Writing the blue revolution

Theoretical contributions toward a contemporary history of aquaculture

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1. Introduction

… in which we come to situate this text as a theoretical contribution towards studying contemporary aquaculture development efforts. We meet the two overarching questions that position this intervention as a discussion of concepts and theoretical sensibilities for exploring and describing what is happening to us here and now.

> Nature for us is made, as both fiction and fact. If organisms are natural objects, it is crucial to remember that organisms are not born; they are made in world-changing technoscientific practices by particular collective actors in particular times and places.
> (Haraway 1991, 90-91)

This text is populated by stories relating cod, people and other beings and processes that shape the ongoing efforts to establish Norwegian cod farming. It is motivated by concerns about how ways of life are made and organisms come to live together, however it does not treat these questions empirically. Rather it does some preliminary work. It seeks to offer the reader certain ways of approaching, inhabiting and studying this contemporary history. The study is therefore centrally about our means of theoretical imagination: the mostly underspecified, pre-linguistic ways we anticipate, delineate, figure, and approach the ongoing transformations of our more than human social worlds. It does so by theoretical elaboration and by way of examples. On an equal footing it proposes and elaborates some conceptual – linguistic – tools, which open for an understanding of aquaculture as a story of domestication as well as a site for political negotiations on the nature of more-than-human futures.

In doing both it suggests taking a few steps back and seeks to situate the very posing of the problem in a specific description of the current historical juncture. We live to inherit and shape an ongoing evolutionary story, one which we, I submit, might learn to inhabit as processes of co-domestication we negotiate with vast populations of more-than-humans. Cod

and people, their environments and technologies are variously engaged in cultivating themselves and each other, variously articulated to each other in the flesh and via media, across various levels of organization. With massively distributed work towards domestication of a species and the making of successful farming futures it is no longer clear who and what are the doers of evolutionary change – genes? environments? tools? words? hopes? dreams? The very diversity of the processes observable at even a very preliminary level begs the question by what pathways of information emerging ways of life come to be altered. The text then tries to open up an imaginary of the present historical juncture as more-than-human multiagentially constituted, all the way down. What kind of sensibilities for approaching this unfolding history of "active every-things" might be needed when a mere turn of phrase in a planning document can change minds in a single situation and alter the future of whole populations? In exploring this new landscape I wish specifically to offer perspectives to the ongoing work on the "small technologies of politics", specifically the renewed focus on the work of text and symbolic materials in Science and Technology Studies (STS) and history respectively (Asdal 2012, 2008, 2008; Asdal et al. 2008; Asdal, Borch, and Moser 2008). In good actor-network-theory (ANT, see for example Latour 2005; Law and Hassard 1999) tradition this work highlights the agency of doers that are not human. Texts and words themselves become not mere representations of nonlinguistic things or merely grounds for subjective interpretation, but rather full-fledged doers with specific transformative effects down to the very level of wording.[1] This text can thus also be read as suggestions for framing the kinds of work texts actually do as eminent drivers of evolutionary process, irreducible to human intentions.

So it wishes to provoke doubts about what and who is going on, how to know what and who is doing the disciplining and cultivating. and make do

[1] See the classic example of how Pasteur modifies the whole history of fermentation through textual intervention (Latour 1988), the more recent work on the roles of mapping in the domestication of salmon (Treimo 2007), or the ongoing work on understanding strategy documents used in the development of cod farming (Cod-Group 2001, 2003, 2006, 2010) as coordinating and timing devices (Asdal 2011).

with them. It is an occasion for readers to become occupied with words, to become turned by a phrase, and be turned on to literatures that might help us think these things well at the present historical juncture: Norway is currently site and witness, catalyst and anticatalyst to a growing industry that is making Atlantic cod (*Gadus morhua*) and Norwegian people (*Homo sapiens*) aquacultured creatures – nascent *Homo*- and *Gadus codomesticus* evolving in diversely inter- and unrelated mortal projects. Carried and resisted by bodies, fish and human, technologies, coastal currents, farmers, scientists, tax money, surprises, emotions, administration, theories, disease, genes, consumer desires, the nation, coastal communities, words and so many more, new modes of coexistence for living beings are charted, explored and articulated in practice. The discussions that make up this text are provoked by an interest in how cod and people, implicated in conditions of indeterminate, non-teleological co-evolution, are shaping and shaped in abundant relationalities, their sticky and generative entanglements. How are cod and human lives made, remade and lived? And how are future lives made present, made known and changed in the ever receding present?

One way into exploring the landscape is to start thinking about how some body-mind couplings, humans and other species, are caught up in dynamics of learning to be differentially affected in emerging aquaculture relations, how their unequal coexistence is accounted for, for whom and where, how it is variously refigured, reconfigured and rendered public, problematic or not. One example I draw on is that of Norwegian research funding administration coming to know and act on certain versions of cod-land, produced via textual action. It is relatively seldom that individual living farmed cod is co-present and comes face-to-face with humans. It is mostly many – a swarm – that are busy doing cod-stuff below the threshold to their element – saltwater. After death, dismemberment and packaging its white flesh often ends up in supermarkets, on plates, in bowls, stomachs and sewers. However this is only one of many forms as which farmed cod may be active

in changing and bringing forth worlds, doing stuff to other non/living things, enjoying a varied public life, going into politics as well. It is a veritable shape shifter: morphing from bloody flesh into contagious words, uttered or written, pictures, figures, thoughts, ideas, dreams, hopes and fears. Its proper full ecologies – imagined as all situations where versions of cod are involved in bringing forth new realities - are infinitely more diverse than the mere sums of materials that flow in and out of those various production locales where carefully selected individuals are stripped for eggs and sperm, the miracle of fertilization happens in a bucket, eggs are incubated and fry is hatched, start-fed with microscopic organisms called rotifers, habituated to tolerate globulated dry-feed, grown to relative maturity and robustness, fed to market sizes in off-shore net-pens, killed, sold and processed. Made language and text cod travels to many places it never reaches in the flesh. It is multiply known, done and consequential, always in local situations. What and how it makes do there is often co-enactive with human persons. The active powers humans bring to the situation make for the creation of new realitites in turn. They come to experience cod-realities that travel to them, make a situation with them, occupy them and change them. Human percipient agency, especially involved in textual actions, are therefore remarkable events where lives of knowers are shaped by the things that occupy them, where issues and themes take hold of bodies and can result in the eruption of new trajectories for thought and bodies, immediately and later in biographies, leading towards more and less local effects.

At the core of these efforts I then aim to elaborate the intuition that *experience-, attention- and imagination-engineering* are crucial to real, historical organisms learning to live well with each other. Today this happens eminently with the deployment of texts (see above). How lives are made better and worse, what better and worse is and how anyone might care, may be known, responded to and changed on the basis of what is given in experience to finite knowers. Human percipient agency (Wautischer 2008)

happens for groping single organisms and their situations, and it is an ingredient constitutive of almost 7-billion homo-sapiens –textured worlds in constant unfolding process. It is a commonplace observation that there is no automatism by which any one experiences, knows, imagines the same thing as anyone else. Individual psyches are for all we know unfolding private interiorities, making us myopically discrete specks of experience. While this may seem an exceedingly simple point, it might just serve us well in guiding analytic attention towards how, where and for whom certain world-experiences are, enabled, offered, shaped, formatted, foreclosed and so on. In the case of human experient it leads us into the peripersonal spaces[2] of individuals and what is given to them there, also via technological mediation from other times and sites. The co-constitutive coupling of organism-umwelt is then significant as a birth-zone of knowing that arise from engagement with extramental things – every organism is a unique site to percipient action. Such an analytic perspective leads us – in principle - to a non-anthropocentric conception of experience. It decentres the human sensor, who in turn becomes only one ingredient necessary for making a special kind of thing that gets made in the world: human flavoured experience. In modern Western human ecologies it routinely arises in technically enhanced sites, perhaps in the copresence of other living beings, perhaps not. Cultivating a theoretical appreciation of this our eminently technologically equipped living, I argue, entails thinking as much about our selves as it entails thinking about our others and our co-relative becomings. Our available modes of seeing, influencing and responding, are sculpting us, our others and our future relations, maybe for the better and maybe for the worse. This intuition is used in the following as a point of entry for starting to think the Norwegian cod-farming project, especially the role of textual action for the imagination work of practitioners, as well as reflecting on the deeper imaginative foundations

[2] See (Rizzolatti et al. 1997) for one technical use in neuroscience. I simply borrow the term to roughly denote the field a body has perceptual and interventive access to in a given situation.

of social scientific observation and description. My intervention is therefore descriptive-analytic only in the shallow sense of using analogies and empirical material as examples, and less superficially philosophical-theoretical in the sense of exploring modes of thought, attempting to cultivate theoretical sensibilities and pointing towards what may for future descriptive endeavors become useful perspectives and literatures. And as the text twist and turns the imagination in perhaps unexpected ways it might itself be read as example of the little technologies by which new availabilities of experience, attention and imagination redirect us towards the world differently once again. The reading experience then might be conceived as an experimental offering that might enable reflection about what text and mind may do together, and how mindsets might yet have to evolve to accommodate the provocations to thought offered for example by global aquaculture. Although texts figure prominently in scientific practice I take it as a point of departure that linguistic materials and their active, affective powers are still underappreciated in mainstream human-centered social theory. The ways symbolic technologies intervene actively in the very genesis of specific world-experience and the making of lives might yet have to receive their proper ontological weight in social scientific thinking. Technologies, especially those intimately entangled with, enveloping, sustaining and enabling individual and collective lives, seem to perpetually recede into invisibility - while making-do with us most, if not all, of what we do. Ending with an opening to broader contexts of such work, it can be noted that in times that have been characterized as the anthropocene era in planetary geological evolution (see for example Crutzen 2002; Steffen, Crutzen, and McNeill 2007) we might finally need to acknowledge all of our extensions, supports, coactors, enablers and the things we come to become and do together. The transformative powers of these things cannot be reduced to the actions of subjects or the phantasms of "inanimate matter." If such humanist imaginaries then miss out on much of the active stuff that makes earthly existences go on, then an unabashedly thorough imaginative and

conceptual soul-searching and –remaking is also crucial for sustained psychocultural change also beyond the academic sphere: to equip moderns with mindsets that enable them to affirm and expect to find at work in the world a full diversity of distinct and differently subsisting earthly beings (things, objects, processes, realities - the words are not irreplaceable) that might require to be made intelligible, spoken for, against or centred in academic descriptions and analyses.

2. Encounter sensibilities

2.1 Textual action and experience as singularities in evolutionary history[3]

Our shared beginning on such an expedition might then very well start with an exercise that is an unorthodox point of departure for social scientific texts. You are here and you are reading me. Yes, for I am here too; or rather translations of my thoughts – words - transported via various practices and media into your peripersonal space, and this well-travelled document is helping you think this moment. In the word of Alphonso Lingis, it is this word that makes you thoughtful, carries you forward and occupies you to the exclusions of other possibilities (Lingis 2005, 444) As readers we might engage a wide array of anticipations, expectations and framings of a given text. I don't wish to activate any particular stance here. Rather I would like to invite you to frame the reading experience minimally as chances to be perturbed, to be made to feel differently by the encounter, to try on the modes of thinking I hope to successively make available to you. And what is understood as this little word *you* might just be all-important. I would like it to refer not to a generic type of reader, or a generic type of situation, but the personal you in just this situation, consciously minding these words, perhaps reading out loud or experiencing them as internal operations of thought. Now why would I ever point that out? Why clout an academic narrative with minute existential reflection? I hope to make that clearer. Here is one situation you might consider yourself as partaking in: an irreducibly individual mind-body coupling on an itinerary from birth to death, at the present point of your biography engaged with written language that has travelled from elsewhere to enable and co-enact these very moments of experience with you. In less morbid terms: your irreplaceably personal

[3] These considerations are amended by sections 5.5.1 and 5.5.2.

experience is currently co-composed with these words, the meanings that might be made, and the novel trajectories this situation is now making available to you. You might feel that I am stating the excessively obvious (hopefully), but I would like us to circumvent any reflex that this minding-thing that is going on is in any way to be neglected in its biographical and historical particularity. Such a dismissive impulse could announce itself in the feeling that perhaps this is *in kind* like many other situations and thus does not warrant the special attentional focus I am trying to elicit. You might begin to feel that this talk of you and me is almost inappropriate for an academic text, which, rather than indulge in petty historical detail, should distance itself as far as possible from the intimacy of persons and their specific living conditions. Is this not precisely the excessive pre-theorized life we must abstract from? I wish to press on right at this junction and suggest that might have hit upon a blind spot, an existential condition of organisms' knowing, which is almost structurally eclipsed as taboo in Western social scientific culture: thinkable in principle, but little present in and consequential for our theories and wider imaginations of what moves and makes societies.

So let me just briefly suggest that this *we* - here provisionally employed as a fictional psychosocial type of the Western academic - might in fact not have done a very good job at accounting theoretically for how empsyched beings actually make do in the world. Our professional ontological matrices and personal theoretical hinterlands might just be populated with conceptual resources, intuitions, beliefs and mechanisms of dismissal that obscure to a considerable extent a detection of subtle realities like minding (imagining, experiencing - the words are, again, not irreplaceable) in the world. Intellectual technologies like the words actor, structure, culture, nature, subject, object, human, nonhuman, society, economy and the onto-imaginaries they prop up might gloss over more detail than they are intended to explicate. When we take these words as fundamental building blocks out

there, as ontological givens we might in fact produce for ourselves an occultation. Like a cosmic body may eclipse another, our conceptual availabilities might gloss over in our imagination what we witness daily as the provocatively excessive world-making contingencies – which all the while are given immediately to every experiencing observer to move towards! The graining of the contrasts that such venerable, tradition-honoured words draw may be inappropriate for accounting well for the graining of the action as it unfolds. Caring for our abstractions implies then an ethics of thought, as pointed out by Isabelle Stengers, to remain able to be compelled to thought by every novel meeting with the world (Stengers 2009). My intuition is that a privileged way to make perceptible what might be unhealthy about the aforementioned abstractions and the imaginaries they structured for us while we still believed we were modern, is precisely to anchor theoretical considerations to the fully *historical, situated and irreparably passing* living conditions of real individual experiencing creatures. Accordingly, the following might be taken as theoretical mantras, transformative and affirmative touchstones for troping into the kinds of nonmodern social scientific imaginaries necessary to describe cultures where modern cosmologies still are highly embedded in minds and their technologies. I will engage the following ideas offered by Argentinian Neurobiology not because I take them as indisputable facts, but because I believe they help us elicit crucial contrasts and allow fruitful movement of thought onward. So the science is taken as secondary to the operations of thought enabled by the concepts. Perhaps they can keep bringing us back to, and help us remain faithful to the zero degree existential conditions where experience, thinking and abstraction arise, on the one hand making perceptible to ourselves the contingency and radical singularity of our every movement of imagination, attention and experience, while on the other pointing to the singularity of all

things, whether it be those specters given to an experiencing subject or the extramental objects no representation can exhaust.[4]

First, consider yourself as a self-knowing observer that erupted into being at a unique event in cosmic evolution, circumstanced to a particular brain and body, a particular planet, a particular family and a particular epoch. You are thus not another in that you do not only inherit a unique personal history, but that you sprang from a different source, an irreducibly unique situation of conditions determined at the point a self-knowing experient came to be and successively become.[5] Perhaps the most remarkable feature of this who-that-is-you is its *cadacualtez*:

> The intrinsic unbarterability, unrepeatability, incommunicability, and singularity of every existential being, thus manifests as the ontic determination, in nature, of every event of a finite observer's finding herself experiencing in a circumstance rather than, instead, in another. (Crocco 2008, 375)

Second, your minds availabilities are unique to your cadacualtic psyche as sedimentations of biographical experience, enabled by and actively coupling with a never regular brain and body, sedimented by irreducibly unique paths of species-specific and more general biospheric evolution. These availabilities are what may be engaged at every new situation you, an inextricably linked mind-body coupling, are situated by.

There are several movements of thought this way of describing persons can help get off the ground. For one we get the idea that there are singular beings to be found in the universe, beings that are not any other, ever.

[4] English speaking audiences may refer to these synoptic overviews: (Crocco 2008; Wautischer 2008).

[5] A neuroscientifically inclined reader might here expect a more detailed theory of the localization of personal psyches. The scientific argument is highly contentious, marginal to mainstream Anglo-Saxon neurosciences, and its technical merits cannot be judged in this text. What is important here is that AE grants a psyche its own ontological dignity, irreducible to circumstancing conditions, to be added to the list of things that exist and demand description in terms that don't obliterate it. In this view, self-knowing minds are facts of nature in their own right, endowed with their own ontic consistencies, their own productive powers and so on.

Like a kind of gem, each of which there is only one. If one thinks seriously with that possibility, then every earthly occurrence where persons impart psychogenic perturbations to a situation becomes an irreducible singularity by way of being caught up in change with a unique cadacualtic being. Guilty by association: an event embroiled inextricably with a singularly unique factor cannot be like any other. So beyond that, also when empsyched animals like people are not around, we might begin to suspect the irreducible uniqueness of anything. It might not only be psyches-body couplings that are cadacualtic, but all occurrences, things, objects, occasions. To build that assumption into how we encounter beings and their worlds might make it easier on moderns to encounter not kinds, not already finished realties, not mere examples-of, not global teleologies or simply emergent properties, but all things as those eligible to become appreciated in their full diversity and specificities. Once the onslaught of unfolding history can be felt in such terms the need for new cosmological stances becomes almost inescapable.

Second, the notion of cadacualtez allows us to encounter and for good disable reflexes that would a priori resort to a vulgar kind of scientific materialism as a baseline arbiter of sorting the real into kinds: that machine which would reduce any phenomenon to another level of what might be envisioned as a kind of layered reality. Envisioned thusly the world is made up of strata of stuff, each of which may be less real than the other. In the case of psyches the strongly modern traditions in neuroscience do not recognize persons beyond the malleability of some stuff (matter, neurons, the level of description is not of the essence) into what as emergent properties makes up the theatre that is a personal experience. The move that gets smuggled in with this template for thought is that what is more fundamental, what is granted a stronger ontological dignity, is responsible for what comes at less fundamental levels of the ontological onion. If one were to believe the Churchlands, thought, the kind whose procession we follow intimately as subjectively experients and not translated into via neuroimaging for instance,

would be in a sense unreal and should be decentred if one was to talk truthfully about the workings of minds. Prominently of course philosophers like Daniel Dennett have begun to use the language of illusion for what is given in experience to single persons. Now I would never wish to discount the value of scientific work into the intricacies of any kind of reality, or even the elimination of classes of beings in the course of certain well-defined knowledge-projects. The problem arises only when we fall victim to that kind of reasoning as a guide to meeting what exists and does stuff in the word. When we let it loose to hack and slash through our ontologies. A thought, as you have it now, could never be a neuron or any kind of description with the related scientific resources. No sentence here referring to what goes on in a specific beings stream of experience could be that experience. We need to be able to talk about all these things without by any a priori decision to discount the extent to which different things might have weaker or stronger existence. By doing so we might just become able to let all things equally exist, while affirming that no thing exists equally. To take any concept endorsed by any popular or scientific tradition to be the basic metric (matter, energy, atoms, species, genes, evolution), by recourse to which other things should be described, would result in a uniformly grey sketching of realities. Against such temptations an intellectual technology like cadacualtez calls us to order and obliges us think irreducible diversity among beings, diversity down to the historical singularity of any act. In the same move it also dignifies the passing lifetime of organisms, down to any duration of experience, as significant for analysis of evolutionary process. The internal, experienced twitch of your left eyelid must be talked about, be taken seriously, be approached for learning just what kind of thing it is, as much as any account of what the neurophysiological basis could be said to have been. In the language of Graham Harman, we need to resist impulses of overmining and undermining.[6] The latter refers to the way one spirals downward to explore

[6] http://doctorzamalek2.wordpress.com/2011/01/24/the-case-for-objects/ - last accessed 01.12.2011

the makeup of an object by reference to lower order constituents ("A subject is more fundamentally neural activity"). The former refers to lumping any thing one encounters into higher order dynamics, processes and so on. The point is not that neither of these can ever make good analytical sense, which they of course routinely do, but simply to alert to the demand any object might make on us before we slide down or up respectively in register. What are the words a thing deserves? Cadacualtez is in that sense a reminder for being able to feel the obligation to anticipate weird realities, like the procession of experience we call a psyche, like the weird beings that are gods or fictional beings, and all their to-be-described ontic consistencies, modes of subsistence and existential ecologies (Latour, Harman, and Erdélyi 2011; Latour 2011).

So to sum up why the insistence on you was important in a different idiom: this reading experience, this period of coming to know differently is something that is happening in and to the world. It is a sequence of events constitutively made by you, traces of my thought in writing, and whatever else is coactive in making this occasion. It is now constitutively transformative for you as a knower, your unique bodily circumstances and all the other ingredients that are perturbed through this enactment. Diverse ingredients, with diverse histories have to conspire and congregate towards enabling and transforming the situation. You might look up and witness the seconds ticking away chronological time in parallel, direct attention to your pulse giving you life for yet another instant, appreciate the ability to make almost immediate meaning with words which you inherit as an organism unskilled into a very specific form of literacy, or think of how impossible this adventure of thought would be without the actual presence of this text. Let's appreciate how contingent this dance of agencies is to what and who is involved, how they all make do into this very event. In an utterly concrete sense these very happenings are private to this very elapsing episode of continued subsistence for all of these things – which of course also has

divergent consequences for all involved. Experiences and their situations become in constitutive relationalities, to pass, never come again, and sediment new subjectivities and their situations. The price for paying attention with text is paid by your forward-transformation towards new states of affairs, replete again with ingredients that, as we have come to suspect, should not be a priori reduced to anything else if one could ever hope of describing the action well.

3. Conceptual touchstones

We might now be in the situation to affirm that we are not at the end of history, and that we are not at the end of the history of ideas. This is because you and I are not at the end of our histories, just as no knowing *who* is at the end of the histories of her psyches differentiations. We yet have a lot to learn, a lot yet to acquire and become different as empsyched-bodied creatures and academics trying to understand the world well. With Latour citing Stengers-thinking-with-Whitehead we may affirm the potential to be transformed once more, for "every synthesis begins 'anew' and has to be taken up from the start as if for the first time" (Latour 2005, 223). This way of situating ourselves allows us to approach in a particular way the question of what it may mean to know cod-farming, for us and for practitioners knowing cod-worlds with text. The whole aquacultural land- and waterscape is one that implies in so many situations *cadacualtic* existentialities, percipient agencies, among other things, living and not. This is now thinkable and anticipatable. And it is with this minimal commitment that we can approach this field where real organisms are coming to be, betting on life and are found in diverse engagements in situations. These situations do not make themselves. They have to be continually made by diverse agencies, non-living, living and living-and-empsyched. The ways they are shaped are consequential, not only for every transformation of particular situations, but also the sculpting of future conditions of becoming.

This is where one might situate the problem of knowing *sustainabilitie*s. The word is deployed in the plural here to mark a multiplication of the states of affairs that may become of concern. Depending on what is discerned as a relevant state of affairs, it points to the situated concern for the *abilities of the various elements making up this or other situations to sustain each other into liveable futures*. Thus it matters in the specifics pertaining to such states of

affairs how *concerns for sustain-abilities* come to be enacted. Minds and their minding of situations thus become crucial ingredients in processes of probing into and enacting transformations into possible futures, when and where the ideal of *living well together* might become actual or not. Taking situated minds as special nodes for generating willed and conscious (or not) interventions in shaping the trajectories of cod-assemblages, I wish to become able to think just how concerns with good futures of cod-farming are thought and done. How do always contemporary more-than-human associations deal with the pressing originalities and uncertainties of their co-becomings? How are these evolving beings and situations accounted and accommodated for? How can we ask again just what is at stake in knowing pasts, presents and futures - and what they may demand from beings learning to live well together?

Let's then imagine again this cod-farming project, which, like every project, is both experiment and adventure. The changing associations of empsyched and non-empsyched beings, living and not, are taken up in all kinds of aqua-cultural doings: bodies are surviving, farms are farming, scientific experimental setups are experimenting, administrations are administrating, consumers are consuming and minds are made up and changing all over the place. Any hub of these scattered and variously linked activities might be approached as evolving more-than-human associations. The guiding intuition in approaching these knottings is that how they make-do and are made-to-do, pushing into future common worlds, demands an understanding of world-making politics as geared on the situational specificities of states of affairs' becoming-differently in real-time courses. To direct attentional focus towards emerging materialities of sustainability almost naturally entails moving from a style of thought anticipating preformed realities towards a kind of attention anticipating the relationally and dynamically constituting *abilities of entities to know and sustain each* other. Doing sustainabilities might in consequence be taken to describe an

activity of *explicitation* of these relations and dynamics (Sloterdijk 2005; Thrift 2009): the historical and situated work of rendering visible, speakable, thinkable and intervenable the spheres that sustain lives. The passionate hope driving these theoretical moves is that we may come to better understand the modes and conditions of *response-ability* (Haraway 2008, , for instance p. 93). This might enable us to think and work towards making bodies, minds and material arrangements into configurations that enable better kinds of attention and intervention: learning to be differently affected, experimenting with iteratively disclosing and rendering *matters of concern* the past, present and future relations of beings.[7] Such a shift, I argue, is crucial for making an emerging nonmodern, nonhumanist and *compositionist* social science (Latour 2010), as well as providing a *compositionist* understanding of what it means to develop cod-farming as future ways of life and death. In that sense this text is only a stepping stone towards a more nuanced analysis in the future, and it pays for this ambition by having to do an unusual amount of theoretical work. In this generally sketched cod-land out there, then, unresting generativities are driving trajectories into futures, agencies proliferate to make and break worlds of multispecies flourishing and suffering as you read, and knowledges are habitually outdated when all are in-the-making together.

In addition to the already mentioned Argentinian Electroneurobiological tradition, my writing through these concerns is crucially indebted to resources developed by scholars working the many fields contributing to Science and Technology Studies (STS), especially those groping towards decidedly empirical political philosophies, feminist studies of technoscience,

[7] This concern may be construed as analogous to that liberating reinterpretation of its own practice Bruno Latour offered environmentalism in *The Politics of Nature* (2004). He demonstrates how incompatible maintaining in theory the totalizing notion of "nature" is with practices that always deal with *this* river, *that* GM crop or *this* landscape. Like the sciences environmentalists never encounter "nature" or indisputable "matters of fact", but rather specific, controversial and engaging "matters of concern" that pertain to collectives made up of humans and nonhumans. Reinterpreting sustainability as a practice of attention might similarly enable a shift of imagination away from a theoretical abstraction that is too large to be inhabited in favor of a concern with specific material arrangements of entities. It might be here that *responsibility* for the *abilities* of present and future entities to *sustain* each other might take on the materially situated a*bility to respond* (Haraway 2008, 76, 93).

and nonhumanisms at work in a range of disciplines from geography and cognitive science to academic philosophy. It is my hope that by anchoring myself to these theoretical touchstones I might become enabled to stay on my best countryside behaviour: to tread lightly enough to register, resonate with and amplify the contingencies that make important differences; to steer clear of premature abstraction that might totalize, unify and gloss over worlds-to-be-made into figures of nature and society, subject/object dichotomies, fact/value distinctions, or the human/nonhuman pairing (Asdal 2004; Latour 2005, 1988; Barad 2007; Braidotti 2006; Haraway 2008; Law 2004; Mol 2002).

Donna Haraway's cry that opened this introduction thus exemplifies a whole host of sensibilities that inform my approach to studying more-than-human association. Earthly worlds and who/what might be considered to populate them are always caught up in contingent assembling and always open to differential articulation, historically specific as timed and spaced, timing and spacing, in the word, the flesh, the thought and other modes of existence. This goes for the multispecies relationship we have been calling human (Haraway 2008, 3, 31-33; Hird 2010), as well as other living beings and still otherwise figured agencies, the ways they mix and mingle, tracing and transforming their collectives. The cod-farming enterprise becomes approachable as so many contemporary experiments in which various modes of living together and apart may be articulated and rearticulated, demonstrated and judged, stabilized and destabilized, extended and ended. The mode of inquiry into such a densely populated field then cannot be anything but a probing exploration, an attitude attuned to following with inhabited curiosity some trails traced by cod, people, technologies, and agentive beings still to be described. If we should be wary of received master-abstractions, who knows what is out-there before we have gathered carefully something to make present in-here? Working from that position I do not anticipate being able to exhaust a preformed empirical field in analysis,

but attempt to find concepts with which responsible accounting might proceed at another time, working more empirically. For now I hope that we can catch glimpses of what it could feel like to do research into the social as resonating with the associations that bind beings together and apart, as a practice of cautious *explicitation* tracing the movements assembling us among others (Latour 2005) *and* minding how collective movements might do good compositions of worlds worth inhabiting (Latour 2004).

3.1 Method histories

Having framed my concerns in very general terms I now turn to the problems that made me think. In chapters 5 and 6 I will speak with examples derived from a specific set of textual sources. This was not always clear. It was a situation to be arrived at. What this text was to become was transformed at junctions in promiscuous excess of what I can possibly make present here. In referring to some of these junctions I do not wish to exercise a reflexivity that would add or subtract authority. Rather I feel it only fit to begin, before all else, to consider pragmatically a sketch of what enabled very specific meetings with specific texts. In that sense it can be seen as functionally congruent with method-discussions that are traditional in social science writing: sharing a stance on how we have come to interrogate the world. In a self-imposed naiveté my initial commitments are mostly negative. I must also admit right away that I do not wish rigorously to establish a meta-language, not only because "there is no metalanguage, only infralanguages" (Latour 1988, 174), but more so because parcel of my argument is a skepticism concerning aesthetics of costless abstractions. The concepts that direct us towards the world all cost their specific ways they lead us toward the world. And while social science can never do without the training of minds enabled by theory and philosophy, I do not here wish to elicit the impression of working towards a fundamental social theory imagined as

some kind of unified metaphysical system. When engaging philosophical moves I take it to be the kind of "intellectual calisthenics" necessary to be as subtle as the empirical case at hand may demand (Latour 2005, 51). A prime intent is then to introduce possibilities for entertaining experimentally a set of sensibilities whose merits might be later iteratively tested empirically in relation to simple requirements: do we allow ourselves to see fewer or more entities and agencies at play in our future accounts of cod-land? And more importantly: will we allow ourselves to see more in the future? Those judgments must of course be up to the reader (and the author in future projects), who proceeds onward via whatever conceptual vehicle, reference or turn of thought she found here.

Staying with the aesthetic of persons-engaged-in-events introduced above, the following genealogy thus provides a partial history of how I came to be concerned with the matters I will relate. This course of past events could also have been couched into sections cleanly delineating "method" and "the empirical", however in light of the above theoretical moves such a presentation reduces into artificial coherence what mattered in the course of messy real-life processes. In traversing this personal historical terrain we might start feeling more at home with a "social world" that of differential becoming of all manner of things via always eventlike transformation . It attempts only to point at junctions when some things became real in some and not other ways, thanks to deep and ontically heterogeneous histories that cannot be disentangled by *a posteriori* methodological decisions. Making this text thus was possible only by its heterogeneous histories, its very own collective becoming. What I would come to register as relevant in cod-worlds changed with changing questions, situations, texts and a host of other players. Neither the accountants nor the accounts endured in a formation for long: consequentialities proliferated at every juncture, contingent, often surprising and to no teleological end. A hardly systematic reading across a range of academic literatures done parallel to my questioning of cod-farming allowed

me to become attuned to different forces at play in the world I was studying, changing what should count and how in unanticipated ways. In equally hard-to-predict (and hard –to-postdict) fashion newly understood worlds routinely kicked back and prompted novel trajectories of thought and writing. Redirected? Often. Overtaken and taken over by turbulent agencies? All the time. Lone master? Thankfully not. So let me attempt to collect some of the assemblages we drew together along the way. That this reads like a narrative along a linear chronology is due simply to the fact that it was made so. For someone raised on the metaphysics (Latour 1993; de Castro 2004; Shapin and Schaffer 1985; Descola and Gísli 1996) and method-thinking (Law 2004) of the moderns it is not easy to write the eventive character of actual occasions, that nonetheless are the parcels of unfolding history. Neither does it help that writing demands a special type of linearization of experience. The numbering here marks a time course (t minus nine, t minus eight and so on, leading up to a present) and is aligned retrospectively with the recollection of some experiences into a linear procession (which of course never proceeded in precisely this way).

> t-9. I started out my search for a research topic with a feeling I seem to share with many others alive in times and places where living together seems to routinely and disruptively engender crises: action may be powerfully consequential with the tools-at-hands and goods-to-pursue of Western and westernizing industrial societies. Uncertainties and risks proliferate to haunt people and others, here and elsewhere, now and in the future (Beck 1992). This basic notion enabled the first basic question: how do we know what might go wrong, right here and now? The first answer: we concern ourselves with questions about the *durable goodness of emerging states of affairs* - then my working definition of sustainability.

t-8. What then might be a matter to concern myself with? Cod-farming in Norway drew me in under circumstances I now find difficult to re-member. It fit right in: not only is it an industry-in-the-making bound to reshuffle forms of living together, but it is also made via sets of practices that are routinely questioned in relation to the goodness of their emerging arrangements. Aquaculture is routinely a contentious subject for many people and many reasons. In addition I embraced the prospect of being able to cultivate my newly discovered curiosity for the STS-literature: already then I could think contemporary fish-farming endeavours as techno-scientific nature-culture-assemblages par excellence. This is where I could ask that question: is cod-farming sustainable?

t-7. How to study that? I was no longer modern enough to turn to the sciences as an apolitical vendor of baseline knowledge or legitimate source of the master-abstractions (Latour 1993, 2004). So I could not give in to the temptation to contrast oblivious aquaculture-practitioners with the indisputable facts of scientists. I had also learned that reality never was destiny, but that indeed the very ontologies, what counts as the relevant furnitures of the world, are decidedly historical and differentially enacted at multiple sites, variously translated into each other or not (Mol 2002; Schrader 2010; Law 2004). I had learned scruples against compiling "from nowhere" (Haraway 1988) knowledge about what matters and decided instead to "follow the actors"[8] (Latour 1987; Law 1986; Callon 1986; Latour 1984, 2005), to let them deploy and me redeploy in writing their practices and metaphysics. This move however demanded a reformulation of the question: How does someone, somewhere know if cod-farming is sustainable? Sustainability in the

[8] It must be stressed that this ideal for doing empirical work in the social sciences is not enacted here, due to this text's preoccupation with exploring modes of thinking that at later points might prove valuable for detecting actors, forces and beings at play.

singular became sustainabilities in the plural, ontologies to be choreographed in practices somewhere. I would go and find out how.

t-6. Imagine here swarms of agencies making my body, mind, thinking, writing, feeling and talking. Moving to another part of town, happening upon interesting formulations in casual conversation and quickly entrusting them to a notebook (eventually losing that notebook), afterthought, feeling changed by that one paragraph in that one book, rock-climbing and becoming subjected to my own body as it was injured, clicking that link on that webpage, being dreamed by weird stuff and oversleeping, trouble and sorrow, enduring in one mode and not another, a bicycle breaking down our companioned mode of usual transportation, taking the tram and eating cod filet for dinner that was packaged in China, becoming with the flesh of an anonymous yet well-travelled fish. This kind of action happened and was formative.

t-5. So I planned to engage with cod-farming practitioners and their fish at sites I presumed to be core-nodes of the cod-farming nexus: the very production facilities where cod and farmer rarely come eye-to-eye, where vaccination-needles meet flesh, fish teeth encounter cage-netting and so on. My justification for this choice went along the lines of the following: If this is where the farming-enterprise is sedimented hands-on into the flesh of organisms, then it is crucial to analyse how considerations of sustainability are enacted in just those practices and sites where biological bodies do and will coexist. Implicit at this stage was the assumption that unintended and/or undesirable consequences were epiphenomenal to the making-do at those sites. The farmers that were to host me cancelled my fieldwork unilaterally and on short notice and I was freed and coerced to pursue somewhat different lines of inquiry. It has to be noted here that the results of detailed ethnographic attention to salmon-farming in Norway are currently forthcoming (Lien and Law

2011, , see for example). Complementary research into the sited enactments of cod-farming might provide valuable means for contrasting the two developments.

t-4. I was still set on cod and what I then understood as distributed epistemologies of sustainability, situated knowers implicated into consequential practices in so many different settings. Where else could I find out how sustainability is enacted, made relevant to the emerging industries and its organisms? Again I stumbled across something promising: a set of strategy documents accompanying the making of the industry, accounts produced by and for research funding bodies of what was relevant and to be done by and for the practitioners. This was satisfactory enough: I could inquire into the worlds of cod-practitioners through their texts. In parallel I had already developed a fascination for the word *cosmogram* (Tresch 2007, 2005): material artifacts drawing together orderings of the world for concrete historical times, spaces and publics. The intuition: these documents could be studied as parts of cod-world-making practices. By restricting myself to them, I would be able to follow the "cosmological" imaginaries of those aiming for certain cod-farming futures. I would be able to see as they see pasts, presents and futures; what is real, important and considered relevant and irrelevant to their projects. From there the sites where cod is made in the flesh, I became attentive to other sites where fish- and people-lives are also made, albeit via different conduits – words, text, grant money for cod-making research and so on. The media that fold words into flesh are more diverse than just water, or food: the action travels electronically, through voices that excite aerial vibrations, through memory systems, the hopes and dreams of people and many more.

t-3. What I did not anticipate was the poverty and generosity of the textual interface. While texts indeed allow us to open up worlds as others

came to word them, they cannot tell the stories of their own use. I found that I could not but follow their twists and turns and at the end I was still seated and thinking. There was no way for me to access what these texts did to anyone else (except as accounted for in the texts themselves, a point I will come to). That was something happening always elsewhere, demanding an ethnographic attention I could not pay. My experimental setup simply did not seem adequate for drawing those kinds of conjectures. However it slowly dawned on me what kind of specific and richly textured experimental situation I was nonetheless subjecting myself to. Textual action itself came into focus as the most immediate empirical material I had to go by. Surely the details of diverse angles on the cod-farming projects were related to me by these texts, and just as it became available to me, so it becomes available to others when such a text enters into their lives. My attention shifted from concerning the stories I could tell as synthesis of the stories I was given by the text, to considering the problem of textual action itself. Making a virtue out of vice I could perhaps bring more to the analysis by taking seriously not only the knowers and their accounts, but also the medium and the very specific offers, gifts and idiosyncrasies it imparts to a situation. What happenings does the presence of a text make possible in the world? How to conceive of textual action in a way that makes it possible to appraise its specific modes of efficacy? In asking these questions a whole realm that had been lying implicit was opened for inspection. The challenge for me would be to map a theoretical space to wiggle around what happens when readers make do textual action. Thankfully I could rely on literatures dealing with textual agency (Asdal et al. 2008), (co)domestication (Leach 2003), and the spatial anthropology of Peter Sloterdijk (Sloterdijk 1998).

t-2. So indeed I had come to reappreciate the problem of epistemology of sustainabilities as now experimentally comprising the puzzle of what

may happen when texts are central ingredients of the action. Between "subjects" (human persons) and "objects" (cod-land) a new vista opened (Latour 1993), a field of action where experiential-symbolic technologies become situational constituents of an act of knowing. Clearly the field was not one of subject and object, but one of multiagential happening. This rendered the imaginary at once much more intimately populated, while it eminently left open just what kind of beings and interminglings do make do in the making of what might be termed cosmogrammatic practices. It leaves open for description just in what ways texts may contribute to action. In staying with the imaginaries of subject and object I would have closed down this space. In trying to find other terms of reference I was thus compelled into suspending belief in just what may populate the fields that enact situated knowing. Concerning the existence of subjects or objects I had to enact what the poet John Keats outlined as negative capability, being "capable of being in uncertainties, mysteries, doubts, without any irritable reaching after fact and reason"[9]. Jumping towards stability and certainty too early would only obscure what might be there to appreciate. So rather than merely re-inscribing the stories my sources relate I came to consider the specific kinds of offers these words, language and inscriptions make to human organisms in situ.

t-1. For my reflections on textual action I rely, among select other sources, on the case of one series of documents that attest to and develop a commitment to making cod-farming big, the fish many and profitable. These texts were first produced upon request of the Department of Fisheries in 2000 and first published in 2001 by the Norwegian Research Council (NRC) and The Norwegian Industrial and Regional Development Fund (NIRDF, Innovation Norway after reorganization in 2004). The title: „Farming of Cod - Plan for Coordinated Commitment to

[9] http://www.mrbauld.com/negcap.html - last accessed 05.05.2011

Cod by NRC and NIRDF 2001 - 2010“. The series saw revised versions in 2003, 2006 and was launched anew in 2009 to prospectively chart development from 2010 to 2020 (Cod-Group 2001, 2003, 2006, 2010). The NRC is a state agency that distributes public funding to scientific projects. It currently runs seven “big programs” among which the impetus to develop marine-based sectors figures strongly. Cod-farming is a major area of investment in this national project and the cod-plans are seen as instrumental for identifying and funding research and development that is expected to help establish a viable industry. They are meant to chart out where knowledge and skill is seen as lacking, to name challenges and trace paths ahead for science, state, commerce and fish. They are involved in guiding monetary flows to projects, proposing objects in need of research and development and in the process making certain futures more likely than others. At the same time they also account for things now happening in cod-land – organisms, technologies, sciences, markets and worlds more. They collect what are considered accomplished states of affairs at certain times, relating assumedly contemporary conditions of possibility to futures possibly forthcoming. All the while the matters given voice in the texts are some things-entangled and not others, stories and beings held together in some ways and not others, some protagonists are explored, given space, attention, money and research projects.

t-0. On-road I will think with philosophies that gravitate around no-longer-humanist and non-Kantian articulations of a *cosmopolitics* (Haraway 2008; Latour 2004; Latour and Weibel 2005; Stengers 2005). My engagement with the cod-plans is somewhat disciplined by experimentally meeting them as *cosmograms*, exploring what they may be doing with the living and dying trajectories of organisms. Simultaneously I encounter them as *exograms*, understood as some of the elements scaffolding the knowledge work of explicitating living

conditions (Clark and Chalmers 1998; Latour 1990; Hutchins 1995; Sutton 2010; Donald 2010). I thus came to attend to more than one kind of non-anthropomorphic actant: experiencing minds, texts, timings, paper fish and more. The words quickly trip off the tongue and readily feed the imagination with something definite. Yet, as we will see it will require quite a bit of work to sort out what and who, to render them intelligible *at work* in their ecological niches. It might turn out that these are not hermetic caves at all, but rather a contingent choreography of movements, encounters and transformations.

3.2 What kind of project is this again?

One answer might be that it wishes to acknowledge that it is a text that will always remain firmly in the middle of things. It will be implicated in finite local action, an event other from the writing situation, where it again will become a kind of linguistic scaffolding to occupy (likely social-theoretically non-innocent) persons, bodies, minds to make anew souls with them and lead these persons towards the world differently once again. This is always the quotidian work of *homo sapiens*' sapience, as far as words enter into it: in a very banal and extraordinary way words happen to us and we to them, in specific situations, where they can propel us and we them into new trajectories of thought, action, doing, being and so on. Words are eruptive occurrences when they find a human to do things with. Yet ontically, seen from an artificial distance, they are only so many flickering, distributed fragile beings in a cosmos where innumerable different kinds of beings exist and subsist differently. So to be sure, recall the discussion in 2.1 above: to foreground words, concepts and their lively, distinct and historical materialities does not mean to move into a realm less real than any other region of the cosmos, and especially not the tired myth of meaning vs. matter.

I might have stressed the theoretical, explorative, open and unfinished character enough already, but one last reminder might still be in order. What this text ultimately became was a working collection of resources to make better intelligible earthly worlds for researchers in the social sciences and humanities, implicated in more-than-human hyper-objects like national and international aquaculture projects. It travels to places, brings back words, sentences and select conceptual provocations. It could perhaps succeed somewhat, somewhere in attuning sensibilities anew and, with luck, make perceptible to someone, somewhere, new realities. It can of course be argued that dealing with such a mass of conceptual elaboration is excessive, and that the approach itself is perhaps too narrowly unempirical to a fault. Still, I think it can be argued that it has merit in doing a kind of preliminary groundwork upon which much richer analysis can be built in coming studies of human-cod co-domestication in Norway. The map is never the territory, but any mapping will have to rely on ways of framing the empirical as well as terminologies somewhat sensitive to the territories at hand. If such modes of attention and ontological imaginaries can be helped along with this text, it will not have been entirely in vain. The caveat lies of course in the gap of execution: it can only do the work it will do with a reader in a situation. Either it perturbs a mind-body coupling in ways that will redirect attention as intended, or it will be consequential to unintended ends. Taking seriously that fate to be decided elsewhere, the project itself can only bet on an extended life in the company of living creatures. If and how it will possess people for some time are uncertain. In that sense it can only be launched with the hope of being resourceful to a situation where intervening analytically or practically is once more the task at hand.

Chapter 4 in that sense is the most conspicuously experientialist text. It takes flight to fiction, whose eminently craftable character makes it possible to draw up imaginaries à la carte. Hopefully, by way of parable, it can succeed in engineering with a reader a set of sensibilities that make better

apprehendable the empirical and correspondingly theoretical landscapes of concern - of which various regions are brought into focus in subsequent chapters. In fewer words: a primer for the imagination. It introduces the term *cosmogram*.

Chapter 5 frames cod-aquaculture as a historical development of *co-domestication*. It then draws up an extended evolutionary scenario in which persons come to make explicit to themselves and others what it may mean to inhabit the aforementioned processes of co-domestication. It introduces the notion of *exogram* and points to the conditions of textual action. It introduces the notion of *explicitation* and sketches what is at stake when people have to do two things at once: explicitate living conditions while shaping their own and those of their others. The last two sections, drawing on Whitehead and James respectively, precipitate some suggestion about what kind of attention the previously introduced empirico-theoretical landscape might demand. The former gives us a nonviolent ontological imaginary that directs description towards novelty and how it obliges us, while the latter strengthens our resolve to start anticipating weird ontic consistencies that oblige us to care for the ways we describe them. Lastly it introduces more resources to think cosmogram, textual action and hints at the politics they involve.
Part 6 offers some closing remarks. The potential political import of the perspectives suggested is pointed to, especially in relation to the kinds of publicity and response-ability textual action may and may not enable. The conceptual instruments developed are affirmed as vehicles towards interrogating how aquacultures are shaped with textual action, as well as approaching the blue revolution in more general terms.

4. Learning to see non-anthropomorphic co-actants

… in which we by way of analogy of the home, the door and the lock learn to imagine the kinds of work texts do in coordinating how we live together. We get a feeling for how crucial these underestimated nonhumans are for drawing together publics and making collectives anew.

> How can a livable and breathable "home" be built for those errant masses?
> (Latour 2010, 488)

4.1 Unlocking a story

And now for something completely different: an attempt at imagination engineering by way of a poorly constructed parable. The front door is something we act with regularly. We know where to find it and it is straightforward to deal with, we open and close it. However, sometimes living together becomes difficult. Let us suppose that one day the lock refuses to function according to script and we can't get into our home. We call a locksmith and upon examining it she tells us that the model we have is known to cause problems. She suggests informing our landlord as it is likely that other tenants will experience similar difficulties. We go with her advice and forward the issue to our landlord. She then files a complaint with the company that manufactured our lock. It turns out our landlord is not the only one. A whole surge of customer complaints leads the producer to scrutinize the production process and discover an error. The company then offers its customers to replace their problematic locks with another model. Our landlord goes along with the offer and decides to replace not only the lock in our door, but all locks in our building. The doors are refurnished and peace settles once more. New sets of locks and keys, doors in their hinges and humans slip back into new old routines. Non-fictional history would have

gone on without halt (and who knows how long it would have gone well?), but I'll take the liberty to stop here for now.

4.2 A little-known companion perplexes

What happened? The answers we can give depend on the ways we can approach the question. We might say that an object we thought we knew intimately surprised us. The lock acted up. It underwent a transformation from being an inconspicuous translator of action-as-usual to a problematic thing that prompted a change in the flows of action. To employ a term frequently used in the social sciences, it assumed qualities of an actor. While an increasing variety of scholars would in general terms agree with this notion, it is still far from conventional wisdom. The idea that things which western traditions have come to regard as inert objects exert force of their own in the social world is thus frequently met with scepticism. Circumventing in this section the frictions and lively discussions that this theoretical move continues to fuel, I would like to suggest one way of approaching the question. If we want to understand how routine courses of action changed in my story, we would miss a crucial moment were we to ignore the lock itself. Simply put, it refused to shut up and be subjected, it finally kicked back. In the engagement with wider assemblages of non-living material (the door, the key, the building and the tools of our locksmith for instance) and living organisms (the tenants, the locksmith and the landlord amongst others) the lock revealed a new quality – it affords to interact with the rest of us in a novel way. Acting with a wider cast of players the lock could drive a wider assembly into perplexity, to stumble, deliberate and readjust. We could now just as well try to venture back in time and attempt to grasp trajectories of action that resulted in the very make-up and tied-in-ness of the lock. We can imagine a biography of the mined ore, detailing multitudes of the transformations it afforded, changing through interactions

with machines and factory workers, salesmen, movements of freight trains and transport infrastructure, more locksmiths perhaps, the wood that serves as our front door and the keys that eventually became unable to perform a specific kind of action – opening our door. In short the lock acted and acts with its entanglements. This in turn leads me to another way of understanding the initial question.

4.3 Getting to know a lock

Things became more complicated than we had, or better, had not anticipated. We started uncovering a simple object leading an active life in its entanglements. The lock in our front door was not without history and it could do more than we knew. In the course of my story it became more than a silent part of our front door and daily routine. It became part of a series, a kind, a manufactured model that may display certain qualities. It also provoked our engagement in a different way and accordingly changed our understanding of how it may behave. In other words, it acquired a new and more complex personality. We may say that a new affordance of the object emerged in interaction with the effectivities, the correlative action-potentials of other objects. According to this perspective the locks quality of refusing service changed the available modes of action for a whole host of others. Before this event it afforded to us the routine of opening and closing our front door, which in turn was made possible by our effectivities of being able to use the key to open it. A modified version of this analysis could describe this meshing of affordances and effectivities for the relation between lock and the key: the lock once allowed to the key the opening of the door, given the corresponding material qualities of the key. The point I wish to make is that these abilities emerge in the relating dynamics of objects, human and non-human. Together with my hand I can use a key to scratch an itch, but in relation to a lock a key acquires another mode of doing. The events are two

different ones; the course of action follows different trajectories. To rephrase, the ways objects structure social process is dependant on the contingent ways they are entangled in wider assemblages of objects and the relevant qualities that are evoked in their relationships. Had we and our daily routine not been involved with the front door lock in the way we were (perhaps because our culture simply didn't do front doors?), that particular quality of the lock had not revealed itself to us. So another version of what happened could read: "the" lock changed in the course of time, not randomly, but in relation to what it and its relative others materially afford. From being an ontologically one-dimensional "tool" that reliably did our bidding it grew a more multifaceted personality. In the course of events we came to know a different object.

4.4 A risky lock haunts

I have now suggested two versions of what happened. A non-human displayed agency and it became someone else. Let me add a third approach to thinking the events. Before the lock intervened, things seemed in good order. We were nicely assembled, the door, the keys, the lock, our understanding of them and our daily routines. All followed through the usual motions, the assemblage was stable; the relevant features of our little shared world were known and well aligned. It was unproblematic to act together. However, at a point the harmonious order became less so as one member of our collective stopped behaving according to the script. We encountered something unforeseen and not intended. A non-human companion-in-action turned out to be resilient in different ways than imagined, and indeed it turned out we had underestimated its capacities for action. What had been good and proper routine came to a grinding halt as we stood scratching our heads, locked out of our own apartment. Let's join the action again.

Our thoughts raced. „Will we be able to grab our laptop in time for that meeting in the afternoon? That training session at the gym certainly won't work without our climbing gear!“ Precious time passes as we try to get a hold of the janitor. He is not available so we phone up a locksmith. She arrives and her expertise and experience quickly pay off. Not only is the door open, but she also has a guess about how the lock broke. She tries to explain, but we have a hard time following her. We gather at least so much: the series our lock is part of is unfortunately constructed in some flawed way, at least the problem has been a recurrent one in the last weeks and she advises us to replace it with another model. We stop and ponder for a bit about how this could have happened. We know little about the intricate workings of a lock-producing company in the industrial age and even less about the ways state-of-the-art locks function, so our pondering leads us to the modest conclusion that we simply don't know enough. However, we do have the feeling that surely something should have been done to pre-empt a situation like this. In any case, we are surprised to think that this kind of risk became possible. What the editorial “we” is witness to here is a phenomenon the social sciences have long known but only rather recently rediscovered with vigour: unanticipated consequences. Something risky was unattended to in a genealogy of action and translated into the disruption of lives. A third way of reading what happened is then that we were overtaken by unintended and unforeseen consequences of action.

4.5 Speaking with locks

A fourth way of approaching our story highlights the role of knowledge in developing the events. It turned out we didn't know our lock very well, neither did the landlord when she decided to install it, and neither did the manufacturer. Yes, even the party that could be said to have worked most intimately with the material, seeking to develop it towards desirable qualities,

was overtaken by a mysterious resilience of the material. Some potential causalities were unfortunately not taken into account and, in the language of economists, undesirable effects were not internalised. Perhaps some models the developers used to simulate wear and tear did not approximate the actual usage patterns well enough? Maybe a material used displayed unexpected behaviour in the long run? Regardless, our lock ended up on the market, with a company representative or a sales catalogue speaking in favour of its purchase. The landlord in turn sanctioned its instalment into the lives of her tenants and we started living with it. We lived well and ignorant of processes that would at some point cause us some irritation and minor frustrations. We did after all make it to our meeting, but had to drop the climbing because we were busy writing an explanatory email to our landlord. So we did not know our lock well enough, although living deceptively intimate with it, and proverbial tragedy had to strike to alert us of the precariousness of that arrangement. Our locksmith, the expert that was able to know our lock as a potential troublemaker, entered the stage too late to avert it. Had we earlier involved her knowledge, she could have related the problematic character of our lock, thus saving us the troubles. Luckily the script of this story allows for a more positive development of her role as well. As knower of locks and a spokesperson for the recurring problems people encountered with our model she makes a positive contribution towards enabling a future that spares our neighbours the experience of being locked out of their homes. In the email we sent our landlord we presented her assessment of the situation. Our landlord contacted the manufacturer who then replaced all locks. In the end then things could have turned out worse.

Revisiting the voices we have heard so far I would like to highlight three here. First, the company advertised the lock as a reliable member of future collectives. They mis-represented it, unknowingly. Second, the locksmith spoke and her voice carried far enough to make a difference for the better. The new, resulting assemblage of locks, doors and tenants is, at least in this thought experiment, a more sustainable and liveable one. The third

voice is a less intuitive pick: the faulty lock that prompted the whole restructuring. Had we let it speak up before, the basis for a different, more peaceful story could have been laid earlier. Perhaps different procedures during development and production could have shifted attention to crucial processes? Maybe another set of quality control routines, different tools for directing attention, could have rendered decisive irregularities easier to detect and in turn made it easier for a human to speak on behalf of them. In more general terms then voices of warning could have been heard earlier, had their emergence been better facilitated. A fourth version of what happened could then be told along the motif of humans speaking or not speaking (well) on behalf of nonhumans.[10]

4.6 Learning to be affected by locks

The last approach I want to think with touches on all four perspectives I introduced. The lock story threw us into an unfinished, unfolding ecology of people and things acting together: an, at the outset, undeterminable many influence the course of events, and in the dance of agencies people and things display changing qualities and both can be made to speak together. They are deeply enmeshed and certain arrangements are better for the involved and less risky than others. So far we are able to follow the story. However, what if it had not been a more or less skilfully scripted fiction, but a contingent episode of history unfolding with us, others and our actions? We would have lacked the technology that before made it so easy to sort out the could-haves and the should-haves with comfortable distance – the narrators perspective. As simple as it now was to sort out how known and unknown entities could end up risking good order, so difficult is the task of deciding how we may live together, in real time and with the historically specific and situated

[10] Latour proposes his version of how to think and do such an extended cosmo-politics in Politics of Nature (Latour 2004).

knowledges that characterize earthly experience, becoming and survival. Who might end up betraying the collective, along which paths of action, in relation to which others, by tomorrow or in the course of a century? How do we decide now which relationships enable living beings and things to sustain each other, make lives liveable in the long run, are worth stabilizing, nourishing and developing?

4.7 Finding cosmograms at work

In a last shift of attention I would then like to point out three moments where we can arguably catch glimpses of potential tools and procedures that help with re*composing* worlds. First, our email translated the locksmiths account of what was going on to our landlord. In our text we directed attention at a world of being-with: ourselves-amongst-others, the lock in different roles, the manufacturer and our door, other doors and other tenants, and not least the potential risks that were otherwise unseen and unspoken of. However, to pursue that notion still further I want to suggest that we not only directed attention at a world, but we enabled that world, its entities and relations, to exert forces. We took part in translating material flows, mediating trajectories, from other places and times - importantly the locks industrial biography in the past - through the entities we invoke in our text, and through our text to other times and places - here figured in our landlord. So the work we participated in was not one of merely re-presenting things and states-of-their-affairs by the logics of reflection, but a more transformative one. Second, our landlord enabled through her text (together with other unsatisfied customers) new courses of action for the manufacturer, to change production procedures to make our line of locks less chaotic members of future societies and to restore peace along customer-relations that had become problematic. Third, we have the communicative practices in the factories, the procedures and textual artefacts that help guide the

development and production of a new lock. We were led to speculate about their shortcoming in partaking in the „good governance" of future lock-worlds; they were obviously not fine-tuned enough to register crucial differences and direct attention. It is here that I'd like to reintroduce a notion I presented in a rather sleight-of-hand manner in the first chapter: that of cosmos. It might direct attention skywards to consider the universe or bring to mind the science of cosmology, a contemporary branch of astronomy. However the meaning I wish to introduce here is another. In classical Greek philosophy the word *kosmos* carried meanings akin to that of a well ordered world, antithetic to the absence of well articulated relations. As alluded to above, thinkers like Stengers, Latour and Tresch have recently worked towards a rehabilitation of this notion for thinking anew the politics of collective world-making. Associations of earthly beings are in perpetual need of being made knowable, accounted for, spoken for and ordered. The concept will receive a further explication in the following chapter, so it only in a very minimal sense that I here borrow here from Tresch (2007) the term *cosmogram* as denoting artefacts that make appear a world to an individual and perhaps whole networked publics: they articulate possible inhabitants and their relationships and thus allow us to make public, move forward or hesitate, question and coordinate the on-going recompositions of worlds - also fictional lock-worlds.

5. Co-evolution, the explicitation of living conditions and co-domestication

> While we might have had social sciences for modernizing and emancipating *humans*, we have not the faintest idea of what sort of social science is needed for *Earthlings* buried in the task of explicitating their newly discovered attachments.
> (Latour 2007)

Before we progress towards thinking about the texts introduced in chapter two, I would like in this section to sketch, by ways of example, an extra-textual field of cod-farming activities out-there and introduce three perspectives for opening such a field. First I wish to argue for the usefulness of the concept of domestication in thinking the various processes of aquaculturing with cod. I will engage particularly the concepts of co-domestication and the construction of ecological niches as rich points of entry. In a second step I wish to introduce the concept of explicitation as a tool to make graspable what is at stake when situated human beings are implicated in tasks of making explicit to themselves and others the living conditions they are involved in co-shaping, for themselves and others. The example I rely on here is a particular point where domesticated cod crosses trajectories with another kind of cod, "coastal cod". While the specific example is not elicited from the core material, I deploy it as a means of deepening our appreciation for the work of explicitation as what makes imaginable, speakable and intervenable the aforementioned processes of co-domestication and co-construction of ecological niches. In a third step I will attempt to draw up a schematic for understanding the problem of such circumstanced knowers, perpetually presented with the task of constructing ecological niches and in turn being domesticated by them, while *simultaneously* facing the arduous task of explicitating the very conditions they and their others are coming to live by. How certain finite observers

might actually make do in working the problem is then the subject of the following chapter, where we encounter planning documents as powerfully active ecological players, cognitive technologies engaged in enacting tasks of explicitation.

5.1 Norwegian aquaculture as a project of domestication

As is the case with the more established practices of farming salmon and rainbow trout, Norwegian humans are playing key roles in making the conditions of shaping and reproducing cod as both "wild" and "domesticated". The work of Marianne Lien, writing on the trajectories of salmon, enables us to understand these developments as part of a wider aqua-cultural turn in the history of domestication. Although various forms of aquaculture have been practiced throughout human history, traceable as far back as the cultivating of carp in ponds in China during the period 2000-1000 BC[11], she argues that the recent historical developments present a considerable shift in gears. While more traditional modes of production relied largely on a little controlled perpetuation of populations in ponds and lagoons, and tended to utilize feed and conditions found in those respective environments, contemporary fish-farming is worked according to very different logics.

"Atlantic salmon", Lien writes, "was among the first species to be successfully enrolled in intensive commercial aquaculture three decades ago", and

> (…) Atlantic salmon (*Salmo salar*) has gone from being an exclusive delicacy, the 'king of fish', to a mass-produced global commodity available in supermarkets in most parts of the world. The change reflects the development of a global industry of

[11] http://www.fao.org/docrep/field/009/ag158e/AG158E02.htm - last accessed 26.05.2011

> intensive and market-driven production systems that has made aquaculture one of the fastest growing food production sectors in the world (…). Through this process, Atlantic salmon has become a thoroughly domesticated species, enrolled in techno-scientific regimes of production which resemble those of chicken, pork and beef. The term 'blue revolution' captures the rapid transformation which is due, for a large part, to the expansion of intensive aquaculture. Intensive aquaculture may be analyzed as the most recent turn in the human history of domestication (…). (Lien 2007, 170)

In contrast many terrestrial domesticated animals have been selectively bred and farmed since Neolithic times (Lien 2007, 209). However one may add that the past century has also seen a radicalization in the continuing industrialization of these organisms into qualitatively novel relations of exploitation and other modes of survival: to serve and die as agribusiness laborers or model workers in scientific and commercial laboratories (Haraway 1997; Rader 2004), to function as tools of military and police control (Scranton and Schrepfer 2004), to exist in more and less familiar pet relations and as more and less independent and valued working animals (Haraway 2008).

A few words on the global magnitude of this "blue revolution" may be in order here to make appreciable the transformative forces at play. Aquaculture comprises a diverse set of practices, involving a multitude of different species farmed in sea water, brackish- and freshwater environments. Production regimes are usually classed on a continuum from extensive through semi-intensive to intensive. The former is most often conducted in ponds, lakes and rivers and is often characterized as limited by naturally occurring feed and nutrients, usually resulting in a lower density of cultivated organism per unit of measured space. Regimes tending towards the latter may be characterized as involving progressively tighter controls of the various elements of production, such as technological monitoring of behavior, scientifically guided rearing of organisms at different stages of development, farm size, stocking, and feeding. Intensive regimes usually engender a tight mesh of making explicit and controllable the life cycle of the relevant species and their relative growing conditions (see for example Asche 2008; Swift

1993). Together these various practices can be understood to comprise a project of global aquaculture. According to the FAO Fisheries and Aquaculture Department

> aquaculture today is the fastest-growing animal-food-producing sector and it is set to overtake capture fisheries as a source of food fish. While aquaculture production (excluding aquatic plants) was less than 1 million tons per year in the early 1950s, production in 2008 was 52.5 million tons, with a value of US$98.4 billion. Aquatic plant production by aquaculture in 2008 was 15.8 million tons (live weight equivalent), with a value of US$7.4 billion, representing an average annual growth rate in terms of weight of almost 8 percent since 1970. Thus, if aquatic plants are included, total global aquaculture production in 2008 amounted to 68.3 million tons with a first-sale value of US$106 billion. (…) Growth rates for aquaculture production are slowing, reflecting the impacts of a wide range of factors, and vary greatly among regions. (FAO 2010, 5-6)

These figures showcase well the rapid transformation which the farming of aquatic organisms has undergone on a global scale, and they support Lien's characterization of these developments as revolutionary. Not only is aquaculture predicted to overtake capture fisheries' production (i.e. making up <50% of world production), which is remarkable in its own right, but it is also growing at rates exceeding the production of terrestrial livestock. Growing at the above mentioned 8% since the 70s, it has been increasing at three times the rate of world meat production, which is assumed to have been at "only" 2.7 percent for poultry and livestock together (FAO 2010, 18). This is the contemporary history today's aquaculture professionals, their organisms and consumers inherit and continue to shape. As already mentioned, we have been dated to the anthropocene (Steffen, Crutzen, and McNeill 2007), but these figures suggest that this characterization might be yet again too anthropocentric. Arguably we are just as well witness to, amongst possible others, an era shaped by fish – a piscopocene.

What about Norway then? Norwegian aquaculture crucially developed with the domestication of salmonids, a family of fish that comprises salmon, trout, char and freshwater whitefish among others. Since its founding days in

the late 1960s the industry has expanded significantly and was in 2009 responsible for the lives, deaths, slaughter and eventual sales of 862 908 tonnes of Atlantic salmon and 74 072 tonnes of rainbow trout[12]. While salmon has for millennia populated waters that are now territories of the Norwegian state, the trout is a species that has been exported and imported all over the world and was introduced to Norway only in the 19th century (*Oncorhynchus mykis* according to taxonomic classification, formerly known as *Salmo gairdneri*). In order to appreciate the rates and magnitudes at which this sector industrializes marine organisms it helps to think some more with large numbers. In 1990 Norway sold 145 990 tonnes of salmon bodies and a corresponding 3 795 tonnes of trout. Only ten years later those figures had increased to 440 063 tonnes of salmon and 48 777 tonnes of trout respectively[13]. Now if we stay in 2000 for a bit and shift our attention from the statistical person "food fish" (figured in metric tonnes and/or human currencies) to numbers of individual animals we may catch a glimpse of the about 166 289 000 salmon and 34 693 000 rainbow trout caught up in Norwegian aquaculture relations.[14] To be sure, this was ten years ago (and the statistic only speaks for those still alive when the accounting was done): in terms of individual fish lives subsisting in aquaculture relations the stakes are even higher today. A rising number of other aquatic species are farmed in Norway – often referred to as "new species" because they are seen as expanding on the established species - however to date, salmon and trout by far make up the largest groups of organisms socialized into Norwegian aquacultures.

Although cod inherits extensive shared histories with Norwegian humans it is in the context of aquaculture regularly referred to as one of the above

[12] http://www.ssb.no/emner/10/05/fiskeoppdrett/tab-2010-12-01-01.html - last accessed 26.10.2011

[13] http://statbank.ssb.no/statistikkbanken/Default_FR.asp?Productid=10.05&PXSid=0&nvl=true&PLanguage=0&tilside=selecttable/MenuSelP.asp&SubjectCode=10 – last accessed 26.05.2011

[14] http://statbank.ssb.no/statistikkbanken/Default_FR.asp?Productid=10.05&PXSid=0&nvl=true&PLanguage=0&tilside=selecttable/MenuSelP.asp&SubjectCode=10 – last accessed 26.10.2011

mentioned “new species”. Efforts to develop cod as a working organism for aquaculture have been under way since the early 1980s, but only since the late 1990s has the project really taken off: from a comparatively meagre 147 tonnes in 1999, production and sales had increased tenfold by 2002 and are estimated to have been at 20 924 tonnes in 2009.[15] Again, while the numbers are good to induce a feeling of the sheer masses that are set in motion, the statistics don’t make explicit the diverse ecologies these bodies become and die in. For now is enough to imagine in broader strokes a diverse field of cod-becoming out there: multitudes of living, dead, diseased, malformed and healthy bodies as the contingent results of work in heterogeneous networks traced by a wide range of movers, human and not. Processes sprawling across categories like politics and business, science and management. Entrepreneurs are working hard to develop and stabilize the various processes of aquaculture production and consumption. Technique and technology evolved in the interaction with more established marine species is employed, tested and modified in order to accommodate cod and farmers. Correspondingly versions of cod that will play along and help make their own existence as farm animals profitable are sought. Lives are imagined, tested and charted, on paper, in laboratory tanks, in fjords and in the flesh. Scientists, politicians and industry are engaged in lively exchanges of money and words, the crafting of legislature and new matters of concern. There is talk of bottlenecks to be overcome, financial and biological. The future of the nation is invoked, healthy and sustainable coastal communities too, the stakes are called high and the time is deemed right to invest in aquaculture. Reading across programs, strategy papers and more or less discrete advertisements published by state and industry alike one may pick up on two prophetic themes: cod as the potentially next big thing to happen in aquaculture and aquaculture as the potentially next big thing to happen for the Norwegian economy. The

15 http://statbank.ssb.no/statistikkbanken/Default_FR.asp?Productid=10.05&PXSid=0&nvl=true&PLanguage=0&tilside=selecttable/MenuSelP.asp&SubjectCode=10 – last accessed 26.10.2011

perceived importance of aquaculture, *havbruk* in Norwegian (literally "use of the ocean"), is exemplified in the work of the Norwegian Research Council through its "big programs". By financing and administrating research these are expected to contribute know-how of long-term national significance, to stimulate value creation or to generate knowledge that contributes to tackling perceived societal challenges. "Havbruk" figures here as one of seven, in the company of amongst others research into functional genomics, nanotechnology, petroleum production and clean energy sources. According to a recurring slogan aquaculture is "our most important growth-industry". Cod is figured as the dominant player in the category of "new marine species", as the most potent contributor to diversifying and strengthening a Norwegian portfolio for "marine value creation". So hopes run high that cod will turn out a lucrative ally for Norwegian farmers of aquatic organisms and much is done towards making it so. Alongside the above mentioned soaring growth in "produced biomass" the young 21st century is also witness to a steady increase in cod-aquaculture related research projects.[16] On the business end of the spectrum it is also worth mentioning that farmed cod has since 2001 had its own dedicated nationwide business-network, a set of publics and concerned parties with a common mission: "*sats på torsk*" ("go for cod").[17]

5.2 The generosity of domestication

So what might be a way to open up these diverse fields of activity to description? One path, I argue, is to further pursue the theme of domestication, of humans and other organisms. Domestication might at first glance trigger the imagination of humans appropriating the lives of other

[16] This is the result of a cursory search in the online archives of the research council. Projects specifically addressing cod in aquaculture first show up in the late 1990 and have increased steadily in the last ten years - http://www.forskningsradet.no/no/Prosjektarkiv/1181730334233, last accessed 29.05.2010
[17] http://www.torsk.net/ - last accessed 26.05.2011

animals and plants in a unidirectional utilitarian mode. We might consider the Promethean picture of the human engineer at the drawing board, selectively modifying lineages of other species towards human intended ends. It is of course immediately clear that this figure is a convenient fiction. While conscious selection of traits certainly is and was a central feature of many domesticatory trajectories, adopting such a perspective may leave undetected the diversity of forces at play. In a 2004 article entitled "Human Domestication Reconsidered", the anthropologist Helen Leach sought to refigure how human domestication was conceptualised. Her intervention aimed precisely at diversifying for archaeological anthropology the kinds of processes considered as viable components and explanatory resources. My intervention here aims to elicit in turn from her project a preliminary set of sensibilities for what may matter in thinking thoroughly the contemporary Norwegian cod-aquaculture project. Crucially Leach reviews evidence from the archaeozoological record that point to inadequacies of an understanding of domestication simply as "the process by which humans transformed animals and plants into more useful products through control of their breeding" (Leach 2003, 349): the morphological transformations found for animals going through early phases of domestication parallel similar changes in the human morphology over corresponding periods. Humans, it seems, change together with their animals.

Leach goes on to argue that the dominant definition stressing human intentionality has hindered considering these phenomena as related, perhaps even effects of the same kinds of processes. In building her argument she highlights and differentiates potential pathways of unintentional selection processes, theoretically formulated either as

> (1) unintentional by-products of deliberate selection by humans, (2) the results of natural selection operating in a human-modified environment, (3) variations permitted by the relaxation of natural selection pressures, and (4) the outcomes of new selection

> pressures that are brought about by humans but of which they are largely unaware. (Leach 2003, 359).

It is only in the first case that artificial breeding intentions ("deliberate selection by humans") would be a required condition. Thus one could explain animal morphological change as stemming from those willful interventions, while the corresponding human morphological changes ride as unintended effects on just those actions. There would remain two different kinds of causes: one traceable to human intention and another one which, while resulting from intentional action, strikes home in unforeseen ways. The other three cases are all able theoretically to allow for sets of unintentional selection pressures acting on both human and animal. Seen from the perspective thus opened up, human intention becomes significantly decentered. But where else would one now look for the non-intentional causal powers that could transform animal and human alike? Leach here argues for a significant role of the built environment, decreased mobility, and changes in diet consistency associated with increasing sedentism (Leach 2003, 360):

> A key factor in this human-domestication hypothesis is the artificial protective environment created by humans and shared progressively with animals and plants. It contributed to an increase and consequent concentration of their numbers and to conscious or unconscious interference in breeding. For the human, the combination of adoption of a built environment, change in diet consistency, and lowered mobility brought about morphological changes similar to those seen in certain domestic animals.

So what does Leach have to say to us implicated in contemporary conditions of domestication? First, she directs our attention to the possibility of intentional action being overtaken by unintended effects of that very action, as well as the transformative forces that cannot be attributed to any intentional act of selection in particular (more collectively interdependent dynamics and trajectories). Second, Leach highlights for us the potential role of the architectonic, the constructed environment, matters of metabolism and nourishment – a more full view of the very ecological niches that are

inhabited in the maintenance of lives. The archaic setting she is interested in was of course radically different from the material conditions of humans and fish implicated in domesticatory action today. We can imagine those envelopes of living as comparatively bare of advanced architectural solutions, and perhaps more so of cognitive technologies, inscriptions and electronic media for instance. In contrast our modern material envelopes come richly textured with all kinds of features engineered to detail, interactive technologies, symbol-rich interfaces, textual offerings, media that allow all kinds of perception and action at a distance. The kind of sensibilities we can take from Leach may then help us direct attention not only to the intentional, not only to the human, and not only to the role of nonhuman animals, but to the material scaffolding of all organisms that find themselves situated in contemporary aquacultures. Such a perspective allows us to attend to the kind of domesticatory roles played by features of our eminently constructed ecological niches themselves. The *domus*, broadly construed, from this perspective is to be anticipated as a reservoir of domesticatory action, for people and other animals.

So the material conditions that enable livelihoods today can be imagined as a densely populated by technologies of various kinds. It would however be a mistake to overemphasize the stability that the words niche, envelope or *domus* seem to carry. Instead they might be more fruitfully conceived as perpetually constructed themselves, transforming in negotiation with their respective "domesticates" as well as forces coming from elsewhere. Lien for instance has emphasized the role of universalizing mobile knowledges in shaping "salmo domesticus" (Gross 1998) in a transnationally constituting salmon industry (Lien 2007). So information, artifacts, organisms, and ways of doing things are often significantly mobile. They may frequently move from envelope to envelope in which lives are sustained: an idea might just reach us from the other side of the globe, a pizza may be ordered by telephone and delivered to the doorstep, fish feed may travel

thousands of miles before it reaches hungry bodies in net-pens. From all the possible mobiles that may then impinge upon the situations organisms find themselves in, I wish here to think a bit more with those that make our knowledge ecologies go ‘round. Such an angle on the domestication-story can be gleaned from cognitive science and especially traditions emphasizing the agential efficacy of cognitive technologies (Hutchins 1995; Donald 2010). In a recent contribution Donald has outlined what he terms an “exographic revolution”. The basic principle is rather straightforward: a mind that can rely on external “symbolic technologies” is augmented in its tasks of cognition and memory. Memories assumed to be stored inside the organism were in the 1950s termed “engrams”. In recent decades the offshoot complementary term “exograms” has gained currency as denoting memory stored outside of the skin boundary (Donald 2010, 71). The kinds of exograms around today are many, from the richly interactive interfaces of computers to the more humble notebook. Their histories are diverse, particular and unevenly localized even before the emergence of writing, however it may be argued that the written word effected a shift in gears (Donald 2010, 72). Donald enumerates the “radical properties of exograms”, which, absent in pre-exographic memory systems, account for their revolutionary impact on individual and collective cognition (compiled from Donald 2010, 72):

> Unlimited number of physical media; Unconstrained formats, may be reformatted; Quasi-permanent; exceeds life-span: Unlimited capacity; Entries may be very large (e.g. novels, encyclopaedias, reports; legal systems); Much less vulnerable to unintended distortion; Retrieval paths unconstrained; Novel options such as cataloguing, indexing; Theoretically unlimited direct perceptual access to exographic records with various kinds of interface; Many possible organizational strategies, using catalogues, indexes, titles, tables of content, pagination, etc.; Working memory is expanded into an external display organized in a rich 3-D spatio-temporal environment; Exograms can fully activate perceptual brain areas, and can appear to be clearer and more intense than the ‘reality’ they supposedly represent.

The argument may seem trivial once it is made, however it positively directs attention at phenomena which lie so “close to home” that it is easy to become insensitive to the transformative powers at play. Quotidian and unremarkable

as the act of picking up a newspaper and reading a sentence seems to us, there is an almost magical transition enacted every time we tune into the neat, linear textual translations of another person's thoughts. In a specific situated way one becomes moved at a distance.

It is then with these conceptual resources that we can once more consider the material envelopes that human-and-fish co-domestication plays out in today. Not only is the architecture of such ecological niches differentially constructed (think for example the fish inside the net-pen below the water's surface contrasted with the farmer outside the net pen above the water's surface (Lien 2007), it is also variously enriched by cognitive technologies and exograms. The argument here can be made in yet more general terms: the full organic *and* nonorganic elements partaking in the shaping any situation of co-domestication should be considered relevant for analysis if one does not wish to miss out on what maybe be doing the domesticating of fish and people. This perspective ties in well with recent attempts to make better intelligible a public life where technology already figures integral to humans' making-do. The point, congruent with a *fully* material account of domestication, is that the technological might indeed never have been external to the human. In their discussion of the domain of a posthuman social theory Brown and Whatmore (Braun and Whatmore 2010, xvi-xx) redeploy Adrian Mackenzie's quasi-concept of *originary technicity* (Mackenzie 2002). It helps us grasp, they argue, that

> our embodied relations with things are not something that comes to be "added to" human life. The human body and its capacities emerge as such in relation to a technicity that precedes it and exceeds it: there is no body, no original body, no origin outside this relation, no thinking, no thought, no logos, without that which forces thought. As we use the phrase, then, *technicity* refers to an exteriority that is necessarily also an interiority, or what various authors have discussed in terms of transduction, the coupling of embodiment and technics by which humans and nature interpenetrate. (Braun and Whatmore 2010, xix)

When we pay attention then to contemporary processes of domestication we would arguably do well to not divorce technicity from organism in our analyses. Braun and Whatmore articulate this sensibility as a methodological caution in pointing out that

> to insist on a universal history of technicity is to insist that nonhuman and technical objects are an irreducible part of stories of the becoming-being of the human, both individually and collectively, and that this could not be otherwise. It is to insist that the genesis of the individual (and here we understand the individual to mean groups) is necessarily also a technogenesis. (Braun and Whatmore 2010, xix)

As we will see, this commitment is not only theoretically fecund, but in fact empirically unavoidable for both cod and human "becoming-being" in aquacultures.

5.3 Making fish publics and fish-publics

Aquacultured cod is not the only cod the Norwegian coast is home to. Another kind, "coastal cod" ("kysttorsk"), also lives there today. Despite the name however coastal-cod does not come from there. Indeed it inherits a turbulent history that made it at home there, that gave it an identity that is "coastal". Research papers and popular science articles on this coastal-cod routinely point out that fishermen have since the 1800s known differences between the cod they caught in fjords and coastal waters and the kind of cod they caught further out (Solås 2008; Berg 2004). They insisted on it being more blunt in shape and different in marking. Intriguingly it seems today a rather straightforward matter to say to say that what these people were in fact doing was distinguishing a more stationary kind of coastal-cod from the migratory, oceanic population in the Barents Sea. We know this to be true. History has a way with words; or rather Western style of thought has a way of giving objects of knowledge, our established facts, an aesthetic of always having been there. The metaphysics necessary for granting such contemporary nature-objects a seemingly timeless existence, has now been

described by science studies (Latour 1993; Law 2004). It can be understood as a set of specific inherited assumptions we have come to entertain about what we consider to be out-there. Speaking generally, we grant those realities an existence that is antecedent to and fundamentally independent to our ways of knowing them. We might come to study those realities, but we are confined to particular perspectives on a preformed objective world. We can look at it from different angles, but the very objects of knowledge are not perturbed or changed in the process. Matters of fact do not need to labour to earn their subsistence like mortal and all other deteriorating beings do, and in effect they are granted a kind of existence that has no real history to speak of. They appear to have been there all along, and indeed in common parlance "coastal-cod" seems to always have been a "coastal" cod. However once we are aware of the pitfalls of such ethnocentric ways of figuring the real we can inquire into the rich political histories also of entities like "coastal-cod". Although scientifically endorsed and widely appropriated as a term, "coastal-cod" too had to come into being: Research aimed at scientifically establishing coastal-cod as distinct from its "northeast-arctic" relative has been published since the early 1930s. A study by Rollefsen is commonly cited as the first of these efforts: the structures of the *otoliths*, motion sensors anatomically located in the heads of cod, were found to systematically differ in structure for this "other population" (Berg 2008). From 1970 a thus marked "coastal cod" began making appearances in research reports prepared annually for the International Council for the Exploration of the Seas (ICES), an international organization which advises member countries on the status of important fisheries of the Northern Atlantic. Anita Maurstad has in a recent paper traced the birth and career of "coastal cod" in these reports and discussed the work involved in making it stick as a scientific reality, an administrative category, an internationally acknowledged Norwegian population, and not least a truthful way for you and me to talk and write about a kind of marine organism (Maurstad 2008). I will not here recount that story, but only remark that coastal-cod acquiring a definite reality happened by fully historical

means like measurements, passing legislation, writing, arguing and so on. Had such histories remained obscure we would have succumbed to what Latour has described as “the myth of double-click information” (Latour 2005): knowledge that seems to pop up from nowhere in particular, realities that seem ad-hoc assembled, objects that are portrayed as exhaustively deployed to experience, states of affairs as matters of fact – all weirdly self-contained and un-produced by richly eventful pasts and passing presents. One antidote and positive replacement of such an imaginary might be found in John Law’s articulation of a resolutely relational understanding of reality, which underpins his version of an actor-network ontology. It invites thinking

> (...) everything in the social and natural worlds as a continuously generated effect of the webs of relations within which they are located. It assumes that nothing has reality or form outside the enactment of those relations. Its studies explore and characterize the webs and the practices that carry them. Like other material-semiotic approaches, the actor-network approach thus describes the enactment of materially and discursively heterogeneous relations that produce and reshuffle all kinds of actors including objects, subjects, human beings, machines, animals, 'nature', ideas, organizations, inequalities, scale and sizes, and geographical arrangements. (Law 2007, 2)

Significantly in such a view there are no operations possible that would allow any reality to "hop out" of history. Also nature-objects are transformed in sticky, generative entanglements, always somewhere, never emerging from nowhere (see for example Asdal 2004, on the making of governable nature-objects in postwar Norway). So coastal-cod had to be made at home along the Norwegian coast. In fact just where and how home is, is still very much under negotiation. Research aimed at getting to know how and where "coastal cod" go about their submerged business indicates that one category might not be enough to take them into account. Coastal cod might itself not be a (genetically) homogeneous population, but subdivide into a number of them, which grow and mature sexually at different speeds, travel less or more than others, and possibly exhibit a multitude of other habits. These differences are hypothesized to occur even at a very local level, a single fjord perhaps (Jorde et al. 2007). But the story is still more diverse.

One context for marking coastal-cod as a reality deserving its own consideration is an older, more safely established reality, that of the "northeast-arctic cod" ("nordøstarktisk torsk"). Northeast-arctic cod is perhaps best known in Norway under the name "skrei": the variety of cod that migrates to the Lofoten area in order to spawn. This annually recurring phenomenon forms a basis for the "lofotfiske" (the traditional Lofoten fishery) where humans have been exploiting the annual abundance of cod for centuries. The northeast-arctic stock is considered the largest in the world and has been classified as healthy in recent years. It is against the backdrop of

such an established cod-relation that coastal-cod emerged as problematic. From 2003 the fishery "coastal cod" was explicitly made an object of public concern: it was categorized as "outside safe biological limits" by the International Council for the Exploration of the Seas and Norway was advised to discontinue fishing in 2004 to allow the population to recover. That advice was repeated for all following years. The total allowable catch[18] (TAC) for the total Norwegian cod fishery is annually determined by The Joint Norwegian-Russian Fisheries commission. For many years the commission used to grant Norwegian fishermen a fixed quota of 40.000 tonnes of coastal-cod, in addition to the agreed upon TAC for northeast-arctic cod. Since 1997 a steady decline of coastal populations was reported, in total amounts „biomass"(presented in metric tonnes of fish), „spawning population" (comprising those deemed able to reproduce), and „recruitment" (referring to the amount of fish surviving their early years and thus „recruiting" to the total population). After the ICES had recommended to stop fishing coastal cod in 2004, the TAC was reduced to 20 000 tonnes for 2005 and 21 000 tonnes for all following years.[19] However in Norwegian administrational practice coastal cod is traditionally combined with northeast-arctic cod, so the separation of stocks that existed on paper did not translate into success in differentially structuring the amounts caught of both kinds. The catches landed by fishers were and are routinely mixed. Efforts to counter this problem were introduced in 2005 with special regulations to shift the fishing pressure from the coastal kind. In 2006 it was placed on the national Red List with the attributes EN - endangered – for coastal cod North of 62°N and NE – near threatened – for coastal cod off the Norwegian coast south of 62°N (Kålås, Viken, and Bakken 2006). According to the Norwegian

[18] For an STS-informed discussion of how this "TAC-machine" was constructed see for example Kåre Nolde Nilsen's dissertation "Science|Politics: Boundary Construction in Mandated Science - The Case of ICES' Advice on Fisheries Management" (2008).

[19] http://www.ices.dk/committe/acom/comwork/report/2011/2011/cod-coas.pdf - last accessed 26.05.2011

Institute for Marine Research in 2011, the situation is no better today. Hence the advice that

> no catch should be taken from this stock in 2011 and a recovery plan should be developed and implemented. The survey indicates that the SSB is close to the lowest observed level. Recruitment has declined over the period 1984-2002 and has remained low since. Recruitment is clearly impaired at present SSB.[20]

So in very specific ways coastal-cod had to be negotiated an identity and further mobilised. This becoming-real, becoming-known, becoming-problematic and becoming-political of coastal cod has made it eligible for deployment in public discussions, sparked a range of innovations in management and regulation, and fuelled a whole host of research projects aimed at producing a more manageable fish.

5.4 Explicitating living conditions

How might we then understand this becoming real and public, a fish to be reckoned with? Certainly fish did not announce themselves, neither as decidedly "coastal" nor as "near threatened". Mobilization was needed to become explicit as a problematic entity for a wider ecology sustaining lives along the Norwegian coast. A public career needed to be engineered by scientists, international organisations and administration in order to enable contemporary concern for its continued survival. This process was driven by more than a detached interest: by being implicated into human modes of production and subsistence the thriving of coastal-cod stocks became an issue relevant to the continued thriving of humans. The living conditions of one

[20] http://www.imr.no/radgivning/kvoterad/kvoterad_for_2011/ICES_rad_pa_arktiske_bestander/kystorsk_nord_for_62_nord/en - last accessed 23.05.2011

species became relevant as crucially enabling the living conditions of another species. This kind of movement may be grasped as what the German philosopher Peter Sloterdijk has termed "explicitation".[21] Latour has recently characterized the theoretical import of this idea in these terms:

> [Sloterdijk] has proposed that history was never about "modernization" or about "revolution", but was rather about another phenomenon, that he names "explicitation". As we moved on, through our technologies, through our scientific inquiries, through the extension of our global empires, we rendered more and more *explicit* the fragility of the life support systems that make our "spheres of existence" possible (…). Everything that earlier was merely "given" becomes "explicit". Air, water, land, all of those were present before in the background: now they are explicitated because we slowly come to realize that *they* might disappear —and *we* with them. (Latour 2007, 2-3)

Sloterdijk, in the hands of Latour, thus enables us to think the fragility of the life-sustaining spheres humans (and indeed any organism) rely on for continued existence. Coming to know well the elements that sustain such enveloped lives becomes, in light of this perspective, crucial for securing survival. Now, as already hinted at, the historical developments that have lead Sloterdijk to develop this notion are not examples of a careful, precautionary probing into what may perturb living conditions or not. Rather he finds the logic of explicitation at work on human battlefields, exemplified specifically by the destructive horrors of gas warfare:

> The twentieth century began on April 22, 1915, for Peter Sloterdijk, when a German regiment launched chlorine gas over the Ypres front towards French troops. Wind blew the gas towards the targets, who were puzzled. At 6.20pm, the French general, Mordacq, rode towards the gas to investigate. By 7pm, a six kilometer breach had been opened for German troops to march through. The French were carved open without being attacked with direct shots. But more importantly, the German military had shown that environments could be harnessed to cause harm. Beyond the immediate kinetic effect, they created an awareness that our environment, the air we breathe, is not necessarily safe. (O'Loughlin 2010, 1)

[21] Sloterdijk's three volume magnum opus "Spheres" (1998), which present explicitation in context of his philosophy, is not yet available in English. I here rely on sources available in English in order to make access easier for an international audience. A secondary reason is the undeniably dense and unusual style employed, even for a German reader, so relying on commentators is a way of bypassing for now the considerable work of first-person appropriation of his ideas.

Explicitation here is at work in becoming able to intervene in the "air conditioning" of environments in ways that kill their inhabitants. Air itself, previously "given" and implicit to human spheres of existence, could no longer be taken for granted. It, or rather its lacking, became explicitated as a source of mortal danger (Latour 2007, 3). In Latour's own idiom: we could not help but realize our intimate, vital *attachment* to other agencies. Such a history might be written for coastal-cod too, with the important difference that it would not have to concern itself only with the life-support systems of humans, but the life support systems of another species as well. This line of reasoning also foreshadows a way of framing the task shouldered by those looking to establish cod-aquaculture as ways of life and death for both human and fish: learning to become attuned to what makes livable envelopes for both. There is however more to take along from Sloterdijk. His philosophy complements in a unique way the perspectives developed above, which highlighted the importance of the architectural, the constructing of niches in more-than-human domestication. In his view humans inhabit indeed a kind of originary technicity, that of the life sustaining envelope, a sphere that has to be designed as livable. In Latour's words:

> [In] the same way as a space suit or a space station is entirely artificially and carefully designed, so are all of the envelopes that constitutes the fragile life supports of humans. (Sloterdijk calls these "spheres", and uses the term, "spherology" to name his endeavour.) Human are to be handled with infinite precaution from the womb (natural or artificial) in which they are grown (Sloterdijk defines philosophy as a kind of obstetrics!) all the way to the place where they survive and die. (Latour 2008, 8)

Thrift echoes this view, but proceeds to draw out the spatial implications in even more explicit terms:

> (…) Sloterdijk provides a history of thinking space that works out from the earliest times to the present. Space is understood 'gynaecologically' as a set of envelopes or surrounds or shelters, self-animated spaces that give their inhabitants the resources to produce worlds. (…) Sloterdijk adds in a spatial dimension of being-with-in-a-

> world that is a sphere (whether the sphere is a womb, a home, a polis, a nation, an empire, or some other sheltering envelope), a move which allows him to picture pictures of what life might be when generated from within existence: 'Human beings are at bottom and exclusively creatures of their interiors and the results of their work on the form of immanence that is inseparable from them. They thrive only in the hothouse of their autogenic atmosphere' (…). Without our worlds, in other words, we are nothing. (Thrift 2009, 9)

What a vista. Our inhabited interiors are constantly worked-at and with, and in turn they give us resources to produce future worlds, i.e. renew and expand our niches (as well as those of our domesticates) However it would be a mistake to conflate the womb, the apartment, the workplace, the nation, the empire or the spaceship-earth as if their kinds of being-with were of the same kind. Sloterdijk himself is instructive here. In an interview he discriminates "systemic space" from "existential space":

> Systemic space is created by the operation of great political, administrative, and economic systems. Existential spaces, on the other hand, are the spheres that exist only insofar as they are animated by their inhabitants. (Royoux 2005, 229)

Bypassing here the question of systemic space, the character of explicitation can be recast in spatial terms by the notion of "existential spaces", animated by their inhabitants. If we follow this line of reasoning then organisms, humans in Sloterdijk's account, are immediately local to their existential spaces, their existential interiorities. If contemporary explicitation can be shared and negotiated for distributed knowers, then traces, knowledge, thought and experience need to travel what separates spheres. Sloterdijk here invokes what we above have characterized as exographic agencies:

> With the advent of the printing press, we observe the phenomenon of an effective synchronization of consciences distributed in space. With telecommunication, it's no longer necessary to travel in order to meet someone on the other shore. The quasi-totalities of other shores have become instantly available and accessible. Telecommunication is the rational faculty of haunting no matter what place in the world. (Royoux 2005, 226)

Explicitation, as a publicizing movement, thus relies on exographic means if it is to travel beyond the interpersonal sphere where people can "overlap" immediately. So by means of telecommunication we can haunt and be haunted by other existential spheres, by these events essentially "animating" once more what Sloterdijk sees as the "primordial existential sphere", which is

> created every time a moment of inter-psychic space happens [space happens!]. Being possessed means having the capacity to host subtle guests. The psyche has this strange gift of understanding what others say, of hearing them, and this opens us to possession by others. (Royoux 2005, 224)

Explicitation can then, from this vantage point, be understood as a phenomenon, by which becoming "possessed" is enabled at a distance.[22] There is no reason this should be limited to language or pictures or text, also feelings and subjectivities and objects of knowledge might become "epidemiological". Spheres are then, in this view, indeed animated by their inhabitants, even if by others at a distance. Where and how exactly bodies and minds are made up is thus no longer certain. Livable envelopes are necessary for survival, but they are permeable and far from uniformed, preformed of finished at any point. In effect what becoming a specific organism (perhaps with a specific mind, perhaps even a specific personality) involves is also at the mercy of its continually transforming envelopes. I wish to understand this as relevant for all aspects of individual development, nourishment, shelter and communication all present an alteration of the conditions of being-with for irreducibly unique beings. Primitively organisms do not come in kinds, just as envelopes don't come in kinds, just as life histories don't come in kinds.

[22] With the rehabilitation of Gabriel Tarde's sociology the notion of possession has gained a lease on life in social theory. See for example Latour's *The Science of Passionate Interests: An Introduction to Gabriel Tarde's Economic Anthropology* (2009) and Didier *Debaise's The Dynamics of Possession. An Introduction to The Sociology of Gabriel Tarde* (Debaise 2008).

There can thus be no "natural" teleology towards ever more complete general public explicitation. It all depends on personal life-histories of having become co-constructed with certain interiors and their offerings, and not others. The food or word that travelled into my envelope was locally transformative to me and my envelope, making possible survival and maybe a transmission to other envelopes I have immediate bodily or technologically mediated access to. So instead of being able to rely on explicitation to simply happen, we are directed to ask: *Where* is explicitated *what/who*and to *whom*? And in a second step: What kinds of transformations of organisms-with-envelopes are made possible by an event of explicitation? At this point we are sufficiently prepared to discuss explicitation as imagination, attention and experience-engineering at work. All will feature: the domestication project, farmed cod, coastal-cod, individual persons-with-minds, exograms and cosmograms, as well as matters of concern.

5.5 Explicitation at work

The quote below is taken from an article published on www.kyst.no, an outlet for fish-farming related news. It dates from early 2009 and cites Liv Holmefjord, the director of the Norwegian Directorate of Fisheries, the state body concerned with administrating the countries fisheries and aquaculture. As a private person she owns shares in a salmon-farming company, but here she speaks as the person holding an office concerned with matters of public service. The occasion was a speaking engagement at the "AqKva Conference", arranged by the Norwegian Seafood Federation, the main employer's organisation, representing a majority of companies in the fisheries and aquaculture sector. The topic of her talk dealt with what is necessary for a better regulation, governance of the terms of co-existence of cod-aquaculture and coastal-cod, as well as expressions of concern about the

immunity conditions of fish and human spheres. A basic sentiment is already captured in the title of the article: "Must have more knowledge about cod."[23]

> In the short term we should establish requirements for approving operating plans for cod farming [...] In addition the requirements for the net pens should be sharpened. We have a zero-escapes vision, and with by that we don't just mean cod, but also zero leakage of eggs and larvae. [...] In order to develop a good and sustainable industry, I believe it is important to think holistically in the management of both wild cod and farmed cod. We should therefore coordinate all regulation with the aim to manage coastal cod in a sustainable manner.

Before we even turn our attention to what is given in language we can note some features of the envelope from which Holmefjord speaks. As a cadacualtic mind-body coupling she is enacting an episode of making sense in a particular situation. She arrived on site as a result of her trajectories through a personal biography of experience, spanning travels through diverse formative spheres of existence, from the womb to public office and uncountable concrete situations in between. She comes sedimented with capacities of speaking publicly about matters of concern that have their own histories of explicitation. Her speech act is indebted crucially to explicitatory trajectories of both cod-aquaculture and coastal-cod hinted at above, and her personal mental and material acquiring of these explicitated states of affairs. Otherwise there would be no issue for her to speak into relevance here. Should this idea still be a sticking point for the reader, it may be clarified by way of comparison with other elements that were present in making the speaking event: the building enveloping the company endures from a specific history of construction and it had to hold up and subsist in its given form to enable the proceedings. The realities Holmefjord articulates have a thoroughly constructive history as well, populated by texts and plans and buildings and minds and fish. What culminated here into a very specific concern for sustainability-conditions relied on the explicitatory enabling efforts, undertaken in the past and elsewhere. They had to be brought along

[23] http://www.kyst.no/index.php?page_id=59&article_id=83814 – last accessed 20.05.2011. This and all following translations from the Norwegian are my own.

in traces, as neurological memories, as the text that is read from a piece of paper and as uttered words that come to make meaning with the audience. This audience is another set of elements. It is made of those people that came to be collected around the conference theme, and more specifically those that would be present at the moment of the speech. If you were not there you did not experience it. This is of course not entirely true as traces of the event have made it, via the article on www.kyst.no, into our own company at this point of the reading experience. Then and there it became a period of experience in the life of another set of organisms, as those that would be moved by the words as they were read and spoken. In personal real-times selves were intonated into a stream of sense-making:

> In the short term we should establish requirements for approving operating plans for cod farming [...] In addition the requirements for the net pens should be sharpened. We have a zero-escapes vision, and by that we don't just mean cod, but also zero leakage of eggs and larvae. [...] In order to develop a good and sustainable industry, I believe it is important to think holistically in the management of both wild cod and farmed cod. We should therefore coordinate all regulation with the aim to manage coastal cod in a sustainable manner.

There it was. You were intonated by the same words again. Of course you are not physically situated as they were, and our pragmatic situation is wholly different. We are elsewhere and our tasks are internal to another project in another place and at another time. However you have gathered that Holmefjord urged an "us" to implement tighter controls of a number of aspects of cod-farming. For one, she expresses the goal of making it mandatory to have operating plans for farming sites approved by state administration.[24] The very membrane that is employed to restrict the spatial movement of farm fish beyond farmer control, the net pen, should be better controlled via regulatory intervention. The "we" Holmefjord invokes has "a

[24] The change in the relevant legal regulation has since been effected and 2011 was the first year that cod-producers had to provide operating plans for their rearing and growing sites. This requirement had applied only to farmers seeking concessions for producing salmon and trout. The plans themselves, amongst others comprise measures to target health issues and prevent escapes of fish from marine sites into the surrounding waters.

zero-escapes vision, and with by that [doesn't] just mean cod, but also zero leakage of eggs and larvae". It is concerned with what cod may do once it transgresses the membrane, either as mature organisms (which have been known to gnaw their way out or exploit holes and material failures), or in the form of eggs or larvae drifting through the netting into regions where they can have unseen and uncontrolled destinies. Next the two kinds of fish, for which we have witnessed fragments of their explicitatory histories, are figured into a problematic coexistence that needs to be "holistically managed". The idea is that one can hardly foresee the effects of escaped "cultural" cod might have on fragile populations of "natural" cod. Both need to be considered jointly.

So far we can follow and I don't want to deepen the discussion of the linguistic content, more or less contingently inserted above. Rather I wish to draw attention again to what happened as you came to experience, or indeed the audience to which the speech was originally delivered. You have not had this happen to you before. Indeed that whole problem-space of cod-farming might have been absent from your personal trajectory until now. A person named Liv Holmefjord too and the imagination of net pens, escapes, administration, sites and so on. I would doubtlessly do quite a bit of violence to the specificities of what is going on if I assume you to be constituted in a definite way before you arrived at this event, and if I treated you as becoming constituted by the event in a somehow ready-made way. These are the classic mistakes of sociologies that treat persons as kinds with a catalogue of defining features, situations as mere types and experiential events as less than *sui generis*. So how to think of the experiences produced then and there, and here and now? And how do they come to relate?

It is obvious that texts have a crucial role in enabling both sets of experience. Exographic artefacts were plugged into organisms' peripersonal spaces and by this coupling a new kind of experience emerged: the textual

experience. Holmefjord became Holmefjord-equipped-with-text and by that coupling a new kind of reality was possible: the reading and hearing into presence of the conference absent cod, coastal and farmed, and concern for their terms of cohabitation. What power! Who knows what Holmefjord-without-text might have done? Surely it would have been something else and that duration of the conference would have been filled with different experiences by all present as well. The notion of an equipped humanity (Thevenot 2002) decouples agency as necessarily infused with intention. Intentional action surely has a place in many chains of action, but here I want to point out a baser kind of efficaciousness: Exograms are active participants in the trajectories woven by equipped humans. Like gravity or oxygen, they are enablers of specific trajectories of thus situated organisms. As a piece of paper co-enacting Holmefjord's speech for instance they might be conceived as plug-ins and subjectifiers (Latour 2005, 207-210), vectors of pull, that, once engaged, guide serial subjectivities along, producing experience of certain states of affairs and not others - possibly perturbing the trajectory of bodies too by redirecting attention, further voluntary movement and so on. This kind of active materiality of previously "inert" things has in recent years been the focus of much scholarly work. Jane Bennett for instance has argued for a kind of "vital materialism" (2010) in thinking the more-than-human world, a mode of attention that grants "vibrant matter" its proper efficacies, or "thing powers" (Bennett 2010).[25] By the powerful intervention of text the cod-realities could be conjured into a sensuous reality, experience and attention redirected, and imaginations of entities and their entanglement engineered.

However, as stressed in the introductory remarks on personal experience, it would be too much to overstate the presence these cod-realities as

[25] See also the recent volume *Material Agency: Towards a Non-Anthropocentric Approach (Knappett and Malafouris 2008)*, which approaches the topic from a variety of disciplinary angles.

collectively shared, if by that one imagines something like several hands touching a more physically durable thing. Sure enough all that become situated by a specific text or a certain situated speech act are offered to be moved by elements that have a certain isotopy. Printed text relentlessly conserves forms and utterances catapult forth soundwaves that will intonate similar biological sensing-systems similarly. Neither one of us would react to a dog-whistle, but a friendly "Hello!" is apprehendable by both of us with intact hearing and the capacity to interpret such an event. Words sent in order arrive in order if they are not intercepted, and so on. We would nonetheless leave unexploited what becomes analytically possible with our chosen perspective of experience as *cadacualtic*, if we assumed the same realities to be produced for each experient. We might instead consider again the specific trajectories of experiencing persons, who all come individually constituted, as travelers with diverse histories into the situation of being audience for a speech. Each of them can be said to inhabit their own sensuous events as they apprehend the situations, the speaker, the words, the imagination induced. And for every single one of them the precise intonation of their experience, then and there, is thinkable for us as what arises from what is brought to bear on its production: a historied personal cultural, physiological and mental constitution, the spatial situatedness in the very moments of sensation, the physical movements initiated by the own body, the operations of thought that might be prompted to follow a certain trajectory and not others – provoked by happenings internal or external to body and mind. They were perturbed surely, but exactly how they made-do and were made-to-do must have been private to the sensuous event. This poses a considerable problem for anyone trying to understand what went on in terms of subjects gaining knowledge of objects across an epistemological divide. Likewise would it become impossible to describe what is going on if one would insist on a finished Kantian subject and objects of knowledge that can be accessed without becoming different in the act. In my cursory account the sensuous event seems far too multiagentially constituted, far too singular and far too private

to allow a subtle enough description starting from those terms. Starting from such a mindset a study of knowledge work in the codomesticatory ecologies introduced above would have to be approached with this radical specificity of sensuous events in mind. It matters who gets possessed by which words, via which media, when, where and how.

5.5.1 A Whiteheadian ingression

Picking up on the themes of singularity breached in 2. and approached here now again, a short discussion of Whitehead is instructive to further deepen this theoretical sensibility into the fragility of producing realities. Things change in situ and novelty emerges in situ, not in any global or teleological manner. Now I do not wish to ask my reader to simply accept this as an accomplished fact about the world. Rather I wish to think it through Whitehead's "ontological principle" which figures earthly existence such (…) that 'there is nothing which floats into the world from nowhere' (…), that is, that whatever happens must be related to reasons. And creativity is not a reason, for 'actual entities are the only reasons' (…). (Stengers 2008, 92, citing Whitehead). In Whitehead in the hands of Stengers cosmic process becomes not by the constant instigation of some creative force construed as a kind of built-in motor: only "actual entities", also termed "actual occasions" or "events", may legitimately be reasons for something.[26] In Whitehead's metaphysics these are the "final real things of which the world is made up" (Whitehead 1929, 18). Note that the historical and concrete character of events is open in this scheme; it is left to be determined in situations where events always are found to occur. It is then not that Whitehead proposes to know the origin of novelty, but rather "that the question of originality obliged

[26] It must be noted that the meanings of these highly technical concepts derive from an intricate ecology internal to Whiteheads work. If I allow myself to borrow some of them here I cannot guarantee to stay faithful to an original context. Terms are necessarily translated, employed for the novel meanings they allow me to trace.

him to put to the test and revise his concepts" (Stengers 2008, 105). Stengers observes that

> One of the challenges at work during the composition of *Process and Reality* was the implementation of the possibility of relevant novelty and the tuning of Whitehead's conceptual agency until it was able to enhance and unfold into disclosure what originality demands. (…) And this is the very role of the 'ontological principle' (…). For the 'ontological principle' demands reasons and prohibits any easy appeal to creativity as explaining novelty. It thus confers upon novelty the power to compel thought. (Stengers 2008, 105)

Whitehead then does not ask us to trust him as a guide to a safe meeting with some final entities partitioning the universe (the infamous ontological furniture), or to accept cosmic creativity as a default, but to engineer our abstractions carefully in our encountering novel experience. But he does not leave us entirely helpless. Novel events occur by the "ingression" of other events into what becomes a new "actual occasion". The touch is extremely light. Just what the ontological consistency of any event may be is left open. We might think of a living animal body as an example of a certain kind of physically dense event, a reality that subsists by its proper conditions and ecologies, with its proper effects. And at any moment of the prolonged existence of such a being its subsistence has to be provided by an innumerable multitude of other events, of which only some can be hinted at: cells and their metabolisms provide their constitutive services to fend off entropic deterioration, oxygen and respiratory machinery too, chemical elements stick to their habitual interactions and even microphysical processes need to retain some form of stability. And with such a list we are still light-years away from doing justice to the full etho-ecological complexities involved in an actual living organism's making do in any situation: We have not even begun to scratch the surface of the deep and dynamic eventfulness of historical beings. Nonetheless, as good conductors of the scientific imagination of our day we don't meet much resistance in going along with this picture. What it did do for us is supply an intellectual technology that

leads us towards all that is necessary for things to happen in a co-enacted world.

So what if we tried out this ingressive logic on other kinds of things? A speech act for example. It qualifies as an event because it will ingress into other events and create new realities, but what kinds of actual occasions need to congregate to make it possible? The event needed Holmefjord, who in turn certainly needed her own operations of thought, feelings and meanings, words, the explicitatory histories that enabled certain cod-realities to become sedimented on a sheet of paper, the occasion of the conference and metabolisms of energy conversion that fuelled her body through another duration. Subtract one of these tributaries and the event changes character. And if the event changes character it will differently ingress into other events. Had a black hole opened, her train of thought stopped or had other words been written - for whatever reason - the future would have changed for all that were there to hear the speech. That is the kind of ontic efficacy *each* of these constitutive, "ingressive" events brought to the novel thing "speech". Not only do we gain then a sense of how utterly fragile the enactment of such an occasion is, but we are also directed to the strikingly different ontic consistencies it displays when compared with the example of a living body above. The speech is no doubt a real thing in the world as much as a body. Both have to be made and both do things, but their modes of existence differ. Both are composed of very different elements: one requires quickly passing, ethereal realities like imagined beings, racing thought, propelled speech and passing sensation to remain held in subsistence, while the other is something you can bump into, pierce with a knife or caress with your hand (that a body too is constantly reproduced by dynamic, fluid, even ethereal, processes is of course selectively neglected here). What we can gather from this Whiteheadian ingression is the following: all elements discussed so far seem to warrant the same kind of ontological dignity, no matter what their specific mode of existence, or ontic consistency. Like Darwin, Whitehead fully secularizes the production of difference, without shifting into generalized

process (*becomings* in Deleuze, or an *élan vital* in Bergson) (Latour, Harman, and Erdélyi 2011). Events are necessary to keep any thing in existence, a precondition for discerning any kind of becoming trajectory. Subsistence always has to be achieved via "the other", ingression into different other events, and does not follow from a general principle of process. Negatively the empirical philosopher-social scientist will arguably do well to rehearse the kind of light touch Whitehead enables. Positively she might start describing new genres of beings. Of course Latour's forthcoming work[27] on modes of existence would be required reading for anyone seeking inspiration on how to push into resolutely non-modern onto-imaginaries.

5.5.2 A Jamesian ingression

We can then complete our discussion here by highlighting a component reality I have so far referred to as experience. Let's hear Holmefjord one last time:

> In the short term we should establish requirements for approving operating plans for cod farming [...] In addition the requirements for the net pens should be sharpened. We have a zero-escapes vision, and with by that we don't just mean cod, but also zero leakage of eggs and larvae. [...] In order to develop a good and sustainable industry, I believe it is important to think holistically in the management of both wild cod and farmed cod. We should therefore coordinate all regulation with the aim to manage coastal cod in a sustainable manner.

Predictably enough something happened, again. You were given as stream of experience. The whole story, replete with beings, processes, relations,

[27] This is the thrust of Bruno Latour's work towards enumerating *modes of existence*. "If we can no longer count on substances and everything has to be made to subsist, then how many ways are there to subsist?" (Latour, Harman, and Erdélyi 2011). Taking cues from among others Whitehead, William James and Étienne Souriau, he aims to elaborate a "European ontology": those modes of subsistence the anthropological Westerners could not do without. Alternatively these are described as the "vital contrasts" we have stumbled upon in the course of our history. The "actor-networks" of ANT were never actors or networks, but trajectories of transformation in which something is passed on. The notion of *modes of existence* adds to these trajectories the *keys* in which they are sent, their own ontic consistencies and modes of instauration. Latour also terms the production of these keys *regimes of enunciation*. The system is still forthcoming, however some of the mutually exclusive tonalities Latour proposes have leaked: among others *the passage of law* (Latour 2010), scientific chains of reference (Latour 1999), what it means to *speak religiously*, how fictional beings can be said to exist, and even how souls are constructed (Latour 2011).

feelings, fears and desires. You went from worrying about something particular like eggs and larvae, to considering a leviathanic being like an industry, all in one meandering, pulsing stream. This very experience came to be given to you in the procession of your "unelapsing ontic consistency" - the *cadacualtic* observer reality - which curiously always experiences in a personal now. It appeared as a presence of relevancies in your personal now-time, articulating as "the self" an attention-to and imagination-of things. Isn't this always the case? No matter if we think of percepts, of memories remembered, of thoughts and feelings – all seem to share this raw existential condition of making up a self at a now of that self. Of course we may inspect past experience, turning attention towards what was given as a self at some point, but that demands a new operation of thought which in turn also intonates the self in now-ness. In a fundamental sense we are occupied by experiences as we have them, and thus preoccupied to the detriment, exclusion or nonpresence of other possible experiences. Behind them, there is nothing for us.[28] We are possessed indeed, not according to master-slave logics, but according to an additive logic. We are intonated in succession by every train of thought, percept or memory. This seems an irreparable human condition. So why is this not a just-so story? It marks the primal and exclusive singularity of worlds given to an experient. As William James elaborated with his notion of radical pluralism (James 1996 [1909]): we are indeed inhabitants of separate universes for which no general tool of unification is available, or indeed reasonable . By the basic fact of being passengers through distinct and exclusive outer and inner situations, we become at the outset as locomoting hermits – spatially divided into distributed sensing bodies which coincide with an equally exclusive observer-reality. A vital question for such animals is: how to get a grip on

[28] William James has noted this immediate givenness of things in experience. In the now famous article "Does Consciousness Exist?" (1904) he argues the point that any experience is given in full *as* the things and relations that make up the experience. There is no canvas of "consciousness" upon which what is given in experience would be projected. The world does not come bifurcated into primary and secondary qualities, as Whitehead would later put it. Experience proceeds in full as all that *is* the stream of experience, hence the title of the article that followed: "A World of Pure Experience" (1904).

common projects? How to become concerned for other regions of the pluriverse? We cannot expect our worlds to overlap at the outset. How do I know I have a stake in a nation with you? I don't, before it is given to me in experience. How do I know I share something called humanity with you? I can't, before it is offered to me in concept. How does someone know she is part of a common Norwegian cod-farming project? She doesn't before she receives the gift in experience. So words help, institutions help, exograms help, architecture helps - as so many means of coordinating projects and luring us towards what might become common worlds. And a crucial bottleneck is always engineering experience. If persons are not given offers for similar experience - in their individual biographical trajectories, through means of sustaining them institutionally, infrastructurally, possessing them textually, linguistically, nourishing them audiovisually and so on – collective projects become exceedingly difficult. We would tend to remain insular "cultures" of one body-mind, given to the biographical "natures" of one lifelong trajectory through existential envelopes. Now we might be so thoroughly enmeshed in possessions by others and from elsewhere (from birth to death, throughout the course of every day in industrial modern cultures), that it is hard to grant this observation salience, either as existential datum or basic fact that social theory should acknowledge. The simple antidote might be to call into attention the fact that for the whole of this argumentation you were guided by text, offered perhaps in an institutional setting were reading this text is part of a collective project? You might have the radio on, reminding you of the national day tomorrow? Or you might speak with your friends, family or go feed your fish later. Defined negatively the totality of these offers and their engagement is preventing you from going feral, nourishing you again and again with concerns, keeping you shielded against becoming a hermetic uni-verse. Defined positively you are continuously direct again towards what may become shared worlds, and every site and word counts. What is at issue for any other observer would lack utterly from your life, were it not for mutual possessions.

So just as these thoughts were given to you, as intervening and popping into presence at one moment, the event of the original speech gave an experience to Holmefjord and every single listener she addressed. Their personal nows, having arrived at this episode by the inheritance of a stream of past private nows, came to be led into the presence of new psychic availabilities, coming to knowingly graps something, privately and eventfully. If we were to imagine this spatially we could think of a vector for each person, each of which at some point intersects with neighbourhood coordinates of the speech situation. For each life-line this ingression is a unique event in the trajectory of a body and the unique chance to be perturbed in an encounter. Experience at that point was offered to each, negotiated into private percipient and experiential events. Taking into account the above discussions of the multitudes of other agencies (or events) that were necessary for this noetic event to come into existence, we can appreciate that these personal realities required an "engineering effort" of a wide range of actual entities: the words, the paper, your biographical mind and body and so on. Things quickly progress from past nows, either you read on, stop reading and follow another trajectory of thought or engage in a wholly new set of practical tasks. As far as we can tell every human shares this basic condition of navigating from existential envelope to envelope, while partaking in this wholly private cadacualtic stream of experience - a perpetual personal reclustering of attention and imagination. Like a technological project or a living animal it deserves theoretical recognition of its own ontic consistencies, its own flavour, its own ways of being built, called into being, demolished, recovered, transformed and so on. It has nothing subjective or objective about it, in fact it defies the terminology for subjectivity or objectivity may arise first as notions to the experient: it is simply another kind of thing. Though never regular, qua being *cadacualtic*, it may be thought as an element at work wherever humans make do. Human-like experiencing has a tendency to pop up where human bodies do, but

reducing the one to the other would only serve to de-realize what every experient can attest to. Like plasma or a gas it is hard to contain, keep stable, fixed, render it a specimen for analytic inspection – yet it is ubiquitously found as going on "in nature". Just what we try to mark by giving a name to persons might be conceived as trying to denote an element that came to exist finitely once in cosmic evolution. Every she, from this wholly secular perspective, can be, again, thought of as a kind of gem of which only one exists. The thought is beautiful and it has serious implications for how to think theory, here specifically minds probing into considerations of sustainabilities. Every explicitatory moment becomes a cosmic event, knowing realities and external ecologies, becoming concerned, imagining a world-out-there, perhaps propped up and led on by cosmograms.

5.6 Cosmograms

> If you want to keep your intentions straight, your plans inflexible, your programmes of action rigid, then do not pass through any form of technological life. The detour will translate, will betray, your utmost imperious desires.(Latour 2002, 252)

Perhaps the most analytically rewarding of the concepts introduced above is that of cosmogram. Before closing I will here sketch some analytical (re)orientations it enables and draw some connections to previously introduced perspectives. The scholar that has written most concretely on cosmograms as a potentially valuable concept for contemporary humanities and social sciences is historian of science John Tresch (Tresch 2007, 2005). I here rely mostly on his elaborations for probing into what cosmograms might be, do for us, and do for us as concept. Scholars of religion had used cosmogram to denote artefacts that made materially durable the word-orderings of certain groups (Tresch 2005, 67-69). Anthropologists had long referred to cosmologies, but the problem was one of access, and as I point out

above, also one of assumptions about the character of subject, mind and experience. On the topic of access: anthropologists dealing with oral cultures had to compile in meticulous work mostly utterances in order to gain insight into the world-orderings of these groups. Beside the considerable problems of interpretation and corroboration, this practice also fuelled the unrealistic assumption that world-orderings were systems that resided in heads. Considering the previous discussion such a tendency could only reifies myths of hermetic subjects, relatively unperturbed by the specificities of practices, with various engagements in experience making up surface-perturbations of a hardened "cultural" core. It is worth quoting Tresch at length

> [In] short, figuring out what is going on in the heads of your informants, describing their worldview or cosmology as a kind of post-hoc imaginary reconstruction, is just about impossible. Which is where the notion of cosmogram comes in. There are always certain points of reference that enable people to bring themselves into agreement – in a sense like the rites and symbolic objects Durkheim analyzes in *Les formes élémentaire de la vie religieuse.* Annual festivals establish such fixed points of reference for everyone who claims to be a member of a given group. And that's exactly what a cosmogram does: it puts this totality in a concrete form as the basis for new interpretations and action: social relations, relations with other cultures, with natural entities, with animals, plants – but it also establishes the relations between different domains or ontological levels – the mundane world, the world of spirits, God and the ancestors, places where they intersect. It's much more concrete than a cosmology. A cosmology can't be seen; a worldview is locked up inside people's heads. It also allows for a lighter grip: people can relate to it in different ways, it's not some monolithic mental pattern that determines their thoughts and actions. So a cosmogram points to a cosmology as part of ongoing practices, a representation made by holders of a worldview of that worldview. (Tresch 2005, 69-70)

Cosmogrammatic action as textual action then is thinkable as a genre of explicitation: plural, contingent, local, non-innocent and particular, revisable, comparable, transformative, mobile, stabilizing, destabilizing, restabilising, opening and closing (Tresch 2007). Texts may bring pasts, futures, presents and the whole of the cosmos to bear on any one event. Human language and imaginative capacity are therefore ingredients in processes of evolution charting their own contingent futures, on the basis of contingent pasts and presents. One does not have to assume a creator when people and texts themselves work as so many creators, folding

meaning, hopes, passions and even love into the genesis process of future ways of life. This is why it is as mundane a political imperative to start comparing competing cosmograms and how they are poised to act or not, as it is of cosmological-evolutionary significance how words find their way into the flesh of beings and their plural worlds. The latter does of course not derive from abstract principles, but the very concrete types of events we are witness to. And in keeping with the plea to not reduce any thing to any other thing as well as the spirit of the introductory quote, it must be emphasized that we have to anticipate cosmograms to do their own work, like any novel reality unleashed on the world. The following section is a short exploration of the kinds of action imparted by textual actors.

5.7 3D-beings translate into 2D-beings translate into 3D-beings

Image taken from (Cod-Group 2001, 1)

Lastly it becomes necessary to relate organisms, words, translations and practices and technologies of representation. How did the young cod

above arrive here? The legend gives it away: via technological mediation, photographed in the existential aquatic envelope it existed in as a breathing organism, inserted into the 2D-environment of a text, and transposed, again by technological means into this text. Much was lost and gained by these transformations. It can no longer surprise us by sudden movement, but in turn it affords to have a logo superimposed above its delicate features: "Norge. Seafood from Norway". It can be looked at again and again, it does not suffer and it does not die. Much like the text it was taken from. The generosity of the textual interface allows authors to draw together disparate elements (Tresch 2007), to assemble them in ways that would remain utterly impossible extra-textually. The possibilities are infinite, as long as things can be made to appear in 2D. Fictions, fact, feelings, uncertainties, animals and desires can all share a commensurable kind of materiality, and become immediate storied concerns to knowers.

It is a cod. You can see the photo. But is it an actor? This is how John Law and Annemarie Mol recently opened a discussion on material agency: "The Actor-Enacted: Cumbrian Sheep in 2001" (2008). A difference here is that I have taken the liberty to give a Norwegian cod the place they give to a Cumbrian sheep. Their text does theoretical things with Cumbrian sheep and the practices that differentially enacted them during the 2001 episode of foot and mouth disease in the UK. It problematizes what a sheep *is* by exploring what is *done* by and with it. It draws together several versions of sheep as they made a difference to the lives of sheep and people: divergent practices, all enacting sheep in certain ways. Sheep was more than one, but less than many – a sheep multiple, acting and being-enacted at different sites, with and in struggle with different agencies (Law and Mol 2008, 59):

> At this particular point, then, Cumbria, March 15th, 2001, the sheep in our picture is not only "in a picture". It finds itself at the cross-roads of a diverse set of practices. In each of these practices "a sheep" *is* something different. Each of these practices *enacts* "sheep" in a different way.

Besides multiple sheep a lesson here is that no one acts alone, neither people[29], nor sheep, not epidemiological models, nor landscapes, and so forth: all are taken up in specific practices, shaping consequences at moments of indeterminacy, outcomes that only after the fact may be attributed to individual actors. In the case of Cumbrian sheep caught up in a set of disease-related practices (amongst others epidemiological, economic and veterinary) as they unfolded through a number of related-yet-different enactments, sheep-multiple became consequential in a variety of more and less fortunate ways, for (unnecessarily) culled animals, dis-eased farmers, slaughter men and landscapes to name some. In this respect the article delivers a remarkable account for thinking complex interdependent action where those who act are not all human and some are more than one, but less than many. Their account highlights the need for a language between mastery and slavery, agency and structure, passivity and activity in writing the social. The consequentialities of different assemblages are not played out along neatly delineated and ahistorically knowable actors and structures that house them; clear-cut objects with determinate qualities, modes of action and outcomes-by-teleology. What/who matters and how is implicate to specific entanglements of living and nonliving things and the practices that relate them. This notion is a formidable point of entry for thinking through realities and promises of cod-plan-cosmo-grams, as wordy doers.

However as realities don't make themselves, things don't make themselves textual by some automatism either – the help of people and others

[29] It might be worth noting that I sometimes employ the word *people* to circumvent reifying more than necessary the word human: a taxonomically conceived kind, a type of organism with fixed capacities, known qualities, a finished entity. If on the other hand human organisms have always been "multispecies knottings" (Haraway 2008) and an organism "betting on life" (Latour 2005) that traces trajectories through time and space achieving sustenance only *by* heterogeneous and perpetual entanglement with all kinds of "nonhumans", what is "human" about people becomes more interesting. With Latour we should then rather attend to the material and discursive "humanizers" that circulate the material equipments that allow our bodies to speak, feel and become "human".

is needed to de/inscribe in human language, graphs and pictures what is going on, make cod-land appear in cod-plans. There are practices of authorship involved and the crafting of certain stories and not others, certain versions of the world make it, others don't. The process by which some words and stories come to be made present warrants attention: picture of a young cod with an imprint of the nation on the flesh did not come to appear here by itself and it was changed in the process. The fish swimming in some actual water-ecology had to become embedded with another: it needed to be translated into the ecology of our document through a heterogeneous genealogy of action; practices caught up constitutively with technology and technique: machinery, knowledge and action of photography, digital image processing, importing an image into a text document and as many more as we wish to think through. So while our cod was at another time and another place immersed in H2O and posing for a photographer, it is now situated in the center of a European standard size A4 page, with an ISBN number (82-9172-73-0), the document title (OPPDRETT AV TORSK – Strategi for koordinert satsing fra SND og Norges Forskningsråd 2001-2010) and a date of publication (28.03.2001) above it, and the respective logos of The Norwegian Industrial and Regional Development Fund and The Norwegian Research council below it (Cod-Group 2001). An organism was made textual. Of course this is the tip of the iceberg, and I wish this example only to enable us to think all the practices and technologies of translation it takes to re-present fish via text. Tracing those practices and technologies in future inquiries will allow us to ask questions about how well fish are being represented and for whom, to what ends.

Many academic traditions have thought and written relations between language and the world, text and history. In my ways of these relations here I am perhaps most crucially indebted to a family of theories that employ the notion of a material semiotics. Possible origin stories are many, the diasporas are scattering and theory has been in constant translation (Law 2007). Law

and Mol recently drafted an account of material semiotics in relation to how we may think action in the social sciences beyond the hopelessly ossified agency/structure pair. Their formulation, while hopefully accelerating osteoporosis in a tired dichotomy, amplifies aspects I wish to put to work with cod (Law and Mol 2008, 58):

> [Material semiotics] disentangles agency from intentionality. Within material semiotics, an entity counts as an actor if it makes a perceptible difference. Active entities are relationally linked with one another in webs. They make a difference to each other: they make each other *be*. Linguistic semiotics teaches that words give each other meaning. Material semiotics extends this insight beyond the linguistic and claims that entities give each other being: that they enact one another. In this way of thinking agency becomes ubiquitous, endlessly extended through webs of materialised relations.

So much for the perhaps most basic intuitions of material semiotics: relations are constitutive; the entities they enact are mercilessly historical. But how to tell stories about pasts, presents and futures in worlds of perpetually proliferating enactment? It helps to think a bit longer with Law and Mol (Law and Mol 2008, 58)

> But where to localise agency in such webs? Where to pin it down? This becomes a matter of attribution, *post hoc* and after the action. In telling stories about events, some entities are detached from their background and called "actors". They are made to conceal and stand for the web of relations that they cover. They become the place where explanation, moral, causal, practical, stops.

Entities can then be understood as what is detached from backgrounds in an account, what and who acts is named by the things, people and instruments doing the storytelling (for otherwise we would speak exclusively with verbs). This may be an adequate description of what happens when people write cosmograms. This does of course not mean that making entities and action explicit with language and text is innocent or arbitrary or easy. No knowledge making is innocent (for example Haraway 2008): translation is the name of the game and it is always also betrayal (Law and Hassard 1999). The word is never the same as the set of relations it *is made* to conceal and stand for. Experience-engineering via text is of course no exception.

Asdal makes this point in another context, but to similar ends (Asdal et al. 2008, 114)

> [...] if we understand the text as a more or less mechanical reflection of that which the texts is dealing with, we ignore that the text is different from that which it relates. It is simply a result of something else – language and other semiotic resources – than the realities it deals with. At the same time we risk ignoring that what is presented as factual and technical also carries judgements and attempts at interpreting and changing reality.

Making something textual is acting with and upon realities in non-innocent ways. The non-innocence ranges from what and who (some nouns) is made present from a background of on-going intra-action - and by the same token what and who is made absent – to the ways action is told (some verbs and adjectives and not others). But there is more: Asdal here theorizes with bureaucratic text, a style akin to our cod-plans. Along with the disciplined "nakedness" of scientific text, bureaucratic text is a strong contender for what in the modern imaginary makes an innocent account of "facts": reality-is-reality-is-reality, ideally auto-inscribed, without making detectably present a human author to dilute the realness. In contrast then the closing sentence emphasizes the crucial component of human experience in crafting realities-as-text. Making human language and text is a practice with people-entangled: human organisms are points of passage for translating reality to text; if not obligatorily so – machines write too - then routinely so (and importantly in our cod-plans). And as all living things they are situated: in historical spaces, times and knowledges. To be sure, this is not to think the becoming textual of realities as a merely anthropogenic process: it places human bodies firmly in the sticky company of heterogeneous others. We may think of them as a host of living and not-yet-living co-authors: the realities that are made textual must afford their inscription through sets of bio- and techno-logies – computers and brains, fingers and keyboards, scientific instruments of inscription and human visual systems, and always a myriad of others. Again, these dynamics deserve to be described and considered in relation to the

question of good and bad re-presentation, their proliferation in networks, and their potential careers into issues that might spark publics (Marres 2005). Not least do the curious dynamics of co-domestication via text deserve attention. Future cods are ubiquitously deployed in the cod-plans, their textual presences become basis for interventions into the engineering of the flesh of their three-dimensional finned kin (for example via provoking funding for breeding, genetic research, regulations and so on), making potentially new ways of life, and new kinds of organisms. An analogous argument can be made for humans, and more importantly, interrogated empirically for both people and fish.

6. Closing remarks

As I have continually tried to offer intermediary conclusions I here leave it up to the reader to answer for herself, if the above considerations have enabled her to see more beings at work in the social world than when she set out reading. And then there is the hope of having inspired interest in the discussed literatures, as well as the empirical challenges sketched. Perhaps you were possessed by friendly beings not of your own making? Inspired, perturbed, equipped with new sedimentations of experience, new trajectories of thought and action opened. As remarked at the outset however, these results are at this point beyond my situation.

Perhaps the most exciting prospect uncovered for me is the possibility to in the future approach an aquaculture nexus where humans and cod truly can be studied as also self- and co-domesticating via their technological-cognitive envelopes, including hopes, dreams, orderings, and organisms made textual. Textual action has become thinkable as an eminent driver of this uncertain co-evolutionary process, fraught of course with all the eminently political questions of what/who is made to matter for what and whom, via which media. Are cod well represented to people, and ultimately unto themselves and their future ways of life? To which publics and on what terms are contentious issues of sustainabilities made relevant? What are the issues that drive renegotiations of cosmograms? How do the various cod-cosmograms in circulation relate? It should be only fair that the cod-plan ecologies so unjustly neglected in this project in the future become opened to sustained empirical analysis in this vein.

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