

From Supply Lines to Resource Ecologies

World of Matter

INTRODUCTION

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and Helge Mooshammer

World of Matter is an international media, art and research platform that investigates contemporary resource ecologies. The project brings artists, architects and photojournalists with substantial research experience on globalization together with theorists working in the areas of geography, art history and cultural theory.¹ It aims to generate new audiovisual media, texts and cartographies, and to debate this material in a series of symposia, exhibitions and publications, all of which will culminate in a web-based platform, expected to launch in spring 2013.² Focusing on the development of innovative and equitable approaches to resources, World of Matter considers the provision of visual source material a valuable instrument for education, activist work, research and raising general public awareness, particularly in light of the ever-more-privatized nature of both actual resources and knowledge about the powers that control them.

An important strand in this endeavour to invite wider participation in the production of resource knowledge is to employ the destabilizing and reframing qualities of aesthetics.³ This underlies the emphasis placed by World of Matter on integrating an archive of media files into the quest for a new resource discourse. The following compilation of short texts and visuals (as well as a contribution by Uwe H Martin and Frauke Huber to be found in the online supplement of this special issue of *Third Text*)⁴ – resource ‘files’ like those comprising the forthcoming World of Matter database – echoes this process of producing, undoing, rearranging and retagging. The ambition of this collaborative effort is not to mimic a false mastery of the structure of contemporary resource ecologies but to instigate a rethinking of the relationship between discursive practices and the material world.

Humans have come close to exhausting virtually all known resource deposits on the planet and are heightening efforts to locate yet

1. The core group includes Mabe Bethônico, Ursula Biemann, Lonnie van Brummelen, Elaine Gan, Uwe H Martin, Peter Mörtenböck, Helge Mooshammer, Emily E Scott and Paulo Tavares.
2. <http://www.worldofmatter.org>
3. For a thorough elaboration of the politics of aesthetics, see the seminal work of Jacques Rancière, *Dissensus: On Politics and Aesthetics*, Steve Corcoran, trans, Continuum, London and New York, 2010.
4. ‘Land Rush – Ethiopia’ by Uwe H Martin and Frauke Huber is a visual investigation into the changing landscapes of Gambella in Western Ethiopia, where vast areas of virgin land, formerly allocated to the Gambella National Park, have been transformed into plantations for sugar cane and palm oil by foreign-owned agribusiness ventures. Please refer to <http://www.thirdtext.com>.

undiscovered and untapped reserves. Large-scale mining is penetrating ever deeper layers, multi-national land grabs are advancing to remote corners, and the race is on for the neocolonial division of the seabed. In the last sixty years more natural resources have been raided by humanity than in all previous centuries together. The frantic rhythm of this ‘progress’ has thrown up images of crisis and doom while firing the competitive rush for new frontiers.

With growing consciousness of the global limitation of vital resources and the unsustainability of the current patterns of their consumption, we believe there is urgent need for new discourses and modes of representation that will shift resource-related issues from a market-driven domain to one of engaged public debate. First and foremost, the very assumption that everything we encounter is automatically a resource for human consumption can no longer be made; this human-centred vision has been the motor for many environmentally and socially disastrous developments. There are many hints of a shift from an economic to an ecological paradigm, something World of Matter intends to drive forward.⁵

Since early 2010 a core group of nine researchers has come together for a series of week-long research meetings in London, UK, in Zurich, Switzerland, and in Belo Horizonte, Brazil, to develop common ground for the project. One of the first declared tasks was to expand the notion of natural resources – or ‘commodities’ as traders call them – from hitherto geophysical and economic-industrial contexts toward the aesthetic-philosophical arena, within which it has scarcely been broached. Yet we are aware that if we attempt merely to ‘culturalize’ the discourse on the ecologies of natural resources by multiplying images or forging new terminologies, we fail to address a deeper problem. If we are to speak about the non-human world, it will not suffice to build a socio-cultural vocabulary through a discourse that has been traditionally human-centred, conceiving of the Earth primarily as a provision, object of scientific research, or sphere of human perceptions, experience and control. To de-centre such anthropocentric perspectives, a more radical shift in thinking is needed.

Our collective response to the dominant resource paradigm and its crisis-generating strategies is to confront the flourishing politics of austerity and an all-encompassing culture of greed with a supply of open source material. All contributors to World of Matter have pledged to share material from their current work on an open access archive that connects different files, actors, territories and ideas. Essentially an entanglement of empirical studies and critical-aesthetic reflections on this same research, the digital platform will offer users myriad potential entry points and navigational trajectories, resisting any overarching narrative structure. Rather than full-length videos, all media will be edited into a multiplicity of documents and video clips that can be reconfigured and interlinked to one another, rendering new insights into relations between seemingly distinct resource issues and locations. By connecting a visual document about illicit gold mining in the Amazon basin with a video file of the Nigerian Delta oil states or Egyptian land-use politics, we suggest a variety of possible readings about global connectivity among these sites. More importantly, we are interested to see what might arise in the gaps between different sites once conventional frameworks are removed, and what new landscapes of resource flows may emerge.

5. The term ecology here refers to the compositionist state of existence and means the non-hierarchical neighbouring relationships of heterogeneous orders that may include technological and nonhuman ones. At the heart of the ecological order lies the radical reconfiguration of the relationship between subjectivity and exteriority. Erich Hoerl, *Die technologische Bedingung*, Suhrkamp, Berlin, 2011, pp 23–43.

Individually, each of the World of Matter participants has developed his or her own methodology for intervening in existing discourses. The structure of the website, however, as the backbone of the project, is a collective effort. Selecting and organizing the keywords for our media archive has become an important aspect in conceptualizing our intended contribution to resource discourse. The forthcoming World of Matter web platform and the compilation of short texts and images in the following pages propose diverse processes of producing, undoing and relinking existing narratives to ignite a rethinking of the relation between materials and discourse. More broadly, our project seeks to advance a deeper understanding of resources as intricately entangled ecologies of things, places and species interactions.

EGYPTIAN CHEMISTRY

water, agro-ecologies, pollutants, land reclamation, revolution

Ursula Biemann

Exploring hybrid water ecologies in Egypt, *Egyptian Chemistry*, 2012, a multi-channel video project, takes a keen interest in the instance of water coalescing with other organic, social or technological entities. Water vigorously shapes Egyptian life as it merges with land-use politics, crop cycles, nitrate industries, soil chemistry, farmers' collectives, irrigation technologies or hydropower. These entities, and their variable interactions, constitute a significant part of Egyptian reality. Yet when it comes to explanations of the current realities of change in the country, we see an overemphasis on political forces and an erasure of the multiple components that shape the complexity of contemporary Egypt. *Egyptian Chemistry* takes a close look at long-term and continuous transformations of Egypt's physicality, some of which have political consequences, others not.

While I saw great benefit in pursuing an artistic analysis of geospatial relations and spatial experiences (migration, containment) with a view to building critical human geographies, I feel that, in its flatness, the spatial model proves inadequate in rendering moments of great depth, of inner thickness. Instead what I propose as coordinating principle and narrative organizer is to take chemistry as a conceptual tool that enables us penetrate to the internal relations of objects and come to grips with the mechanism of attraction and bonding between human and non-human, organic and technological components; but also, most significantly, between signifying and a-signifying ones. In other words, *Egyptian Chemistry* enters the molecular level of Egypt.

Egyptians have long built large-scale engineering projects and launched huge land reclamation ventures capable of reallocating water across time and space for communities and entire ecosystems. While humans were able to have a great impact on the hydraulics of the Nile by regulating its velocity, gauge, volume and seasonal flows, the water quality per se – meaning its salinity, acidity, oxygen content, its mineral composition, nutrient systems, organic pollutants, suspended particles and the silt it carries – all these vital physical properties seem to escape human control, no matter how much they are monitored.



Egyptian Chemistry, video installation, 2012

The ordering system could be deliberately changed, not so the water properties and its organic composition. I will mention just two of the many mutations in the river ecology set in motion when the hydraulic regime of the Nile was altered by the High Dam and a series of barrages built in the last century. The migration of fish that formerly circulated from Ethiopia through the Mediterranean into the Atlantic and back came to an end. These high-performance species, which thrive in fast-running waters, disappeared and in moved large, lazy tilapia. And, with the diminished supply of oxygen that used to speed up the decay of organic pollutants, these have now turned into biochemical combat units, infecting pools and reaching land through the billions of irrigation canals. On the other hand, by managing water through engineering projects, Egypt was able to embark on an ambitious programme of desert development and begin to push industrial export agriculture. Sidelined by neoliberal government policy affecting credit lines, fertilizer and water supplies, small farming in the Nile Valley has become unprofitable and the young generation has moved to the cities seeking day labour. The urban centres where the revolution was sparked in January 2011 were full of people from the villages who had experienced a continuous deterioration in their livelihoods.

The entanglements described above imply forces generated by a combination of natural, technological and social processes, a combination that brings about new realities. Altered water chemistry transforms soil quality and entire agro-ecologies, interacting with land management, peasants' desires, urbanization processes and food supply chains. Yet all these components neither line up in a causal chain of reactions, nor are they subject solely to an economic paradigm. They synthesize into dynamic interactive clusters, into hybrid ecologies equipped with



Egyptian Chemistry, video installation, 2012

agency, in which desert developers and tiny pollutants unfold equally effective actions. Engaging with these sensitive ecologies, without allocating to political processes an omnipotence they do not deserve, is the goal this video project sees as worth striving towards in these formative times in Egypt.

POLITICS OF SCARCITY

resource scarcity, ecosystem management, rare earths

Peter Mörtenböck

Global resource investments, the movement of capital and the rise and fall of stock markets have long been seen as reasonable performance indicators for defining economic prosperity and growth. Trapped in a matrix of consumer economies, we have nurtured a belief in a feedback system based on share values, mortgage financing, asset concentration and credit derivative swaps. As the Western economy now flatlines and the economic crisis collides with long-term problems such as food and energy scarcity, overconsumption and physical depletion, more and more people have begun to lose trust in the sustainability of this feedback mechanism. What prevails is scarcity and with it the profound crisis of our time: nothing threatens to hamper consumerist habits more than the prospect of tightening resource constraints. But the concept of scarcity is by no means an unbiased framework for grappling with the gradual loss of ready access to natural resources. From Thomas Malthus' late eighteenth-century *Essay on the Principle of Population*¹ to the Club of

1. Thomas Robert Malthus, *An Essay on the Principle of Population* (1798), Oxford University Press, Oxford, 1993

Rome's 1972 *Limits to Growth* report and resurgent concerns over a diminishing resource base for humans, the ideology of scarcity points to a conclusion shared by many diagnoses of resource crisis, namely that we will have to accept rationing of some sort if we are to survive on a limited planetary surface.²

In the 1960s and 1970s, visionary architects such as Paolo Soleri and Mike Reynolds transformed the intellectual and ecological paradigms of resource scarcity into experiential spatial laboratories with their designs for eco-cities that leave only a small footprint on the Earth. These concepts were formulated in a time that saw the emergence of neighbourhood action initiatives, free-thinking groups and eco-communes intent on producing new narratives of self and relatedness and on radicalizing political and environmental thinking. Based on a philosophy of simple, low-tech environmental principles, Arcosanti, perhaps the best-known experiment of this kind, was conceived for a population of 5000 inhabitants. Forty years later, it has a population of only sixty. But more recently Soleri and his generation of 'archological' urban designers have attracted increasing interest from municipalities and groups of developers.³ The current revival of an alliance between the scarcity paradigm and the search for ecological solutions is different in the sense that it is taking place in the context of post-millennial concerns over climate change, peak oil and the loss of biodiversity, one in which resource depletion has become increasingly entangled with the affective regime of late capitalism and its expansion of commodity space.

The nature of this complicity is epitomized by the current race for rare earth elements, minerals that are critical components in modern electronic devices and 'green' technologies ranging from hybrid cars and flat-screen displays to low-energy light bulbs and generators used in wind turbines. Leading the way is the Bayan Obo Mining District in Inner Mongolia, with almost forty per cent of global production.⁴ The fact that rare earths are scattered in small quantities within soil makes mining these minerals cost-intensive and ecologically harmful. The environmentally taxing aspect of this enterprise is skilfully softened by an aesthetics of slick elegance and luxury. Rare-earth compounds are displayed in on-site showrooms in which minimalist-but-luxurious style outshines the glamour of iconic artworks such as Damien Hirst's well-known *Pharmacy* installation (1992) with its display of cabinets full of mysterious substances or his recent sculpture of a diamond-encrusted human skull (*For the Love of God*, 1997). These parallels are anything but accidental. Like the art world's fusion of market and aesthetic assets into long-term value, resource value has in a sense become dependent not only on the idea of scarcity but on its ostentatious celebration. Scarcity has been transformed from a threat into a stage-act.

In his book on *Assemblage Theory and Social Complexity*, Manuel DeLanda describes how resource distributions never exist in an abstract space but are always related to concrete spatial entities, such as communes, markets or interpersonal networks.⁵ Resources can be seen as the emergent properties of such entities, be they physical resources such as oil, water, cotton or rare earth metals, or conceptual ones such as solidarity, mutuality, legitimacy or trust. Obviously, there is a connection between these tangible and intangible assets that needs to be explored further to fully understand the nature of the crisis in which

2. Donella H Meadows, Dennis L Meadows, Jørgen Randers and William W Behrens III, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*, New York Universe, New York, 1972

3. Archology, combining 'architecture' and 'ecology', is a term coined by Paolo Soleri to characterize large-scale structures that supply all resources for a comfortable life for large populations.

4. Lee Levkowitz, 'China's Rare Earths Industry and its Role in the International Market', research paper, 2010, available online at: <http://www.uscc.gov/researchpapers/2011/RareEarthsBackgrounderFINAL.pdf>

5. Manuel DeLanda, *A New Philosophy of Society: Assemblage Theory and Social Complexity*, Continuum, London and New York, 2006

6. This thinking comprises not only the management of resource crises but also economic techniques and repertoires such as the emissions trading schemes used by airlines, or the outsourcing of environmentally hazardous businesses to the global south.

we feel immersed, as we are becoming more and more aware of the workings of a dominant economic model that is not just bolted on to this structure but skilfully woven into the *thinking* of our resources and what we consider as today's 'resource crisis'.⁶ I am not sure whether the connection lies with a remodelled attachment to the ecologies that we inhabit or whether these feelings have now entered new and complex circuits of cross-contamination, but what is clear to me is that there is a loose thread running through the various fields of crisis, one that has to do with a changing relationship between the individual and the collective – between *individual forms* of understanding losses and gains and a *collective structure* that is needed to engage productively in a situation of crisis.

CO-OPERATIVE OF THINGS

commons, externalization, thingness, imagination

Helge Mooshammer

While the many different files of World of Matter cover fairly distant sites and quite specific local constellations, one characteristic they tend to share is that of a conflictive confrontation between on-site conditions and trans-local dealings, the socio-ecological fabric on the ground and the demands of a global market. This conflict not only stems from antagonistic self-interests, but is underpinned by wider philosophical concerns about how we can make sense of our collective being in the world. The urge to find a theoretical framework more apt for the complex interplay of human and non-human forces has surfaced in parallel to a growing recognition that the multiple crises of today cannot be overcome purely by readjusting the settings of old-school economic operations. It is here that we find the call for a new ecological understanding coalescing with the call for a new political economy.

At the heart of these contentions lies the demand to break with capitalism's tendency to externalization. Affected parties are pressing increasingly hard for current resource exploitation to take into account all the things and costs that the market economy has so far succeeded in excluding from its expenditure and profit calculations. An important strand of research into the possibilities of a more inclusive understanding and use of resource environments has been the recent focus on co-operative structures. Elinor Ostrom's 2009 Nobel Prize in Economics for her research on economic governance and the United Nations declaration of 2012 as International Year of Co-operatives, among other things, have drawn attention to the capacity of co-operatives to stake out a middle ground between the extremes of over-regulation through centralized authorities and total liberalization of a privatized market.¹

Within this ideological struggle around the limitations of humanity's dominion over the world a new stream of thinking has been gaining increasing popularity: the discourse on the social life of things. Promoted by philosophical circles from liberal institutions exploring the idea of speculative realism, it has the air of a radically new vision in which thingness might become a cathartic object of critical enquiry.² Indeed,

1. Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press, Cambridge, 1990
2. See for instance the voices gathered in Levi Bryant, Nick Srnicek and Graham Harman, eds, *The Speculative Turn: Continental Materialism and Realism*, re.press, Melbourne, 2011.

3. As Carolyn Christov-Bakargiev, artistic director of Documenta 13, states, the 2012 programme of Germany's most important international art festival 'is dedicated to artistic research and forms of imagination that explore commitment, matter, things, embodiment, and active living in connection with, yet not subordinated to, theory... This vision is shared with, and recognises, the shapes and practices of knowing of all the animate and inanimate makers of the world, including people'. See <http://www3.documenta.de>. Other recent examples include the 2011–2013 programme on 'Thingness' at the Vera List Center for Art and Politics in New York, and the widely noted book *Vibrant Matter: A Political Ecology of Things*, Duke University, Raleigh, North Carolina, 2010, by Jane Bennett.
4. David Harvey, *Rebel Cities: From the Right to the City to the Urban Revolution*, Verso, London and New York, 2012

it would seem vital to recognize that the conceptualization of natural resources as commodities is only one of many options in the life-cycle of objects that, over time, appear in different constellations and are thus put to use in different ways and in line with different value regimes.

While the patterns of argumentation and rhetoric deployed by speculative realism seem to promise scope for transgressing the limitations of human-centred interactions with the material world (and resource exploitation is a key example of such interaction), we also have to be careful not to throw out the baby with the bath water. It is, of course, significant that the rise of this new fashion coincides with the recent cycle of 'value-adjusting' crises in the market economy exemplified by the 2008 credit crunch and the ensuing austerity politics. Could it be that this recurring focus on the independence of the life of things merely serves as means of obviating human responsibility for what is happening to the world we live in? Moreover, the vehemence that this narrative has taken on in the art world, instantiated most recently by Documenta 13, raises the question of whether the new aestheticization of objects and their material qualities might actually conceal a certain fetishization of tradable objects, precisely in times of volatility.³ Is this rehabilitation of the thing allowing a purified market of exchange in through the back door, as it were, one that is again managing to exclude all potential externalities from its calculations? Again, the crucial question is how critique relates to the amalgamation of the art market where connoisseur art critics and stock exchange brokers coincide in their preference for measurable material quantities rather than having to deal with the messiness of relationalities.

In discussing the creation of the urban commons, David Harvey, the seminal voice of counter-geography, is certainly very clear about the commons being not a thing but an issue of social practice,⁴ which in turn allows for many things to be conceived in a multitude of ways. The challenge for World of Matter is based on the commitment to join, on the one hand, the ecologies of things to, on the other, the manifold human relations that develop around them. The point here is to expand the imaginarity of possibilities. Perhaps it is time to start thinking about a co-operative of things.

MINERAL INVISIBILITY

accessibility/distribution, archive, extraction, mining, actors

Mabe Bethônico

The primary economic activity of Minas Gerais, the second most populous state in Brazil, is announced in its name. Although mining occupies vast expanses of land in the region and profoundly impacts on air and water supplies as well as human health and livelihoods, it remains largely invisible to a majority, including those who live in its shadow. Only in the last couple of years – as Chinese investors have become involved beyond the realm of mineral importation, now acquiring large tracts in Minas Gerais and thereby control over extractive operations – has mining surfaced in the daily news.

Despite its massive economic role, the subject of mining remains strangely absent from public debate. A collective amnesia, or rooted



Images from inspection reports compiled by the Brazilian Ministry of Work and Employment: workers' transport and accommodation, Minas Gerais, Brazil

disinterest, persists in the cultural field. Minas Gerais holds little trace of its mining history. In public archives, museums and libraries, isolated material can be found, but only rarely and always de-contextualized. Images of mineral production are strictly controlled using arguments of industrial secrecy, perpetuating invisibility and abstraction. Mining companies have recently proposed that cultural institutions devoted to their industry be established. By financing, for instance, a museum of mining and metals in a public building they enforce their own perspective on this history. These enterprises are no more than entertainment centres, or publicity machines, devoid of (ie voiding) reference to issues of labour, environmental damage, historical legacy and political context.

The aim of my research project is to give visibility to this context of mining in both its historical and contemporary manifestations – contributing to the circulation of information through the production of images and content. At the start, under the pretext of researching women workers in the mines, I was granted access to visit and take photographs. I was aided by the perception that I was harmless as an artist, but also by the mining companies' common belief that female employees give a positive image to their endeavours. In fact, these women are largely happy with their jobs; the major companies are internationally targeted for health and safety regulations and apparently have good standards for overall working conditions.

As for the small mines, geographically scattered and often illegal, the conditions in these are of another kind. They are regulated by the Ministry of Work and Employment (Setor de Fiscalização da Mineração do Ministério do Trabalho e Emprego), which has limited means for carrying out inspections and is operated by insufficient numbers of ill-equipped workers. They produce photo reports and written analyses of each inspection, constituting an archive. It is an X-ray of the mines beyond 'the great industry', in which women are in fact largely absent. The images show where workers in the mines live and eat, where and how they work, their toilets, how they eat, drink and rest during work hours, their machines, transport and tools. Kept in an administrative office, whether available for public consultation or not, department officials have been eager to have their material shown through my own project. The entire photo archive, a record of official inspections from 2000 to the present, has been made available for my project, raising in itself questions of public versus private information, and visible versus invisible resources in this field.

The project 'Invisibilidade Mineral' also comprises dialogues with professionals in different fields concerning the lack of imagery and information. Why is it not possible to provide evidence that mining towns have a quality of life inferior to that in places with no major mining activity? Why is there an ongoing absence of representation of mining and its history in Brazilian artistic production, in contrast, for example, to Mexican and Colombian art? What strategies are used to suppress the workers' side of the story in Minas Gerais' new Mining and Metals Museum? Why is mining still being taught at schools through maps only and rarely through photographs? Why have local miners' unions not gained more visibility in recent years? Based on field trips and conversations, 'Invisibilidade Mineral' produces texts, videos, photographs, publications and posters which are then circulated in the form of

a campaign – non-aggressively and with an awareness of the general lack of interest in the subject. Still, interest is slowly growing and the project is becoming an important source of information.

**MAPPING RICE/MAPPING TIME: SUBSISTENCE,
SUPERHEROES, SYNCHRONIES**

rice, time, political ecology, multispecies commons, biodiversity

Elaine Gan

Rice drives the most resource-intensive agricultural systems – sites of relentless productivity and rationalized exploitations that feed half of our human population.¹ In early 2008, rice prices more than doubled from US\$393 to US\$1020 per metric tonne. Resulting food shortages, particularly in the Philippines, were linked to rapid-fire futures trading and long-term structural adjustment programmes – not grain supply.² Hunger induced by bookkeeping.

One of six humans today is starved. In response, agricultural sciences ramp up genetic modification and precision-breeding contracts to deliver ‘elite’ strains of rice that grow faster, produce higher yields, and consume less water, land and labour. Superhero seeds for better incomes: over seventy-five per cent of rice planted today was developed by research institutes.³ But these capital-driven ‘solutions’ are tethered to histories of colonial accumulation and neoliberal dispossession. Superhero seeds obscure backdrops of slow, unspectacular deaths. Working with farmers in India, Vandana Shiva powerfully links unprecedented



Pondfield terraces before planting season in Batad, an Ifugao community, photo: Wanda Acosta, 2010

1. Francesca Bray, *The Rice Economies: Technology and Development in Asian Societies*, Basil Blackwell, Oxford, 1986, p 12

2. Walden Bello, ‘Creating a Rice Crisis in the Philippines’, in *The Food Wars*, Verso, London and New York, 2009, pp 54–67

3. J L Maclean, D C Dawe, B Hardy and G P Hettel, eds, *Rice Almanac: Source Book for the Most Important Economic Activity on Earth*, third edition, CABI, Wallingford, in association with International Rice Research Institute, Makati City, et al, 2002, p vii

species exterminations to seed biopiracy by transnationals, particularly Monsanto, and the criminalization of indigenous exchange.⁴ Agribusiness breeds new transgenics while committing others to extinction. Practices of shifting cultivation that sustained centuries-old mountain provinces are declared illegal, even as industrialized rice production becomes the largest source of methane, a potent greenhouse gas. Seedbanks such as Svalbard Global Seed Vault in Norway freeze varieties *ex situ* as cost-effective archives for future synthetics, severed from communities cultivating them over generations.

How might we navigate through deadlocks of neoliberal scarcity and genetic obsolescence? To map rice is to unpack time as durational synchronies, contingent intensities and simmering futures of multispecies cycles. Marx's labour theory of value is grounded in socially necessary labour time. Sites of exploitation cannot be considered solely in terms of place or discrete location. They must be considered as technologies of temporal coordination, or the standardization of 'differential patterns of mattering'⁵ into calculable units of homogeneous market time. Counter-hegemonic practice must propose methods for mapping temporalities through which multiplicities emerge and endure. In short, we need new clocks.

Highly adaptable lineages of grass, there are hundreds of thousands of varieties of wild and domesticated rice. Taste, aroma, colour, grain size, seed shattering and consistency index site-specific biocultural entanglements. At different stages and forms (variously seed, monocot, food, memory, derivative, genetic code), rice interacts with different partners. Germination, growth, reproduction, dormancy, mobility are enacted through iterative encounters with wind, light, heat, water, soil, gas, plants, animals, insects, microbes, and, as of roughly 9000 years ago, humans. These are neither random nor autopoietic events, but polychronic coordinations among incommensurables.⁶

Comparison of indigenous *tinawon*, annual varieties indigenous to Ifugao communities in the north-western Philippine Cordilleras, and commercial IR36, for instance, defines contrasting temporal relations. Tinawon cycles through approximately 210 days in pondfield terraces constructed by hand over centuries, along steep mountainsides at altitudes of 2500 to 5000 feet. Anthropologist Harold Conklin's lifelong studies of Ifugao rice describe a complex system of hydraulic engineering that binds symbolic, biotic and abiotic forces with interlocking durations and shifting seasonalities.⁷ Water irrigation and drainage are organized along miles of bamboo poles linking to rivers and springs. Depending on monsoon rains, rice season begins in December to March, when panicles are planted in seedbeds and then transplanted to fields. Harvest arrives in late June to July, bringing with it a climax of celebratory feasts and rituals in the Ifugao year. Over generations, seed selectors store the best seeds for forthcoming plantings.

Commercial semi-dwarf IR36 has a 110-day growth cycle in lowland irrigated fields. Developed by the International Rice Research Institute (IRRI) in Los Baños, Philippines, it was bred from thirteen elite and wild varieties from six countries in 1976.⁸ By 1981, 2.73 million hectares or seventy-eight per cent of Philippine ricelands were planted with high-yield varieties, ninety per cent of these with IR36. By 1982, it covered eleven million hectares of Asian ricelands, becoming the 'most widely planted variety in history'. But accelerated cropping cycles, fertilizer sat-

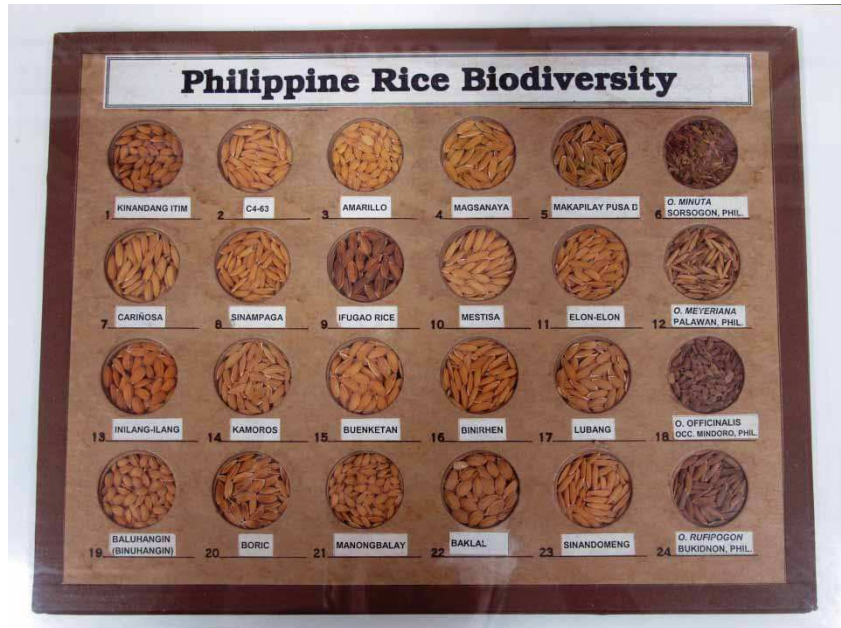
4. Vandana Shiva, *Stolen Harvest: The Hijacking of the Global Food Supply*, South End, Cambridge, Massachusetts, 2000, pp 9–13, pp 79–84. To get involved in Navdanya, a growing movement founded by Shiva to save and share seeds, practise chemical-free agriculture, and safeguard biodiversity, go to <http://www.navdanya.org>.

5. Karen Barad, *Meeting the Universe Halfway*, Duke University, Durham, North Carolina and London, 2007, p 180

6. Research is ongoing, growing in dialogue particularly with anthropologist Anna Tsing.

7. Harold Conklin, 'Ethnographic Research in Ifugao' (1974), in *Fine Description*, Yale University, New Haven, Connecticut, 2007 and *Ethnographic Atlas of Ifugao: A Study of Environment, Culture, and Society in Northern Luzon*, Yale University, New Haven, Connecticut, 1980; R F Barton, 'Ifugao Economics', in *American Archeology and Ethnology*, vol 15, no 5, 12 April 1922, pp 385–446.

8. The Rockefeller and Ford Foundations opened IRRI in 1961. Within a few years, IRRI scientists developed the first 'miracle rice', IR8, a high-yielding, fertilizer- and pesticide-dependent variety that triggered the Green Revolution throughout Asia, drastically altering rice landscapes and economies from the late 1960s on.



Display case of a few varieties at IRRI's International Rice Genebank in Los Baños, Philippines. No 9 is labelled 'Ifugao rice', one of over 300 varieties cultivated by Ifugao communities, photo: Elaine Gan, 2010

uration and shrinking biodiversity altered valences, eventually triggering mutations of insects such as brown planthopper and viral diseases such as grassy stunt that deform grain and destroy yields. IR36 proved unsustainable and was replaced within a decade.⁹

9. Donald L Plucknett, Nigel J H Smith, J T Williams and N Murthi Anishetty, *Gene Banks and The World's Food*, Princeton University, Princeton, New Jersey, 1987, pp 171–185

How to represent these dynamics? Much is at stake in attempting new clocks, temporal cartographies that mediate and provoke critical modes of synchronization. To study seeds as emergent manifolds constituted through multispecies temporalities is to jolt – and radically open up – calendars and quarterly reports of profit extraction that compress ecosystems into financialized supply chains.

WASTE

land, (in-)visibility, contamination

Emily Eliza Scott

Like 'wilderness', its ancient etymological twin, 'wasteland' derives from the Old English *westen*, a term denoting remote or barren regions, those stubbornly recalcitrant to human development. Already in the Middle Ages, wasteland signified 'a landscape and a relation of men to their natural environment characterised by depopulation, the infertility of nature, and a crisis of social order'.¹ Today, places which bear the imprint of, or become body to, various environmental-social dilemmas – at times, to the point of being *rendered by humans* uninhabitable or infecund – are ever more prevalent: deserts from over-grazing and farming; seas depleted of recently intact ecosystems; the now iconic

1. Howard R Bloch, *Etymologies and Genealogies: A Literary Anthropology of the French Middle Ages*, University of Chicago, Chicago, Illinois, 1986, p 200

trash heaps of worldwide mega-slums; suburban subdivisions with row upon row of foreclosed homes; monumental pits from mineral excavation; acutely contaminated sites cordoned off behind barbed wire. Historian of science Peter Galison puts forward the hybrid notion ‘waste-wilderness’ to draw attention to the affinities between these seemingly dichotomous categories as well as the ideologies that give rise to them. As ‘twin zones of exclusion’, or places where humans are deemed somehow foreign or no longer at home, he argues, they prompt a radical re-thinking of our contemporary relation to the land.²

World of Matter seeks to de-familiarize understandings of natural resources, taken not as discrete entities but rather in terms of complex human and non-human ecologies. The various investigations constituting this multi-year collaborative project, while elucidating the movement of goods through globalized networks, simultaneously attend to the peculiarities of individual brute substances, embodied actions, legal and political machinations, and sites on the ground (many of which have been ravaged by resource extraction or production, moreover out of common view). We are interested in the potential of visual images, and critical-aesthetic practice more generally, to orient and disorient – to convey information while at the same time unsettling the informational in order to catalyse more nuanced and democratic forms of ecological thinking and action.

One of our tactics for *contaminating* neatly packaged discourse and imagery is to litter our own web-based platform with residue from our research process. Reflecting our commitment to transparency about how concepts and images are built within World of Matter, the database will, for instance, include media files representing a spectrum of stages from raw footage to processed documents. It will moreover entail a meta-archive – indices of our collective labours: material typically dissipated beyond the meeting room, accumulated in email trash bins, shed on the studio floor, subsumed into final works and obscured from view. Rather than a figurative brushstroke registering our presence, this gesture is primarily meaningful for its operational potential, including the potential to act as a resource for kindred practitioners. The New York-based Center for Urban Pedagogy – an organization that creates ‘visually-based educational tools that demystify urban policy and planning issues’, describes its belief in the value of amplifying the often mundane processes by which policy is shaped and shapes:³

... we resist the abstraction of bullet points... Instead of presenting information systematically linked to a cohesive structure, the structure itself is magnified to reveal the discordant information that composes it, the material specifics of abstraction: the coffee spill at the public hearing. The concretization of abstraction, pointing towards the permeability of the idealised control system, opens the door to rethinking oneself as the agent.⁴

Not unlike the coffee spill at the public hearing, material ruptures and potentialities occupy the foreground in many World of Matter investigations. Paulo Tavares, for instance, traces the story of tainted Ecuadorian mud – extracted from deep below the Earth’s surface to bear witness to the unreported seepage of toxins by the American oil giant Chevron, which has effectively undone the corporation’s self-projected (and false) image of environmentally sustainable and socially responsible drilling.⁵

2. ‘Waste-Wilderness: A Conversation with Peter L. Galison’, posted online 31 March 2011 at: <http://fopnews.wordpress.com/2011/03/31/galison>
3. Center for Urban Pedagogy’s website, <http://welcometocup.org/>, accessed 23 September 2011
4. Center for Urban Pedagogy, in Nato Thompson and Independent Curators’ International, eds, *Experimental Geography: Radical Approaches to Landscape, Cartography, and Urbanism*, Melville House, New York, 2008, pp 80–81
5. His recent essay in an issue of *Cabinet* profiles the highly publicized transnational legal dispute that resulted in Chevron being subjected to unprecedented fines (which have yet to be paid), owed to local communities in 2011 for the contamination of soil and water around Lago Agrio, a petroleum frontier town in the Ecuadorian Amazon. It centres on the extraction of in situ evidence from makeshift laboratory-courtrooms in the jungle, and how the murky earth itself was relayed into the legal arena and made to speak. Paulo Tavares, ‘Murky Evidence’, *Cabinet* 43, 2011, pp 101–105

How might we, and others, develop practices that intervene into top-down flows and abstractions, thereby contributing to widened public debate and opening onto thorny (political) ecological issues with due attention to questions of justice, human and otherwise?

AMAZON FRONTIERS: NOTES ON THE ‘AMAZON INSURGENCY’, PERU, 2009

enclosures, regulation, land, nature

Paulo Tavares

The robbery of the honey and the robbery of our safety, the robbery of communing and the taking of liberties have gone hand in hand.

Peter Linebaugh

Supply Ruptures: at least thirty-three people died on 5 July 2009 when security forces moved to break down a road blockade sustained by more than five thousand Indians and peasants at a place known as the Devil’s Curve, a precarious road bend that links the Andean highlands to the Amazon in Peru, near a frontier town named Bagua, some thousand kilometres north of the capital, Lima. More than half of these security forces were police officers. In the previous two months state repression had been escalating in response to the well-orchestrated demonstrations and infrastructural disruptions that took control of practically the entire Peruvian Amazon. Protests had thus far been peaceful, but not inconsequential. Marches were reported in many towns across the



The Great Enclosure: the lines of the state of emergency declared by the Peruvian Government in May/June 2009

1. The protests were led by AIDSESEP – the Asociación Interétnica de Desarrollo de la Selva Peruana (Inter-ethnic Association for Development of the Peruvian Jungle) – the Peruvian national coalition of indigenous movements, which published day-to-day reports on the mobilizations; see <http://www.aidesep.org.pe>. Several local and international NGOs also monitored the protests. See AmazonWatch, *Day 50 of Indigenous Protests in Peru*; World Rain Forest Movement, *Peru: Amazon Peoples, Bastions of Resistance*, and Amnesty International, *Peru: Baguá Six Months On*, 2009. Among the corporations operating in the affected regions are the national oil company Petroperu, Spanish Repsol and Argentinian Plurispetrol, which reportedly halted production. Protests were also directly related to conflicts around mining sites operated by Chinese gold-mining firm Zijin, the Canadian consortium Dorata and British-owned Monterico Metal.
2. The Free Trade Agreement was signed in December 2005 by former presidents George W Bush and Alan García. After a long process of legal-technical negotiations, it was finally ratified in December 2007, the same month the Peruvian Congress approved the exceptional mandate to swiftly enact its implementation. Decree 1090, which was published on 28 June 2008, contends that de-forested areas in the Amazon should be no longer legally considered as part of the inalienable patrimony of national forests but regulated as agricultural land according to a commodity-based regime. The law thus effectively legitimizes environmental destruction as the means by which private property is produced on the ground. Activists claimed that it would stimulate the

jungle and demonstrators held position for more than fifty days straight at various strategic points such as refineries and airports, gas and oil pipelines, river routes and roads, cutting virtually all the supply-lines coming from resources extraction sites located in the Amazon.¹

Legal Enclosures: spatially dispersed but politically articulated, the protests embodied a common claim against ninety-nine laws put forward by the federal government under a special mandate that allowed bypassing of parliamentary debate and ruling by decree issues related to the implementation of the free-trade agreement signed with the United States. This new legal agenda was aimed at preparing the ground for a radical transformation of land-zoning and proprietary regimes in order to remove barriers for private capital investment in agribusiness and heavy mineral extraction in the entire country, most importantly in the Amazon, where the subsoil contains large reserves of yet untapped hydrocarbon and mineral resources, and wherein indigenous populations remain with relative territorial autonomy in relation to state control. Most fiercely opposed by the indigenous movement was decree 1090, otherwise known as the ‘Forest Law’, which enabled the legal re-coding of land previously designated as ‘forest’ into ‘idle and unproductive agricultural lands’. If this law were enforced, large tracts of the Amazon, most of which form part of (non-titled) commons held by indigenous nationalities, would be excluded from the National Forest Heritage and become available for trading in the global market.²

Political Enclosures: the empowerment of the Peruvian government with a legislative mandate that would allow the imposition of a wide neo-liberal agenda on the Amazon without public debate was followed by the radicalization of popular mobilization, which shifted towards direct action. In turn, the government enforced a sixty-day state of emergency in almost all the Amazonian districts, enclosing the entire forest in a large siege zone. Articulated at the same time in Congress and on the ground, an exceptional state was employed as a legal-political mechanism through which the reorganization of an entire ecology could come into force. The curtailing of political rights and the erosion of the rights to communing operated mutually to reinforce each other.³

Epistemic Enclosures: in order to let materials *flow freely* to global markets, it was necessary to promote territorial enclosures that were anticipated and projected through legal mechanisms and backed up by means of political containment. Enclosures were not only political and territorial, but properly ‘epistemic’, ruling out other ecological practices that are in excess of the imperatives of commoditization of nature. More than a set of codes, the Forest Law operates as a powerful cartographic device that encircles socio-ecological diversity into means and ends that can be recognized and appropriated by market mechanisms. The legal re-framing of Amazonian soils not only represented a change in proprietary regimes, but in fact projected an entire ‘environmental’ transformation which, while eliminating socio-ecologies historically rooted in collective-based systems of managing resources, completely re-organizes human–non-human relations over the area it rules.⁴

penetration of slash-and-burn agricultural frontiers into forested areas, contributing further to expanding illegal land-grab into indigenous territories. Another highly contested law was Decree 1064, which eroded indigenous rights in relation to resources by eliminating the requirement to obtain 'informed consent' from local communities before launching mining and oil drilling projects in their lands, thus clearly violating the ILO-169 Convention. For a detailed analysis of the Forest Law, see the report of the NGO Derechos, Ambiente e Recursos Naturales (DARN), *Hechos y Aspectos Vulneratorios de Los Decretos Legislativos 1090 y 1064*, June 2009.

3. This is the crucial point of the much needed manifesto written by Peter Linebaugh, *The Magna Carta Manifesto: Liberties and Commons for All*, University of California, Los Angeles, 2008. Linebaugh recalls that the elaboration of 'The Great Charter of the Liberties of England' in 1215, the landmark medieval law that limited the monarch's power over his or her subjects, was accompanied by the formulation of another law named 'The Charter of the Forest', which guaranteed access to the common forests of the kingdom. The former provided political rights, the later limited material expropriation: the right to the practice of communing was integral to minimize state power over people; it was a freedom guarantee. Hence Linebaugh's conclusion that one and the other are mutually constitutive and, conversely, that enclosures have been historically related to the erosion of civil and political liberties. Conflicts around resource extraction operations carried out by large corporations in indigenous territories have been escalating in the last years in many countries in Latin America, chiefly in Peru, where the recent high index of GDP growth is heavily dependent on raw



Lamalito (Little Mud). Along the newly built Trans-Andean highway at the margins of the Madre de Dios River, western Amazon, Peru, migrants have been illegally occupying large areas of forest with improvised dwellings, set up to extract gold. These are typical frontier towns: stateless and lawless micro-polities that grow fuelled by intensive labour, alcohol, prostitution and private guns. While the mineral becomes scarcer in the surface of the Amazonian soils and its price continues to climb on the global market, the mining cities move to more gold-rich strata, opening up land that later will be occupied by capital-intensive extraction and plantation activities. Designed to be un-built and re-built as fast as financial ups and downs hit the market, they configure an archetype of the resource frontier-architectures of our present time, when labour has become flexible and the materiality of gold remains a secure resource amidst a sea of economical instabilities, cloudy political forecasts and environmental scarcity.

Politics/Ecology: the violent mishandling of the demonstrations, arbitrary imprisonment and juridical persecution of key protesters that characterized the 'Amazon Insurgency' – as this episode came to be known in Peru – led to reactions both locally and internationally. Soon after the violent clashes at the Devil's Curve the government was forced to cede, and revoked the Forest Law. Besides expressing the continuous resistance against land dispossession and erosion of customary rights of the indigenous people of the Amazon, the conflict rendered visible the disagreement over the monolithic notion of nature that was being inscribed through the law. If ecology can be

earth exports. In turn, resource-extraction sites have become more securitized and militarized, while protests are constantly dealt with using exceptional political measures. Recently, in May 2012, a thirty-day state of emergency was again imposed on the region of Cuzco after violent clashes erupted during indigenous protests against the Swiss mining-corporation Xstrata plc.

4. For the Amerindian populations of the Amazon, the Forest Law, more than a threat to territorial autonomy, was a menace to cultural and social survival, since the decrees could potentially disrupt the institutional and material assemblages upon which their life-world is cultivated. At a strict legal-scientific level, the battle was fought over the very 'natural' condition of the Amazon as a forest. Critics pointed out that regulating deforested forest areas by agriculture-oriented legal regimes was unconstitutional, and that the new law was ill-defined because it limited the notion of 'forest' to the characterization of the surface-cover, whereas it was necessary to consider the entire bio-ecology of those areas. 'The forest as a natural resource embraces a set of elements like the climate, the soil, the vegetation, water, fauna and other elements', scientists and lawyers argued, and therefore the legal/natural definition of 'forest' could not be given only by the characterization of the earth surface. Instead they promoted a geological argument based on the examination of 'the conditions of the vulnerability of the soil, that goes well beyond the presence or not of the trees', and argued that according to the Peruvian national geological index, the soils of the Amazon differ from the soils of land with agricultural potential, and therefore should be regulated by a forest-oriented legal regime. See DARN, op cit, p 4.

a politics, it is one that is less concerned with the ethical imperatives of 'saving' or 'protecting' nature than with the necessity to destabilize the very hegemonic notion of nature itself that is being actualized through the recent neoliberal enclosures. In a sense, the crucial conflict fought in the Amazon was not so much to defend 'land rights' as to resist the imposition by law and state force of a concept of land that would erase the political and ecological foundations of peoples' liberties.

A UNITY OF BODIES, SPACES AND SPOKEN WORDS actors, materials, sites, fieldwork

Lonnie van Brummelen and Siebren de Haan

Less than an hour's drive from Amsterdam lies an oxymoronic area, consisting of reclaimed land inhabited by migrant-farmers and a former island housing an old fishing community. We were curious to find out how these farmers and fishermen, who pass their skills from father to son, hold on to tradition while adapting to new circumstances. Therefore the area became the field of our artistic inquiry.

The so-called North-East Polder is a 180-square-mile section of former seabed that was drained and added to Dutch land during a period in which overseas colonies became independent.¹ Geometrical parcelling created an isotropic plane: a homogeneous surface optimized for standardized production and distribution of crops. Every farmer



Still from a 35 mm film, *Aolen in Boeten*, 2013, made by the authors in collaboration with the people of Urk; Urker fisherman reciting scripted conversation derived from a recording while mending nets

received a house with a prefabricated barn. Even the social composition was decided upon from above. Migrants invited to the newly created land were selected not only for their farming capabilities but also for their aptitude to form a new community.² This may be the reason why every town in the North-East Polder still has a drama club. The island of Urk was incorporated into the reclaimed land and the inland sea where its fishermen had fished for generations was closed off.³ Although the government had amortized the local fishery, Urk's fishermen managed to improve their boats and exchanged their nearby fishing places for pitches far out in the North Sea. Nowadays, the once secluded and traditional fishing community owns large parts of Europe's fleet and fishing rights and hosts Europe's largest fish auction.⁴ It has become avant-garde in experimenting with sustainable fishing methods and is testing on-board anaesthesia to reduce fish suffering.

Dominant debates in Europe tend to focus on the contribution of producers to employment and export surplus, but in the conversations with farmers and fishermen we recognized another discourse in which respecting nature, religion, generosity and exchanging ideas is equally as relevant as livelihood. This multifaceted perspective connects to an intuition in our work that various modes of being, such as living and inanimate objects, power struggles and the mythical, share the same landscape.

As artistic fieldworkers we are used to evaluating our actions. During our research we found out that many of the farmers and fishermen to whom we spoke were engaged in similar processes. The global upscaling of the market and an increased critical public perception cause them constantly to re-narrate their story, reconsider their practice and reshape their self-image. This reshaping and rephrasing takes place as a collective performance of the community, an ongoing dialogue into which we, as artistic producers, were welcomed.

How could we bring across this dialogical process of reshaping ourselves in a multiverse? As a first experiment and in dialogue with our fellow producers from the trades of farming and fishing, we asked them, together with members of local theatre groups, to recite dialogues addressing these concerns on suitable locations. We recorded their performance in situ as a unity of space, body and spoken words. Dialogue is here a research method, a structuring device for the scenario and our approach to film-making. It seems a proper medium to convey how meaning is produced through exchange and collaboration, since in a dialogue the words spoken are inspired by the words of the other.

1. Preparations for the reclamation started in 1936. The process of draining, cultivating the land, building infrastructure and distributing the land lasted until the end of the 1950s. In 1962 the North-East Polder officially became a municipality of the Netherlands.
2. These migrants came mainly from Friesland, Noord-Holland, Brabant and Zeeland, areas they had, in many cases, been forced to leave because their land was used for industry or infrastructure.
3. The salt water became fresh and only eel survived the transition.
4. Urk is nicknamed 'little Brussels'. More than sixty per cent of the English fleet and fish quota for the North Sea is owned by Urkers.