battlespace. Following this, Kilcullen, taking cover behind the subjectivity implicit in traditional ethnographic studies, proposes to construct another battlespace with an even finer resolution, such as Libicki’s original formulation of ‘the Mesh and the Net’, imagined as being fine enough to catch anything may be realised. In the process, however, Kilcullen is unable to provide us with a single clue as to how to halt the slow but steady seepage of terror, fear and surprise that oozes from the chthonic battlespace and wreaks havoc onto and into the tellurian one – for, despite the identification of such ‘accidental’ guerrillas,

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63. Kilcullen, *Accidental Guerilla*, xiv.

the bombings continue, the tellurian battlespace keeps getting ripped apart and the energetico-structures that are the 'matter' of Kilcullen's study keep getting infected with the non-belongingness of the void.

Studies and policy recommendations such as Morris's and Kilcullen's thus fail to recognise that the tellurian logic that drives a statement such as the following: '[t]he dynamic interaction between the modern international system of nation-states [...] and [the] two discrete but often interconnected and loosely cooperating classes of nonstate opponent – terrorist and guerrilla, postmodern and premodern, nihilist and traditionalist, deliberate and accidental – may be part of what gives today's "hybrid wars" much of their savagery and complexity',<sup>64</sup> is an essentially flawed one. Flawed not simply because of the manner in which the groups that such studies and analyses identify and differentiate as postmodern and premodern are falsifiable, but because they fail to recognise that embedded within these very groups is a kernel of the chasmic void and that the resistance that they offer on the tellurian battlespace (which is all that Kilcullen can recognise) is itself a signature of the passage of the SIMAD.

Thus, Morris's, Kilcullen's and other suchlike analytical studies, whilst otherwise engaging accounts of 'post-modern terrorism' and of 'the accidental guerrilla', betray a fealty to a patently Clausewitzian imagination of war and consequently, when considered in the context of the chthonic battlespace, remain insufficient in their imagination to contend with the SIMAD and the virulent *polemos* that it brings in its wake. It is, therefore, little wonder that Kilcullen (whose analysis and 'recommendations' may be proposed as being

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64. Ibid., xv.

representative of the state-centric response to the terror-operations in the twenty-first century) would close his account of the ‘accidental guerrilla’ by enumerating a number of interesting conclusions and recommendations, which he contends would aid us in combating terror-operations, or what he refers to as ‘hybrid wars’ in the twenty-first century:

1. This will be a protracted conflict.
2. We need to take a measured approach to national mobilisation.
3. We need to disaggregate and distinguish between enemies.
4. We need to use military force extremely sparingly.
5. The role of government agencies needs to be limited.
6. Non-military means need to receive greater emphasis in national security.
7. We need to emphasise the primacy of virtue, moral authority, and credibility.
8. We need to rebalance capabilities.
9. We need to rein in unsustainable spending and consolidate<sup>65</sup>

Some of these recommendations leap out at us for what they imply in the context of our discussion: Firstly, there is the overall and implicit edge of palpable paranoia in these recommendations. Does this betray a fear of the envolding that we have suggested lies within the energetico-structures that populate the battlespace that Kilcullen is familiar with? Secondly, there is the recognition that this ‘battle’ will be protracted – amazingly, Kilcullen suggests a 50-100 year timeframe! Whether the structural foundations of the nation-state,

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65. Ibid., 284-7.

which are being constantly eroded and/or morphed by the chasmic forces that we have referred to, in addition to information and communication technologies, will be able to retain their integrity over such a period remains surprisingly unquestioned. Indeed, it remains an a priori assumption that the nation-state will be able to retain its current form and structure, albeit with a few minor adjustments. This is reflected in a number of Kilcullen's recommendations, such as the need to consolidate; the need to conserve resources; the need to rebalance capabilities, etc. Further, Kilcullen sets out the basal features of the nation-state – moral certitude, virtue and credibility. By positing this, as is perhaps evident, Kilcullen attempts a reinscription of the subjectivity of the nation-state, thereby making a valiant effort at reinforcing the tellurian non-planar surface on which energetico-structures such as nation-states thrive. Most interestingly, Kilcullen also makes a direct reference to the production of difference-engines whereby a disaggregation and distinguishing of 'enemies' can take place. In the context of our discussion, and when considered in light of the post-9/11 global security scenario, this should not be surprising for, if our thesis that difference-engines are continually spiked by the SIMAD's insinuation of a chasmic envolding holds true, then this recommendation of 'disaggregation and distinguishing' – at least in the sense in which Kilcullen means it – is stillborn. Thus, only when we begin to recognise and appreciate the ensuing implications of this radically different notion of the *polemos* that the SIMAD brings in its wake, will we be able to account for the gradual and imperceptible morphing of what today passes as the post-modern face of the global insurgency that seems to have gripped the world of nation-states.



And finally, to appreciate the passage of the SIMAD, we need to break the transcendental logic of the Clausewitzian architectonic of war within which theorists and practitioners of war like Morris and Kilcullen offer their analyses. As we have seen, the tellurian battlespace is one which is artificially constructed by the Clausewitzian theory of war in a bid to keep the terrifyingly Real prospects of Absolute War at bay. As a consequence, in order to avoid chthonic magneto-dynamic attractors – the SIMADic insinuations of disruption, wreckage and distortion – the transcendental logic of the Clausewitzian architectonic of war expresses a false fealty to the earth, for it hovers like an ‘ultimate horizon’ that attempts to enwrap and smother the earth within its tenuously constructed net-centric war-machines whose generative principle is engineered by the production and sustenance of difference-engines. These Clausewitzian war-machines do not originate from the earth; instead they arrive from a transcendental plane virally proliferating on and across the tellurian battlespace. Bringing with them a strategy of stratification, these tellurian war-machines have as their first order of business the object of establishing a plane of logistics across the tellurian non-planar surface. The ambition is stark: To Determine the Future of a New Earth. However, the mysterious liquidly molten chthonic plane, while not overtly spiking this surface ambition of tellurian-specific war-machines, churns the tellurian surface by means of an infinitesimal vermicular process, breaking apart the plane of logistics on which the Clausewitzian theory of war is grounded. Thus, the SIMAD, riding the anomalous vectors of chthonic magneto-dynamic flows, ungrounds the tellurian surface. Consequently, the Clausewitzian plane of logistics contorts into a cesspool of constantly wrecking difference-engines, resulting in the

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fragmentation of associated energetico-structures, which are hurled into the deepest recesses of a terrifying chasmic void. To presume that these fragments are pushed into a space exterior to the earth would be a tragic misunderstanding of the advent of Absolute War. On the contrary, the void is chasmically in-depth with the earth – that is to say, it is in complicity with the chasmic Abyss that Nietzsche steeled himself to stare back at when it glared balefully at him. This glaring back and forth is not a ‘confrontation’ or a combative stance between us and the SIMAD. On the contrary, it is the signature of a sub-surface movement – a complicity of visions between the chasmic void of non-belonging-ness and ourselves, where we are nothing but chasmic envoidings in deep cover or in a mode of hypercamouflage as tellurian-specific difference-engines and energetico-structures. In other words, in the Age of Simadology, we are the SIMADs. We are that which decays *and* the agents of decay. We are expressions of the terrifying envoiding chemistry of decay.

# Undercover Softness: An Introduction to the Architecture and Politics of Decay<sup>1</sup>

Reza Negarestani

Amongst philosophers and theologians of the Middle Ages, few did not make at least a tangential remark on a particular or general aspect of decay and putrefaction. Whether in the context of theological quandaries concerning the world of beings or in the context of philosophy and the science of the age, mediaeval thinkers touched on putrefaction as a problem too intimate with the world of beings or the *explicatio* of the universe to be brushed aside on emotional or rational grounds. Yet even among this rot-frenzy of the Middle Ages, there are only a handful of passages that directly focus on the implications of omnipresent problems which decay and putrefaction give birth to. One such passage can be found among the pile of proto-scientific works on impetus theory ascribed to the German theologian and mathematician Henry of Langenstein, also known as Henry of Hesse the Elder.

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1. This essay was extensively developed from a seminar originally given at The Centre for Cultural Studies, Goldsmiths, University of London, in May 2007. Whilst the arguments and analyses are different, the fundamentals are still the same. I could not have written this essay without engaging commentaries provided by Robin Mackay, Ray Brassier, Eugene Thacker, Nick Land, Mark Fisher, Eyal Weizman, Susan Schuppli, and Luciana Parisi, who chaired the seminar.

Henry poses a ludicrously bizarre yet metaphysically troubling question regarding the possibility of the generation of one species from the putrefying corpse of another species: that of whether a fox can spontaneously be generated from a dog's carcass. Even more grotesquely unsettling is Henry's strong suspicion that 'it is not clear whether all men are of the same species or not, and so too with dogs and horses; [since] corpses which had been of the same species when living might differ in species from one another when corrupted.'<sup>2</sup> For Henry of Langenstein, putrefaction creates a differential productive field in which natural evolution is transmogrified into a sinisterly putrid inter-species production line. The so-called beloved creatures of God, in this corrupt scenario, are so unfortunate that they might be the festering fruits of rotten dead worlds and corpses. It is not only that forms of different species can overlap in decay, but that, according to Henry of Hesse, following the scholastic polymath Nicole Oresme and his theory of qualities or accidental forms, in putrefaction one species can uniformly or difformly deform in such a way that it gradually assumes the latitude of forms associated with other species. These deformities can progress to such an extent that one species might engender an entirely new species, an unheard-of thing, a universe whose reality can only be speculated upon. The gradational movements of decay – its vermicular liquidation across all latitudes and longitudes – thus create fields of differential deformity wherein the rotting corpse of one species or formal category interpolates between all other known species. In other words, gradients of decay or the blurring movements of rot

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2. L. Thorndike, *A History of Magic and Experimental Science*, Vol III (New York: Columbia University Press, 1934), 485.

*calculate* latitudes and longitudes peculiar to other species by interpolating other forms between them. These interpolated forms are in fact derivatives of the initial form of the decaying species, putrid or thawing forms which are derived as the process of decay differentiates or gradually subtracts from a formation or structural framework. This is suggestive of an affect without the positivity of affirmation – a becoming devoid of desire but driven forward solely by the creeping power of thawing forms and their differentiation across the latitudes of forms already taken by other bodies and entities. In this sense, *we can say that in putrefaction the universe is calculated; yet even more importantly, the universe that is sensed or speculated, whether as an idea or a materialized form, is the calculus of an infinite rot* – this is the belated epigraph from which we shall begin our investigation into the architecture, mathesis and politics of decay:

The world has its origin in putrefaction.<sup>3</sup>

## THE CORPSE OF WORLD POLITICS

The whole world is full of corpses.<sup>4</sup>

If political systems are constituted of formations – both in the realm of ideas and in concrete structures – then, like living species, they also are subject to the troubling deformities brought about by the process of decay. In fact, Henry of Langenstein's formula of decay as a weird interpolating or extrapolating differential dynamism calculating

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3. This remark is associated with the Friulian miller Domenico Scandella, also known as Menocchio, who was declared a heresiarch by the Inquisition and burnt at the stake. See C. Ginzburg, *The Cheese and the Worms: The Cosmos of a Sixteenth-Century Miller* (London: Routledge & Kegan Paul Ltd, 1980), xi.

4. From *Sweet Movie* (1974) written and directed by Dusan Makavejev.

the entire universe through the putrefying gradations of a corpse finds its most refined expression in politics and on socio-political grounds. The power of differential interpolation or weird affective dynamism lends the idea of localized or isolated decay a universal twist. What is rotting is indistinguishable from the wholesome remainder: not only can the decaying part generate the healthy parts through differentiating into their forms and ideas, the healthy parts themselves may indeed be the gradients of a decaying part. That is to say, in decay the origin qua the ideal shrinks more and more toward nothing and becomes unrecognisable, whilst the idea is spewed forth from the differential subtraction of the ideal. To put it differently, in putrefaction, it is not the decaying formation that is derived from an idea, but the idea that is differentially or gradationally formed through putrefaction. The idea, accordingly, is a deteriorating husk belatedly formed over an infinitely shrunk ideal. It is in this sense that the most proper form of a political formation – its idea – can be the product of a process of decay feeding simultaneously on the unidentifiable corpse of the ideals of that system along with the putridly amalgamated forms of other decaying systems.

The process of decay constructs the idea only as a byproduct of the differential regurgitation of a shriveling body which is in the process of becoming less and less, without ever finding the relief of complete annihilation. This is to say, once again, that the troubling aspect of decay has to do more with its dynamism or gradation than with its inherently defiling nature: The most proper form of a formation such as a political system is not enveloped, as an origin or a priori ideal core; it is rather unfolded as a form which is differentiated

a posteriori from the putrefaction of that formation or political system. The ideas of the wholesomeness and decaying (whether in regard to design, function, economy or ideas) of socio-political formations, accordingly, are posited as the latter products of a putrefying system. Yet this is not where the scenario of rot ends. Decay does not result in an equivocation between putrid and wholesome; it rather constructs *both* ideas as its gradationally proper forms, so that what is considered wholesome can in fact be seen as a rotten derivative of an initial construction that has limitropically diminished. The reverse of this scenario is not only possible but is even more prevalent: through putrefaction, the system or construction can assume forms and ideas associated with those systems or constructions which have – whether rightly or wrongly – been assumed wholesome.

The obvious, yet gullible, objection is that such an investigation of the politics of decay is not a universally or globally-relevant political issue or project, because a discussion of political rot is supposedly relevant only once one makes assumptions about the Middle East or the Balkans. In other words, in order to speak of political decay and its mechanisms, one has to provide an example such as Dubai or Bucharest – otherwise the problem of decay is not that relevant. If this is not a blind and oversimplified identification of world politics, it at least indicates a failure to understand the mechanisms at work in decay. Not only because a rotting political formation can germinate other forms which might overlap revolutionary, emancipatory and civilised political formations, but also because Western political formations and civilisations might indeed be the degenerate forms of an already rotten and

limitropically decomposed Middle-Eastern or Balkanese socio-political formation. In this sense of putrefaction and rot as persisting and creeping, political decay casts a morbid shadow on the question of relevancy (or irrelevancy) and swiftly neutralises the idea of a 'localized rot'. There is no decay whose swollen and slimy nodules of rot – its differentiated forms – have not already interpolated themselves between all known and unknown forms in the softest and smoothest way possible so as to disguise the deterioration or putrefaction of the whole. These are just a few of the numerous conclusions to be drawn from a politics of decay; conclusions that hardly any political system or agency – despite testifying to the current fetid atmosphere of world politics – is ready to admit. The reason for this ironically passive stance, frequently espoused by both the right and the left, is that such conclusions overthrow certain presumptions about the fundamentals, ideas and concrete formations of socio-political systems and agencies. What putrefaction changes, mimics and hollows out is not only the surface of a system but also its essential interiority, all the way down to its inner ideals, fundamentals, axioms and so-called necessities. It is this spontaneous threat against the interiority of the system or formation from within that no political system or agency is willing to acknowledge, for it is exactly the admission of such a resident threat – the chemical evil of decay – that casts doubts on one's political agenda or the legitimacy of an emancipatory socio-political formation. In short, to profoundly doubt the interiority of one's politics or political agency can hardly be anything other than a real political *faux pas*.



World politics and its systems – whether erected on the side of outright repression or on the side of emancipation – have every reason to be wary of a politics of decay, because the ultimate truth of decay is that it is a building process that builds a nested maze of interiorities whereby all interiorized horizons or formations are exteriorized in unimaginably twisted ways. To put it simply, decay is a process that exteriorizes all interiorities via their own formal or ideal resources (capital<sup>9</sup>); and in doing so, its politics and schemes of complicity operate not on behalf of the interiority of the horizon (of any kind) but rather on behalf of the exteriority which demands their inflection to the outside. For this reason, we shall simultaneously explicate the weirdly-resident, or undercover, exteriorization of decay in regard to space and time so as to subsequently draw out a formalism of decay's dynamic process wherein the abstract matheme of decay gains a chemical disposition, and the chemistry of putrefaction is distributed in a mathematical space. The embracing of a politics of decay as a building process toward exteriority, and the possibility of political intervention against decaying formations, both demand a systematic investigation that criss-crosses territories associated with chemistry, mathematics, biology, geophilosophy and ontology. Without such a preparatory investigation, one risks either over-aestheticising decay as the fetish of the age, or falling into a moral credulousness that sooner or later will host a political parasite which cannot tolerate any doubt regarding the wholesomeness of its interiority. As a mere overture to the politics of decay, this essay, accordingly, proceeds to expound on the calculus of putrefaction – together with the reason as to why we associate decay with calculus – with respect to its conceptions of space, time, form and dynamism.

## COLLAPSE VI

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Since decay is the intensive destiny of terrestrial life and ecology, tellurian formations and earthly thought, a geophilosophy or tellurian politics that does not inflect upon its intensive destiny has its head – speaking entirely non-metaphorically – in the clouds.

### **DECAY AS A BUILDING PROCESS, OR EXTERIORIZATION VIA NESTED INTERIORITIES**

The first axiom of this essay is that decay is a building process; it has a chemical slant and a differential (hence open to mathematical formalisation) dynamic distribution. The process of decay builds new states of extensity, affect, magnitude and even integrity from and out of a system or formation without nullifying or reforming it. The decaying formation is dispossessed of its chances to die or to live wholesomely, to be abolished, reformed or delivered to its origin. For this reason, decay is an irresolute process of building that potentiates architectures which, whilst infinitely open to new syntheses and transformations, cannot undergo complete annulment or return to their original form. One of the basic questions regarding decay as a building process is, thus far, the question of its vectorial alignment: Is decay a positive or a negative building process? The answer is that the building process of decay is subtractive, which is to say, it is concurrently intensively negative and extensively positive. Just as the vector of perpetual subtraction adds to the subtracted amount by deducting from what is subtracted, the process of decay generates differential forms by limitropically subtracting from the rotten object. This process is manifested vividly in a rotting fruit as it generates gradients of decay and differentiates into close and distant derivatives, whilst at the same time

progressively shrivelling. The differential or germinal derivatives of the rotting fruit – its rancid smell, maggots, colour changes, secreted enzymes, etc. – constitute the positive building vector of decay which extends outwardly. Yet the shriveling body of the fruit as it continuously shrinks forms the negative building vector of decay. As long as the fruit shrivels, it gives rise to its derivatives or gradations of decay. In fact, the longer and more the object shrivels, the more remote and distant – hence weirder – its putrid derivatives and differential forms become. The process of decay, therefore, exacerbates the blackening indeterminacy already entrenched at the heart of subtractive cosmogenesis: It is no longer possible to determine how much one can lose or shrink before it becomes void and zero or how much one can spew forth and generate before it becomes nature or God.

Confronting the problem of the *infinitesimal persistence* of the decaying object, it becomes increasingly difficult to say when the process of decay ceases to exist and is supplanted by complete ontological annulment or extinction. However, the problem of infinitesimal persistence (becoming infinitely close to zero but never effectively becoming zero) poses yet another perplexing quandary in regard to the process of decay, a problem which can be summarized as follows: If the decaying object never completely disappears, and, in so far as it continues to become less, generates derivatives and maintains a germinal capacity, then does this mean that death never occurs and the minimally surviving object can never be fully exteriorized? An affirmative answer to this question surely risks advocating a form of vitalism that is ultimately unable to think exteriority. An outright negative answer can also lead to a form of

utopian naivety for which the outside – viz. inflection upon death and binding exteriority – is always available and at hand. In order to examine the process of decay whilst avoiding such tortuous traps, we propose that decay as a building process renegotiates – or simply *twists* – the loci for the effectuation of architecture, exteriorization and binding death. In brief, the process of decay finds and develops a different site for the unilateral power of negativity. The infinitesimal persistence of the decaying object – in other words, its limitropic convergence upon zero – and correspondingly, its unceasing germinal power in decay, should not be examined in an isolated manner. In decay, the infinitesimal persistence of the decaying object marks a limitropic line of transition along which the interiority of one decaying object falls back onto the interiority of its constitutive ideas, and those ideas in turn are undone to other fundamental interiorities whose intrinsic nature is exterior to the decaying object. As the ideas break into their more fundamental but minimal ideas, the infinitesimal persistence of the object becomes asymptotic to the extinction of the object. Correspondingly, if in the subtractive logic of decay, *remaining* (viz. residing within the interiority of what is left) means *remaining less* (viz. moving in the direction of more fundamental interiorities which constituted the horizon of what had previously remained), then to remain indefinitely means to limitropically converge upon zero. Therefore, although the inward and depthwise movement toward the constitutive ideas or the ideal substratum which manifests itself as ‘remaining less’ happens only within the confines of different horizons of interiority, its dynamism limitropically embraces the *zero of ideas*. In doing so, the interiorized movement becomes asymptotic to a line of exteriorization upon which death is inflected, and objectal persistence in

decay becomes an asymptotic expression of loosening into the abyss.

In order to simplify the above argument, we shall develop a spatial model for decay whereby both the infinitesimal persistence of the decaying object (i.e. a horizon of interiority) and its outward differential productivity become the essential vectors of a process of exteriorization – a *corrupt* method of binding exteriority. The reason why, in decay, binding exteriority occurs in such a twisted way, comes down to the following: living things undergo decay, not so much because decay and life come hand-in-hand, as because the living – whether living on a biological level or not – secures a horizon of interiority whose envelopment must be exteriorized according to the differential rates or gradients that bind the horizon to that which is exterior to it. In other words, if decay is most frequently associated with life, it is because the manifestations of life are all founded on horizons of interiority. All that is interiorized decays.

If the process of building is not exclusive to architecture and if, wherever building as a process is actualised, architecture too is potentiated, then the locus of architecture can also be renegotiated. Architecture and its socio-political aspects can be approached in territories where they are least expected. We call this architecture with an anomalous locus, *ex situ* architecture. The process of decay as a building process, as we will elaborate in what follows, generates an *ex situ* architecture where what is built cannot not be dwelled or grounded in any possible way. Because what is in the process of being built, in this case, is a nested exteriority wherein one interiorized horizon (such as the organism) falls back upon its precursor exteriority, which

itself is another interiorized horizon built upon an exterior horizon which is in the process of loosening into its abyssal backdrop. Just as the lines of envelopment and growth for any horizon of interiority (whether the organism, earth, sun, or matter on the cosmic level) are convoluted and circuitous paths (*umwege*) toward the precursor exteriority, the line of exteriorization is also a circuitous path drawn along and through the horizons of interiority which fall back, decompose and loosen into each other.

Consider an elucidating – albeit reductive – example: Terrestrial organisms mark the organic interiority enveloped against the inorganic materials which under hospitable conditions can envelope the potencies of life. As both the vessel and the medium of complicity for inorganic materials, Earth is yet another interiorized horizon which is set against its immediate source of energy, the Sun. However, the solar empire is, in the same vein, an interiority enveloped and determined against its exterior cosmic backdrop. This nested continuum of interiorities goes on to the material substratum of all horizons. Yet even matter as the fundamental requirement for embodiment and materialisation is an enveloped horizon whose interiority and supposed necessity is a roundabout expression of a refractory indifferent universe in which even matter is an interiorized – hence idealised – contingency. Accordingly, what decay or putrefaction draws is a line of exteriorization toward the precursor exteriority. The organism decomposes into its inorganic terrestrial environment, the tellurian bedrock is in turn decaying into the solar horizon as the Sun's thermonuclear decay dissipates the star into its cosmic backdrop, whose material veneer, in turn, is peeling away. Decay draws a line of exteriorization which traverses

the nested interiorities in order to asymptotically bind exteriority. Therefore its dynamism is subjected to differential bonds which connect and nest these interiorities within each other. For this reason, such a differential line of exteriorization or dissolution into conceptless exteriority is neither manifestly a *return* to an ideal origin nor a *decontraction* back into the originary exteriority where even matter enjoys no privilege of any kind. This is because decay's line of exteriorization builds a space of complicity between horizons of interiority wherein the unilateral power of exteriorization is mathematically and chemically contorted. This contortion or twist happens in a specific fashion: That which is exteriorized or dissolved into its precursor exteriority becomes a differential interpolation of a nested series of interiorities whose limitropic convergence upon zero (i.e. inflection upon death) has a weirdly chemical – thus contingent and productive – disposition which simultaneously forecloses the idea of return to the ideal origin and differentially convolutes the path of decontraction to the originary flatline of death. Let us recapitulate the reasons why the process of decay does not abide by the laws of return to the ideal origin and the energetico-dynamic principles of decontraction:

- The site where decay's process of exteriorization is effectuated is the interiority of the horizon. Therefore, the course of exteriorization conforms to the differential fields enveloped inside or extended from the interiorized horizon. Decay loosens up the interiority of the horizon, firstly through exploiting the horizon's own differential links between its actualities and potencies; secondly by conforming to the differential bonds between the interiority of the horizon and

its precursor exteriority. Yet precursor exteriority (whether as the material, systematic, formal or ideal fundament, as in the case of inorganic materials and the organic horizon) is itself an interiorized horizon determined by its inner and outer differential bonds. This nestedness of interiorities wherein every idea or form differentially – and in this case regressively – inflects the next idea or form keeps decay's line of exteriority in conformity with the differential bonds and the increasing inflections of the nested horizons of interiority. Therefore, decay's process of exteriorization does not bind the outside from without so much as it binds the exteriority from within nested horizons of interiority. This binding of exteriority, however, is in conformity with differential fields inherent to each horizon of interiority as well as inter-connective differential bonds between these nested horizons. Consequently, the course of decay's process of exteriorization is conducted in accordance with spatial involutions, differential rates and modes of distribution immanent to nested interiorities. Since courses of exteriorization are subjected to differential peculiarities and twists of the nested space of interiorities, effects of exteriorization – that is to say, the effects of binding exteriority and inflecting upon death on interiorized horizons and formations – are also expressed in different ways. For this reason, the persistent involvement of nested interiorities undoubtedly complicates the philosophical, political and social implications of binding exteriority, inflecting upon death and extinction, for all formations and systems (from basic terrestrial formations to social networks, political systems and the horizon of thought). In decay, what is considered as the bedrock



of the originary turns into a slimy swamp of nested interiorities where the bottom is always too soft and unsolid to hold or ground anything. The sinking is neither swift nor clean.

- The differential and regressive movement through nested horizons of interiority which the process of decay undertakes is not unidirectional and simplex, since, as argued above, this process conforms to the space of interiorities, which are nested within each other, not according to a one-to-one line of correspondence but according to a differential and multiplex nested structure. For example, in decay an idea qua an index of interiority is not merely differentially founded on one precursory idea but on a multitude of other fundamental and constitutive ideas which themselves are also inflected within different ideas. The image that the nested space of interiorities – as the site of decay – calls to mind is not a unidirectional tunnel of connected niches whose size and qualities are uniformly changing, but rather a rabbit warren or a worm-ridden cheese where every niche or hole opens into numerous smaller or larger interconnected caverns and holes. As the liquid that enters the first niche seeps into all such connected caverns, the gradationally rotting object, idea or formation also oozes, or more accurately, is exteriorized into the multitude of interiorities inside which it is nested. The model of exteriorization, in this sense, follows (1) the instantaneous rate of change between the decaying interiorized horizon and those non-uniformly nested interiorities into which it is being exteriorized, and (2) the instantaneous rate of change between the inter-connected multitude of interiorities

which are differentially exterior to the decaying horizon of interiority. The idea X is inflected back upon its nested fundamental ideas which are themselves differentially interconnected (X inflects back to  $X_1$ , Y, Z, D, F,  $X_2Z_3$ ,  $X_3Z_2Y_1$ ,  $D_2$ ,  $Y_2D_3$ , ...). The process of decay, accordingly, traverses multiple ever-changing ideas or variables (as indexes of interiority). Therefore, in order to differentially exteriorize or putrefy an object, the process of decay must operate according to the instantaneous rate of change not only between the decaying object (the variable X) and nested interiorities gradationally exterior to it, but also between those interiorities / variables into which X is limitropically diminishing. The instantaneous rate of change, accordingly, is calculated between X and  $X_1$ , Y, Z, D, F,  $X_2Z_3$ , ... as well as between  $X_1$ , Y, Z, D, F,  $X_2Z_3$ , ... themselves. The interconnected and nested space of interiorities, for this reason, requires that decay operate as an instantaneous rate of change between different horizons of interiority or points of inflection. It is this ability to exteriorize a horizon of interiority via the relation – viz. nested interconnections – between exterior horizons which themselves are being exteriorized – and thus changing – that posits the process of decay as the blackening counterpart of the differential calculus. This is because differential calculus is a technique to determine and calculate the instantaneous rate of change between different uniformly or difformly changing variables. Just as Leibniz's solution for calculating the instantaneous rate of change between different changing variables involved the concept of infinitesimals, decay exteriorizes an object into its exterior backdrop through the limitropic shrinking of

the object. For a decaying object, what is considered the exterior backdrop – as argued earlier – is a nested space of interiorities whose complicities do not allow the process of exteriorization to be vectorially unidirectional, structurally uncomplicated or, as a consequence, unproblematic. *The complicity between interiorities cannot be undone or decontracted in a simple fashion, for such complicity engenders differential fields which can only be exteriorized by the subtractive logic, chemical techniques and mathematical dynamism of decay as a building process and a model of complicity.* The political implications of decay as a model of complicity corresponding to the original ideas buried in differential calculus call for a thoroughgoing investigation into the calculus of decay.

- The differentially regressive plunge of decay into the depth of nested interiorities always finds an extensive echo in the form of differential reverberations of rot. There is no depthwise putrefaction or *nigredo* without the wriggling of worms on the surface and the mephitic extension of the rotting object into the air. Decay's intensive exteriorization of nested interiorities has an outward productive expression which is subtractively correlated to the blackening line that traverses the confines of nested interiorities. The more enveloped and interiorized the horizon, the more chemically productive its extension to the outside. It is as if the degree of interiorization – that is to say, the spatial confinement of the horizon and the amount of capital enveloped for sustenance and development – is directly proportional to the chemical fertility of the horizon when it begins to extend outside of its confines. Here, the degree of interiorization does not become

an impeding factor for the extensive loosening of the horizon, but contributes to the differential extension of the horizon to the outside as well as the chemical – hence contingently dynamic – productivity of the horizon during decay. This illogical proportionality between the insistence on remaining interiorized and the spontaneous chemical loosening into the outside shares more with the laws of the grave than with the laws of nature – the putridly productive amalgamation of the restrictions of *nomos* and the confines of *taphos*. We argued that decay is neither wholly negative nor wholly positive; it is rather subtractive. The subtractive logic of decay suggests that decay does not merely build the nested horizons of interiorities as an intensive limitropic vector toward zero but that it also builds via extensive deployment of interiorities so as to create a dynamically contingent universe. Leibniz – following the proto-scientific ideas in the Middle Ages – frequently uses as an example the model of a rotting body (usually cheese) whose remaining perforated body suggests an intensive limitropic convergence upon zero. Yet this intensive movement in the interiority of the object, manifested as shrinkage, cannot exist without another opposite movement which extends the body into the outside in the form of contingently differentiated ideas or smaller bodies. At the same time as the apple shrivels, it spews forth worms as extensively deployed and hence dynamically contingent interiorities. These worms or derivatives in turn envelop smaller worms and further derivatives which contain yet smaller bodies *ad infinitum* ... all ready to heave forth and be extensively deployed in the most contingent manners. This applied dynamics of contingency marks the rise

of chemistry as a process commencing from within. The subtractive movement of decay's blackening line of exteriorization through nested horizons of interiority produces two functions: firstly, a limitropic convergence upon zero dubbed *complicatio* and formally expressed as progressive shrinkage; secondly, a differential extension or divergence from the object, called *explicatio* and expressed in the form of a dynamic and contingent process of productivity. *Complicatio* and *explicatio* are subtractively correlated, in such a way that the intensive interiority of *complicatio* contributes to the extensive deployment of interiorities in *explicatio*. The decaying idea, in this sense, not only undergoes a nested twist as it limitropically approaches the *zero of ideas*, but also a productive twist as it is subtracted to the outside. For this reason, decay's process of exteriorization is in complicity with interiorities and their differential fields on two levels: (1) the intensively enveloped – hence nested – interiority of the decaying idea or rotting object; (2) the extensively developed interiorities which are differentiated from the rotting object and whose contingent world points to a dynamic chemistry which enforces the irruptive contingencies of time mobilized through the involutions of space. To sum up, decay's line of exteriorization has, weirdly, a productive disposition which generates extensively and contingently distributed differential fields (or sites of chemical activity). The eruption of these explicated differential fields reinforces the necessity for a complicity between the process of exteriorization (*viz.* binding exteriority and inflection upon death) and horizons of interiority, whether as fundamental terrestrial formations or socio-political grounds and networks.

The three reasons enumerated above briefly explain the complications that the process of decay brings about for the idea of return to the origin, and for a philosophy based on the implications of binding extinction and decontraction into originary death. Yet they also diagram the spatial model in which the process of decay operates. In order to present a formalism of decay which provides us with a mathematical model for decay's dynamism, we must, in addition to decay's conception of space, examine decay's conception of time. For this reason, we shall inquire into decay's conception of time and how it is expressed by the spatial involutions generated by decay's line of exteriorization as it traverses nested interiorities.

### **MEMENTO TABERE: THE TERNARY CONCEPTION OF TIME, OR THE MISSING LINK OF CHEMISTRY**

The process of decay has a spatial model comprised of intensive envelopment and extensive development, and whose subtractive correlation creates differential fields which are sites for the generation of abstract twists and deformities. In other words, these sites spatially narrate chemical activities potentiated by time's contingencies; activities whose irruption endows the spatial plot with a holey and porous underside. Chemistry, therefore, as applied dynamics wherein contingencies of time are extensively enforced by the involutions of space, requires a third conception of time whereby absolute contingencies of time can operate from within the interiority of a horizon. If putrefaction marks the beginning of chemistry, its subtractively-productive process needs such a conception of time so as to mobilise the contingencies of time as the chemical traces of those spatial involutions and

envelopments which are asymptotic with the conceptless exteriority of space. This brings us to more fundamental questions concerning the role of time in any politics or philosophy incorporating decay as the building process of its formations or ideas: What is the relation of decay or putrefaction to time? Is decay a narrative conception of time's indifference to ontic differences, or is it the experience of time as presence which – in a Heideggerian fashion – turns death into an infinitely-deferred occurrence through *Dasein's* already-dying? What exactly is the role of time in decay, and does this role reinscribe the correlationist appropriation of time through experience and presence, or amount to an idealism which favours and privileges time over space? And finally, if time is imbued with radical contingencies which suspend all affects and relationships through the indifference of time as an impenetrable alterity, then how can decay as a building process bring about the opportunities of complicity between the involutions of space and contingencies of time? It is evident that decay's conception of time, which emphasizes the role of time in the chemistry of decay, is so pivotal that it determines different conceptions of decay and putrefaction. Decay as a romanticized concept, decay as a necrocratic fetish, decay as a differential form of emptiness, decay as an *umwege* (maze) toward base-matter and decay as an ontological fate, are all decided by different conceptions of time, in itself and in its relation to space.

The chemical potency of putrefaction (*tabes*) which decomposes the object into other horizons of interiorities across infinite latitudes of forms, attests to the fact that there is a complicity between irruptive contingencies of time and spatial folds and inflections of space.

Through such complicity, the diachronicity of time and the exteriority of space are evinced by each other: Whilst space is perforated by time's emptiness or fundamental indifference, time's contingency is formally expressed by space's unbound ferocity for the assimilation of any ground of individuation. It is this collective fold of complicity – neither demanding a commonality between the parties involved nor the substitution of either of them by the other – that makes decay an unwholesome participation between the most abominable aspects of time (non-belonging and pure contingency) and the most degenerate aspects of space (space's tendency for infinite involutions which undermine any potential ground for the emergence of discrete entities). It is the complicity between the worst nightmares of space and time that brings about the possibility of putrefaction (even an infinite decay) as a differential form of irresolvable emptiness disguised as ideal objectivity with a generative twist. To think of this impregnable hollowness endowed with a generative proclivity, one can envisage an infinitely porous abomination, an obscene hollowness, folded and mobilised in such a way that it has an objectal grimace: The mediaeval *danse macabre* depiction of the Tree of Rot – a 'difformly difformly difformly difform'<sup>5</sup> (Nicole Oresme) tree trunk which spews forth a cosmic range of both familiar and nameless creatures as a differential extension of its arborescent emptiness.

The complicity between space and time – that is, between the dynamism of inflections and the irruption of contingencies – brings forth the possibility of chemistry as the concomitantly softening and loosening dynamism of putrefaction.

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5. See L. Thorndike, 'An Anonymous Treatise in Six Books on Metaphysics and Natural Philosophy', *The Philosophical Review* 40, no. 4, 1931: 317-40.



As the chemical space of decay, putrefaction exposes the object to the contingencies of time so as to thaw the object's ideal integrity and initiate its loosening into the conceptless involutions of space. In order to explicate the nature of this complicity as an intrinsic act for the chemical dynamism of putrefaction, first we must clarify the modes of complicity at work here. If time belongs to no one and is absolutely indifferent to ontic differences, then how can its worst nightmares participate with space? And if, notwithstanding such irresolvable incommensurability, time and space can indeed participate with each other, then how can this participation be conceived outside of the correlationist ambit? Our conjectural solution for these problems concerning a blackening complicity between space and time consists of two stages: In the first stage, our solution entails the implementation of two conceptions of time. On the basis of these two conceptions, we seek to bridge the exteriority or diachronicity of absolute time and the exteriority of space. This means that in addition to the absolute conception of time, an intermediary conception is also required. The intermediating time must be interconnected with the absolute conception of time (i.e. time as an indifferently impenetrable alterity that belongs to nothing and no one) as a manifestation of the latter's pure contingency. In other words, the intermediating conception of time should itself be a production of absolute time's pure contingency which suspends all natural laws, obstructs the operation of belonging and nullifies ontic differences. To put it differently, the intermediary conception of time should itself be a symptomatic production of absolute time's pure contingency. *Accordingly, the intermediating time does not suggest a dichotomous scission in time, but a temporal and contingent conception of its absolute form.* Only the vital temporality of this

## COLLAPSE VI

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intermediating time can bring about the possibility of ontological difference in relation to appropriated regions (scales) of space.

Space-time syntheses – necessary to support ontological determination – require the bifurcation of Time into two different but interconnected conceptions. Without such a bifurcation, absolute time and thanatropic space remain inherently exterior to each other and cannot ground the conditions for ontological determination on any level. It was the Stoics who for the first time fully realised the necessity of having different conceptions of time with the aim of explaining the vital syntheses of time and space. In order to explain the intensive vitality of determination *qua* difference-in-itself, Deleuze adapts and ingeniously modifies the Stoic model so as to develop and employ two conceptions of time, the time of *aïon* and the time of *chronos*.<sup>6</sup> Since the indefinite non-pulsed time of *aïon* is inherently closed to vital bodies, there must be another conception of time capable of synthesizing with the scales of space and supporting vital vibrations. This second conception of time is the pulse-time of *chronos*, which supports organic vitalities and provides time with qualities compatible with the structure of corporeal beings. Accordingly, the first *already-established* stage of our solution requires the bifurcation of Time into two different but interconnected times. Following Deleuze, but in contrast to his quasi-Heideggerian reading of time, these two conceptions are reabsorbed in this fashion:

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6. See John Sellars, 'Aïon and Chronos: Deleuze and the Stoic Theory of Time', *COLLAPSE III*, 177-205.

1. The ungraspable and cosmic time which belongs to nothing and no one. It is the absolute time of pure contingencies or cosmic climates which unilaterally suspends all laws and eliminates all necessities.
2. The temporal conception of time, which is time insofar as we experience it and which, therefore, is characterised by the access to its presence rather than its quiddity *per se*. Yet, even more importantly, the temporal conception of time supports the temporality of beings by providing the conditions for their ontological determination and emergence. These conditions are nothing but the contingencies of the cosmic and absolute time. The temporal conception of time, accordingly, envelops and foregrounds contingencies of absolute time in the form of conditions for the emergence of life (or the subject of temporality). Therefore, the temporal conception of time is an interiorized or bounded form of absolute time, a temporal set wherein contingencies are taken as conditions for the determination and the continuation qua temporality of existence. In other words, temporal time posits the contingencies of absolute time as the ground for the determination of difference and ontic emergence, through a bracketing and interiorizing of those pure contingencies. We call this temporal conception of time, vital time or the time of determinations and making differences. Constitutive to the ground of life, vital time is accentuated in the organic realm through the compatibility of its interiorized and sequential structure with the sequential growth or the rhythmic difference of organic interiority. In other words,

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the interiorized contingencies of vital time become structurally compatible with the involutions or interiorized horizons of space. Without such basic structural compatibility between space and time – albeit at the cost of their envelopment and interiorization – ontological determination and the emergence of ontic differences which are tied to space-time syntheses are impossible.

Vital time – the intermediary conception of time – emerges from the cosmic time of pure contingencies as ‘an interiorized set of contingencies’. As a temporal set, vital time interiorizes contingencies as its elements. Since the function of the set is interiorization, it can intensively determine the contingencies of absolute time as conditions for the emergence of life, or as necessities for making difference. In the process of interiorizing contingencies and realizing them as concomitantly temporal and necessary conditions, vital time appropriates the exteriority of cosmic time and turns it into an interiorized conception of time accessible by life and its manifestations. Yet the cosmic time of non-belonging and pure contingencies can never be fully appropriated or assimilated (interiorized) by vital time and its temporal conception. This is because vital time is itself contingent upon cosmic time as a *temporal condition* for the interiorization and bracketing of absolute time’s contingencies and their realisation as the conditions required for the emergence of life. This means that since vital time is itself a temporal condition *qua contingency* of cosmic time, it cannot fully interiorize the exteriority of absolute time *qua* pure contingencies. Vital time suggests only one of the infinite pure contingencies of absolute time; its fundamental

functions are simultaneously supported and derailed by other contingencies. For this reason, contingencies of cosmic time are never fully reintegrated and absorbed within the manifestations of life (viz. realised horizons of interiority) conditioned by vital time. To put it differently, vital time can be interiorized by beings as the necessary condition for their emergence because it is itself an interiorized conception of cosmic time's pure contingency. This brings us to another problem which constitutes the second stage of our conjectural solution to the problem of complicity between space and time necessary for the chemical dynamism of putrefaction.

If cosmic time can never fully be appropriated by and within vital time, then the horizons of interiority inherent to manifestations of life or ontic differences cannot assimilate and appropriate the contingencies of cosmic time either. Consequently, the interiority of life is a host or a niche for the inassimilable contingencies of cosmic time – contingencies that never completely turned into temporal conditions within vital time but remained part of the unilateral ecology of the cosmic abyss within vital time's temporal set. Briefly, vital time interiorizes contingencies of the cosmic abyss in order to form its temporality; however, there are still contingencies of cosmic time which, despite being interiorized, defy assimilation by the laws of the temporal set that turns contingencies into vital conditions. These interiorized yet inassimilable contingencies, consequently, implement the unilateral ecology of the cosmic abyss from within vital time and consequently, from within an interiorized horizon such as the organism or the planet. In conditioning the emergence of life, vital time introduces the nightmares of cosmic time into the phenomena of life. The horizon of

interiority inherent to the manifestations of life becomes an incubating chamber for the pure contingencies and non-belonging of cosmic time. It is this non-belonging qua principle of negativity that is mobilized by the dynamism intrinsic to involutions of space. The subtractive process of decay is the outcome of such spatial mobilisation whereby the unilaterality of cosmic time underpinned by its irruptive contingencies gains a subtractive – that is, extensively positive and intensively negative – momentum through inflections of space. As an outcome of its complicity with space, time's unilateral negativity is imposed on the horizon of interiority in a way that forces the horizon to be concurrently swept away along the extensity of space and intensively shattered on zero qua the eternal.

Thus cosmic time is deployed inside vital time and, correspondingly, inside the life or the horizon of interiority that is conditioned by vital time. This remobilisation of cosmic time's exteriority and redeployment of its contingencies within vital time and manifestations of life posits a third conception of time which constitutes the second stage of our conjectural solution. The blackening complicity between space and time can only be fully explained via recourse to a third conception of time which is always implicit – as an internal tension – to the dyadic conception of time. We call the third conception of time, the *insider conception of cosmic time*. It is conceived of as a treacherous insider insofar as it internalizes the complicity between time's diachronicity and the exteriority of space within the manifestations of life and the horizons of interiority. The conception of cosmic time as the insider redefines the intermediary conception of vital time as a 'temporal agent' that brings with it into life's horizons of interiority the contingencies and non-belonging

of cosmic time. In other words, the insider conception of cosmic time interiorizes and cultivates the incommensurable tensions between cosmic contingencies within life and its manifestations – thereby giving cosmic ecology an eruptive (i.e. volcanically extrusive) expression rather than an intrusive insinuation.

In the wake of the insider conception of time, the termination of life does not *exclusively* mark the temporality of life qua its contingency, because the very interiority of life (its difference and internal vitality) can unfold as the abyssal infinity of material and ontological contingencies whose irruption is equal to death. This unfolding of cosmic time's pure contingency through life and by life is expressed by decay as a dysteleological process. In this sense, life's interiority is a medium for the cultivation of incommensurable tensions between the contingencies of cosmic time. And decay is the germinally-cultivated expression of these incommensurable tensions or contingencies along infinite involutions of space – a complicity between time's subtractive enmity to belonging and the enthusiasm of space for dissolution of any ground for individuation, a participation between cosmic time's pure contingency and the infinite involutions of space from whose traps nothing can escape.

The process of putrefaction or decay accentuates the compulsion to return toward pure contingencies of cosmic time through the third conception of time (i.e. cosmic time as insider time). This so-called 'compulsion to return' instigated by the insider conception of time becomes a source of tension between the principles of cosmic time (i.e. contingency and non-belonging) and the temporal conditions or necessities of vital time. These contingent

and subtractive tensions are narrated by the degenerate qualities of space through the process of decay in the form of a progressive softening of forms and loosening of the horizon. We can say that in decay space is perforated by time: Although time hollows out space, it is space that gives time a twist that abnegates the privilege of time over space and expresses the irrepressible contingencies of absolute time through dynamic and formal means. This in-flective mobilisation of cosmic time's radical contingencies heralds the birth of chemistry as the blackening complicity between time and space. It is chemistry that endows the subtractive process of decay with a putridly productive nature.

**FIGURING OUT THE FACE OF ROT, OR IDENTITY AND THE FORMS OF BEING LESS THAN A THING, MORE THAN NOTHING**

The subtractive dynamism of decay is generated on the basis of a complicity between space and time which allows for the chemical loosening of the horizon of interiority along nested inflections that are simultaneously extensive and intensive to the horizon. The dynamism of decay utilizes the complicity between space and time as the principle for an unconstrained deformability where loosening and softening – the lytic functions of chemistry and the smoothing functions of differential calculus, i.e. mathesis – are intertwined and unbound. Yet such unconstrained deformability is translated, as elaborated above, into the intensive complicity of nested interiorities as well as the complicity of interiorities in their extensive deployment. Through these intensive and extensive planes of complicity, interiorized horizons asymptotically bind the exteriority of space and the diachronicity of time.



The asymptotic binding of exteriority requires an interpolating dynamism capable of traversing all interiorities complicit in the process of exteriorization as changing variables whose ratio must be calculated. To put it differently, since interiorities are always in complicity with each other, the process of exteriorization must find a way, firstly, to grasp interiorities in terms of their complicities; and secondly, to conduct exteriorization based on the dynamic factors, elements and variables brought about by such complicities. Exteriorization is not possible without factoring in and acting upon the complicities between interiorized horizons. Yet acting upon such complicities – characterized by dynamic relationships and rates of change between horizons of interiority – requires a solution reminiscent of differential calculus, a solution capable of calculating the instantaneous rate of change between changing variables.

The solution of decay's process of exteriorization for the problem of changing and complicit interiorities/variables is the limitropic decomposition of the object or formation. Only though the limitropic movement of the object or formation toward zero (whether as the conceptless exteriority of space or the diachronic eternity of time), can the process of exteriorization cut through the complicity between interiorities which is too differentially convoluted to be disentangled or decontracted through regressive thanatropic movement. The limitropic wasting or subtraction of the object (or formation) along its extensive and intensive vectors does not allow for the complete eradication of the object's ontological registers, structural fundamentals or operating axioms. The effect of such limitropic wastage, in which the formation is loosened

and softened to no end yet leaves traces which linger as the agents and particles of complicity, has a strong socio-political undertone. Even after a political formation turns into an unrecognizable corpse, where all of its structural and operative influences have presumably vanished, there still remain active structural fundaments and functional axioms from that formation without whose complicity the political calculus of world politics cannot possibly be formed. For, once again, in decay the relationship or change between horizons of interiorities (as entities intrinsically susceptible to decay) is possible only through limitropic deterioration toward a *zero of interiority*. The limitropic deterioration brings about the possibility of the differential interpolation of the decaying horizon between other interiorized horizons and, as a result, instigates the construction of a universal calculus of putrefaction. It is this limitropic deterioration that introduces the lingering and persistent axiomatic remnants of the decaying formation to an unsuspecting *uni-versal* calculus, as minute but ineradicable agents of complicity.

Neither fully negating the system by overthrowing it nor reaffirming it through reformation, the process of decay imposes a perpetual deformability on the formation without completely erasing its ontological registers and functional axioms. In short, decay extracts infinite deformability from an interiorized horizon without eventuating in radical erasure or complete transformation. Such perpetual deformability is supported by the intensive and extensive complicity of horizons of interiorities in the form of an unbreakable continuity in which every horizon of interiority either inflects the next or is nested within yet another horizon. Accordingly, it is the ceaseless continuity – in the sense of intensive and extensive inflections of forms and interiorities – that imparts a fluid continuity to

the rotting object without essentially turning it into fluid. Each form is only *gradationally* preceded and succeeded by other forms in such a way that transition along latitudes (of forms) is always blurred. The gradients of deformities are differentially smooth, to the extent that the formal dynamism of rot appears to be that of sludge or oozing flesh. In decay, the solid undergoes a flowing series of deformations without becoming liquid, or in other words, without losing its basic principles of solidity. The wholeness or coherency of the solid is derailed within the fundamental principles of solidity. In a similar fashion, in putrefaction the liquid's degeneration vacillates between solid and gas, slime or miasma, but in either case it remains fundamentally – albeit minimally – liquid. This minimum body of the element, horizon, formation or object, in fact suggests its concomitant asymptotic exteriorization and limitropic diminution. Recall Bishop Berkeley's sneering deprecation of infinitesimal calculus as dealing with the 'ghosts of departed quantities';<sup>7</sup> the decaying object, indeed, is an evanescent yet lingering ontological register that is less than a thing but more than nothing.

Supported by the complicity of interiorities, the continuity of forms or the gradients of deformability ensure that the interiorized horizon is always formalized as a fluxion of contingent and even inconsistent forms. It is actually in decay that inconsistent forms are smoothly connected to each other so as to form a congruous plane of deformability in which becoming does not essentially follow the logic of the affect but rather the logic of putrefaction and its method of exteriorization. Victor Hugo concisely epitomizes this fluxional connection of inconsistent forms, ideas and

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7. G. Berkeley, *The analyst; or, A discourse addressed to an infidel mathematician* (1754), 59.

## COLLAPSE VI

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entities in putrefaction in *Les Misérables*: 'In a pit of slime [...] the dying man does not know whether he has become a ghost or a toad.'<sup>8</sup> It is only in putrefaction that death is essentially and weirdly non-hauntological: one becomes a toad rather than a poltergeist annoyingly clamouring for appropriate mourning, for a proper judgment or a spectral solution. Whilst in putrefaction the human might end up as a toad, the toad itself grows a tail. The tail, in this case, speaks to the differential idea or latitudes of form between a toad and a tadpole, the mathemathico-chemical affect between them, the ratio of putrefaction: the longer the tail, the fouler the putrefaction:

It was observed in the great plague of the last year, that there were seen, in divers ditches and low grounds about London, many toads that had tails two or three inches long at the least; whereas toads (usually) have no tails at all. Which argueth a great disposition to putrefaction in the soil and air. It is reported likewise, that roots (such as carrots and parsnips) are more sweet and luscious in infectious years than in other years. [...] So the parts of beasts putrefied (as castoreum and musk, which extreme subtile parts,) are to be placed amongst them. We see also that putrefactions of plants (as agaric and Jew's-ear) are of greatest virtue. The cause is, for that putrefaction is the subtilest of all motions in the parts of bodies; and since we cannot take down the lives of living creatures, (which some of the Paracelsians say, if they could be taken down, would make us immortal,) the next is for subtilty of operation, to take bodies putrefied; such as may be safely taken.<sup>9</sup>

Putrefaction is comprised of these extremely subtile motions – infinitesimal fields of differentiation – according

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8. V. Hugo, *Les Misérables* (London: Penguin, 1982), 1087.

9. F. Bacon, *The Works of Lord Bacon* (London: Henry G. Bohn, 1854), 159.

to which various and outlandishly incongruous forms can smoothly blend. The idea of the human becomes a smooth gradient of different worms, flies, wasps, plants and fungi. The toad, the miasma, the sludge and the human all become part of a differential field wherein each entity can gradually unfold into another regardless of the congruity of their traits, environments and habits. These subtle, fluxional or infinitesimal movements point to the gradational continuity of deformities in decay whose basal continuity is maintained by the dynamism of complicity as a form of participation in which, instead of commonality and replacement, inflection and nestedness – that is to say, the mathesis of the insider – are the guarantors of the collective action. To this extent, a politics of decay as building process fully employs the mathesis of the insider as the prerequisite for the dynamism of collectivity: In the calculus of decay, it no longer matters if there is a commonality or even a minimal agreement between conjoined or discrete elements; putrefaction causes the decaying or infected parts or elements to interpolate themselves between other healthy elements and parts in such a way that everything is collectively mobilised by and toward putrefaction.

The fluxional continuity of decay gradients smoothly, or more accurately, differentially connects incongruous forms. The act of figuration, in terms of decay, is equal to smoothing what is already out of place; everything must be con-figured again according to the smooth gradients of decay whose basal continuity lies in the complicity of horizons of interiority. To putrefy means to ‘parabolify the straight line’ (to use Boscovich’s term),<sup>10</sup> then to twist

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10. J. F. Scott, ‘Boscovich’s Mathematics’ in *Roger Joseph Boscovich, S.J., F.R.S., 1711-1787: Studies of His Life and Work on the 250th Anniversary of His Birth* (London: George Allen & Unwin Ltd., 1961), 183-92.

the curve and eventually to convolute the already twisted curve. In other words, in order to approximate forms, the line of figuration must pass through points of inflections or latitudes of a given form. In this sense, figuration becomes more accurate as it passes more points of inflection or traverses more latitudes; yet to encompass more points means that the line of figuration cannot remain a straight line but must become an increasingly convoluted curve. The painter Francis Bacon presents such a model of smooth figuration in which a form is limitropically approximated through ever swirling and twisting curves. Bacon's method of figuration becomes a function of approximation rather than reproduction and for this reason, it acquires a configuring mechanism that corresponds intimately to that of decay and its smooth gradients: How many points can a line encompass, how many latitudes can be traversed by a differential function, before the line turns into a coiling abomination or the differential function becomes 'difformly difformly ... difformly difform'? The thawing meat of Francis Bacon's figures, the oozing colour gradients of his landscapes and the heads whose figural approximations are bundles of coiling tails all suggest a differential function which indexes instant and remote derivatives of a given form in the smoothest fluxional manner.

In decay, the act of figuration corresponds to the act of curve fitting in interpolation. Between two forms, two entities or two horizons, one can only make a continuously smooth connection by encompassing the derivatives which remotely connect these forms or entities together. The remoter and further apart the derivatives of these forms and entities, the smoother and more congruously they can be connected to each other. As the forms or given variables increase, the differential function also becomes more complex and the

curve for smoothly connecting these variables or given data points becomes increasingly more convoluted. A curious literal depiction of these seething differential curves which connect putrefying forms together in the slimiest and most twisted ways possible can be found in Laurence Housman's intricate art nouveau drawings. *Cauchemar* (which originally appeared in *The Dome*, published by Unicorn Press [1899]) is a nightmare of a slimy nature lost and perplexed in the putrid mazes of its evanescent forms and their derivatives. It depicts a man being consumed by trees, becoming a tree,



yet this concomitant change of identity and forms leaves behind it a slimy trace, demonstrated by a pandemonium of twirling curves which connect the horizon of man to that of trees.

The universal calculus of decay does not tolerate an abrupt mutation from human to tree, as Hieronymus Bosch's tree-man might imply. In decay as a process of cosmogenesis, the tree and human are not two entelechies or perfected bodies of actuality which can be connected together via a straight line. Both 'being a tree' and 'being a man' are changing variables – rates of change between their respective actualities and potencies on the one hand and between their interiorities and the exteriority on the other. Therefore, the most veritable line of transition that can be drawn between a human and a tree is not a line connecting their fixed actualities or traits but a line that encompasses their existing actualities (given points) as well as their potentials and derivatives (even the remotest ones). The tree is itself a differential field of ideas – or in a Leibnizian sense a generative reservoir of smaller bodies – which themselves are changing and have their own derivatives; the same profusion with subtle bodies and movements is also applicable to man, its idea and its form. Therefore, in order for the line of putrefaction to draw gradients of decay between the man and the tree, it must encompass such ever-increasing (both in quantity and distance from their original ideas or formations as a whole) emerging bodies, ideas or derivatives. In interpolating between all these points and emerging values, the slimy line of rot becomes an ever-convoluting curve. For this reason, the nightmarish plunge of the human into the verdant inferno of growth is accentuated when the line between the human and the tree becomes infinitely convoluted,



encompassing a cosmic array of beings which only differentially – that is to say, very remotely – connect to either the tree or the human. In other words, in decay, the object travels across a world of familiar and alien beings which may or may not have any immediate relationship or affinity with the decaying object. This also means that the most accurate line of transition between a human and a tree is a line that progressively encompasses not only the tree and the human but also their remotest derivatives and the least actual potencies. This is the taphonomic logic behind the slimy forms of putrefaction and the ever-shrinking bodies of decomposition (as in ruins) where the complicity between parts and derivatives becomes a subtractive and hence synergistic counterpart to the limitropically shrinking remnants of the thing's former self. In becoming a vividly accurate (i.e. nightmarish) transition between the human and the tree, the connecting line encompasses more beings and consequently becomes more convoluted. Decay corresponds to such an approximation of the distance or relationship between two given entities as continuously-changing variables. The minimum possible number of curves for passing through the maximum number of points or entities – this flawed but concise formula defines the nightmare of decay as an abominable curve that extracts values and beings from all that it encompasses, building worlds and corpses more efficiently than God. The effect of decay's cosmogenesis for any horizon of interiority is a weird amalgamation of vitalistic trust in one's survival and susceptibility to a unilateral terror from the inside – the treachery of the former and the non-negotiability of the latter. This is not just because decay draws its lurid forms upon the complicity of contingencies of an indifferent time with the conceptless exteriority of space, but because it

mobilises the exteriorizing terror of such complicity right from the inside of the interiorized horizon and through its locus of persistence and its definition of survival.

### **BUILDING WORLDS AND CORPSES, OR THE QUESTION OF MATHEMATICO-CHEMICAL DYNAMISM**

I observe in advance that numerically the same change may be the generation of one being and the alteration of another: for example, since we know that putrefaction consists in little worms invisible to the naked eye, any putrid infection is an alteration of man, a generation of the worm.<sup>11</sup>

It was argued that decay effectuates a perpetual deformation which does not dismantle the primal formation by erasing its fundamental ontological registers or minimal formal traits, but rather ceaselessly pushes the formation to new levels of degeneration by infinitely building over and through it. For this reason, decay can extract softness from solidity (if solidity is inextricable from its stable, molar and rigid qualities as well as its manifest wholeness) and its socio-political abstractions, deducing political tenacity and persistence from the degeneration of power formations. This is the arcane *modus vivendi* of certain political systems whose decay or corruption does not lead to their demise and destruction but rather endows them with the gift of a camouflaged existence – a simultaneous unrecognizability ensued by thawing forms and an axiomatic or fundamental persistence as the result of their limitropic dissolution. Once the state embraces decay as a form of camouflage and persistence, it turns into a site of complicity between

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11. G. W. Leibniz, *Philosophical Papers and Letters* (Dordrecht: Kluwer Academic Publishers, 1989), 96.

all decaying elements or splinters of rot in its vicinity, in the manner of an interpolating differential function. The nebulous term 'rouge state' outlines some of the characteristics of a state which has deliberately bound decay as the building process of its formation. It is in this sense, that the degeneration of the solid and its abstractions does not essentially entail its dissolution into liquid or the fluid state where the solid loses its minimal traits through fundamental transformation, but the differential deformity of the solid to such an extent that the idea and formal integrity of solidity are chemically pulverised by the inner potencies of the solid itself. The solid gains a corrupting mobility – or a differential power of interpolation – at the cost of losing its integrity and established forms. The impaired integrity of the solid formation allows for the eruption of potencies whose actualisation would otherwise have been subjected to the pre-established laws and climates of solidity (viz. its coherence, formal rigidity, stability, etc.)

The forms of rot, as discussed in the previous section, are in direct correspondence with the dynamism of decay or its differentially corruptive mobility. Since the complicity of time and space in their contingency and exteriority bring about the possibility of this peculiar dynamism, the dynamism of decay is characterized by a chemical disposition with a calculative mode of distribution. Whereas its chemical disposition is associated with the spatially enveloped and mobilised contingencies of time, its calculative mode of distribution is the result of its asymptotic approach to the exteriority of space according to which every interiority inflects yet another interiority, whether in the direction of the precursor exteriority (*complicatio*) or the extensively dissipated interiorities (*explicatio*). This chemically-charged

and calculative dynamism, accordingly, operates as a bidirectional building process: it intensively builds the abstract by positively binding a limitropic conception of zero (the body of the minimum) and extensively builds the concrete by extensively giving rise to derivatives or differentiated horizons of interiority (worms, animalcules, ontic differences). In order to formalise the dynamism of decay as a building process, a reductionist mathematical formula of decay can be constructed so as to demonstrate, capture and ultimately diagram decay as a building process. This reductionist formal model incorporates three basic interconnected aspects of decay's dynamism:

(1) Perpetual inclusion – inflection and nestedness: The line of decay or the differential function of putrefaction must cover and encompass all given values – given points, forms and traits of the interiorized horizon as well as its emerging derivatives, actualities and gradationally emerging potencies. Perpetual inclusion ensures that all emerging potencies be indexed and encompassed by the differential function of decay. Any change – whether extensive or intensive, outward or inward – in the decaying object should be included by the process of decay. The possibility of including and encompassing both intensive and extensive changes attests to the imperfectibility of being and the inherent susceptibility of the interiorized horizon to exteriorization. Since perpetual inclusion means that both extensive and intensive changes are encompassed concurrently and since these changes are subtractively correlated to each, the perpetual inclusion is essentially the ratio of changes which registers itself

as a slope – the rate of ex-plicatio (unfolding) to complicatio (folding), extensive motions to intensive motions,  $\frac{\Delta y}{\Delta x}$ .

(2) The law of basal continuity, or the persistent continuity between limitropically vanishing values and emerging values: In a decaying object, no matter how significant the change or how unrecognizable the deformity is, it cannot depart from the ever-shrinking fundamentals, axioms or basic registers of the object or formation. In other words, as the formation undergoes new extremes of deformity or the object rots to new levels, the fundamentals of the formation or the basic ontological registers of the object also become more emphatic – that is to say, truer to their ideal. The law of basal continuity in decay holds that emerging values or changes must be continuous to fixed or established values, fundamentals and basic axioms of the formation regardless of their distance and difference. Here continuity can be formalised as follows: Suppose  $X$  is a fundament or an axiomatic value of a decaying system and  $Y$  is a deformation, a change or an emerging value, and the function  $f$  stands for the putrefying line of decay that encompasses  $X$  and  $Y$ . Now,  $f$  is continuous at  $x$  for some  $x \in X$  if for any neighborhood  $W$  of  $f(x)$ , there is a neighbourhood  $\mathcal{Z}$  of  $x$  such that  $f(\mathcal{Z}) \subseteq W$ ; meaning that, irrespective of how small  $W$  becomes, a  $\mathcal{Z}$  containing  $x$  that will map inside it can be found. If  $f$  is continuous at every  $x \in X$ , then  $f$  is continuous.

(3) Differentiable smoothness: Following and in accordance with the first two principles, the encompassing process of decay as an interpolant should be as smooth as possible, or more precisely, infinitely differentiable so as to support both the perpetual inclusion of all extensive and intensive changes and the basal continuity between persistent remnants and emerging forms and values.

In decay what is firstly enacted is the subtractive power of putrefaction whereby extensive and intensive changes are simultaneously included. Subtractive binding of changes ensures that vectorially opposite changes can be included in regard to each other in such a way that every extensive change inflects an intensive change and vice versa. For this reason, the law of basal continuity which emphasises the continuity between ever-shrinking fundamentals and the emerging changes cannot be maintained except through the subtractive power of decay, or more accurately, decay's perpetual inclusion of changes and deformities. Therefore, perpetual inclusion enacted by the subtractive logic of decay precedes the continuity between the intensive ideals of the formation and its extensive ideas which are in the process of unfolding. In this sense, continuity *C* is built upon the output of inclusion *I* (i.e. inclusion of both intensive and extensive changes). Inclusion alone, however, does not support the continuity of what is included either in terms of 'the continuity between those changes which will be included and those which have already been included' (the intensively enveloped fundamentals) or in terms of

‘the ceaseless differentiability of the process’. For this reason, the input of continuity should be the output of inclusion, which is the sum of the actualities of the interiorized horizon and its gradient of potencies, the extensive development and the intensive

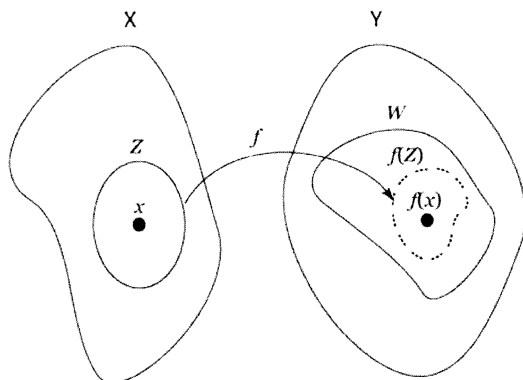


Diagram 1. Basal continuity between the limitropically shrinking object (persistence) and its putrid deformity (change)

envelopment of the formation. Here, if  $I$  is the perpetual inclusion and  $C$  the basal continuity, then their relation can be formalized as:

$$C \circ I \text{ or } x \mapsto C(I(x))$$

Perpetual inclusion  $I$ , basal continuity  $C$  and differentiable smoothness constitute the main principles of decay's dynamism  $D$  in regard to any interiorized horizon  $H$  and in relation to time  $t$ . These three principles give decay the power to mobilise and unleash the irruptive contingencies of time from within and through the interiorized horizon.

Putrid deformities or smooth gradients of decay are forcefully yet nonviolently extracted from the ostensibly secured interiority of the horizon by the combined function of the aforementioned principles. Accordingly, for an interiorized horizon demarcated by the ratio of its actualities (*a*) and potencies (*p*), decay can be reductively symbolized as:<sup>12</sup>

$$D = H \int_p^a \left| \frac{(C(I(x)))^n}{t} \right| dt$$

The Leibnizian notation for the differentiation

$(C(I(x)))^n$  would be  $\frac{d^n(C(I(x)))}{dx^n}$  expressed as a

rate of differentiation within itself – a differential curve within a curve. To put it differently, in the above formalised model of decay's dynamism, the process of decay *D* evolves not only as a curve generated by the complicity of time and space but also as a curve that differentially encompasses the potencies and actualities of a horizon. Decay, in this sense, is a curve in the perpetual act of curving. The act of perpetual curving whereby for every twist another twist is reinvented (*gyra reversa*) presents (reductively) a model of decay as a building process that delivers the interiorized horizon to its heretical wastelands. In line with Leibniz's remarks cited at the beginning of this section regarding

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12. The vertical bars here signify the absolute value of decay's dynamism *D*, both in its negative and positive orientations. Schematically, by positive decay we mean the extensive vector of decay which takes the idea toward its concrete chemical manifestations and unfolds the forms or derivatives which are enveloped by the interiorized horizon. By negative decay, on the other hand, we point to the intensive vector of decay which limitropically abstracts and shrinks the idea toward the zero of ideas and inflects the interiorized horizon toward the precursor exteriority.



the dynamics of infinitesimal vermiculation of the body in putrefaction, the process of decay returns every outward twist developed from the interiorized horizon with an inner twist within the horizon itself and vice versa. The reason (*ratio*) according to which the horizon of interiority works and strives for its ideal status takes a vermiculate turn once it is bent from both ends by the twists (abstract worms) which force it to veer in unforeseeable directions. Once a rectifying ratio between the ideal and the idea (both in its intensive envelopment and extensive development) is established, reason becomes a worm that bores through the horizon so as to prepare it for that which can easily creep in or ooze out. By differentially corrupting the ratio between the idea and its ideal and the ratio between actualities and potencies of an object, decay reinvents the interiorized horizon on the heretical side of itself. It is the pragmatic artistry of decay to harvest limitless potentialities from the subversive logic of interiority on behalf of an exteriority in whose term every horizon must be deserted according to a reason (*ratio*) which is crooked at both ends.

Nowhere has the curving function of decay been more explored than in scholasticism – in particular in the theories developed at Merton College, Oxford and the University of Paris, which constitute some of the germinal ideas of mathematics and chemistry. In scholasticism, *mortificatio*, *migredo* and *putrefactio* all point to the overlapping regions between chemistry and mathematics through proto-scientific ideas germinated in theology, natural philosophy, medicine and the culinary arts. The corpse, as the epitome of putrefaction, demarcates the transition from the *complicatio* of a body to its *explicatio*. Such transition essentially takes place as a slope, ‘the rise of potentialities in the form of actualities’ in respect to ‘the varying flux of

potentialities'. These are the slopes of body qua *complexus* that provide the process of decay with fields of gradation whose dynamism can only be differentially grasped. Unlike the *complicatio* of God, the *complicatio* of body qua *complexus* is under the influence of its actualities whose distribution is extensively toward the outer world or the world of multitudes. In other words, since the actualities of the body are not perfect (immutable), nor are its potencies fixed, the *complexus* of the body is determined by the ratio of *complicatio* (envelopment of potencies) and *explicatio* (the development of potencies as actualities) in regard to each other ( $\frac{\Delta p}{\Delta a}$ ). For God, there is no rate of change (slope) between possibilities and actualities, since God is the complete actuation of its complete potencies or *Possest* (Nicholas of Cusa). Accordingly, if there is no rate of change between possibilities ( $\Delta p$ ) and actualities ( $\Delta a$ ) in God, or in other words, if God is not ontologically differentiable within itself, then  $\frac{\Delta p}{\Delta a}$  cannot have a rate of change or slope, i.e.  $\frac{\Delta p}{\Delta a}$  must be a vertical line (illustrated by the vertical fold *ap* in diagram 2). It is the verticality of God in the scholastic threefold of existence that precludes deviation, the emergence of gradients and consequently, the curving dynamism of rot – God is the one without slopes. Hence the saying, God is too stiff to rot.

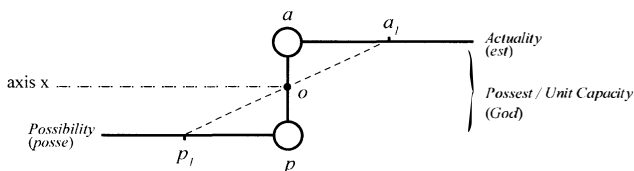


Diagram 2. The scholastic threefold of existence (*posse*, *est* and God qua *possest*)

For the scholastic marriage of mathematics and chemistry through natural philosophy, the *complicatio* of body is full of deviations, rates of changes between actualities and possibilities, little slopes everywhere swerving from the vertical positioning of *possest*. Twisting in and out, wiggling in all directions, slopes are bodies, disturbances in existence for which infinite differentiation is assured. Scholastic bodies are slopes or rates of change between the rise of actualities and potencies capable of being actualized ( $a_1p_1$ ). Despite their tangency to God, they possess the power of infinite differentiability, the power of prolonging the slope process – dragging the rate of progression and change between potency and actuality forever. But at any given time, for scholastic bodies,  $\Delta p \succ \Delta a$  and  $\Delta p \neq \Delta a$  otherwise the body is supplanted by the full body of entelechies whose possibilities have all been actualised. That is to say, if actualities become equal to possibilities or possibilities (all variations of *posse*) become exhausted by being actualised, then the scholastic body becomes a rival for the Divine or is posed as a blasphemous threat to its *possest* where  $a=p$ . The perfection of God is assured by uniting (or completely overlapping) the latitude of both potencies and actualities with the distance or the longitude between them. The impermeable infinity of God cannot express the world outside of itself; because outside of it is the field of slopes which expresses everything in the language of complicities, differentiations and ratios, rises over runs, the worlds produced by the undulations of imperfectibility – the cosmogenesis of decay. For scholastic bodies whose potentialities are infinite, their actualities can be neither infinite (as opposed to the infinite *entelechia* of God) nor equal to possibilities/potencies as in the case of the *possest* of God (i.e.  $\Delta p \succ \Delta a$ ,  $a \neq \infty$ ,  $a \neq p$ ). Consequently,

in this case, as actualities are fulfilled, their number in respect to potencies (possibilities) starts to decrease. In other words, the increase in fulfillment of actualities or perfections is equal to the decrease in actualities' capacity for differentiability. Therefore, for scholastic bodies, which

are tangential to God's *possest* ( $a=p$ ), being is  $\lim_{\Delta a \rightarrow 0} \frac{\Delta p}{\Delta a}$  – that

is, an open quandary in regard to infinity.<sup>13</sup> However, even if the potentialities/possibilities of being are not limitless (as some scholastic theologians like Anselm of Canterbury might object), the scholastic body is still an anomalous tangency to the Divine that instigates an 'infinitesimal subversion' against God:  $\lim_{\Delta a \rightarrow 0} \frac{\Delta p}{\Delta a}$ . Therefore, in either

case, bodies of scholasticism are insurgencies or insistent perversions mobilized by slopes. In taking all beings as tangential to the *possest* of God, being can only be conceived in terms of rates of differentiation. The consequence of the onto-theological marginalisation of scholastic bodies via the privileging of God's *possest* is that the exclusive power and use of slopes is inadvertently dedicated to beings; this power is the power of extracting worlds through differentiation, or unearthing schemas of subversions through the limits of ratios. Everything other than God is the *explicatio* of slopes (Athanasius Kircher's abstract worms); this is far too cosmically revolutionary to be fathomed. Such is the revolution of scholasticism, flourishing in the mediaeval orgy of scholastic theology, natural philosophy and science.

13. The anachronistic use of the limit function here is solely for a succinct exposition of the quandaries spontaneously generated in scholasticism as the result of marginalising the *explicatio* of beings. These quandaries or ideas, as implied in this essay, began to haunt mediaeval philosophy, and initiated a series of philosophical and scientific problems heralding and eventually leading to the rise of Renaissance philosophy and science.

Corresponding to the subtractive logic of decay, the ratios or slopes of putrefaction ramify the mathematico-chemical vectors of decay in two directions. This results in the architecture of decay being posited as a turning point (inflection) at which the concrete manifestation of the process of decay is chemically invested as the product of its abstract process, and the abstraction of decay mathematically returns to its concrete investment. The double-dealing attitude of decay in regard to the concepts of the abstract and the concrete contributes to the twist of decay as a building process: That which is palpably rotting develops out of that which is progressively becoming abstract. To put it succinctly, the process of decay is progressively concrete and retrogressively abstract. This return between the abstract and the concrete is especially evident in ruins, where the abstract is inextricable from the concrete; to privilege one over another is either a necromantic fallacy or a necrocratic policy.

Mathematics with a chemical disposition or chemical revolution via mathematical distributions, decay captures both within its act of building. It is only in the light of the mathematical and chemical complications of decay as a building process that the melancholic admiration for decay and fetid entities, along with the ostracization and dismissal of socio-political decay, can be dissected without blind romanticism, moral opprobrium or crude judgment. It is not that earthly thought is the site of decay from which we must ascend to the fresh air, but that the calculus of decay constitutes the ecology of our interiorized worlds – whether built on the desolate surface of the earth or in the fresh air of a beyond. The calculus of decay has its own problems, ideas and solutions; to politicise, philosophise,

## COLLAPSE VI

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scheme or take action without such calculus is tantamount to calculating out of this world – an outside that does not suggest the great abyssal outdoors but the sealed enclosures of pure entelechy whose immutable horizon does not welcome ecological changes in any direction whatsoever.

## Philosophers' Islands<sup>1</sup>

Robin Mackay

Theoretical physics and cosmology over the last half century has provided a new context in which some of the most fundamental questions of philosophy find a new life and a new sense. In this new context, we find the recurrence of an image that spans the history of Western philosophy: that of the island.

If we think of the fundamental parameters that govern the laws of physics as the axes of a topographical space, a landscape of possible universes, then to our best knowledge, only a very small area of it is 'habitable' by life: We live on an island – or rather, life as we know it is itself an island. Of course this does not mean that the universe was 'designed for us': Rather, it opens up the question of whether there might be other 'islands' in this space, other

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1. Text of a public lecture given in January 2009 at the Scottish National Gallery of Modern Art to accompany Charles Avery's exhibition *The Islanders: An Introduction*.

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possible universes in which radically different forms of life could emerge. Milan Ćirković, posing this question of ‘astrobiology’, insists that we ought not to let the confined shores of our island existence mislead us into thinking that this is the only ‘habitable zone’ in the sea of possibilities. Instead, he hypothesises, there may be an ‘archipelago of habitability’, a system of islands whose pattern might even be mathematically discoverable. Artist Charles Avery’s ‘Sketch for an Archipelago’, with its spiral structure, illustrates the hypothesis perfectly.<sup>2</sup>

This notion of the tiny habitable island in a vast sea of possible universes belongs to a novel philosophical discourse subtended by contemporary physical and mathematical concepts. But it attests to the fact that certain enduring images continue to constitute something like pieces of a reusable theatrical stage-set for philosophical thinking. The image of the island is one of these, and is as old as Western philosophy itself. Charles Avery, like many before him, has taken up this concept of the ‘philosophical island’ and made it his own. In order to understand Avery’s contribution to this history, we shall take a historical tour – inevitably very selective – through the various ages of the philosophical island. This subject, and its history, are so rich in particular because philosophy shares the ‘geophilosophical concept’ of the island with literature. In fact, the island has always defined an important relationship between the two: The island is a kind of conceptual laboratory for transplanting stories into ideas, for imbuing narratives with concepts, for bringing ideas alive through myths.

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2. See Milan Ćirković, ‘Sailing the Archipelago’, *COLLAPSE V*, 292-329.



The island first appears when Western philosophy, at its birth, is still negotiating its divorce from its other: namely, myth. In Plato's *Tīmaeus* the fable of the island of Atlantis occurs within a discussion of the rational principles of a perfect society. Socrates complains that, whilst he *understands* the conclusions arrived at, he would 'compare [him]self to a person who, on beholding beautiful animals either created by the painter's art, or, better still, alive but at rest, is seized with a desire of seeing them in motion or engaged in some struggle or conflict to which their forms are suited'.<sup>3</sup>

This demand of Socrates sets in motion the history of the philosophers' island. The demand for something to *bring alive* ideas; to quicken the still body of rational discussion, finds satisfaction in the story of Atlantis, the lost island.

As we know, Plato's dialogues often comprise secondhand reports, but the *Tīmaeus* ramifies further this strategy of framing, as the story of Atlantis is reported by Socrates' friends as an ancient story heard from a grandfather, who in turn heard it from a friend of *his* great-grandfather, Solon, who received it from an Egyptian priest. Through this relay of memory, Plato establishes Atlantis at an immemorial distance from his audience, endowing it with a properly mythical status.

The priest's story is of a war waged by the island kingdom of Atlantis against the city of Athens – but this is an Athens separated from Plato's contemporary Athens by an impassable gulf of forgetting. For the flooding of the Nile, as the priest tells Solon, has on many occasions saved the Egyptians, and their knowledge, from great catastrophes

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3. *Tīmaeus* 19b.

periodically visited on the Earth and which have wiped out many other peoples including the Greeks. In this way Plato gives his audience to understand that they belong to a shallow memory cut off from the deep past in which the story takes place. Hence the priest's gnomic declaration: "You Hellenes will never be anything but children".

At the climax of the war both (the immemorial) Athens and Atlantis were inundated by a great flood, and their people, Plato tells us, 'disappeared in the depths of the sea'. The island of Atlantis never reappeared, but Athens rose again from the waters. Reborn into an immature state, stripped of its former glory, the 'infant' Athens would have to learn once again to be the perfect republic.

This unveils the original function of the philosophers' island as being connected with a mythical conception of time, with forgetting and memory, with re-beginning and with founding; It sets up a theme of utter oblivion and forgetting only so as to pose the question of the new foundation – no island, therefore, without the flood.

How does this myth transform the philosophical discussion of Socrates and his friends? 'The city and citizens, which you yesterday described to us in fiction, we [...] now transfer to the world of reality'. Paradoxically, fiction imparts reality to the philosophical discussion. For the ideal city they had discussed now becomes the city of their *own* lost ancestors. Where there was the mere *idea* of a city run on rational grounds, now there is the prospect of a repetition, the fulfilment of a cycle. The island myth, of course, dramatises the notion of *anamnesis*, or *un-forgetting*. Rational insight comes not from our experience of this world, but from a remembering of an *other* world, the

recovery of a pure knowledge that was lost when we were incarnated.

Plato's Atlantean myth rises again as the perfect narrative form for the ideals of the humanist Renaissance – naturally, considering that it precisely concerns a 'rebirth'. In Francis Bacon's 1623 *New Atlantis*, for example, all the important elements are reworked: A crew lost in a 'part of the South Sea [...] utterly unknown', cut adrift 'in the midst of the greatest wilderness of waters in the world', discover the island of Bensalem, whose perfectly-calibrated civilisation, with its gentle, humanistic, scientifically-advanced government, embodies all of Bacon's aspirations for the improvement of human society. The people of Bensalem, it transpires, whilst their existence is perfectly unknown to the rest of the world, have an astonishingly complete knowledge of the whole globe, and their civilisation has endured from time immemorial, from before the 'universal flood'. Of the people of this island, too, one could well say: 'you Europeans will never be anything but children'. Again, Bacon's advanced ideas on society and science, in the mouths of these fictional, antediluvian islanders, become an invitation to repeat: Not only does his 'New Atlantis' repeat Plato's, it also calls his contemporaries to repeat the example of the people of Bensalem.

But we are getting ahead of ourselves: For we should remember the extent to which, before the Renaissance, It was Arabic philosophers and commentators who nurtured and developed philosophical thought. And the concept of the philosophical island is no exception. One remarkable text by a Spanish muslim philosopher could, without much exaggeration, be described as being halfway between

Aristotle and *Robinson Crusoe*. This is Ibn Tufayl's book 'Hayy ibn Yaqzân', a twelfth-century arabic text translated into English in 1708 as 'The Improvement of Human Reason', known in Latin as '*Philosophus Autodidactus*' ('the self-taught philosopher'). This is a text known to have been influential for some of our most enduring modern myths: *The Jungle Book*, *Robinson Crusoe*, *Tarzan* to name but a few. Tufayl's narrative tells the story of a child named Hayy ibn Yaqzân, who is cast away on an unpopulated island, and raised by gazelles. The narrative follows the development of this castaway's philosophical meditations as he grows up and discovers the world, in isolation from all human contact.

Tufayl's book is essentially a philosophical treatise, speaking of all things from biology to planetary motions. But its form is that of a progressive narrative, recounting how these philosophical reflections emerge in a man reduced to his 'natural state', removed from all cultural influence: We see Yaqzân growing up among animals, first lamenting his own weakness and vulnerability relative to them, then discovering the uses of his hands, making clothes, devising tools and weapons. He discovers fire and cooked food, thus awakening his human difference from the animals. But his philosophical development really begins in earnest when his gazelle-foster-mother dies. This precipitates a reflection upon what is alive in an animal being, with Yaqzân concluding that the body is 'a very inconsiderable thing', and beginning to foster a conception of the soul. Thence to the questions of how the soul is conjoined with the body, with the conclusion that the soul is akin to fire, a kind of warm vapour. The individuality of

each being must then consist in this 'vapour'; and Yaqzân conceives an analogy between his own use of various tools, and this vapourous spirit's use of the various animal bodies for different purposes. With lengthy meditations on unity and plurality, individuals and species, the self-taught philosopher rediscovers the principles of Aristotelian taxonomy, and proceeds to classify the entire animal and vegetable kingdom, finally considering inanimate objects, and coming to the conclusion that 'all these things [are] in reality one, though multiplied and diversified accidentally as the plants and animals [are]'. But what then is the nature of this unified substance that underlies all these various things in the world? ... With further meditations reaching ever more abstract questions and lofty conclusions, the feral child Yaqzân achieves philosophical enlightenment as an adult.

In fact Yaqzan does make contact with civilisation again, through the medium of a holy man who comes to the island to meditate; however, after having returned to his fellow humans, he finds them so unwilling to consider the way of wisdom that he returns to his island.

This remarkable story is the first fully *philosophical* use of the island. Recounting the genesis of philosophical thought as a natural development, it serves to ratify a body of doctrine as belonging to the natural progression of reason, untainted by outside influences. And the function of philosophical islands continues to be involved with this desire for purity – with philosophy's impatience with dogmatism or received wisdom, its compulsion to begin from nothing, to re-begin with no presuppositions, to *found* itself. For the philosopher, the island is a chance to begin

over again, giving us the possibility of re-founding our knowledge on the basis of an imaginary innocence.

Returning to the Renaissance and to its utopias – those New Atlantises reflecting the optimistic spirit of the age – the most important is probably Thomas More's 1516 fictional crescent-shaped Atlantic Island *Utopia*, a name which of course harbours an etymological ambiguity: 'no-place' and 'good-place'. It's precisely an ideal which cannot be fully realised but which might serve as an orientation, a navigation point: More's discussion of the ills of society, the vanity of people, the belligerence of leaders, gives us an enduring model of sociological and philosophical reflection that is very much alive two hundred years later – in more satirical form – in *Gulliver's Travels*, which however teaches through a mocking *reductio ad absurdum*, not by example, and is all the more entertaining for it.

Where Ibn Tufayl's account of the gazelle-child Hayy ibn Yaqzân contained both an treatise of philosophy and a philosophical thesis on the genesis of thought in one isolated individual, these political fables use the island as a controlled setting for thought-experiments concerning the foundations of the social. A great seminal moment in philosophical island literature occurs, however, when these two aspects – the innocent *individual* finding enlightenment in the seclusion of an island, and the ideal island *society* prompting reflection on our own – are brought together. This is Defoe's 1719 *Robinson Crusoe*.

In *Robinson Crusoe* all the essential problems of the philosophical island are brought together beautifully. We have Crusoe as Christian autodidact, discovering true faith through his own solitary meditations. But it is not only

God that Crusoe discovers: he also enacts the origins of sedentary human society: The need to settle and defend, the planting of crops and building up of stores, the need to domesticate wild animals, even the development of hierarchy and the legitimacy of servitude ... But *Crusoe* is also the point at which the philosophical island comes into disrepute, when we begin to harbour suspicions about the supposed innocence of the protagonist. Readers excited by the idea of the shipwrecked mariner exploring the virgin isle, surviving on his wits, cannot but be somewhat disappointed when Crusoe spends his first two weeks rowing back and forth to the shipwreck to bring out everything he needs to set up home, from gunpowder to tunics, from oatcakes to a complete set of carpentry tools; cannot help feeling a little cheated when he takes his smug walks to his 'country house' with his four guns slung around him, or when by 'chance' he discovers some ears of wheat and prudently sews and stores his harvests for three years ...

At a century's distance Marx sums it up drily in the first volume of *Das Kapital*: 'having saved a watch, ledger, ink and pen from the shipwreck, he soon begins, like a good Englishman, to keep a set of books'.<sup>4</sup> For Marx, Crusoe represented 'a totally illusory foundation for economics, that of the independent, non-social being'. The story was an ideological sham, serving to naturalise the system of bourgeois capitalism, its function to justify a system through a bogus mythical 'proof' of its spontaneous nature. In short, the island is 'a false "origin"'.

In his 1946 essay 'Causes and Reasons of Desert Islands', Gilles Deleuze, whilst affirming the philosophical power of

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4. K Marx, *Capital*, vol I, tr. B. Fowkes (London: Penguin, 1992), 170.

the island myth, seconds Marx's suspicions. The problem with *Robinson Crusoe*, he writes, is that Defoe's narrative fails the profound sense of the *reinvention* of mythology that characterises the philosophical island: In *Crusoe* 'The mythical recreation of the world from the deserted island', Deleuze says, 'gives way to the reconstitution of everyday bourgeois life from a reserve of capital. [...] Robinson's vision of the world resides exclusively in property. Nothing is invented.' He continues, somewhat harshly: 'One can hardly imagine a more boring novel, and it is sad to see children still reading it today [...] Any healthy reader would dream of seeing [Friday] eat Robinson.'<sup>5</sup>

Despite these cavils, the structure of *Robinson Crusoe* so perfectly distils the island concept that it has proved robust enough to be critically rewritten, not only in countless inferior and derivative novels, but also in many inventive and subversive ways: For example in the wonderfully philosophically-rich 1972 novel *Friday, or the Limbo of the Pacific* by Deleuze's friend Michel Tournier. Tournier's Robinson, on the island he names 'Speranza', is depicted in the light of a philosophical and psychoanalytical *mélange* combining Freud, Jung, existentialism and structuralism. For Tournier, the story becomes that of Robinson discovering that what made him human was his interaction with others. Alone on the island, he begins to succumb to depersonalisation, sinking into a delirium where he identifies himself increasingly with the island. The very delirium against which Defoe's *Crusoe* had defended himself implacably with all the salvaged accoutrements of civilisation becomes, for Tournier, the

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5. G. Deleuze, *Desert Islands and other Texts*, tr. M. Taormina (Cambridge, Mass.: MIT Press, 2003), 12.



truth of the island adventure as philosophical, psychotropic journey. As he struggles to 'humanise' the island, Robinson becomes dehumanised, becomes the island: 'So Robinson is Speranza. He only has a consciousness of himself by way of the fronds of myrtle, through which the sun launches its arrows of light, he only knows himself in the foam of the wave washing across the white sand'.

The influence of Tournier's novel can be read in J.G. Ballard's short 1973 novel *Concrete Island*, in which – with typical mordant wit – a businessman finds himself car-wrecked on a traffic island. Unable to escape, this hapless protagonist also undergoes a kind of psychogeographical trial, repeating, at the height of his ordeal, the phrase of Tournier's Robinson: 'I am the island'.

Between Crusoe's island and the Concrete Island, we must also note a great efflorescence of what can only be called island narratives without islands: The social contract theorists. The thought-experiments of Hobbes, Locke and Rousseau, imagining how society might develop from a 'state of nature', are the great speculative works of modern political philosophy. These theorists rightly saw that the island-principle corresponded to an important truth: The real – even the reality of society – can be profoundly explored only through an ideal scenario, a controlled experiment, that steps beyond the bounds of that reality. In the twentieth century, John Rawls re-imagines the social contract experiment using imagery that corresponds to that of isolated islands such as Bensalem, with the 'veil of ignorance' an impenetrable bank of fog around the philosophical island. To make his argument, however, Rawls for the first time posits the 'original position' of the

philosopher *outside* the island, meditating on the possibilities of what it might hold and planning his disembarkation.

Even if social contract theory represented in certain respects the consummation of the political employment of the philosophical island, in a new modern conception of the 'grounding' or re-foundation of the social on the model of a civil contract, from the nineteenth century onward its works were liable to come under suspicion, and to be dismissed as 'robinsonades': post-*Robinson Crusoe* any supposedly 'innocent' deployment of the island as a speculative device would be subject to great critical scrutiny.

In marking out Reason's legitimate from its illegitimate uses, Kant's *Critique of Pure Reason* aims to provide the map for a domain of well-founded, systematic knowledge, and secure it against the flights of fancy and the speculative excesses to which Kant considered earlier philosophers had all-too-easily abandoned themselves. And yet to promote this somewhat gruelling task Kant employs the image of the *island of truth*, in this famous passage from the *Critique of Pure Reason*:

We have now not merely explored the territory of pure understanding, and carefully surveyed every part of it, but have also measured its extent, and assigned to everything its rightful place. This domain is an island, enclosed by nature itself within unalterable limits. It is the land of truth – seductive name! – surrounded by a wide and stormy ocean, the native home of illusion, where many a fog bank and many a swiftly melting iceberg give the deceptive appearance of farther shores, deluding the adventurous seafarer ever anew with empty hopes, and engaging him in enterprises which he can never abandon and yet is unable to carry to completion. Before

we venture on this sea, to explore it in all directions [...] it will be as well to begin by casting a glance on the map of the island which we are about to leave, and to enquire, first, whether we cannot in any case be satisfied with what it contains – are not, indeed, under compulsion to be satisfied, inasmuch as there may be no other territory upon which we can settle; and, secondly, by what title we possess even this domain, and can consider ourselves as secured against all opposing claims.

As Michèle le Doeuff remarks in her *The Philosophical Imaginary*, Kant uses the image of the island to defend his sober 'critical philosophy' against the more colourful and grandiose promises of speculative metaphysics: The 'critical' island is certainly not a paradise – but it is infinitely preferable to the frustrations and dangers of the boundless ocean, upon which metaphysical speculation recklessly sets out. If he claims to re-place our knowledge on its proper ground, Kant is most circumspect about what sort of territory philosophy can promise to secure for us.

Notably, as le Doeuff remarks, elsewhere Kant warns against *another* island: the paradisiac island of the South Seas. The yearning for its easier climes and for its innocence is a snare, Kant suggests: they represent a pernicious, imaginary utopia. Thus Kant sets the seduction of the southern isle against the foggy northern isle which, whilst somewhat bleak, is true and solid. As Deleuze says in his book on Kant, this is the element in which Kant's thought is at home: 'the fog of the North'. When Kant trills 'the island of truth – seductive name!', this is nothing but sarcasm: the *serious* philosopher has no business with seductive, pretty islands where he can lounge about all day under palm trees.

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So Kant reinvents the philosophical island as a duality: There is the southern isle, with its dangerously desirable holiday-brochure illusion of luxury and leisure; and the northern isle, safe, secured, and systematic, if a bit grey. In short, the island of truth is a *dreich* isle, but it's all we've got. But even Kant's carefully-delimited and hard-won piece of solid territory doesn't last long in the history of the philosopher's island, as Nietzsche, in his 1882 *The Gay Science*, announces the crisis of late modernity – not only have we left Kant's island of stability, our own critical self-consciousness has destroyed it:

In the horizon of the infinite.— We have left the land and have embarked! We have burned our bridges behind us—indeed, we have gone further and destroyed the land behind us! Now, little ship, look out! Beside you is the ocean: to be sure, it does not always roar, and at times it lies spread out like silk and gold and reveries of graciousness. But hours will come when you will realize that it is infinite and that there is nothing more awesome than infinity. Oh, the poor bird that felt free and now strikes the walls of this cage! Woe, when you feel homesick for the land as if it had offered more freedom—and there is no longer any 'land'!

In the epoch that this declaration announces, the problem is no longer that of founding or re-founding. Instead it is the crisis of the fruits of enlightenment turning bad, of science and critical thought having gnawed away the very foundations of human existence. But even Nietzsche's declaration that there is 'no longer any "land"' cannot prevent literature from re-engineering the island for this age, and according to its dreams and fears. From the end of the nineteenth century, the philosophical island becomes a dystopia where the most extreme possibilities, doubts,

and horrors of Western civilisation are given free (if safely-sequestered) rein. This tradition begins with H.G. Wells' (1871) *Island of Dr Moreau*. Rather than the island being a metaphorical setting for a *philosophical* thought-experiment, instead we find ourselves on an island where actual (scientific) experiments are underway and running out of control. The island becomes a warning, concentrating the most threatening aspects of contemporary reality into their confined space.

Instead of accommodating an ideal society whose principles instruct our own, then, the twentieth-century island – in which we can include, of course, many of science-fiction's alien planets and stranded space-stations – is more likely to amplify developments of real society, concentrating them into an imagined future that is all-too-near. The power of ideas, rather than being owned and judiciously employed by philosophy, is now a power effectively at work in the world, embodied in technology, uncontrolled or controlled by megalomaniacs and evil geniuses, perplexing and injuring humanity. This, in short, is the philosopher's island resounding with the aftershock of World Wars; and the island *after* Marx *after* Freud, *after* Darwin.<sup>6</sup> And after the twentieth-century revolution in physics: it is the Island of the fateful experiment – the Bikini Atoll – and its aftermath (*Lord of the Flies*, and countless other post-apocalyptic fantasies).

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6. Incidentally, we should remark that we owe the whole elaboration of evolutionary theory from Darwin onward, to an island voyage – Darwin's journey, onboard the *Beagle*, to the Galapagos, islands whose slow geological drift apart had effectively isolated the different species of finches, which thus provided a living stop-motion image of the process of natural selection. Note, however, that in his new book biologist Steve Jones argues that despite their mythical importance in the popular imagination, in actual fact the most important island for Darwin's work was England. S. Jones, *Darwin's Island: The Galapagos in the Garden of England* (London: Little, Brown, 2009).

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In his last novel, entitled imply *Island* (1962), Aldous Huxley seems to reverse the trend: He turns the island once more into a utopia contrasting with the dystopia of reality. Imagining science being harnessed only for the use of man, rather than overpowering him, Huxley's 'Pala' is an imaginary island of sanity in a mad world, where Eastern wisdom and Western science comet together in the persons of a shipwrecked scientist and an indigeneous quasi-buddhist order, giving birth to a society stable and free from madness and venality. Like the autodidact Yaqzân, everyone on the island is in a state of enlightenment, nirvana even. And through the great slogan of this modern Utopia still echoes the voice of Platonic *anamnesis*: 'Nobody needs to go anywhere else. We are all, if we only knew it, already there'. If only we knew it, we could repeat, return to where we really are. Ultimately, however, the final twist in Huxley's tale shows that he was himself no longer convinced of the possibility of such a 'sane society', such a return to the source.<sup>7</sup>

Let's now ask whether we can make out the shape of a new, twenty-first century philosophical island? Previous models still haunt us: Just as, in the sixties, *Lost in Space* reworked *The Swiss Family Robinson* for the space age, Koushun Takami's (1999) comic book *Battle Royale* and its (2001, 2003) film adaptations unfolded as an ultraviolent revisiting of *Lord of the Flies*, and the TV series *Lost* (2004-5), with its plane-crash and its characters named Locke and

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7. In a typically cynical reappropriation of Huxley's combination of science and religion, Michel Houellebecq's (2005) *The Possibility of an Island* returns it to reality. Houellebecq envisions an island run by a 'cloning cult', based on the actual cult 'Raelians' - a real world example of the terrifying combination of genetic engineering, nanotechnology and religious messianism.

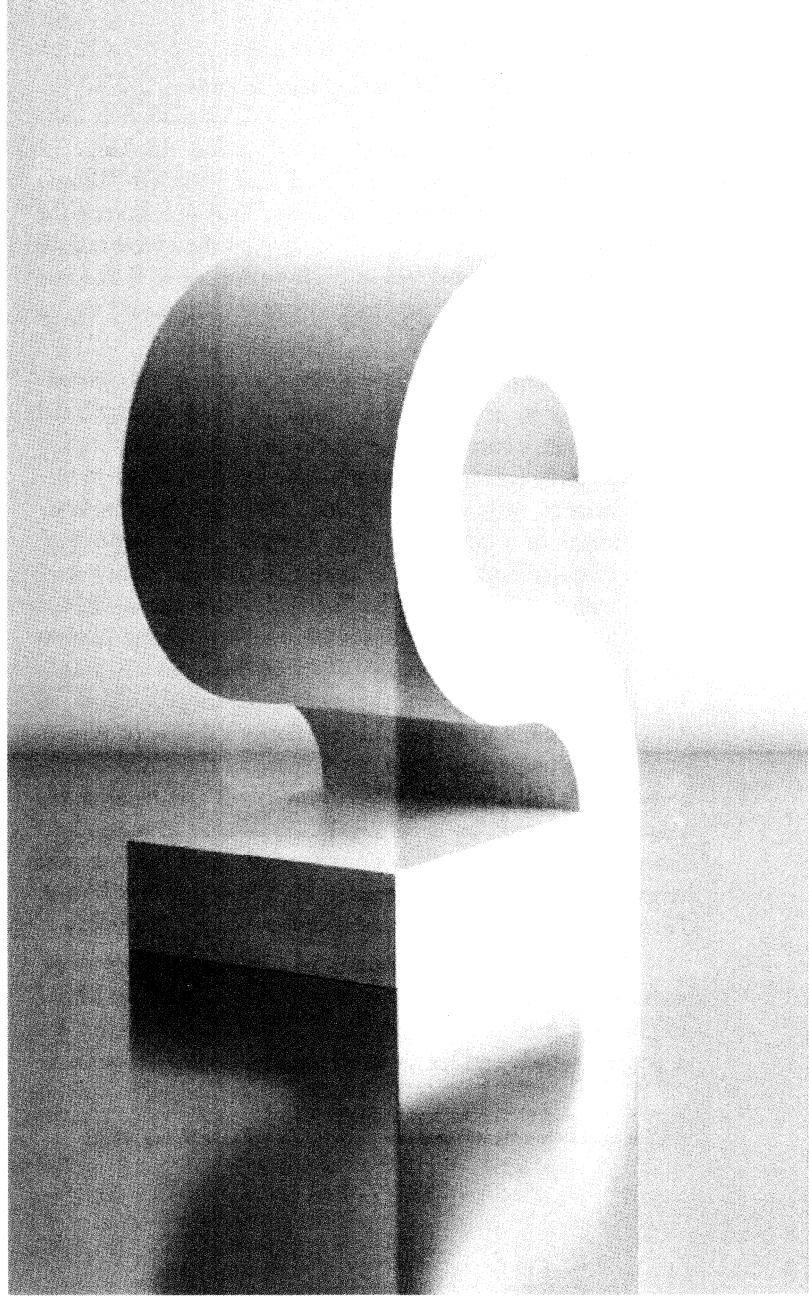
Rousseau, remixes a bygone era of island thinking. At the end of the second episode of *Lost*, entitled 'Tabula Rasa', one of the characters declares: "This is a chance for everyone to start again, regardless of what they were before the crash". Utopia endures in Hollywood, even if the tale of *Lost* becomes darker and more twisted (fatiguingly so) as the episodes progress.

Perhaps ours is more properly the age of the house-island, isolated but visible by millions, and manipulated by an unseen controller. *Big Brother* and its various reality TV imitators (several of which take up the island theme very literally, with woeful results), although they harbour no illusions of a *tabula rasa* or a complete new beginning, are perhaps still rather tied to antiquated forms, their social engineering redolent of *The Tempest*, where the audience delights in Prospero's behind-the-scenes manipulation of the hapless groups shipwrecked on his enchanted isle. Ours is also the age of the geoplastic megalomania of Dubai's man-made archipelagos, where millions of tonnes of sand is dredged up from the bottom of the sea to create new islands full of luxury villas. (Have their architects never heard the phrase 'built on sand' ...?) Since every modern convenience has already been imported, however, the rich man's island is never interesting, it's never a desert island. None of these constitute a philosophers' island for today.

The philosophical references of Charles Avery's work set the conditions for one possibility of what such an island might be. And his project itself responds to them. It's a project which resides as much in his book,<sup>8</sup> at once an

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8. C. Avery, *The Islanders: An Introduction* (London: Parasol Unit/Koenig, 2008).





island travelogue and an enigmatic work of philosophy, as in the catalogue of drawings and exquisitely-crafted objects in different media which make up his oeuvre.

At first, Avery's island seems to represent the landscape of philosophy, rather than being a vehicle for any particular philosophical thesis. Looking at the names on his maps, it seems Avery wishes to make the landscape of his island and the world surrounding it describe the whole history of philosophy. In this, his closest reference is Borges' (1940) story *Tlön, Uqbar, Orbis Tertius*, which tells of a researcher's discovery of a land – possibly real, possibly conspiratorially fabricated by scholars – whose regions can be differentiated according to their inhabitants' subscription to different philosophical theories of meaning. But if we read Avery's island as some sort of grand allegory, we soon find out that there is no straightforward 'mapping'. Far from simplifying the world of ideas by mapping it out, Avery adds to it and twists it with his strange cartographies. The relation between metaphor and what is metaphorised is always slipping and sliding, and everything refuses to fit together neatly.

There are however some privileged philosophical references. They belong to the development of the philosophy of logic and mathematics at the beginning of the twentieth century, the story of the search for a theory that would provide a systematic foundation for all logical and mathematical thought. One of the few actual philosophers to appear in Avery's drawings, Bertrand Russell, has the great distinction of having ruined this idea forever, in his polite letter to his colleague Gottlob Frege. The simple but powerful paradox discovered by Russell, and which bears

his name, resonates throughout Avery's work: Take the set of all sets which are not members of themselves: if it does belong to itself, then it doesn't – And vice versa ... Take the barber of the regiment, defined as the man who shaves everyone who doesn't shave themselves ... does he shave himself or not?? (You'll find Avery's own answer to that particular riddle in his book.) Russell's paradox seems to be the engine of all the dualities in Avery's work. His islanders love to cut everything in the universe in two. In fact, the apotheosis of the islanders' creed might be the old joke that 'there are only two types of people; those who divide people into two types and those who don't'. But the island is also prowled by anomalous animals that don't seem to obey these distinctions: The Elusive Noumenon; The If'en, whose 'defining characteristic [...] is that they lack a defining characteristic';<sup>9</sup> The Essential Mr Impossible ... one suspects these are the animating principles of the island, paradoxes that not only accompany the sharp distinctions the islanders like to make, but might even sustain them, as the hope of snaring the Noumenon sustains the hunter.

The disorienting effect of all these paradoxes is already a little like stepping into Avery's 'Eternity Chamber'. But there is more. Russell had shown that the most powerful foundational logical theory was punctured by paradoxes. But by the 1930s, Gödel had proved his incompleteness theorem, demonstrating that any logical system powerful enough to provide a foundation for simple arithmetic *will* contain at least one proposition whose truth is undecidable. This shatters philosophers' dreams. Avery's work registers both the gravity and the humour of these developments.

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9. Avery, *The Islanders*, 47.



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No foundations: does this mean no islands? 'In the horizon of the infinite', neither philosophy nor art can rise above or systematise the All, or provide it with a foundation. philosophy and art are themselves situations within the world, and all situations are incomplete. Avery's work constantly presents us with this 'punctured' and incomplete state of knowledge.

In this respect, one might relate Avery's work to that of an apparently very different artist, Keith Tyson. In fact Tyson shares similar formal concerns, since his work wrestles with the idea of systems that strive to encompass and tabulate. In *Large Field Array* Tyson tries to create a modular 'system of everything' – scientific theories, his childhood memories, images from TV, abstract concepts – and systematically connect it all together. But he is inevitably faced with having to rescind this work's claim to be comprehensive or to systematically represent the world. Of this 'failure' Tyson says that we must accept that it's impossible for the artist to create, in a work of art, a model of the universe that doesn't participate in that universe; works are models *in* the universe, not models *of* the universe. In an image very apt for the present discussion, he says that they are 'like a postcard on the beach'.<sup>10</sup> Avery's work is something like this: a map of the space of thought we inhabit, but continually folding back upon that space, so that the map can never be completed, but continually complexifies what it's mapping.

G. K. Chesterton, in a witty piece entitled 'The Philosophy of Islands' (1903), remarks on the very human need to identify things, and sees at the root of this a wish

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10. Keith Tyson, *Studio Wall Drawings 1997-2007* (London: Haunch of Venison, 2007), 27.

to isolate. It is to this desire that he links both what he calls the 'perennial poetry of islands' and 'the perennial poetry of ships':

A ship like the *Argo* or the *Fram* is valued by the mind because it is an island, because, that is, it carries with it, floating loose on the desolate elements, the resources, and rules and trades, and treasuries of a nation, because it has ranks and shops and streets, and the whole clinging like a few limpets to a lost spar. An island like Ithaca or England is valued by the mind because it is ship, because it can find itself alone and self-dependent in a waste of water, because its orchards and forests can be numbered like bales of merchandise, because its corn can be counted like gold, because the starriest and dreamiest snows upon its most forsaken peaks are silver flags flown from familiar masts, because its dimmest and most inhuman mines of coal or lead below the roots of things are definite chattels stored awkwardly in the lowest locker of the hold.

This explains why earlier philosophers' islands now appear to us to be typical 'philosophers examples' – they are commodious to the mind only because of their oversimplicity. The contemporary island can no longer pander to the desire for isolation, because we know our world is complex, interconnected, and uprooted: There *are* no more desert islands. Nicholas Bourriaud calls Avery's island a 'heterotopia' rather than a 'utopia': it's neither 'no-place' nor 'the best place', but an 'otherplace', a 'manypplace', a multiplicity that is already 'out there'. It is the multiverse as refracted in Avery's mind. His question, though, is how to create 'one' out of this dazzling multiplicity. This is precisely the task Avery set himself when, in the inaugural gesture of his mammoth project, he declared that from now

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on *all* of his work would find a place in this island kingdom (so that the ‘work’ consists not in any one of the objects created, but in the structural consistency of the whole).

In regard of the need to isolate things, Chesterton speaks also of the fear of infinity: for ‘to be infinite is to be shapeless’, he says. However, as Alain Badiou has argued, it is the *finite* that is the exception: infinity is normal. Every thing, every situation, can be seen from infinitely many perspectives, dissected in infinitely many ways; so that things are never one in themselves, they are always multiple, infinitely multiple: To ‘count-as-one’ a situation or a thing is always to intervene in it, to creatively shape it.

Cantor’s transfinite mathematics, which Badiou suggests we take as one of the conditions for contemporary philosophy, is the third of Avery’s philosophical sources to which we should draw attention: Cantor’s proof that there are different *sizes* of infinity, which secularises the concept of infinity and introduces some exquisite paradoxes into thought. For on Avery’s island we meet the strange, ramified quasi-elephantine creatures the Alephs, believed by some to be ‘descendent[s] of the Noumenon’, of which we are told: ‘upon the discovery that Aleph Null was not unique, the ideas accounting for the species were modified’.<sup>11</sup>

And infinite variety is certainly reflected in Avery’s island – it may be a ‘northern isle’, but it is not ordered and bleak like Kant’s ‘island of truth’. It’s an island of gods and pickled eggs, of bagatelle and pyramids, of seagulls and alephs. All these things, belonging to very different registers of reality, co-exist on the island, depicted through Avery’s work through a constantly-evolving palette of techniques

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11. Avery, *The Islanders*, 50.

and media. Thus the aforementioned structural principle of Avery's project is a way for the artist to 'count himself as one', to bring together all the different situations of which he is an intersection: philosophical ideas, places, concepts, people he's seen or known, historical figures, imaginary situations from books – without suppressing their multiplicity. The idea of the 'whole project' always goes before him as a task that will never be finally completed. There is always more for him to discover on this island, now that he's decided that the island is where everything will be.

He therefore suggests a contemporary role for the philosophical island, for individual and society alike: stifled by a wealth of multiple possibilities, we lack any immemorial, mythical example to repeat; there is no deep past, no 'before the flood', that unifies us; We can't appeal to memory anymore for political strength, to tradition for identity, or to ideal models for simplicity. It is therefore no longer a question of *founding* ourselves on the basis of mythical islands. Rather, given this multifarious reality, the problem is to find *ourselves* in it - or to *hunt* ourselves in it, in the process adding to the territory with yet more maps.

Finally, Avery's story is also about the practice of philosophy itself. His protagonist comes to the island with a view to being its discoverer - he craves the glory of discovering something new.<sup>12</sup> But he immediately finds he's not alone. The fantasy of the Victorian explorer is already dispelled on page one of Avery's travelogue. This in itself is the condition of doing philosophy in the present day: a sometimes disheartening process of

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12. Avery, *The Islanders*, 9.

discovering who has already had your thoughts before you. You're exploring a land that seems, to you, to come directly from the deepest part of yourself and to contain the strangest, most intangible thoughts; But you constantly have to accept others have been there before you, already mapped, charted, and named these zones of thought, just like the names on Avery's map: *Descartes' axiom*, *The phenomenon of sense*, *The procession of the Greeks* (an archipelago which includes the island of Timaeus). To think today, is to negotiate an historical constellation of thought-positions; *anamnesis* become historical. It is the problem, not of how to begin from nothing, but of how to synthesise existing, multiple lines of thought into something new. This quandary, this weight of history, was the same in which Avery found himself with respect to an overly historically-conscious discourse of art. The island, the construction of this island that belongs only to Charles Avery, more than the sum of its parts, more than any one narrative, is his response.

According to Avery, if one can't be a discoverer, the only thing to do is to reinvent oneself as a hunter, trying to locate the island's greatest treasures, those that have eluded everyone so far. If Avery says that this characterises the figure of the artist, one would be inclined to say it corresponds also to the figure of the philosopher: 'an eternally hopeful and eternally hopeless individual. Even though history and reason tell him otherwise he continues to believe he will prevail'.<sup>13</sup> As we have seen, the history of philosophers' islands is a moving image of this eternal hope.

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13. Avery, *The Islanders*, 23.



WE DON'T  
STAY HERE  
BECAUSE  
OF GRAVITY  
WE STAY  
BECAUSE  
WE LIKE IT.



## The Islanders: Epilogue<sup>1</sup>

Charles Avery

This is the plain where Rocco once found a dead monster.

Within its thinness I am profoundly lost.

Multitudes of round white flowers vanish into the endless ring of light on the horizon, and there is little else, other than the wind, which ruffles the meadows.

Every so often I think I see, at the edge of my vision, some small animal flitting, but I cannot say that any of these sightings are conclusive.

I resolve to fix my eyes downwards and comb the ground in search of any sign of diversity.

A little flat stone ... the remains of a small and long-dead creature ... possibly ... strange S-shaped lines in the dust... some foamy substance on a stalk ... another stone ... an old bottle!

When turned upside down and shaken, it yields a few drops of rusty red liquid which disappear into the ground.

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1. Text originally commissioned by *To Hell with Journals* and published as 'The Fancy of the Hunter', in issue d (Nov. 2009), eds. C. Arsène-Henry and H. U. Obrist.

## COLLAPSE VI

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Many have ventured to the remotest part of this far off isle. Some return to tell the story. Those who do say they came in search of something new, for it is the fancy of the hunter that, in this reified atmosphere, a beast called the Noumenon may reside. The existence of this creature has never been proven, yet there is a deep conviction that it must indeed be, and do so here, in the wilderness, for the rest of the Island is well charted.

Some come alone so as not to alarm the creature, but hope to enchant it – yet any sighting reported by such solitaries is dismissed as the altitude induced hallucination of the wishful, or the fabrication of the charlatan. Others come in pairs so as to have somebody to corroborate their testimonies, but none have been successful. It seems ‘Three’s a crowd’ as far as the Noumenon is concerned.

Then there have been great enterprises where hundreds have come up here, with dogs and nets, and all manner of contraptions, and have sought to encircle the creature, fruitlessly.

This is clearly a being of infinite finesse. Its existence is sustained by faith alone, or, as The Urbane Wit commented: “It’s behind you!”

Nevertheless there is an ocean of amnesia that new generations must cross to come to the island; and as they pull their barques ashore and savour the moist air, each expedition with its newest equipment, a picture of jovial young women and men on the beach, full of optimism as they head for the darkness.

I too was drawn up here by the scent of this enigmatic cat, and am all regret. I would gladly settle for the impression of its droppings if I could be delivered from this situation.

I am disgusted with my weakness of character, for I must admit that a sickening loneliness has come upon me more quickly and profoundly than I imagined it could. I yearn to be planted back in the marginally less lonely situation of the café in the outpost of Onomatopy, where I first conceived this misguided expedition. Where a rude waiter dumped my coffee in front of me, spilling a good deal in the saucer, conducted exclusive banter with the barmen and made lewd comments about inaccessible females (to him through coarseness, to me through shyness) who walked past the window. Where two huge men in tall hats sat strikingly by a mirror on the wall, engrossed in conversation. A mendicant wandered into the café and mumbled something to me in dialect, about milk for his baby (absent) – from which I understood that he wished to indent me for currency – and stood around for several seconds after my refusal, allowing me to inhale his hum. I thought, drat, why don't the waiters intervene and remove this loon from the premises. To my discomfort he then took a place at the bar, where he appeared to be on first name terms with the staff, and proceeded to imbibe a coffee, served to him immaculately, apparently on the house, exchanging friendly salutations with the giants in the corner as he did so.

But I am far from Onomatopy, and I do not know my way back, indeed death is closer than town.

Yesterday I saw that pretentious hare, at a distance. It stopped a moment and looked in my direction, I thought in pity. I hoped it might point the direction home, but instead it just flashed its rings at me, and passed on. As an afterthought I fumbled a couple of cartridges into my gun but the hare was long-gone.

## COLLAPSE VI

---

Another hunter once told me that all you really amount to out here is the contents of your bag, the contents of your self, and your gun. You have to concentrate to remember what you are, which is why I have started to write, to help me remember. It's no good just thinking: you have to think "I am thinking!"

Each day – a subtle event at these latitudes – I make an inventory to keep me together, or rather to keep myself apart from things:

Self: I am called Only Macphew (really!). My best friend is a girl – I call her Miss Miss. I am in love with her but she has no idea, or pretends not to notice. I am a man.

Bag: Two Pencils. One Notebook. One jar. A knife, naturally, with which to skin that blasted hare when it gets too bold. Half a bag of dried banana slices. One one-armed snake. I'll put it with the other one I have at home, if I ever make it back. I'll mount them on L-shaped bits of wood and have them as bookends. That's a cheering thought.

One hole-punch, the cherished possession of Miss Miss which she lent to me a while ago (a burdensome piece of equipment and utterly useless in my current circumstances). I have it with me because I forgot to take it out of my bag before I left, and did not notice the weight due to my jaunty attitude at the outset of the expedition,

My thoughts wander to an erotic meditation on Miss Miss.

I know I must be high up the world, for the flowers are vivid against the dark grey sky, and I hear the noises without causes, tiny musical explosions in the air – a phenomenon that must be perceived to be believed, like



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flying fish, of which I have heard sailors speak (and whom I don't believe).

I feel as though I am walking sideways through time, my past to the left of me, my future to the right.

I cannot carry on this way. I must make a choice but won't, for fear of it being the wrong one. I am just continuing, putting one foot in front of the other, hoping for a sign to direct me.

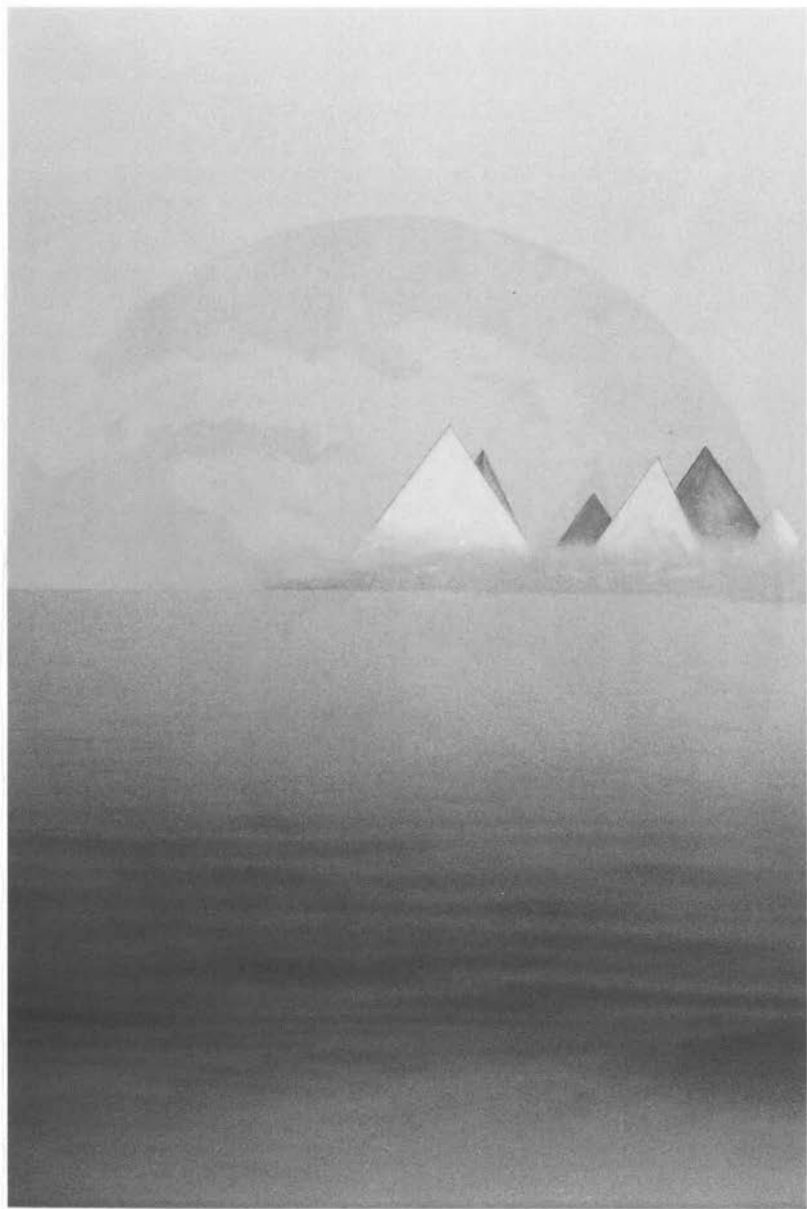
Meanwhile, worst of all, I have started to doubt. I seriously doubt the Noumenon, and wonder if I have jeopardised my life, sacrificed my bones to the anonymous dust of the plain, all for the sake of a chimera. (I imagine that hare will gingerly approach my corpse when it is sure I am dead beyond the possibility of resurrection, and when the flesh has rotted on my fingers, it will take my garnet ring for its collection.)

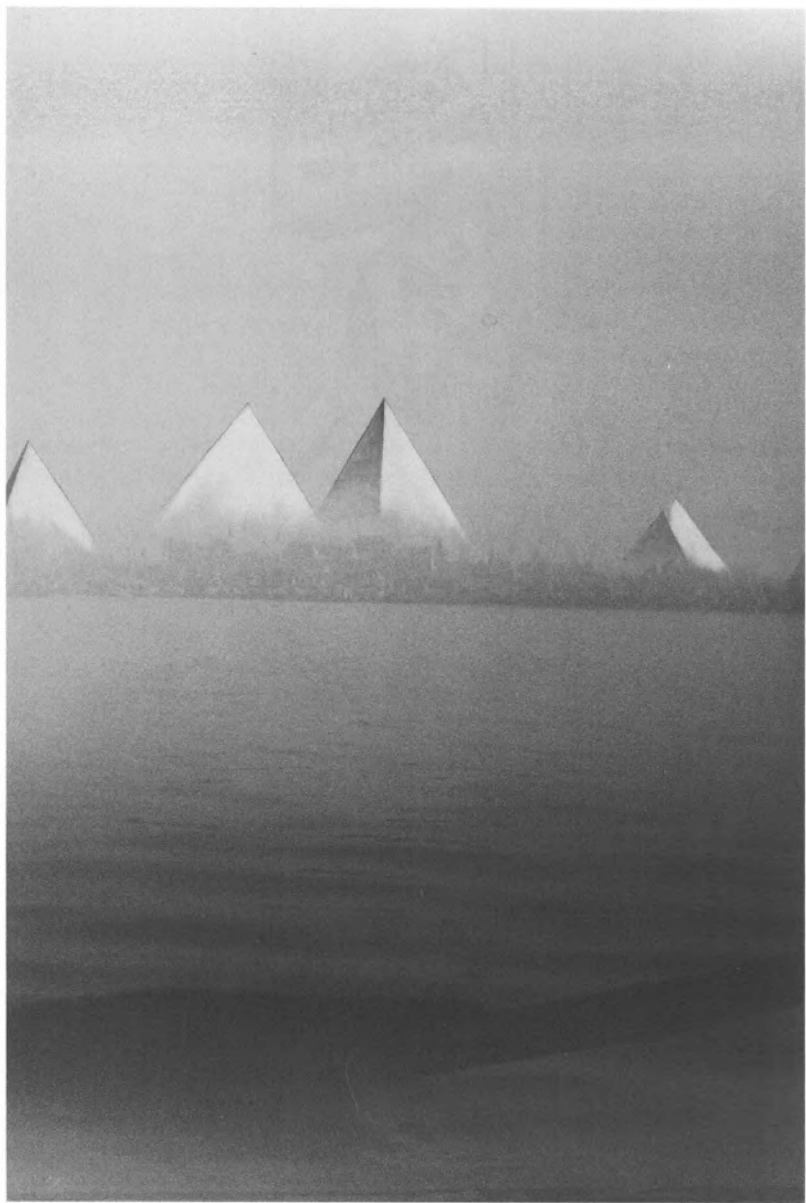
I doubt the affections of Miss Miss, or that her fatalist self will view my demise as anything other than the course of events. Certain other things have also begun to disturb me: sometimes the flowers don't quite align with their stalks. Why have I never seen the bottom of a mountain? Despite my patient efforts in studying the If'enish language, I have acquired no more than a few words – leaving me to suspect that this argot amounts to little more than gobbledegook improvised for the consumption of the tourists.

And finally I have started to wonder if, beyond the shops and bars and lights of Onomatopoeia, beyond the plane of the gods, where the defunct machines and litter are strewn, underneath the Mountains, and the flowers, and the dust and the bones of the hunters, there is an Island at all?

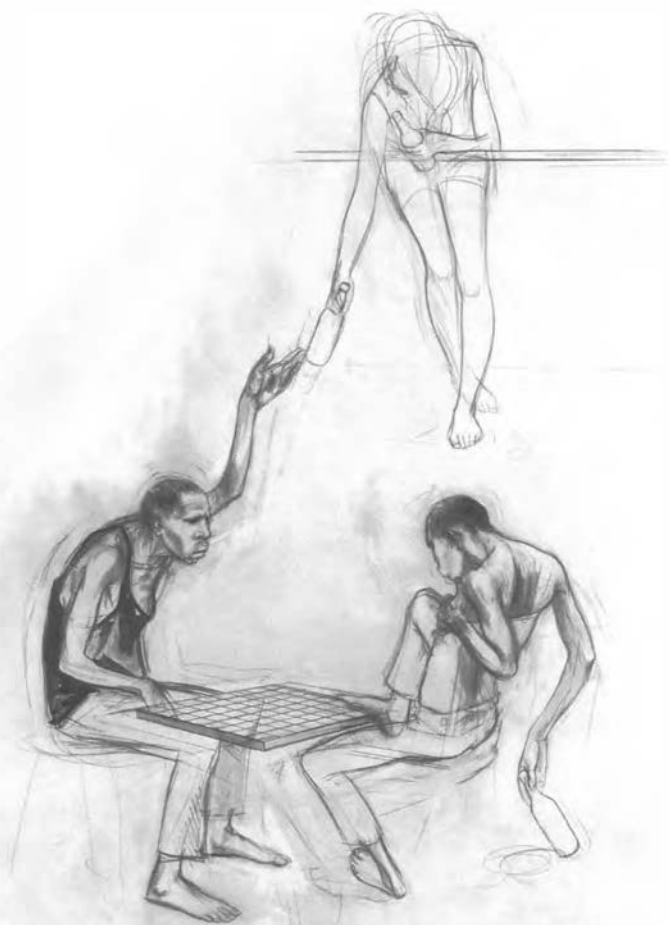












Widow in the morning 1968





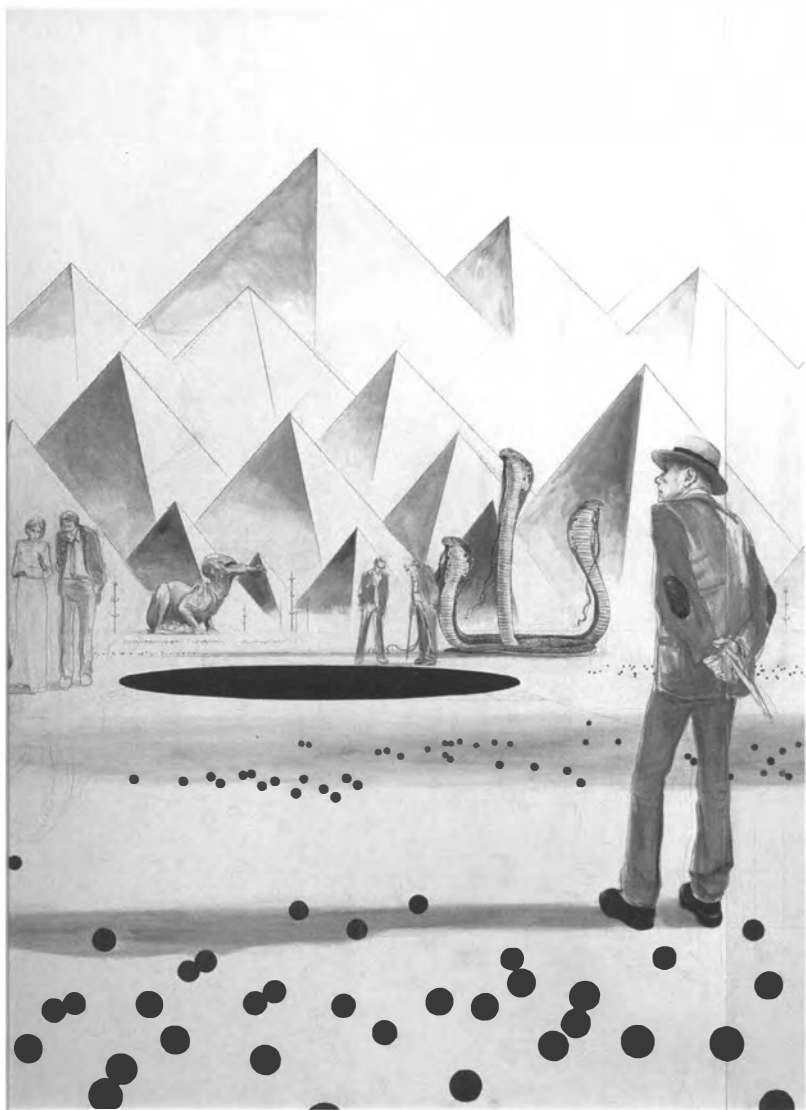


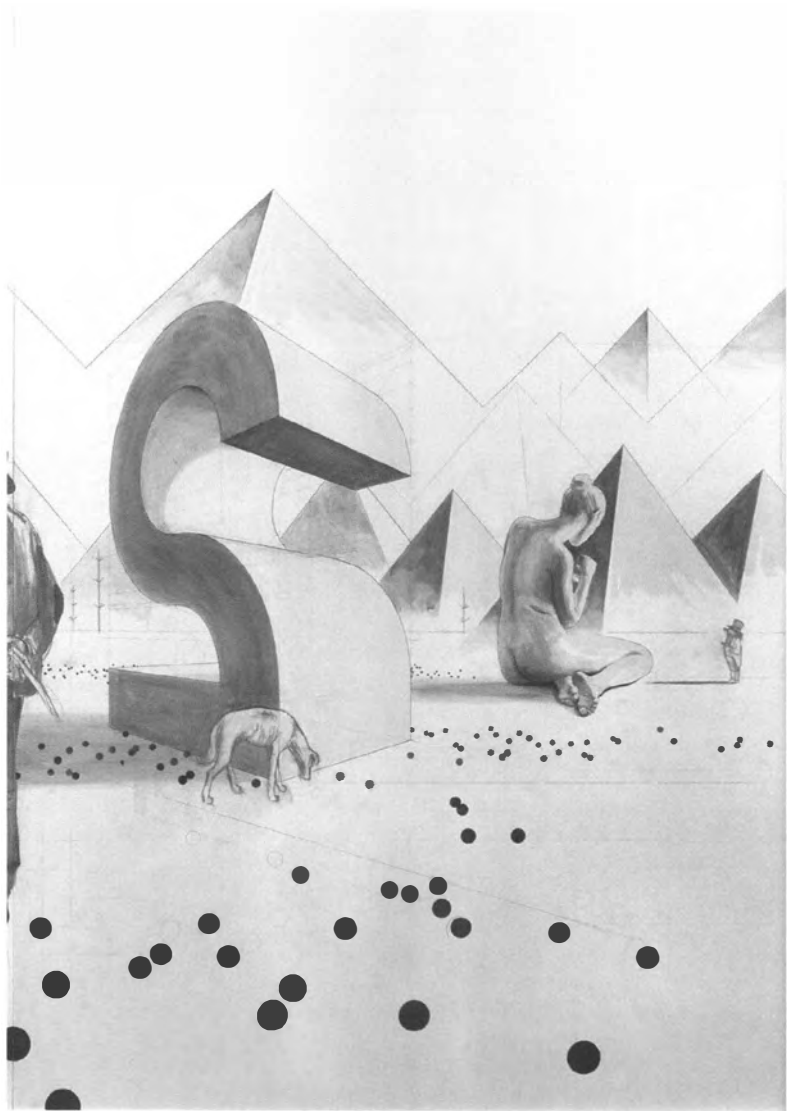
















## Theory is Waiting

Gilles Grelet

## I

**La théorie est attente, établissement de l'homme  
– du réel sans chair, sans phrase, sans monde –  
dans la condition de l'attente**

## II

Le corps de la théorie

– écriture formulaire, enthousiasme ascétique, surrection populaire ordonnée, coque  
passant bien dans la lame, voile vibrant dans la brise, montant à l'assaut du vent –  
est institution de l'attente

## III

Cette institution – cet acte – est attentat au plein du monde, à la  
suffisance des mondains, à la morgue des vivants ; attentat par  
le vide, la distance prise, la parole laconique, défaite, tirée du  
silence ; attentat angélique, de l'ange qu'est le je sans moi, le  
corps sans chair, l'acte sans pratique, la formule sans discours

## IV

**Austère et théâtral, l'acte de la théorie traverse la pratique, ne s'y engluie pas :  
ne fait pas monde. Tranchant de l'aile, du tract épuré, du traité  
incendiaire, de la joie marine traversant la mélancolie sans bornes**

## V

Attente instituée, attentat formel, en forme de traversée,  
de discernement, d'ordre tranchant, sévère, ardent.

Attentat du je traversant le moi  
(écriture en-je destituant les bavardages du moi).

Théorie aiguë, armée.

Théorie-bateau

## VI

Les mondains, qui ne savent que les compromis jou(iss)eurs de la terre et du ciel, parlent d'une mauvaise blague, d'une blague qui ne fait rire personne

## VII

Théorème d'Anacharsis :

**IL Y A LES VIVANTS, LES MORTS,  
ET CEUX QUI VONT SUR LA MER**

Gilles Grelet

Celui Pour Qui Le Monde Est Un Bordel Dont La Pratique  
Est La Putain Et La Philosophie La Grande Maquerelle

Le 3 juillet 2007

# I

**Theory is waiting, it establishes man  
—the flesh-less, phrase-less, world-less real—  
in the condition of waiting**

# II

The body of theory

—formulaic writing, ascetic enthusiasm, ordered popular uprising, hull cutting  
truly through the waves, sail fluttering in the breeze, taking on the wind—  
is the institution of waiting

# III

This institution —this act— is a full-on attack on the world,  
on the vanity of the worldly, on the morgue of the living;  
an attack via the void, the distance taken, via the word that is  
terse, distraught, dragged from silence; an angelic attack,  
from the angel that is the I without me, the body without flesh,  
the act without practice, the formula without discourse

# IV

Austere and theatrical, the act of theory crosses practice without getting bogged  
down in it; it does not become worldly. Incisiveness of the wing, of the purified  
tract, of the incendiary treatise, of maritime joy crossing boundless melancholy

# V

An instituted waiting, a formal attack, in the shape of a crossing,  
a discernment, an order that is cutting, severe, and ardent.

The attack of the I crossing the ego  
(the writing in I dismissing the chatterings of the ego).

Armed theory, extreme theory.

Boat-theory

# VI

The worldly, who only know of pleasant compromises between Heaven and Earth, speak of a bad joke, a joke nobody finds funny

# VII

Theorem of Anacharsis:

**THERE ARE THE LIVING, THE DEAD,  
AND THOSE WHO GO TO SEA**

Gilles Grelet

He For Whom The World Is A Brothel Where Practice  
Is The Whore And Philosophy The Great Madam

5th July 2007



*Renée Green's*



*Endless Dreams and Water Between*

Endless Dreams  
and Water Between

Renée Green





*Dreams*

**Aria:** *'If someone were to tell me I had twenty years left, and ask me how I'd like to spend them, I'd reply: Give me two hours a day of activity, and I'll take the other twenty-two in dreams ... provided I can remember them.'*

\*\*\*\*\*

*'[T]he mind is bombarded by a veritable barrage of dreams that seem to burst upon it like waves. Billions of images surge up each night, then dissolve almost immediately, enveloping the earth in a blanket of lost dreams. Absolutely everything has been imagined during one night or another by one mind or another, and then forgotten.'*

Luis Buñuel



*Dreams and Islands*

**Aria:** *‘This is to state once again that the essence of the deserted island is imaginary and not actual, mythological and not geographical [...] We have to get back to the movement of the imagination that makes the deserted island a model, a prototype of the collective soul. First, it is true that from the deserted island it is not creation but re-creation, not the beginning but a re-beginning that takes place [...] It is not enough that everything begin, everything must begin again once the cycle of possible combinations has come to completion.’*

Gilles Deleuze, *Desert Islands*

**Raya:** *‘Islands may no longer be the material prizes they once were, but islands of the mind continue to be extraordinarily valuable symbolic resources, a treasure trove of images through which the West understands itself and its relations with the larger world. Like all master metaphors, the island is capable of representing a multitude of things.’*

John R. Gillis, *Islands of the Mind*

## COLLAPSE VI

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**Aria:** What is this need to travel? Why are we haunted by it? According to George Sand,

The fact is that nowhere, these days, is anyone genuinely happy, and that of the countless faces assumed by the Ideal – or, if you dislike the word, the concept of something better – travel is one of the most engaging and most deceitful. All is rotten in public affairs: those who deny this truth feel it even more deeply and bitterly than those who assert it. Nevertheless, divine Hope still pursues her way, assuaging our tormented hearts with the constant whisper: ‘There is something better – namely, your ideal!’ (George Sand, *Winter in Majorca*)

**Mar:** In Randa at approximately thirty years of age in 1263, after a dissolute life up until that point, Ramon Llull had a vision of crucified Christ that he took as a sign to dedicate his life to his service. The form of service took three forms: To missionize at the cost of martyrdom. To write a book, the best in the world against the errors of the unbelievers. And to go to the Pope, to kings, and to Christian princes to incite them to create language monasteries for missionaries. Thus he had to travel.

**Lyn:** On a late summer’s day in the year 1608, a gentleman of London made his way across that city. He was a man of ambition, intellect, arrogance, and drive – in short, a man of his age. Like our own, his was an era of expanding horizons and a rapidly shrinking world, in which the pursuit of individual dreams led to new discoveries, which in turn led to newer and bigger dreams.

This man, a ship’s captain, was named Henry Hudson.

**Aria:** From the Convent of Palma in Mallorca, Fray Junipero Serra struggled with his dreams:

I have had no other motive but to revive in my soul those intense longings which I have had since my novitiate when I read the lives of saints. These longings have become somewhat deadened because of the preoccupation I had with studies.

To recapture the intensity he ventured to the New World to perform an act of self-sacrifice, emulating his predecessors. In 1749 he left Mallorca never to return.

Long before his decision to venture out, there were others familiar with legends of gold. In one romance with the theme of attacks by ‘pagan forces on the mediaeval Christians occupying Constantinople’, during the battle the pagans were aided by Calafia, a warrior queen who came from a place

at the right hand of the Indies, an island named California, very close to that part of the Terrestrial Paradise which is inhabited by black women, without a single man among them, who live in the manner of Amazons [...] There weapons were all made of gold. The island abounds with gold and precious stones, and upon it no other metal is found.

Also upon this island ‘there are many griffins. In no other part of the world can they be found.’ From Biscay to Cádiz, “California,” the liltng name for Queen Calafia’s land, was on everyone’s mind.’

*Aria's Dream  
and  
First Letter*

Dear Friends,

Raya (Raya L. Carlton), Lyn (Sandlyn Ryder Hoving),  
Mar (Maryse-Françoise d'Ile),

It was a dream that stirred me to action.

I dreamt that I lived on a precipice by the sea. The house was made of stone and had spacious terraces surrounding it. Beyond that a garden and beyond that, rows of olive trees in red earth. In my dream I had awakened to find that everything that had previously been troubling me was a dream and that I was free to create and use my time as I wished. I had no financial worries and I could sponsor events to invite esteemed thinkers and creators for one month each year. During these days we would meet for a few hours of conversation, go for a swim, and have wonderful dinners on the terrace at night. Only guests who really wanted to be there would attend. They would be few in number. The rest of the year would be devoted to making beautiful, precise publications and productions.

There would be enough time to realise them without stress.

This dream affected me so viscerally that I perceived it as a signal and began writing this letter to you. Please excuse the group message, but this is a way to begin a conversation by writing to each other. I thought about myself and others I knew. Very skilled and intelligent people, yet not really creating as they could be for various reasons. It was around then that I was reading an odd little book called *A Primer for the Gradual Understanding of Gertrude Stein*, in which I read her words: ‘*Anything you create you want to exist, and its means of existence is in being printed.*’ I adapted that sentence to the present, as also meaning ‘diffused via an interface’, and I read on:

After all, my only thought is a complicated simplicity. I like a thing simple, but it must be simple through complication. Everything must come into your scheme: otherwise you cannot achieve real simplicity.

I wondered, “Was Gertrude Stein a Buddhist?” I continued to read:

A great deal of this I owe to a great teacher, William James. He said, ‘Never reject anything. Nothing has been proved. If you reject anything, that is the beginning of the end as an intellectual.’ He was my big influence when I was at college. He was a man who always said, ‘Complicate your life as much as you please, it has got to simplify.’

Ideally I would like us to explore writing letters. This is something that has become nearly extinct and I’d like to attempt reviving the art of writing actual letters, as I’ve been reading examples of correspondence from the past. In these letters we can tell each other our thoughts and feelings in more than a few choppy words.

## COLLAPSE VI

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These letters can be sent via e-mail, although I'd like to experiment with sending them by post, so that it is possible to have something tangible we have touched. Actual matter. Let's see if that has any altering effect on our approach to being in contact. One thing is certain, it will require slowing down occasionally to reflect.

I wanted to remind you that each of us live in island locations. Much water is between us, but we can remain close, as I feel we are. Mar and I live on the same island, but in different parts and rarely see each other. I think there is something affecting about this island-dwelling condition and I'd like to think more with each of you about it. My suggestion is to focus more specifically on where we are. I think we are each trying to do this in our own ways. Yet, perhaps we can also be conscious of how the physical location and history of the places we inhabit affect how we currently perceive and engage living in the world, in conjunction with how we can have an exchange between each other. We're not going to live forever. To be blunt, I'd like to think about our lives and I'd like to do this together. We are each unmistakably independent, but now I think it's a good time to use our energies in conjunction for our benefit. Why not? This may sound old-fashioned, but I thought it might be interesting to write about what we read. Remember, reading? As I know you are each readers as well as writers, perhaps this can be fun? Do you ever feel as if you haven't anyone to discuss much with? This is a way to alleviate that feeling. I've been reading George Sand. Does that seem odd? Check out her *Winter in Mallorca*, edited by Robert Graves, when you get a chance. I'd be interested in getting your feedback. Although I'd never previously read George Sand, as I follow her trail I find many fascinating

constellations to ponder. ‘Constellations’ is my current keyword.

I’m curious to know what you think about these suggestions. I’d also like your agreement that we will continue to keep up a regular correspondence. You must pledge like in the Three Musketeers: “All for one and one for all.” In addition, I invite you to convene in September with me in Mallorca. Please save up and clear some time. We always plan to get together, but life’s many accidents seem to usually get in the way, so let’s really make an effort. Perhaps we can develop interesting ways to think and create together. I have in mind a form of gathering and publishing that differs from what I’ve previously been involved with, and I’d like your help to think with me, as well as to enjoy being together.

That’s all for now. I hope you are each very well and I look forward to our being in ongoing contact.

Yours,

Aria

Aria Phoenix, in case you’ve forgotten which Aria, as we’ve been so out of touch!

P.S. Lyn you are an Oulipian, Mar, you are an Eulipion. And Raya, you flow like the tides.

Take care!

*Aria Phoenix*

*Aria*

Aria is again an editor and now a publisher. She thinks in terms of all that literature has been and can be.

She grew up reading continually and often saw herself in relation to both the characters she read about and the authors she read. Identification of this sort became a concern for her after she'd learned in college that it indicated a naïve relationship to the text and its production. After that she resolved to thoroughly understand this process. She attended Radcliffe Publishing Procedures Course, then still in Cambridge, and immediately began working for a respected publishing house that had been founded, as their colophon depicting a flaming torch noted, in 1817. Thus began her years in book and magazine publishing. She also wrote.

For a time she worked in academia, where she'd landed by chance, via her abilities as an adept editor and manager, with insight regarding intellectual trends.



As a creative contributor she wanted to avoid becoming embedded in the drudgery of administrating. She didn't want her life to be perceived by herself or by others as a path to avoid – the way she'd sometimes thought about her predecessors whom she'd studied and tried to use as models or guides. Often, there were aspects of their lives she'd like to avoid experiencing. She didn't want the same to be observed about herself, so she shifted.

She experienced a moment of conversion and revelation, realizing what she did want to do. That was the beginning of the September Institute. In her travels she met many people, some of whom became friends with whom she has overlapping interests. She decided to write to these three friends and to suggest they begin a project that involved an examination of what they most enjoyed, as well as things they've been curious about. They would write actual letters to each other from their various locations to describe their interests.

Aria reads many languages and is fluent in a few. She prefers to be based in one location, yet she likes to spend time in places to which she feels connected for reasons of friendship, links to her life, and because she enjoys the ways she can feel in these environments. She has an encyclopaedic relation to life. It is important to her that she participate in the relay between what has passed and what is present.

*Sandlyn Ryder Hoving*

*Lyn*

Lyn's been a wanderer. What she enjoys increasingly is gaining deep understanding about where she is and where she's been. She returns to places. For her watching films is also a return to sensations she enjoys. Mental links can be made to other experiences. She imagines these moments of fixed concentration as something akin to pausing at the stations of a pilgrimage to remember. The notion of a pilgrimage appeals to her and she's become curious about the enactments and motivations behind such endeavours. Her own travels mirror these. She is very linked to her island, and its many quirks. More than one lifetime would be needed to begin to sound all that resides there.

Even though she'd been away many years, she decided that this location is her home, even though so much had changed and so many people she'd known no longer lived there or were alive. There she felt closer to the fullness of her life, which now interested her much differently than

when she'd lived on this island as a youth. She felt as if she now could discover where she could be and where she enjoyed being, without pretence or shame. With so many people gone she felt able to have a different relation to her life and to the island. Her focus includes the long past and the nature of the island.

She continues to work independently, sometimes as a designer. Occasionally, if a book of interest is proposed, she will index it, as this way of creating links is akin to the ways she enjoys probing and thinking about material.

Now she lives near the Cloisters, which seems somehow appropriate for this phase in her life. Her interest regarding the Middle Ages has grown. Yet she thinks about that time in relation to different bodies of water, such as the Indian Ocean. For years she'd been interested in the life and writings of Ramon Llull. She felt she could now go further into her interests.

*Maryse-Françoise d'Île*

*Mar*

Mar adapts easily to different environments. She likes to appear to blend into local settings, even places where she isn't fluent with the language. She doesn't like to be a foreigner, even though she can admit her lack of knowledge about the specificity of a place, she compensates by being very curious and receptive to local habits and idioms, as her sense of observation is acute. She learns rapidly, has the humility to accept correction, and others sense her respect for their customs. She is engaged in a lifelong study of herbs and of plants. As these represent knowledge that has been culled over centuries from around the world, her gift of grasping languages and her interest in etymology are put to use in relation to exploring the plant world past and present.

She is independent and used to being on her own since an early age. Travel is common for her, a way of life. Migration of plants is of particular interest to her, as well

as the movement of people. Her parents were agronomists. In a way, she continues some of what they did. That recognition accompanies her and comforts her as they are gone. Her focus is on plant life, their properties and their beauty, that can be observed as well as represented.

She's comfortable in crowds, in markets, in rural and urban settings, and especially by the sea. Her preference is for a base near the water in a modest house in nature. For this reason she's deeply inspired by Lester Rowntree's way of life, based on what she's read about her in her book, *Hardy Californians*. In particular, she often thinks of this phrase of Rowntree's self-description in relation to how she sees herself: '*A wayfarer urged by conjectural curiosity.*'

*Raya L. Carlton*

*Raya*

Raya is extremely intelligent, yet often perplexed by what people say and mean. The differences between what people say and what they mean confuse her, as she imagines these to be synchronous acts, yet via experience she's learned otherwise. She is attracted to organisms in nature, particularly water varieties of fauna and flora. They can have surprising traits. Appearance and encounter can contradict. This contact allows her to form analogies to life situations, growing out of her increasing knowledge of underwater habitats and creatures.

Born inland near a Great Lake, she had an early desire to be near water. She won a scholarship to study at an institute for oceanography on the Pacific coast. Many years have passed and she continues to observe and investigate the waters and the shores.

She prefers being with one person she feel close to. She avoids crowds. She also feels good in small gatherings of

people she knows she can trust and whom she feels close to in some way. Sometimes a person will make a statement that she will ponder for years. Her mind works to attempt to search in the world for evidence of what was mentioned, so that she can mull over and decide what she thinks about what was posited. The statement is usually a casual one, yet for Raya it may loom large with potential content, a sort of key that may open an aspect to living that seems distant to her.

She is quite at ease on her own, walking along the shore, or wading in tide pools.

*Water, Time and Islands*

**Aria:** *'In every country the Moon keeps ever the rule of alliance with the Sea which it once for all has agreed upon.'*

The Venerable Bede

**Aria:** *'Continental islands are accidental, derived islands. They are separated from a continent, born of disarticulation, erosion, fracture; they survive the absorption of what once contained them. Oceanic islands are originary, essential islands. Some are formed from coral reefs and display a genuine organism. Others emerge from underwater eruptions, bring to the light of day a movement from the lowest depths [...] Continental islands serve as a reminder that the sea is on top of the earth, taking advantage of the slightest sagging in the highest structures; oceanic islands, that the earth is still there, under the sea, gathering its strength to punch through to the surface. We can assume that these elements are in constant strife, displaying a repulsion for one another. In this we find nothing to reassure us [...] In one way or another, the very existence of islands is the negation of this point of view, of this effort, this conviction.'*

Gilles Deleuze, *Desert Islands*



Dear All,

This is an immediate follow-up. I realize you haven't had a chance to respond yet, but I wanted to send this off to you as I'm eager to read your initial thoughts.

The basis for the ideas of what I'm calling the September Institute is in a separate description that you'll soon receive. I'm thinking about a project that can rely on our various strengths, or as I've heard stated recently, 'skill sets'. The focus continues to be on locations we inhabit, yet that seem exotic for those who aren't familiar. As a future long term project, I propose creating an *Island Encyclopaedia*. This is an impetus to shift our thought into different kinds of associations, for example, beyond the assumed acceptance of continents or nations. These concepts are up for questioning in any case. We've talked about some of these things before, so why not enact them? First of course, we have to get the letter exchange going. Please excuse my enthusiasm, but I feel as if a weight has been lifted from me since I had a kind of 'conversion' experience. I promise not to attempt to convert any of you. I already like you. But we are all seekers.

To follow up an earlier wish, has anyone yet read George Sand? *Winter in Mallorca*? Please do! I'm beginning to read her *Story of My Life* (*Histoire de ma vie*), a very unusual approach, as she begins the story at least forty years before she's born, which I like. There are many biographies, most of them are annoying, but some are interesting. I come across all sorts of curious descriptions of writing women when I read Sand-related books. It's still fascinating to me that Sand was penalised for what were considered her excesses. Here's one instance, from Belinda Jack's *A Woman's Life Writ Large*:

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For Nietzsche, Sand was a prolific, ink-yielding cow, an example of 'lactea ubertas.' Her overflowing, undisciplined writing was evidence of her incapacity to reason logically [...] [H]e likened her to Wagner. What disconcerted both Baudelaire and Nietzsche above all, beyond or beneath their more rational objections, was Sand's passion, her energy, and her capacity to respond with enormous courage to conviction. These same attributes account for her enormous popularity.

I'm also reading her *Lettres d'un voyageur*, which provide another perspective. Sand's correspondence is impressive. It is still being edited. There are twenty volumes to date. She was a precursor to the open letter, in writing letters to be read publicly. As she said, '*I felt I had many things to say and that I wanted to say them to myself and others.*' Take this as an encouragement. As Henry James put it – interesting how this is the second mention of one the James family – George Sand '*is open to everything*': her discourse might be '*amatory, religious, political, aesthetic, pictorial, musical, theatrical, historical.*' It might also be, as we see in *Lettres d'un voyageur*, botanical, astronomical, mythological. In fact, about almost anything that seized her interest and imagination she was remarkably knowledgeable.

Alright friends, I'll leave it there. As always, looking forward to hearing from you.

Yours,  
Aria

*Humans and Islands*

*‘[H]umans can live on an island only by forgetting what an island represents.’*

*Islands are either from before or for after humankind.’*

Gilles Deleuze, *Desert Islands*

*‘The meaning of a name is more than the meaning of words composing it.’*

George R. Stewart, *Names of the Land*

*Manatay*  
*Manhattan*  
*Lyn*

Dear Aria,

cc: Raya, Mar

I like your idea very much. Count me in. I pledge allegiance to the experiment.

Shall I begin now?

I do feel as if I have been saving many words. I don't really talk with many people, beyond those I encounter while doing errands or in a professional capacity. Not speaking hasn't bothered me, as I write, but since you mentioned it, yes, there are few people now here to speak with about what means something to me, beyond politics and the economy. Is it generational? So many people are gone even though we're not what I used to imagine as old. We were described by the media as Generation X, remember? It figures: no name, just a letter. In the 1920s some advertising type coined the phrase 'lost generation'

and later during 1970s punk times, ‘blank generation.’ It’s kind of ridiculous to even consider being branded by a time period, don’t you think? Now there is a ‘Gen X’ President elected in the US, and youth have hope. Really? Yes, let’s write about our lives and about where we are.

To begin, here’s a dream I’d written down many years ago, before I’d been anywhere farther from this island and this country than Mexico:

This is the second time in a row that I have dreamt about water. Two nights ago I dreamt about the Mediterranean Sea and a Greek island named Pesta. The dream was related to Atlantis, the city that sunk into the ocean. Last night I dreamt about travelling outside of one’s body. I dreamt of the Brontë children dying, but not really being dead. A small boy suddenly died, but his corpse was not buried. Within a few days it did not rot. I saw him breathing as if asleep. He opened his eyes and sat up. Said he had been on a voyage beneath the sea.

Many of my friends were disappearing and I could not find them. They returned telling me that they were in another dimension, beneath the sea. Several of them said that suddenly they were able to go to a place in the depths of the ocean. They were going to have a party there and asked if I would come. I wanted to know the secret of how they were able to go to this deep place. One gave me a very tiny submarine, smaller than my smallest finger, and told me to climb in. I just held it, not knowing how to use this submarine. I looked out of a window, which came to the water’s edge. I wondered what would happen if I were to jump in. Would I develop fins on my neck for breathing the farther I sank? Would I find this secret buried place?

When I had been on the road the first time, years ago, I’d gotten physically familiar with different places.

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By foot I walked in Oklahoma, past an Indian reservation along with an occasional lone Indian, who didn't even try to hitch a ride. For three days I waited at a truck stop for a lift East. I never got it.

Walking became a mode of transportation then. Although my friend Voy's scam got me on a plane and out of there.

Since then I've become familiar with places by walking in them, learning them by foot. Figuring out routes I prefer based on invented reasons of taste. Not enough trees on this street. Depressing buildings on that street. The grade of this hill is more gradual. In many cities, towns and villages, in different countries, I've walked. Walked and worked. And also just walked, watched, listened.

Eventually I lived in a place by the water. It had seven hills and I walked each of them and stared at the water when I'd reach the top. I took ferries across the water and continued to walk. Sometimes I rode buses to the beach and walked the long shore.

Now islands. I never really thought of myself as being particularly fond of islands. But you're right, I do live on one. It had even been called, as well as thought of itself as, 'the island in the centre of the world' – how about that for megalomania? It does seem to be a tendency that has affected different locations at various times in history. Since I've been back I've become quite interested in finding out more about this island and its past. I've also become very interested in studying the Middle Ages. Maybe these interests are strangely related. In part they derive from the fact that I now live on the only part of the island that has areas with its earlier vegetation and rock formations, and this location is near that odd importation of the European

past, the Cloisters. In addition, I've been trying to enter the thoughts of a mediaeval mystic and philosopher from Mallorca, Ramon Llull. Perhaps you can help me from your location? The island I inhabit is indeed a mysterious island, but all of our locations involve combinations. I've been thinking about Llull's *Ars combinatoria*, in relation to living. Perhaps it gives some indications of value in the present, even if it's challenging to decipher thoughts from a medieval Christian mindset. But certain ways of working with permutations are related to computer science. He is also considered by Oulipians as what they call an anticipatory plagiarist.

I think one of the attractions to me of the Middle Ages is that it was necessary for some to keep ancient knowledge alive. The primary protectors of received knowledge at that time were Islamic. This, I'm sure, resonates with your own interests in your Mallorcan island, as there are many traces in place names and in surviving structures of an Islamic past.

Al-Mayurka, is this the correct name? What was Mallorca before? And what was Manhattan before, during those earlier times? Before maps and fixed boundaries? Before passports?

This island region had a confederacy called Iroquois, that dated back at least nine thousand years. It was a complex of islands. Algonquins were called 'The First Peoples' of North America and had at one time covered a third of the continent. Most of the peoples that passed through the area were related to the Lenape, described as 'an ancient riverine people of Algonquin stock.' They can be perceived as comprising hoops or circles within circles of other related peoples. Munsee people were the last to predominate.

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The Mohican descendents of Algonquins are more well known, but they were also called 'People of the River.' I read that there are 18,000 skeletons of Native Americans hidden in museum storage, of different museums like the Peabody Museum, for example.

Menatay means island to the Unami Delaware. Mahatuouh, 'place for gathering bow wood' to the Munsee. Manhattan or Manahatta, 'rocky island', add the 'ten' and that means habitation in Munsee. So Manhattan is the Munsee name.

I'll stop now and see if I have any messages or post from any of you. I picture messages in bottles moving through the sea. We could start a blog, but that would defeat the purpose of intimacy and depth, I think, at least at this phase.

Looking forward to continuing.

Yours,

Lyn



*Al-Mayurka*  
*Mallorca*  
*Mar*

Dear Aria,

cc: Lyn, Raya

Thank you for your letter and invitation. Maybe we'll be in touch differently. Yes, I will participate in a correspondence. It has been a long time since I've written the kind of letter you describe.

While thinking about your proposition I came across a letter in a novel I'm reading. The letter is meant to have been written by a priest and it launches the novel *The Dolls' Room*, by Llorenç Villalonga. It is set in a fictional Mallorcan town called Bearn, which is also the name of the founding family that is dying out. The letter is dated 1890, but the book was published in 1956. I'm reading the English translation, which didn't appear until 1988, after the author's death. He was born in Palma.

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This may interest you. In a way it relates to the issue of generations that Lyn mentioned and change to which you allude. I quote:

The question is not a simple one, and I feel the need to start from the very beginning. Giving you all the details of that life I loved so deeply, despite its grave errors, has provided a solace for me in my solitude. I must admit that the motive of my story, written in the course of these endless nights, may not be solely the scruples of my conscience, but rather the pleasure of reviving the familiar venerated figure I have just lost. With him an entire world has disappeared, beginning with these lands that have seen my birth and that will have to be auctioned off because the creditors have already notified us that they do not wish to wait any longer. The Senyor's nephews and niece neither have enough money to pay off the mortgages nor feel any love for Bearn, being used to city life as they are. There might be one last source of hope: they say a relative of the Senyors has arrived from America after having become a millionaire selling cardboard boxes. It seems unbelievable that anyone should become an important personality selling little boxes, but he has introduced himself with much pomp, laden with gold and determined to dazzle all of Mallorca with an electric automobile that has already killed two sheep. On his calling card, below his name, are the words Cardboard Containers, which no one quite understood until they realised it referred to those famous boxes.

I'll skip ahead, the quote continues:

To me, halfway down the path of my life, this Cardboard Container Bearn would be nothing but an intruder. Yet there is no question but that a new generation is emerging, which is willing to associate these old lands with the personality of an outsider and will experience the same feelings towards the union of senyor and lands, which it will believe to be deeply rooted, that I felt towards Don Toni as a child.

For some reason, after reading this I thought about Robert Graves and Deià, all the changes in that area. I have also been reading George Sand's *Winter in Mallorca* and I took notice of the many footnotes, written by Graves, contesting nearly everything she wrote. It was quite remarkable. I was somehow reminded of Kinbote's role in Nabokov's *Pale Fire*. We've had some laughs over that. Some of these notes extend for pages on their own, as if he's taking over her book. It's quite weird. I realise I wasn't born on this island, although now I feel as if I had been, since I've been 'adopted' by a very kind family. I have become familiar with the vegetation and landscape over these years and I must say that Graves seemed rather harsh on Sand. That made me wonder what had been his experiences? He gives the appearance of being omniscient regarding anything Mallorcan and it seemed as if he'd perhaps had his own story with another woman who was also a writer. Through reading, I found this was the case. Two poets together. He lived in Deià with the writer Laura Riding. They had even founded a press together. Isn't that interesting? Of course you probably know all about this. There are even books in English on their years together, which were 1926 to 1940. Strange, isn't it, what become the remnants of a life and what people who have the possibility to publish choose to remember? Concerning both Robert Graves and Frédéric Chopin in Mallorca, we didn't yet discuss how Graves seems to identify with the male artist, composer and pianist Frédéric Chopin, who spent the winter in Mallorca with Sand – according to her, in a sickly state. Graves and Chopin are considered cultural monuments, whereas Riding and Sand are not. I haven't yet found statues of either of them. They're seen more as extreme, crazy and witchlike, from what I've gathered in conversation and through books.

The photos of Laura in Deià are particularly unflattering. In the early days she was considered to be as beautiful as a movie star. Of course, I prefer to read what she wrote rather than focus on the personal drama. But yes, thanks also for the Polti suggestion. I'll check out the thirty-six dramatic situations.

I have been enjoying reading *Winter in Mallorca*. It's pretty easy to find here in many languages. As it's such a tourism product I'd never felt compelled to read it until you suggested it. Sand describes a challenging situation in an unfamiliar place known prior to her journey only through painted images and travelogues. In some cases I disagree with Sand and Graves. But it is an interesting read. It makes me more curious about aspects I've been investigating concerning the Islamic past, via botany, gardens and architecture. It's been an extreme pleasure to encounter the small painted illustrations in the old herbal botanicals. Even though the classification systems have been contested, there is much to be found there. That's a possible direction I'd be interested in developing.

In terms of my research I have found sources focusing on the Balearic Islands. This has something to do with your request that we think more about where we are. One of the particular aspects we face as islanders concerns scale. There are rare species of flowers here, but they may grow only in a small area. They may be the only examples of their sort in the world. There is no elsewhere beyond these island locations for certain plants. They are not endlessly replenished. I've read that 'the near-disappearance of Minorca's *Vica bifoliolata* can be blamed on collectors of rare plants.' Luckily with photography plants can be 'collected' in photos, rather than killed.

So I've been busily engaged. I'm curious to read more from each of us. The letter exchange is a good idea. Aria, it would be wonderful to see you sometime, even before September. Let's visit? To Lyn and Raya, I look forward to being in contact via post and hope to see you soon.

That's it for now.

Yours,  
Mar

*Yerba Buena  
San Francisco Bay  
Raya*

Dear Aria,

cc: Lyn and Mar

It's great to receive a letter from you. I'm glad to resume contact and I look forward to participating in the correspondence with you, Lyn and Mar. Thinking from the islands we inhabit is an interesting way to begin locating our various intersections and yes, thinking of constellations can be a stimulus. It's been ages since I've written an actual letter to anyone, especially as nearly everyone I know communicates very succinctly via e-mail and in code.

To begin, I want to use words that I like. They remind me of your invitation:

I want you to hear these words. Now I am speaking to you about our lives.

That is the way we begin speeches in Cherokee, and then we say what we would like to see happen, with a simple statement that begins with "I want," as in "I want us to go

to Washington and tell them just what's going on down here." The way white people exhort in their speeches – such as "we should ..." or "we must ..." – sounds to us not only arrogant but devious. Is this guy trying to hide from us his own thoughts? Then why speak? (They often do speak only for the purpose of hiding their thoughts.)

This was from *Those Dead Guys for a Hundred Years* by Jimmie Durham. I've liked those words for a long time and it's great to be able to share them.

I'm surrounded by water, which I enjoy, and I spend most of my time moving through or around water and shores checking the habitats and studying different aspects of what supports life. As I drive to work I see water and other islands, as San Francisco is technically a peninsula, although it feels like an island as it is an archipelagic region and there are, I believe, forty-one islands in the vicinity of the San Francisco Bay, leading out to the Pacific Ocean.

I, like Lyn, imagine what existed before. I think about long spans of time, millions of years, and what was here before and before and before, as I keep finding traces of the past when I walk along the shore. The life forms are also ancient. They survived all kinds of turbulence and adapted to the changes. In this region there is much awareness of the intensity of the earth, as we're on an earthquake fault. The San Andreas Fault, which is actually a network of faults, that converge near where I spend a lot of time, around Bolinas Lagoon. All of the faults have shown tectonic activity, meaning that the North American and the Pacific Plates shift. One of the things I find so fascinating about the area is that two distinct provinces from different geological time periods are now juxtaposed because of the movement of earth. One observer described the aerial view:

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Looked at from the air, the Point Reyes Peninsula seems about as disjunct from the rest of California as Saudi Arabia is from Africa, and for the same reason: a boundary of lithospheric plates.

Witnessing the strength of the sea and the changing climates is unavoidable here. Watching the waves I often think of the distances they travel. For example, seismic waves, called tsunamis. It's impossible not to think of islands in relation to these. Unlike larger landmasses islands, as Rachel Carson tells us,

are the result of the violent, explosive, earth-shaking eruptions of submarine volcanoes, working perhaps for millions of years to achieve their end.

As she notes:

It is one of the paradoxes in the ways of earth and sea that a process seemingly so destructive, so catastrophic in nature, can result in an act of creation.

Forces that occur in the depths of the ocean are fascinating and these processes continue, as they have for millennia.

Yet there are moments of human intervention. One island I see often is Alcatraz. I found a book called *Alcatraz is not an Island*, published in 1972. I quote:

Alcatraz was born a mountain, surrounded by the waters of a great salt sea. [...] We send out our voices to that desolate rock, and are gifted with echoes which resound our strength.

It was reclaimed by Indians of All Tribes in 1971, but it was taken away again by the invaders, yet it's a strong symbol for me. I remember everyday. The Spanish named it Alcatraz as it was once inhabited by many pelicans. It remains a wish to see the prison concrete and steel removed and a regeneration of long gone pelicans, vegetation and wild flowers.



From this island area in this state that was once perceived to be an island, how do I inhabit this place? It's been interesting to begin reading George Sand and to attempt understanding her context. Wars were quite constant in Europe before her birth and through her life. I think about that here, as this nation is still at war. The rift between the rich and the poor is wider than it was before 1981. Prison expansion as a private industry has been growing and California is notorious for its number of prisons and number of incarcerated people. I think about these things here, as there continue to be reminders, like Alcatraz. To balance that, there is the sea and the long histories.

I do experience more dreamy states of mind while reading and drifting. Wet sounds of steadily falling rain and of spinning car wheels. These are common during winter in northern California. This was what I heard as I began reading letters written by George Sand to someone named Marcie.

Writing is a bit like dreaming. Thoughts and memories swirl in and out of my mind, like a fog that I can see from a distance and watch gradually swirl in, engulf me and my surroundings, then shift again and go elsewhere. What one tries to put into words can seem dense and difficult to grasp, and like fog it's full of tiny drops of water-like thought, sometimes feeling colder depending on its density, yet it reflects many degrees of light.

Looking forward to continuing. I'm sure more words will come.

Yours,  
Raya

*Cycles*

*Another Letter from Aria*

Dear Lyn, Mar and Raya,

Thank you so much for your positive responses to my wish. It makes me very glad that we are all in this new form of contact.

Did I mention to you when I was last at the Big Book Sale in San Francisco I found books by women on writing from the early 1980s and early 1990s? It was like discovering items from a time capsule, as they seemed to exist in a very distant past.

Now that we've begun our correspondence I have many things I'd like to respond to regarding what you've already written and in turn, write more ideas that your words have stimulated. There never seems to be enough time. So let's begin planning to convene.

I'd like to mention more on Georges Polti, regarding the Middle Ages, as well as think through William Morris with you. There are interesting possibilities brewing for developing the *Island Encyclopedia*. Also there's more to follow up concerning Laura Riding and her renunciation of poetry, and her quest for linguistic truth. It will take years for us to read George Sands's oeuvre, which I continue to do. I'm reminded of a story by Hollis Frampton. It described a person who'd been filmed from birth and had to watch all of the films until death. I know I've misdescribed this, but the point is that to read what Sand wrote could take a lifetime. Could that be a reason why her works have been dismissed? A resentment at its sheer enormity, that can be presented as excess? Anyway, there are pearls there.

Here are some initial thoughts I've written regarding the September Institute. These are up for discussion, so I look forward to your feedback.

I listed four mottos:

1. *We still own our words and can produce them.*
2. *Anything you create you want to exist, and its means of existence is in being printed.*
3. *Sending transmissions from dispersed islands, linking worlds, time and space.*
4. *We continue the ongoing movement of combination people.*

September Institute compiles and regenerates material from abandoned collections and publications, providing indexical access and linked research tools, that enable circulation within the depths of significant ideas, operations, and productions of those who may have been forcefully forgotten. S.I. publishes out-of-print books to give them new life.

September Institute is not a utopian community, but rather a momentary nexus. It exists in contrast to previous idealist attempts to address shifting contemporary moments. Acknowledging the predilections of the past (idealist, romantic, utopian, and modernist aims), S.I. embraces the present, however it is calibrated, in relation to time, with a consciousness of time's expanse.

Beautiful and odd remnants from the expanse of time are excavated, represented and re-thought. These include books, ephemera, notebooks, photos, and out-of-date time-based formats, i.e. pre-digital. They are evidence of encounters, a trace of experience. S.I. produces books of collected data. Online versions also exist.

Please let's continue thinking and exchanging.

I love words. Etymologically, texturally. It's possible to enter words on one's own. As each of us can enter the

letters we've exchanged on our own. Examining each other's thoughts separately. This process of exchanging and learning about each other's thoughts through letters is a bit like learning about words. Becoming familiar with the vast range of nuances possible, of words and thoughts, is like entering a secret or monastic order. Very few people care about words or thoughts in this way. It's the way things are. I find comfort in this exploration though, perhaps because it's specialised rather than standardised knowledge, which is so abundant. Writing letters to each of you is different than writing for a blog, in the sense that this is a specific activity between four people, even though I do like the Disgrasian™ blog, but this is different. How to translate past feelings, times, and histories into meaningful comprehension that can provide fuel amidst present feelings of lack and absence? Was it always this way? I wonder about life before our presumed extreme technological connectivity and presumed availability. I wonder how you feel and how others have felt. Probing these things has motivated this correspondence. The wish for something else that might be possible. More profound understanding, for example. Other kinds of meaning. I do care about depth and varieties of meanings, as I care about combinations and permutations, as we've discussed.

Autodidacticism can be extremely fulfilling, especially when so much can appear to be a wasteland. This doesn't mean that I'm interested in retreating, but rather I feel my senses available to engage are sharpened as I can choose a more exact way of articulating or conveying them, in words, images, sounds, etc. I respect and admire each of you for also sharing these interests.

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Since so many specialised skills, things, and people are slipping into oblivion, my interest is more and more in what is specific and perhaps thought of as esoteric. What is determinedly unfashionable. This interests me. Maybe some things are too difficult to reproduce, because there is no facility, concentration, or interest that enables easy reproduction. I'm not endorsing 'craft,' as it's recently been labelled. This is not my interest. I'm also not suggesting difficulty for the sake of difficulty, nor am I assuming that specialty can be equated with superiority, yet still, I wish to probe life's complexity.

And I'm glad that each of you is also willing to do this.

I'll conclude my letter with something to ponder, as it relates to what I've written. We can wonder with Henri Bergson and Gilles Deleuze:

[W]hy something rather than nothing, but why this rather than something else? Why this tension of duration? Why this speed rather than another? Why this proportion? And why will a perception evoke a given memory, or pick up certain frequencies rather than others? In other words, being is difference and not the immovable or the undifferentiated, nor is it contradiction, which is merely false movement. Being is the difference itself of the thing, what Bergson often calls the *nuance*.

I'll leave you with those words until the next time. From each of our islands let's stare at the moon.

Yours,  
Aria



*A Film by  
Renée Green*

*A  
Free Agent Media  
Production*





### Notes on Contributors and Acknowledgements

**CHARLES AVERY** is an artist who works with a range of media. Born in 1973 in Mull, Scotland, Avery now lives and works in London. He has exhibited internationally, with recent solo exhibitions in London, Edinburgh, Geneva and Turin, and was featured in the 2009 Tate Triennial *Altermodern*. Avery is represented by doggerfisher, Edinburgh and Pilar Corrias, London.

**ANGELA DETANICO AND RAFAEL LAIN** are artists living in Paris and São Paulo. Their practice investigates possible new configurations within pre-existent systems, such as cartography and written language, in different media as typography, video, sound and installation. Their work has been exhibited internationally, and in 2007 they represented Brazil in the 52nd Venice Biennial. They are represented by Galeria Vermelho in São Paulo and Martine Aboucaya in Paris.

**STEPHEN EMMOTT** is Head of Microsoft's Computational Science Research, leading an international, multi-disciplinary research effort focused on accelerating fundamental advances in science in areas of societal importance, but where current scientific approaches continue to pose barriers to such advances. A neuroscientist, Emmott's scientific career spans research positions at The Centre for Computational and Cognitive Neuroscience, University of

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Stirling; AT&T Bell Laboratories; chief scientist of NCR's advanced research; and University College London. He is also Professor of Computational Science at Oxford University.

**FIELD CLUB** was initiated in 2004 as a live research project based on a four-acre field in Southwest England. The project collaborators seek to deconstruct and re-codify the post-modern notion of 'self-sufficiency' through interdisciplinary art practice and direct interaction with the land. Inquiries include: The nature of progress as contingency, origins and expansion of the human niche, Biospheric/Technospheric interrelations, land as capital, and the indexing of sentimentality and function.

**IAIN HAMILTON GRANT** is Senior Lecturer in Philosophy at the University of the West of England. He is the author of *Philosophies of Nature after Schelling* (Continuum, 2006) and of numerous articles on Kant and post-Kantian Idealism, philosophy of nature, philosophy of science and technology, and contemporary philosophy. He is currently working on a book entitled *Grounds and Powers*.

**RENÉE GREEN** is an artist, filmmaker and writer. Via films, essays and writings, installations, digital media, architecture, sound-related works, film series and events her work engages with investigations into circuits of relation and exchange over time, the gaps and shifts in what survives in public and private memories as well as what has been imagined and invented. She also focuses on the effects of a changing transcultural sphere on what can now be made and thought. Her exhibitions, videos and films have been

seen throughout the world in museums, biennales and festivals. A retrospective exhibition of her work, *Ongoing Becomings 1989-2009*, is currently on view at the Musée Cantonal des Beaux-Arts, Lausanne.

**GILLES GRELET** is director of the series *Nous, les sans-philosophie* (Paris: L'Harmattan) and author of around thirty publications, articles, films and papers in France and abroad. Most recently he published *Citations pour le président Sarkozy* (with Juan Pérez Agirregoikoa; Paris: Editions Matière, 2009).

**MANABRATA GUHA** is Assistant Professor at the National Institute of Advanced Studies (NIAS), Bangalore, India. His research work focuses on 'future war', network-centric warfare, and counter-strategic theories of war and combat. He is the author of *Re-Imagining War in the 21st Century: From Clausewitz to Network-centric Warfare* (London: Routledge, forthcoming 2010).

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**EYAL WEIZMAN** is an architect based in London. He studied at the Architectural Association in London and completed his PhD at the London Consortium, Birkbeck College. He is the director of the Centre for Research Architecture at Goldsmiths College. Since 2007 he has been a member of the architectural collective *Decolonizing Architecture* in Beit Sahour/Palestine. Since 2008 he has been a member of the board of directors of B'Tselem. Weizman has taught, lectured, curated and organised conferences in many institutions worldwide, and is the recipient of the James Stirling Memorial Lecture Prize for 2006-7.

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a freelance software developer and scientist. His research focuses on understanding ecosystems as complex networks and on the robustness of the dynamical systems supported by those networks.

*Key To Charles Avery's works: p448 Dha; p451 The Eternity Chamber; p457 Notice from Heidless MacGregor's Bar; p458 World View (Globe); p463 Miss Miss; p464 The Female Hunter; p466-7 World View (Flat Map); p468-9 Onomatopoeia seen from the Sea; p470 Bar in Onomatopoeia; p471 Detail from the Bar of the One-Armed Snake; p472 The Three Trees; p473 One Armed-Snake; p474-5 The Eternal Forest; p476 Hunter with Dog; Insert: The Plane of the Gods.*

*Spice photographs in Nicola Masciandro's contribution by Kristen Alvanson.*

*Interviews with Greg McNerny and Drew Purves conducted at Microsoft, Cambridge, and via email, by Robin Mackay.*

*Interviews with Stephen Emmott and Rich Williams conducted via email by Robin Mackay.*

*Interview with Eyal Weizman conducted in London, and via email, by Robin Mackay.*

*Thanks to Stephen Emmott for facilitating interviews at Microsoft.*

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