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Editorial

Articles

Book Reviews

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Note from the Editorial Team

Dear readers,

You are holding the first fully open access issue of Science & Technology Studies. A few words about how this came to be, are in order.

Since Science & Technology Studies started as the house journal of EASST (European Society for the Study of Science and Technology), it has had an embargo on its most recent issue that was provided as a benefit to members of EASST and FSSTS (Finnish Society for Science and Technology Studies) and other paying subscribers. During 2016, however, EASST and FSSTS councils deliberated this and decided to drop the embargo in favour of open access. During these debates, the councils considered the value of the journal as a member benefit against the opportunity of creating a flagship free-of-cost, open access STS journal that is also independent of commercial publishing houses. The councils discussed who they represent – the paid members (holding on to the idea of having a journal accessible through membership), or STS as a whole through open access to all.

The journal editorial team, EASST and FSSTS are pleased to announce that the journal will now become available to everyone (including a planned 'online first' pre-publication repository to get papers out ahead of their official publication). The journal appreciates the vision of councils -- open access publication is possible thanks to the financial support from EASST.

Further announcements from the journal include welcoming two new editors Sarah de Rijcke and Alexandre Mallard, and Editorial Assistant Heta Tarkkala. Sampsa Hyysalo, on the other hand, a long lasting editor of the journal, is stepping aside after a decade in the editorial team and as the coordinating editor. With huge appreciation, we want to thank Sampsa for all his efforts in developing the journal to where it is now.

The review section is also undergoing changes. Our book review editors wish to confirm our recent expansion of the formats we are interested in covering the reviews section. Recognising that our reading and writing of texts as STS scholars is one end of a continuum, we have began to include exhibitions and other performative events in our remit. In our previous issue for example, we included a review of the recent museum exhibition *Reset Modernity!* at ZKM by Endre Dányi and Michaela Spencer (see http://sciencetechnologystudies.journal.fi/article/view/59527).

Our review editors seek inputs from readers for upcoming reviews – please contact either Brit Winthereik or Helen Verran if you'd be interested in reviewing any of the following:

- 2017 is the 25th anniversary of the publication of *Science as Practice and Culture*, Andrew Pickering (ed.) by University of Chicago Press. Reviewing it in *Contemporary Sociology* in 1993, Malcolm Ashmore began his review this way: "This volume… has a mission encapsulated in the following slogan or rallying cry: sociology of knowledge (SSK) is dead; long live sociology of scientific practice!" We are asking for an early career researcher to review this text twenty-five years later. How does it look now? Is it an STS classic?
- Last year the whopping 4th edition of the *Science and Technology Studies Handbook* was

published by MIT Press. It has 36 chapters each available as a separate text. We are asking our readers for expressions of interest in reviewing self-designed clusters of up to six chapters. The idea is that we include a review of selected chapters of this text in each of four successive issues across 2017-8. We are then, looking for up to six reviewers who will select up to six chapters from the book and review them as a cluster. We will arrange for the book to be sent to you from the publisher as a pdf. Unfortunately, those who have published chapters in the *Handbook* are not eligible. Identify your chapters and tell us when your review will be available.

- At the end of February Amsterdam's 'Sonic Acts' will stage their annual festival "The Noise of Being," featuring STS scholars as speakers. If you plan to attend and can write a review of this event to be published in the second edition of S&TS in 2017, please email Brit or Helen. http://sonicacts.com/2017/festival/sonic-acts-at-de-brakke-grond

Finally, as ever, we welcome new submissions from scholars across Europe and elsewhere – research papers and review articles, discussion papers and book or exhibition reviews as well as special issue proposals – we look forward working with you. This work would not be possible without our reviewers so most importantly, we want to express our gratitude to our reviewers whose contributions are vital to the success and quality of the journal. Thank you.

On behalf of the editorial team and best wishes,

Salla Sariola
Coordinating editor
Science & Technology Studies

Nearshore Wind Resistance on Denmark's Renewable Energy Island: Not Another NIMBY Story

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Abstract

The Danish island Samsø is world-famous as Denmark's Renewable Energy Island. 21 wind turbines supply the island's electricity. Today, public hostility toward a projected nearshore wind farm off the island's preserved northern coast is growing. This paper takes its main theoretical cue from Gomart and Hajer's (2003) call to open up political questions to empirical inquiry and to pay attention to the material settings in which political questions unfold. The paper seeks to make sense of the islanders' unexpected opposition to a new wind farm, and it does so through a critique of the unexperimental and depoliticizing attitude – found in the empirical case as well as in some academic scholarship – of the NIMBY (Not In My BackYard) logic. Replacing the NIMBY logic of closing down deliberation with an empirical and 'cosmopolitical' (Stengers, 2005) approach to open up the space of politics to close investigation, the paper focuses on the empirical settings which give the controversy its specific shape and asks how the projected wind farm is interrogated, negotiated and recast as it travels through the socio-material politics of the wind controversy.

Keywords: NIMBY, renewable energy, controversy studies

Introduction

An idyllic landscape – rolling, green hills, blue sky, the Danish flag on a pole – appears on the computer screen accompanied by light music. A hand enters the picture, waters a patch of land, and from the soil shoot baby wind turbines, perfectly nested among the trees and grass of the hills. The wind turbines are picked up by a pair of hands and put into the water at the foot of the hills while a speaker talks about how in Denmark for many years now, wind turbines have delivered environmentally friendly, CO_2 neutral electricity. Soon, the speaker goes on, the Bay of Aarhus will have its own wind farm, a farm in which everyone will be able to invest. "The wind turbine guild of the Bay of Aarhus is for *you*" (www.vaab.dk).

The stop-motion promotion film on the wind turbine guild VAAB's website (www.vaab.dk) is accompanied by black and white videos in which members of the guild - teachers, students, nurses - explain why they have joined the project. Their statements center on the importance of being part of a positive change in society; they talk

Figure 1. Screenshot from the promotion video on www.vaab.dk.

about being granted a say in a meaningful project, exercising their democratic duties as citizens, and leading Denmark towards a fossil free future.

Meanwhile, on Samsø, an island of four thousand inhabitants in the Bay of Aarhus. A man, the vice-president of VAAB and Samsø resident, is walking in the preserved hills of northern Samsø – hills which bear no small resemblance to the landscape in the film described above. According to an islander, the vice-president knew that if certain members of the island community were to oppose the wind farm the project's realization would be jeopardized, so the vice-president went to the homes of key islanders, hoping to put a lid on the protests to come over a cup of coffee (interview1, Samsø resident, Nov 2013). Despite his efforts, soon after the announcement of the wind project in the bay area called Mejlflak, protests broke out on the island, turning the project into a heated political issue and the development of the wind farm into a sociotechnological controversy.

This is the story of the still unfolding Mejlflak controversy as seen from the island of Samsø. Samsø is not just any peripheral farming and tourism island. In 1997, Samsø was appointed Denmark's Renewable Energy Island by the Ministry of Energy, a nomination that set an island-wide, locally managed energy transition in motion, transforming the rural island landscape into one marked by on- and offshore wind turbines, district heating plants and solar systems. Ten years from 1997 the islanders had managed the transition to energy self-sufficiency and could call themselves 'CO_2 negative', thanks to the surplus electricity produced by offshore wind turbines which is exported to the mainland to offset the islanders' transportation practices which remain fossil fuel intensive.

This article examines how and why on this Renewable Energy Island still engaged in alternative energy initiatives resistance is mobilised against a new wind project. The aim is to go beyond the tendency to write off public resistance as NIMBY (Not In My BackYard) reactions and take a closer look at the dynamics at play in this unlikely case of opposition against renewable energy (RE). Without a deeper understanding of the dynamics of opposition encountered by many large-scale RE projects, the road toward the de-carbonization of our societies will be bumpy at best. How do the Mejlflak turbines become controversial objects on Samsø? is the question that will guide the inquiry. The analysis will be structured around the settings or forms (Gomart & Hajer, 2003) in which the controversy comes to life: the project's environmental impact assessment report, the public hearing process, the newspaper debate,

the public meeting and the reactualised role of Samsø's previous experiences with RE projects.

Materials and Methods

I conducted fieldwork on Samsø in the fall of 2013 and spring of 2014. For five months, I lived on the island and took part in the everyday life and work at the Energy Academy, the public non-profit organization behind most of Samsø's energy initiatives. I considered the ten Energy Academy employees my colleagues, attended relevant meetings and executed minor tasks for them. In addition to countless informal conversations with Academy employees and other islanders, I carried out some thirty semi-structured interviews with central island actors as well as with Energy Academy employees and ploughed through reports, newspaper articles and books about Samsø. During my fieldwork, I hardly came across any negative accounts of the Renewable Energy Island (REI) project[1]. This led me to focus primarily on the islanders' positive experiences with the community-driven renewable energy project, and I largely came to view Samsø's energy transition as a success story without strong signs of disagreement or contestation. But an ongoing conflict caught my attention: the controversy surrounding the Mejlflak nearshore wind farm project.

As part of my fieldwork, my investigation of the Mejlflak case was one focus point among others. The data material supporting this analysis consists of qualitative interviews with citizens based on Samsø – both summer house owners and full time residents - and ethnographic field notes along with publicly available documents, websites, newspaper articles and readers' letters related to the Mejlflak project (all documents accessed and newspaper searches conducted between September 2013 and April 2014).

The Mejlflak project was discussed in fifteen of my thirty interviews: three of the municipal officials (including the director of the technical and environmental administration in Samsø Municipality and the head of tourism and business on the island) made critical comments about the project, as did two Energy Academy employees. I interviewed the spokesperson of the protest group "Southern Jutlanders Against Wind Turbines at Mejlflak" (www.aarhusbugtenog-kyster.dk) as well as the previously mentioned vice-president of the wind turbine guild behind the Mejlflak project development, a farmer who also played a central part in the REI project. Of the citizens I interviewed who are not part of the project some expressed critical opinions while others expressed surprise that a wind project could meet such resistance on a renewable energy island.

The interviews were conducted at an early phase in the Mejlflak project. The business model and building contractors not yet in place, what was completed was the siting, the environmental impact assessment and related reports as well as the public hearing process. During the months in which I discussed the project with the islanders, people generally felt in the dark regarding the progress of the project, as the developers seemed to have drawn the curtains after the initial publicity phase. This article focuses on the publicity phase, the phase dominated by public meetings, hearings and debate. It is the phase in which the controversy has found its most visible and loud expressions and where all kinds of records of the case are readily accessible (Venturini, 2010: 264).

I have not interviewed the project developers. They make their views clear in numerous articles, reports, minutes of meetings in the wind turbine guild, in communication materials as well as through their actions. The aim of this article is not to provide a balanced, in the journalistic sense, account of the development of an RE project, but to apply a view from Samsø in order to further our understanding of opposition to RE projects. I investigate how positions of resistance commonly disqualified as NIMBYism (Not In My BackYard) can be appreciated as positions from which statements are made that can help articulate the issues at stake and make contributions to the definition and understanding of the object of concern. My hope is that such a deepened understanding of positions of resistance might point to more constructive ways to approach the planning of the RE projects integral to a future less dependent on fossil fuels. Moreover, by approaching the planning of large, potentially controversial projects as genuinely political and democratic exercises involving the entire affected community,

we might learn how CO_2 emission reductions can give rise to community development rather than conflict; something Samsø managed during the island's energy transition in the nineties, I will argue. In the following I sketch the analytical approach underlying the analysis.

Theory

Studying Controversies: Studying Politics in Practice

In their article "Is *That* Politics?" Gomart and Hajer argue that the distinctly empirical approach of science studies can benefit the study of politics (2003). Instead of "thinking that we can know a priori what (democratic) politics look like" (Gomart & Hajer, 2003: 34), we ought to make politics into an empirical question, they argue. A strong empirical commitment prompts us to venture into a serious engagement with the various settings in which our phenomenon of interest takes place, as these settings, according to Isabelle Stengers' experimental constructivism, "deform the phenomenon in an interesting way, giving a novel spin to the ordinary word 'interesting'(…) The interesting setting is one where the person or creature or thing is not left alone, authentic, but transformed by what occurs, and transformed in ways which induce its interference with the project" (Gomart & Hajer, 2003: 39-40). This interest in the settings in which a political problem unfolds and the attempt to turn the study of politics into an empirically grounded effort mirrors Latour's (2007) call to investigate the trajectory of an issue as the issue evolves and enters and leaves distinctive *stages* (or settings or forms).

Scholars in science and technology studies (STS) have long been concerned with the association between issues or controversies and the way in which they tend to 'spark new publics into being' as they call upon the parties affected by the controversy to get engaged and try to solve the problem (Marres, 2005). The controversy as an object of interest within STS is understood as an instance of politics in practice; a politics which departs from traditional political theory on especially one important parameter. This is not a politics confined to a specific 'political' domain, to the institutions of representative democracy and related venues in which policy-making is known a priori to take place. According to Latour, 'political' "is what qualifies a type of situation" (Latour, 2007: 815). Politics turns around issues, "instead of having the issues enter into a ready-made political sphere to be dealt with" (Latour, 2007: 815). 'The political' thus assumes different forms in different settings and is changed through the interaction with the setting (Whatmore & Landstrom, 2011: 3).

This 'politics' is not a stable figure but should be understood as a changeable movement, only to be known through careful empirical investigations. In a similar manner, the public is not equally engaged, nor does its composition remain unaltered, throughout the trajectory of a political issue. For instance, a seemingly apolitical situation operating out of the public eye, such as a government agency's technical-environmental investigation of an RE project, a well-regulated process following strict, pre-established guidelines, is made up of political moments and decisions (what is taken into account, which elements are left out?), but the process towards finalising the reports typically only involves a select cast of experts and consultants, not a public.

I trace the different political 'states' assumed by the issue as it travels through the settings of the RE project: from development and planning to the public involvement phase. By tracing the trajectory of the political issue - closely resembling the way in which actor-network theory taught us to trace the associations of the social through the analysis of heterogeneous networks of human and non-human actors - we gain a deeper understanding of the workings, tensions and dilemmas of the ongoing wind controversy[2]. With Gomart and Hajer, we can experiment with a new definition of politics, namely: "what does a setting (practice, form) do to those who are engaged in it?" (Gomart & Hajer, 2003: 41). This understanding of the political invites an exploration into the "form of politics, examining the particular sort of engagement it enabled or delimited" as each investigated practice or setting constitutes politics in its own way (Gomart & Hajer, 2003: 47). The overarching setting in which the islanders are involved is northern Samsø itself, the part of the island which will be affected by the turbines. While I take the public meeting or the newspaper

debate as settings which allow the controversy to unfold in distinct ways, the island itself is to be understood as an ever-present setting which affects those engaged with it.

While this is a single-case study, I will remind the reader of Andrew Barry's concept of 'the political situation': "Controversies are neither static locations nor isolated occasions; they are sets of relations in motion, progressively actualized.… They contain multiple sites and events" (Barry, 2013: 10). Barry points to the fact that controversies, no matter how specific and local, are embedded in political situations composed of different disputes which provide the implicated actors with their understanding of the unfolding situation. This is not to say that smaller controversies are simply instances of larger, more general phenomena, but rather that the question of whether a controversy has wider significance and is connected to larger issues, say, of resource dependency or political energy targets, will be contested questions fuelling the controversy (Barry, 2013: 11).

On Samsø, the island's status as Denmark's Renewable Energy Island since 1997 is drawn into the controversy over the projected Mejlflak turbines. The narrative about the island's successful transition to renewable energy is used by both proponents and opponents of the wind farm and thus takes part in the political situation under investigation. To proponents of the new project, Samsø is simply offered a chance to consolidate its position as a green front runner. On Samsø, by contrast, the Mejlflak project is brought out as an example of how *not* to go about creating a renewable energy project, thereby highlighting the practices of citizen participation developed and the hard work put into realising the REI project. People's stories about and experiences with the renewable technologies already in place live on and are mobilised to play their parts for and against the projected Mejlflak wind farm; this is one inescapable setting of the current controversy. The islanders' experiences living on a Renewable Energy Island shape their reactions to the Mejlflak wind farm and the analysis presented here.

The Problem with NIMBY

A ghost that has been haunting public debate and controversy around new RE developments is the NIMBY (Not In My Backyard) syndrome. A quasi-scientific idea found in both (critical) academic research (e.g. Delicado et al., 2014; van der Horst, 2007), policy documents and among the affected parties of controversies, the NIMBY hypothesis posits that although people (according to *some* opinion polls, see e.g. Devine-Wright, 2007: 4) tend to support RE projects *in general,* they are likely to oppose *specific* project plans in their local area. They want to enjoy the benefits of clean, CO_2 neutral energy, but not in their own 'backyards' where the plants are feared to be noisy, disturb the landscape and perhaps even harm the health of affected neighbours. NIMBY is seen as a knee-jerk, self-interested, even hypocritical reaction not to be taken seriously, as NIMBYs are people who reject the public good on particularistic and thus illegitimate grounds.

While academic scholarship engaged with the study of public opposition to and acceptance of RE projects has increasingly taken issue with the NIMBY thesis which is generally deemed unconstructive, insufficient and an empirically "inaccurate and unhelpful way of characterizing opposition to siting" (Burningham et al., 2014: 2; and others[3]), in this article I hope to open up a space that takes us even farther from the logics underpinning the NIMBY thesis.

In keeping with many of these studies the present analysis of the Mejlflak controversy stresses the importance of local ownership, trust, community and participation. But my main appeal, my fundamental argument against the NIMBY logic is not that it is empirically inaccurate and that other factors can be identified which constitute more pertinent barriers to public acceptance and carry more explanatory power. In this article, I will not focus on identifying factors that drive or impede project implementation. My main argument is political. The problem with the NIMBY attitude which I will focus on here is that it closes down deliberation. By calling people 'NIMBY', opposing voices are being silenced. 'NIMBY' is a depoliticizing move (see Edkins, 1999: 9) which reveals the managerialist, instrumental logic characterizing some large-scale develop-

ment projects. The project *must* be realized, that fundamental point is beyond discussion, and the public becomes nothing but an impediment to project realization with its foreseeable negative attitude and well-known counterarguments. With every counterargument automatically debunked as an expression of the catch-all NIMBY category, all objections against the project are made equal: they become 'barriers' to be overcome rather than articulations of concern worth engaging with and taking seriously.

Instead of viewing public opposition as something to be simply "overcome" (Aitken, 2010: 1840), I propose that we, in line with the STS literature introduced above, consider the formation of publics a resource and a productive moment of democratic politics. I will argue, in line with Walker et al. (2010b), that ushering the public into the heart of processes connected with the development of more sustainable ways of producing energy has the potential to bring with it not just CO_2 reductions but also benefits for the involved community on a more general level, as was the result of Samsø's own RE transition. Such results require an open-ended, participatory process experimental in character; a process emphasising "mutual learning and an exploration of the unknown, the result of which cannot be methodically guaranteed" (Jensen 2005: 223). With the costs and resources involved in large-scale RE projects, introducing an experimentalist element into the process will seem demanding and risky, and resorting to shutting down engaged publics through allegations of NIMBYism may seem a more straight-forward solution. What I propose, however, is that we – researchers as well as project developers – strive for an open and genuinely political engagement with these publics. I suggest that we dive into the empirical magma of each project (Venturini, 2010). As such, my proposition is a 'cosmopolitical' one.

Proposing a 'Cosmopolitical' Approach

What might we learn from opposition if we listened closely? This attentive attitude resembles what Freudenburg and Pastor in an early article (1992) termed 'the prudence perspective':

> If the prudence perspective is closest to the truth, it would suggest a need for a broader range of citizen concerns to be taken much more seriously. In fact, citizens would then seem to be proper experts for making decisions on values… From this perspective, much of the NIMBY problem would seem not to result from the greed or shortsightedness of local residents, but from the questionable credibility of companies, agencies and others having fiduciary responsibilities. (Freudenburg & Pastor, 1992: 50.)

As I do not consider it my business to call the credibility of the project developers into question (although the empirical data might to some extent do so), I will propose a more empirically grounded approach to taking citizen concerns seriously. What takes the place of NIMBYism is the proposition found in the writings of Gomart and Hajer and others telling us that "no one can define a priori what is 'politics'" (Gomart & Hajer, 2003: 56). Instead of positioning RE projects a priorically on the side of the public good and 'NIMBY' responses thus inescapably particularistic, our empiricism forces us to interrogate such logics and take citizens' decisions and values seriously.

One final point to be derived from writings in STS brings us to Stengers' (2005) "cosmopolitical proposal". Stengers' proposal is instrumental in turning the NIMBY logic on its head. While concerned citizens' 'situated knowledge' (Haraway, 1988) tends to be considered illegitimate due exactly to its 'situatedness', their concerns dismissed as self-interested, Stengers (2005) proposes an alternative understanding, turning citizens' grounding in the concrete settings of their lives into exactly that which makes them *sensible* and their concerns *relevant*. After all, they are the ones whose lives are immediately affected and, following Stengers, we ought to 'design the political scene' in a way that accommodates those whose attachments are at stake instead of disqualifying citizens' positions exactly because their attachments are the ones that are threatened:

> …there is no knowledge that is both relevant and detached. It is not an objective definition of a virus or a flood that we need, a detached definition everybody should accept, but the active participation of all those whose practice is

> engaged in multiple modes with the virus or with the river (…) [H]ow to design the political scene in a way that actively protects it from the fiction that 'humans of good will decide in the name of the general interest'? How to turn the virus or the flood into a cause for thinking? But also how to design it in such a way that collective thinking has to proceed 'in the presence of' those who would otherwise be likely to be disqualified as having idiotically nothing to propose, hindering the emergent 'common account'? (Stengers, 2005: 1002).

The analysis of the Mejlflak wind controversy falls in four parts, each representing a new setting in which the controversy is dealt with and transformed. In the first setting, the nearshore wind farm is presented as a complicated fact emerging from an environmental impact assessment report and other statutory documents. A second setting takes the shape of the islanders' past experiences with becoming Denmark's Renewable Energy Island. Here we see how past practices of citizen participation shape expectations and criticisms of the Mejlflak project. In the third section, two central settings are investigated and juxtaposed: the public hearing process and the local newspaper debate. Both transform and challenge the Mejlflak project and the people involved on both sides of the debate, but they do so in distinctly different ways. The fourth setting is the statutory public meeting held on the island, which curbed rather than invited opposition. The analysis of these empirical forms will allow us to answer the question *What makes the Mejlflak wind farm controversial on Samsø?* This understanding will allow us to appreciate 'NIMBY' responses as meaningful reactions that could not only serve as cues for future projects but also allow RE projects to deepen rather than challenge democracy.

Analysis

Emerging from Documents: The Development of the Nearshore Wind Farm

The idea behind the Mejlflak project came from a group of members of a local branch of the Dan-

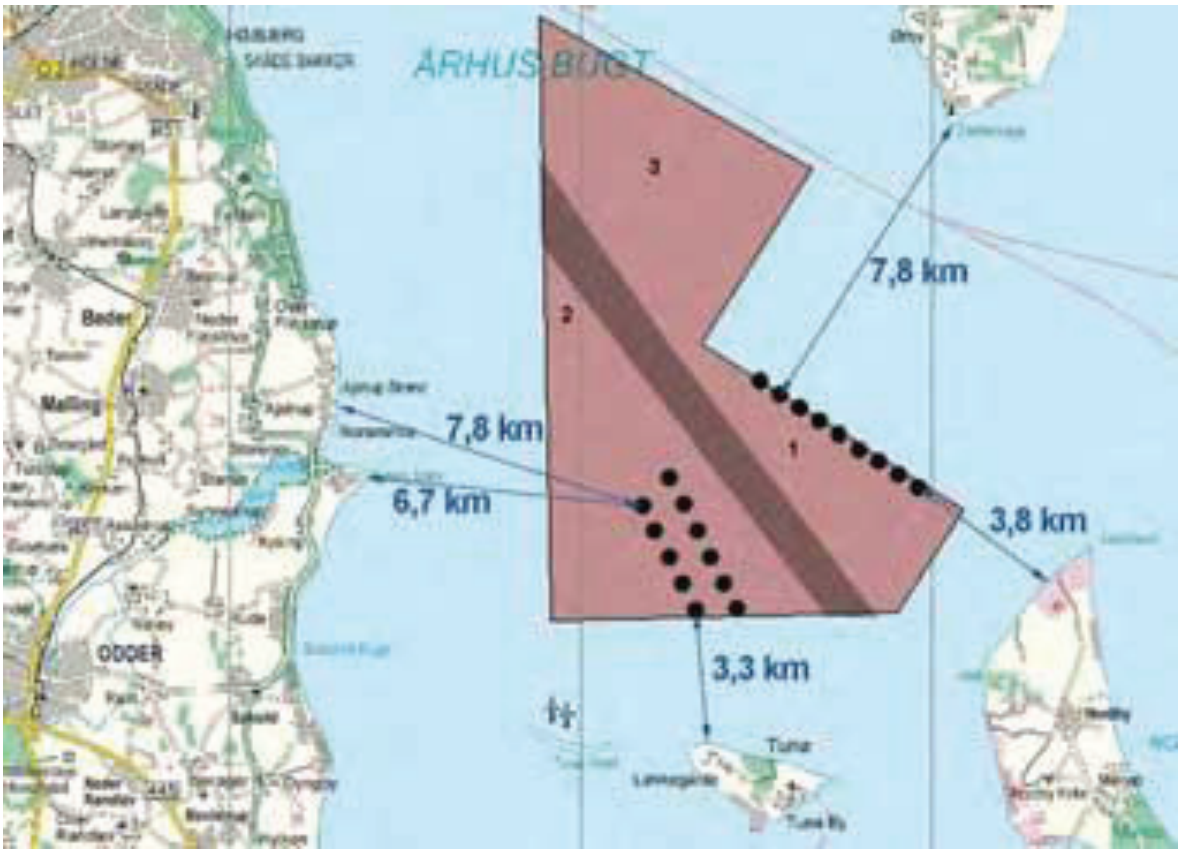

Figure 2. Map illustrating the position of the projected wind farm in the Bay of Aarhus. To the left, Aarhus. In the bottom right corner, Samsø's northern tip. Source: www.oddernettet.dk, Odder Municipality.

ish Society for Nature Conservation. The members founded an association in 2010, VAAB I/S, and got a large, local energy company, NRGi, on board together with four smaller energy companies along the Bay of Aarhus. The group then created HAAB A/S (which ironically translates as HOPE INC), the development company behind the project. The chairman of HAAB, Søren Egge Rasmussen, is also chairman of NRGI's executive committee as well as a member of Aarhus municipal council, representing the Red-Green Alliance (Enhedslisten), the most left-wing party in the Danish political system. The project has thus had both a distinct political and a commercial air from the onset, despite being a grassroots initiative.

In the introduction to the project's environmental impact assessment report (EIA) it is stated that "the starting point was the wish to establish an offshore wind farm which citizens, businesses, municipalities and others around the Bay of Aarhus could take part in and become co-owners of" (Energistyrelsen [the Energy Agency], 2012a: 2)[4]. According to the EIA, the initiators were inspired by Samsø's positive experiences establishing an offshore wind farm on the southern side of the island in the early 2000s as part of the Renewable Energy Island project. The introduction to the EIA also mentions that a new offshore wind farm will be in line with Denmark's energy policy and the goal of having wind energy cover 50 per cent of Danish electricity consumption by 2020. The project in itself, however, the reader will recall, is not a government project but a private initiative.

The Mejlflak wind farm is to consist of twenty *nearshore* sea turbines of 150 meters with a capacity of 60-120 MW. In 2009, only one percent of Danish wind turbines were taller than 75 meters (Energi- og Miljødata, 2009), and since then technological development has been somewhat stagnant (Energistyrelsen, 2012b). To Danes, then, 150 meter turbines in an enclosed bay area do not compare to earlier experiences with wind power (on wind power development in Denmark, see Karnøe 2013). In comparison, Samsø's offshore wind farm of 2003 consists of ten offshore turbines with a capacity of 23 MW. Readers' letters in the local newspapers label the turbines 'monster mills' due in part to their unfamiliar size (Gudmundsen-Holmgreen, 2013).

Nearshore wind turbines - new in Denmark; the first nearshore project has yet to be completed - designate wind farms set up within 20 km of the coast and no closer to the coast than 2-4 km. Nearshore wind turbines have the advantage of being cheaper and less complicated to erect and maintain due to the shallow coastal waters. The Danish government wants to establish 500 MW nearshore sea turbines before 2020. Closer and larger turbines will, all things equal, be expected to be more visually and audibly present, a concern present in my interviews with critical islanders as well as in the newspapers' debate pages. Furthermore, with a new concept, an emerging, still uninstitutionalized technology, comes intensified financial and legal insecurities: at which price can the electricity be sold, which transfer prices and feed-in tariffs to count on? Which rules and protocols apply? Does the project count as an 'experimental project', which would imply larger state subsidies?[5] Such questions are to date (primo 2015) still open and contested (VAAB, 2015).

Without going further into the complex situation which the project is still struggling to settle, it is fair to say that establishing a wind farm is an inherently political situation which mobilizes various institutional contexts as parts of the larger process of investigation connected to the establishment of the turbines. Although the wind turbine is a well-known technology in Denmark (see e.g. Devine-Wright, 2005; Karnøe, 2013), project development is marked by uncertainties for all parties involved. There is a schism between the fully standardized environmental impact assessment process securing the technical-environmental approval of the project and the legal-financial confusion which still characterises nearshore projects. Not all aspects of a RE project can be measured and calculated beforehand (the sudden occurrence of the preserved porpoise which has disrupted the EIA process being a case in point); however standardized, the process is long and uncertain and might come to nothing in the end.

One fact about the project has, however, been firmly fixed from the onset: the *location* of the wind farm - the sticking point of most disputes over RE. One of the requirements of the EIA is that it must include a paragraph on the 'zero alternative', i.e. not implementing the proposal, and alternative

locations. The Mejlflak project's EIA bypasses this consideration of alternatives. Regarding the 'zero alternative', the EIA states that, considering the Danish long-term goal of becoming independent of fossil fuels, there is no real alternative to the construction of the wind farm, as sea turbines are expected to provide a large part of the renewable energy needed. It is *not* possible *not* to set up the wind farm. It is, however, possible to choose a different location, the report briefly states. But, as the following paragraph on alternative locations asserts, since the "ultimate goal" of the developers is to create a wind farm which can engage and involve actors in the Bay of Aarhus area, there is "no real alternative" outside the bay (Energistyrelsen, 2012a: 4). The EIA therefore investigates no concrete alternatives and constructs the Mejlflak wind farm as an unavoidable reality, closing down the space for deliberation and political engagements.

The EIA has been preapproved by the Danish Energy Agency despite the fact that the report does not live up to the legal requirement of seriously discussing alternative locations, thus throwing the legality of the project further into doubt in the eyes of an alert public. According to the former spokesperson of the protest group 'Southern Jutlanders Against Wind Turbines at Mejlflak' (www.aarhusbugtenog-kyster.dk) and summer house owner on Samsø, "it's a Wild West Project. A governmental screening report on nearshore turbines has been published, but the Mejlflak project doesn't figure in it because the preapproval of the EIA came before that report. So maybe it doesn't have to live up to the same requirements as other nearshore projects, no one knows. Legally, it's a mess…"[6] (interview2, Nov 2013). Against this, the chairman of HAAB portrays the organizational and technical uncertainties surrounding the Mejlflak wind farm as "a strong selling point" of the project (Energiwatch, 2014): Mejlflak is taking the lead in the green energy transition. Experimenting means taking risks, moving the RE industry forward, being a frontrunner. As the reader will recall, a degree of technical experimentation might also involve considerable financial supplements as 'experimental projects' warrant larger state subsidies, turning uncertainty into a commercial strength and possibly even a necessary precondition for the realization of the project.

While the chairman has his vision and ideals and tends to refer to a general interest in reducing CO_2 emissions when arguing in favour of the project, the islanders worry about their quality of life, the view from the northern hills and about the social, financial and environmental impacts of the project which, as they see it, have not been fully justified through the EIA process. Some islanders remember the difficulties and resources involved in turning the northern part of the island into a preserved nature area. According to Samsø Energy Academy's director, while it took years to secure the area, this status only includes the coastline and not the coastal *waters* - a distinction thought to be wholly arbitrary - and thus does not prevent the establishment of projects such as the Mejlflak wind farm in the area (interview3, Nov 2013). This difference in views on the project - differences which turn the wind turbines into objects of controversy - is by no means surprising, as the actors occupy opposing and well-known positions vis-à-vis the wind farm which evoke memories of classic NIMBY accounts: the islanders are reluctantly sucked into the project anticipating that the turbines will come to affect their close surroundings. Their interests are first of all particular and local as they are dragged into the project through their personal implication. To the developers, the wind farm is a prestigious political project motivated by references to the public good: taking the lead in the major energy transitions to come. In what follows I will attempt to disrupt this familiar structure, this logic of particular vs. general, public vs. private interest, a distinction found at the heart of NIMBY accounts, and instead view the islanders' opposition and the developers' idealism as distributed phenomena challenging ready-made, preconceived distinctions.

The Past and Future in the Present: Expectations of Involvement

Let us first take a closer look at what is causing the affected communities around the Bay to form a public against the Mejlflak project. In Denmark, after the publication of an EIA a compulsory public consultation process ensues, inviting scrutiny of the EIA. Going through the Mejlflak consulta-

tion responses from affected organizations and citizens, a number of objections can be identified. These include: worries about nearshore turbines near protected natural reserves; concerns about the visual effects of the turbines as seen from the coast (their size and colour, their formation and blinking lights, potentially dangerous low-frequency noise); criticisms of the EIA process and the report, especially regarding the lack of alternative locations. Few also mention concerns about the wind farm's effects on tourism. In addition, there is uncertainty as to how the wind farm will affect plant and animal life in the Bay (Energistyrelsen, 2012c).

All these concerns sound like well-known NIMBY arguments and are similar to arguments voiced in other controversies over renewable energy projects (for an analysis of the rhetoric of wind opposition, see Barry et al., 2008). In that sense, we are dealing with a specific 'genre' of public protest, one that tends to follow quite predictable logics. The categorization and ensuing delegitimization of negative responses as NIMBYism is an easy move, but it is the aim of this article to move beyond such labelling. In this section I will focus on a criticism against the project which is raised across all platforms - in the public consultation process, at public meetings, in my interviews and in the local newspaper debate - by public institutions such as Samsø Municipality as well as by private citizens. This is the concern about the Mejlflak project's democratic deficit.

A number of the consultation responses (to which we shall return in the following section) criticize the project for being 'an investment project' rather than a public involvement project. Denmark has a strong tradition for involving the public in RE projects, and there is a statutory rule of 20 percent local ownership (defined as citizens with officially registered addresses in the municipality) in wind projects (www.windpower.org). While the Mejlflak project was instituted by grassroots from the Danish Society for Nature Conservation, the main investors are energy companies based all over the country as far from the Bay of Aarhus as Copenhagen, where the capital's largest utility company HOFOR has bought shares in the project (VAAB, 2014). It is thus proving difficult for the project developers to realize the "ultimate goal of the project" (Energistyrelsen, 2012a: 4) - to create a wind farm engaging actors in the Bay of Aarhus area.

The Samsø resistance against the project is surprising seen from the perspective of the literature, which tells us that "familiarity with wind farms in the landscape breed[s] contentment" (Warren & McFadyen, 2010: 210). In this case, the opposite seems to be true. The islanders are used to wind turbines, but they are also used to being actively involved in the local energy projects. A banal but essential point in trying to understand the islanders' resistance to the Mejlflak turbines is that the initiative does not derive from the island. The Mejlflak project is perceived as a foreign initiative which will not benefit Samsø. The RE Island project, by contrast, was initiated by island actors and realised with the help of local labour and materials (see Papazu, 2016). The two projects cannot be directly compared, but both sides of the controversy tend toward comparison, e.g. when the Mejlflak EIA mentions Samsø as a role model for the Mejlflak project.

The story of Samsø's transformation into Denmark's RE Island is one that stresses *energy democracy* and *commonity* (commons + community, Hermansen & Nørretranders, 2011) as key values. During my fieldwork at Samsø Energy Academy I witnessed the director, Søren Hermansen, a leading figure in Samsø's energy transformation, tell the story of the island's transition to groups of visitors from all over the world. The story, which has been told, retold and refined since the nineties, is one which foregrounds processes of local democracy. The following is an example of Hermansen's storytelling, in this instance to an odd group of Dutch students, Danish top managers from a large bank, and the newly-appointed Hungarian ambassador to Denmark:

> We made energy democracy. We didn't really talk about climate change, that's abstract. But we created jobs. If we cannot gather people around the burning platform, it's not worthwhile. Then people will say: We know what we have, we don't know what's going to happen. On Samsø we talk about community and the commons as a value. As 'commonity'. It's a matter of defining the commons, defining what we are interested in, our common

> challenges and solutions. Defining the commons means defining the different interests at play and figuring out ways to work together with our different interests. (Field notes, Nov 2013.)

Remember Stengers' spin to the word 'interesting': Hermansen is talking about creating a setting where no one and nothing is "left alone, authentic, but transformed by what occurs…" (Gomart & Hajer, 2003: 39-40). He talks about transforming the island by engaging and transforming the local community. The setting is in focus in his narration; the setting as the community and the diverse interests at play among the islanders, all of which must be accommodated, as the focus is on collaboration. The goal of energy self-sufficiency is not mentioned. The logic of this narrative - the prominence given to the island community, to creating public support for the REI project and using the project to further the islanders' various interests, thus strengthening the community as a whole - is absent from the Mejlflak project. This is not to claim that no controversies arose in connection with the REI project, but I encountered no islanders with a strong recollection of conflicts or disagreements. The project was concluded in 2007, and what lives on, apart from the RE technologies, is the story of community involvement and local democracy. The Mejlflak project has come to serve as a counterpart to this Samsø story; a contrast representing all the pitfalls which the Samsø project allegedly managed to avoid, reactualising Samsø's experiences as exemplary while fuelling public resentment against the Mejlflak project.

The Mejlflak project developers' refusal to name alternative locations has come to highlight the practice of responsiveness of the REI project developers. When the offshore wind project south of Samsø was developed as part of the REI project, three locations were in play (and the preserved northern area of the island was never part of the project plans). In the end, the chosen location was the least advantageous with regard to the wind and seabed conditions and it was the most expensive alternative, but it was the least controversial and the visually most pleasing location as the turbines cannot be seen from the manor on the island, which was a demand on the part of the landowner. As a key player on the island and one of the main investors (as well as the only actual 'neighbour' to this offshore wind farm), the landowner's consent and cooperation was seen as a precondition for the realization of the project.

Siting is a key concept in the NIMBY literature, as well as in the academic literature contesting the NIMBY proposition, as the location of the renewable energy technologies tends to become the main point of contestation (the common disagreement over location is, of course, what gives the NIMBY concept its name). In Corvellec and Risberg's (2007) analysis of Swedish wind farm developers, a developer states: "The value lies in the site, actually. Wind turbines are only a means for exploring sites" (Corvellec & Risberg, 2007: 311). The authors elaborate: "When asked how they start developing wind farms, developers usually answer that they begin by looking for a site with good wind conditions, since this is a key requisite for the profitability of the project" (Corvellec & Risberg, 2007: 310). The focus on the site is thus related to profitability, and this is a further distinction between Samsø's REI project and the Mejlflak project. The former was not a commercial project but a cooperative, local project. While the Mejlflak project is dependent on the support of large investors, primarily utility companies, the REI project secured its funding locally: farmers, citizen cooperative societies, and Samsø Municipality, which bought five of the ten turbines necessary to the offshore wind farm. On Samsø, the value did not lie in the site but in what the RE technologies came to represent: a resourceful community, local democracy, and the possibility of a fossil free future. Hermansen of Samsø Energy Academy sums up the islanders' position on Mejlflak:

> The Mejlflak project gives Samsø the green benefits but it keeps the rest, the jobs and the local development. There's no narrative of 'What's in it for us?' in that project. They don't want to share the yields; they are following an old industrial paradigm where you keep your gains to yourself. In the beginning [of the REI project] I was a bit like the Mejlflak guys, I thought a green project would sell itself. It turned out to be more difficult than that. We had to establish a quorum of citizens willing to take responsibility for their community, we had to learn how to cooperate. 'What we can agree on' became our mantra". (Interview3, Nov 2013.)

Attacks, Appeals and Accusations: Different Formats for Public Debate

The setting which lends the Mejlflak controversy its specificity is Samsø's experience of becoming Denmark's Renewable Energy Island. In this section, two further settings of the controversy introduced are the public consultation process and the local newspaper debate. These are the formats in which the affected public gets a chance to speak. I inspect the arguments voiced and attacks launched and pay attention to the ways in which the newspaper debate and the public hearing process provide different formats for the public to become vocal.

My online searches for articles (conducted September 2013 and March 2014), particularly readers' letters, regarding 'Mejlflak' in the local newspapers returned a large amount of heated and personal expressions of the controversy. The arguments cover a lot of ground as they stretch from concerns about north Samsø's nature ("The Mejlflak turbines will result in environmental destruction of gigantic dimensions", Osbahr, Feb 2014), the wind turbines' size and character ("monster mills", Gudmundsen-Holmgreen, Sept 2013) and worries about the financial viability of the project ("The Mejlflak project is a mixture of Stalinist planned economy and an incredible naivety on the part of the project developers", Breengaard, June 2013) to personal attacks ("OBJ's knowledge of the planet's climate is not impressive", Birkedal, Sept 2013). Newspapers' debate pages have tight word limits and for a readers' letter to be accepted it needs to have an edge. Furthermore, a readers' letter often takes the form of a response to a previously published letter by a named person to whom the new letter is addressed. Rather than providing a deliberative forum for conversations, the format of the newspaper debate encourages bickering and exacerbates differences. An example of the confrontational style of the debate: "Søren Egge Rasmussen's [director of the Mejlflak project] sole argument against my criticism in my latest readers' letter is that I own a summer house on Samsø overlooking Mejlflak" (Skou, Oct 2012).

There is a tendency among the debaters to seek to delegitimize one another's positions through labelling and categorization. In a locally situated conflict, and one in which accusations of NIMBYism play a central role, the location or positioning of the actors is important. When the situatedness of the protesting islanders' positions becomes clear, they are accused of expressing NIMBY standpoints, e.g. when they refer to concerns about low-frequency noise or the visual impact of the turbines on the landscape, effects experienced only by neighbours to wind turbines. At the same time, as is evident from the above citation, the position of critics without permanent residence on Samsø is delegitimized through reference to their status as "summer house owners". Paradoxically, the "summer house owners'" position as outsiders to the conflict makes their concerns even less legitimate than the islanders'. "Summer house owners" are not directly vulnerable to the accusation of proximity, the classic NIMBY charge, but by being slightly farther removed from the problem they become tourists without any legitimate stake in the controversy; they become simply meddlers whose sole interest must be to secure their holiday destination from disturbances. In following this strategy of delegitimization, the director of the Mejlflak project in a lengthy contribution to the debate consistently throughout his discussion refers to the above Skou, the former spokesperson of the protest group against the project, as "summer house owner Skou". He ascribes all criticism of the project to a group of secondary home owners who attend all public project meetings in order to create a fake sense of controversy and local resistance. He concludes that there is no strong opposition against the project (Egge Rasmussen, Sept 2012).

The Mejlflak project, in turn, labours to brand itself as a local grassroots project. The brand of localism of local grassroots organizations is different from that of critical individuals; it is a responsible and altruistic localism aiming at improving the local area. In this case, it involves accepting to do one's share to mitigate climate change despite the costs. As mentioned, with energy companies all over Denmark as investors in the wind farm and a nation-wide campaign recruiting paying members for the guild, the localism of the organization is questioned in many readers' letters, and the director Egge Rasmussen is accused of astroturfing; of parading the project

as a grassroots initiative engaged in saving the planet while in fact being motivated by self-interested political and financial concerns. As a local politician representing the far Left in Aarhus Town Council and chairman of the executive committee of NRGI, the utility company that owns 40 percent of the project shares, readers' letters accuse him of "wearing too many hats" (Gudmundsen-Holmgreen, Sept 2013), putting further into doubt the director's position as a local actor primarily interested in reducing the CO_2 emissions of the Bay of Aarhus area. In his own words: "There is certainly a difference in approach and perspective from the summer house owner who wants to preserve his unobstructed view of the coast line to the local citizen or electricity company concerned with how the Bay of Aarhus area may contribute effectively to the solution to the climate problems" (Egge Rasmussen, Sept 2012). The climate, in this way, is drawn into the political situation of the controversy, the director strategically placing himself and the Mejlflak project on the side of the climate with the "summer house owners" and critical islanders on the opposing side. We will now turn to the public consultation process, a process with fewer casualties, where arguments take center stage over blunt attacks.

In September 2012, the Danish Energy Agency sent the Mejlflak EIA report out to consultation. Out of 102 replies from affected parties - organizations and private citizens - only four responses strongly endorse the project. The arguments voiced in the responses do not raise new concerns about the project as such, but the style

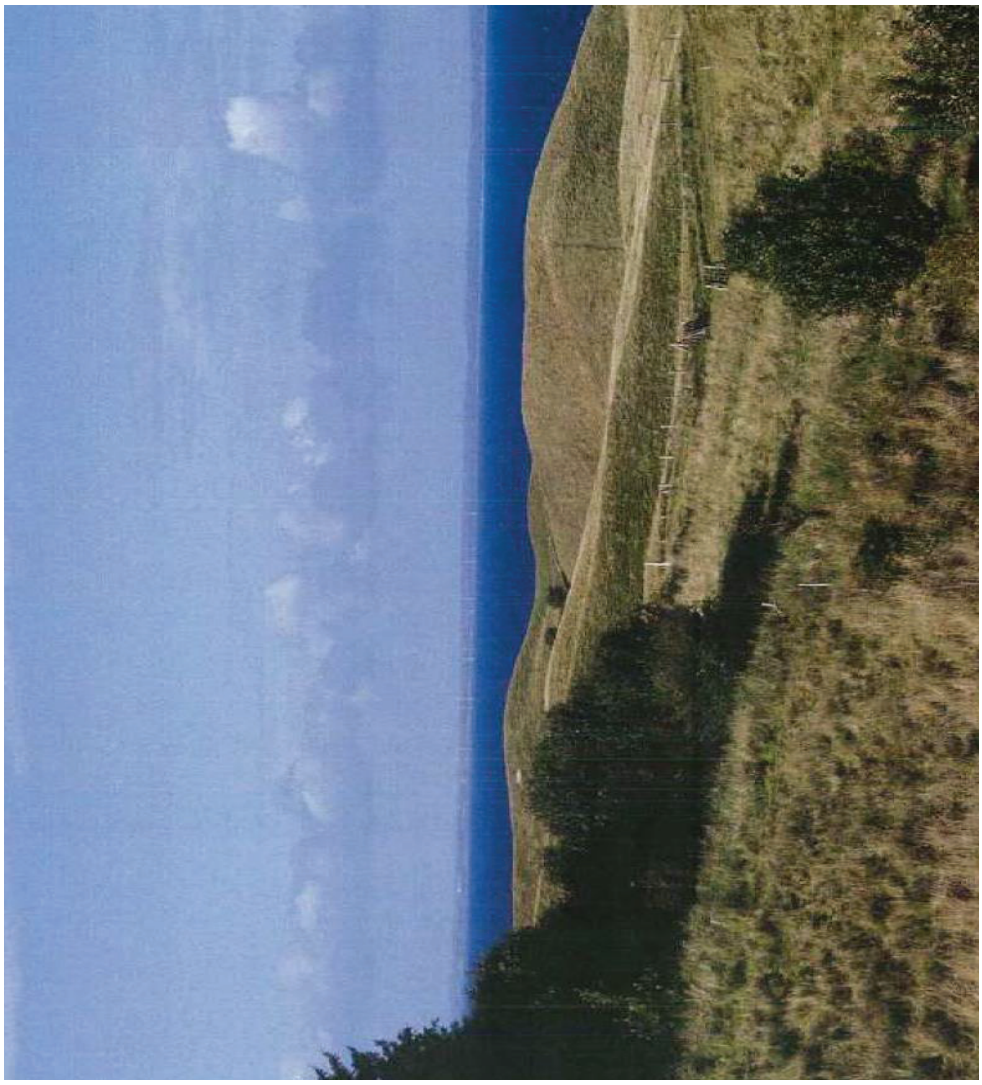

Figure 3. The photo of the hills as it appears in the response to the hearing – turned on its side.

of argumentation and the strategies employed differ markedly from those encountered in the newspaper debate. The responses tend to fall in one of two categories: the (lay) expert analysis and the emotional-personal contribution.

As for the latter, the newspaper debate left little room for expressions of personal attachment as these would leave the contributor vulnerable to NIMBY accusations as well as personal attacks. Since the hearing process does not allow for exchanges of opinions but simply serves to inform the authorities about the attitudes of the public, this format sets the stage for more elaborate arguments and analyses, and the contributors do not as readily risk having their inputs used against them. Among the numerous personally angled responses I will emphasize one, written by an elderly woman and one of the leading figures in Samsø's REI project. In her response, she has allied herself with the island's journalist. His input consists of a photograph showing the northern hills and the sea, taking up one A4 sheet (see below; notice the likeness to the still photograph from HAAB's promotional video on page 1), accompanied by a hand-written description of the camera settings used to produce the photo. Below, typed, the woman writes:

> The picture is taken just outside my house, which is placed exactly north-south and lies about 850 meters from the water to the west and about 20 meters above sea level. We bought the grounds, which cover the statutory 4.08 acres, in 1969, and we later built the house in accordance (of course!) with the regulations in force due to the protection of the area. I have lived here for over 40 years.
> -'It is through such openings that the earth breathes' - Thorkild Bjørnvig [the woman's deceased husband, a local poet who lived in the northern hills until his death, famous throughout Denmark; translated by the author] in the collection of poems 'Morgenmørke' 1977-79.
> (Energistyrelsen, 2012c: 26-27.)

Remember Stengers' proposal to take concerned citizens seriously because of, not despite, their situatedness and personal attachments. Implicated citizens do not derive their interests from the reservoir of disinterested values and ideals known as 'the common good'. On the contrary, their personal attachments drag them into controversies. Recall that "…there is no knowledge that is both relevant and detached. It is not an objective definition of a virus or a flood that we need, a detached definition everybody should accept, but the active participation of all those whose practice is engaged in multiple modes with the virus or with the river" (Stengers, 2005: 1002). This logic runs counter to the central NIMBY-informed assumption that your situatedness makes your critiques illegitimate.

In the response to the hearing, the woman, unafraid of NIMBY accusations, plays up her attachment to the area: she has lived here for 40 years, she is practically (her husband built their house himself) and emotionally (his poem at the end) attached to the place. The large photograph with the technical settings carefully outlined brings a degree of objectivity to the letter, as if to draw in the reader, 'see for yourselves, this place is worthy of preservation', while at the same time serving to place the woman firmly *in* the specific site to which she claims attachment: this is her view. Several of the responses contain photographs; a move that may be thought to provide the government officers in the capital with documentation of the value of the place, as the officials might never have set foot on Samsø. The woman's response also contains a reference to the status of the northern hills as a preserved and highly regulated nature reserve, subtly drawing attention to the fact puzzling to many islanders that while previously proposed projects in the hills have been dropped because of the area's protected status, this is no obstacle to the Mejlflak project, since, legally, a listing of the *coast* does not equal a preservation of the coastal *waters*.

In contrast to this argumentation-through-attachment, many islanders resort to the tactic of argumentation-through-expertise, departing from Stengers' call for situatedness and particularity as a source of legitimacy. As a concerned and highly engaged islander told me:

> My husband is a biologist, he has studied the migration of birds and even the effects of wind turbines on birds. So we wrote a response to the hearing which completely undermined the results of the EIA report. We've also written a response about the past controversy about the radar pylon

> [a project proposed and rejected due to the area's protected status] as well as a response about the effects of the project on the landscape and tourism, because we run one of the largest tourist attractions on the island. (Interview4, Nov 2013.)

In a similar manner, the former spokesperson of the Mejlflak protest group, a physician, has produced two responses, one in non-specialist language outlining the perceived weaknesses of the project, and one ten-page response detailing in complicated and detached legal jargon problems regarding the legality of the project. To illustrate, one sentence starts: "It follows from §3, article 3, annex 2, in the relevant Environmental Impact Assessment order (Order.No. 815 of August 28 2000) that the EIA executive order must contain a review of the most important alternatives inspected by the entrepreneur…" (Energistyrelsen, 2012c: 198).

By bringing in biology and law, this citizen tactic adopts the expert's disinterested "gaze from nowhere" (Haraway, 1988: 581), attempting to escape their personal implication by deriving objectivity from expert language and arguments. However, by drawing on several kinds of expert knowledge - tourism, birds' migration patterns, legal and historical aspects – the (albeit few) citizens behind more than one response counteract their own positioning as experts, as an expert tends to be someone with extensive knowledge within rarely more than *one* field. Instead, these citizens attempt to cover as much ground and deliver as many arguments against the Mejlflak project as possible to the officials in the Energy Agency.

In these diverse ways, the dynamic of the controversy unfolds in different settings, through different strategies. If this is the face of NIMBYism, it emerges as a more varied and variable phenomenon than is commonly construed. In order to render their positions legitimate, opponents of the project experiment with different conscious positionings: personal attacks, individual attachments, expert claims, and rational arguments appealing to common sense. The controversy in this way constantly changes shape as the critics of the project refuse to be held in a position of particularity or NIMBYism.

The public meeting: an unengaging engagement exercise

Our final setting of the controversy is the public meeting held on Samsø by the project developers. Danish law lists certain requirements to secure public involvement which must be followed when developing a wind farm. The public consultation process is one such step towards inserting a degree of public deliberation into the process by legal means and, similarly, community meetings have become traditional and are now required by law. The Mejlflak project held five public meetings presenting the results of the EIA, one of them on Samsø. Gomart and Hajer (2003: 45) pose that "*[d]eliberation cannot be understood without taking the role of 'practice' into account*…" , arguing that public engagement exercises run the risk of serving as nothing more than an opportunity for developers to manage people's positions and even silence criticism. The public gets an opportunity to raise their concerns, after which the developers can continue realising the project knowing the public was given a chance to speak. The public meeting differs from the formats of the newspaper debate and the consultation process where confrontations are never direct but always mediated by writing. The public meeting carries with it the potential for the parties to critically and directly engage with one another's positions and concerns, but there is no guarantee that such a deliberative forum arises, hence Gomart and Hajer's call to take practice into account.

The meeting took place in one of the island's community centres. About one hundred islanders attended. I was not present myself so this section rests on a newspaper report and my interviewees' impressions of the meeting. HAAB's director, according to the local newspaper article, stated ahead of the meeting that "We don't expect to reach agreement" (JRE, 2012). Following this statement and the setup of the meeting, it seems that no real involvement of the citizens - in Gomart and Hajer's sense of 'constructing', 'transforming' and 'empowering' actors into participation (Gomart & Hajer, 2003: 45) - was intended. The presentation of the results of the report took up more than half of the evening and centered on the two classic 'NIMBY' issues, low-frequency noise and visual impact. Experts had been invited

to calm the crowd. After lengthy, technical presentations, one hour was allowed for debate. The questions raised by the public did not center on noise or visual impact but on the location of the turbines, a point the presenters had not brought up. Asked about the choice of location, the director responded that he wants "a locally anchored project" and the turbines to be placed "where they will be seen". Representatives of the guild, VAAB, added that the project was "simply following Samsø's example" (JRE, 2012).

To HAAB, the wind farm is a demonstration project and the visibility of the large turbines is a force of the project. To the islanders in whose everyday lives the turbines will become a visible factor, their size and impact is an unwanted change. If the developers took the islanders' objections seriously, the turbines would not be erected near Samsø's northern point. Engaging in a democratic process would most likely mean abandoning the project in its current form. Since the EIA lists no alternatives to the current location, it is likely that the project developers' interests are so tightly connected to the location close to Samsø that no alternative project would be conceived. This is the dilemma of public involvement: to practice it in a serious manner involves the risk of non-realization. Still, had the public been involved at an earlier point and invited into the development of the project, the process might have carried with it the potential to *transform, construct* and *empower* the island community in ways that could have produced results that differ from those of today.

Conclusion

What makes the Mejlflak wind project controversial on Samsø? To approach a controversy as an instance of politics which must be understood through concrete, empirical engagements is to move beyond the NIMBY logic. Each section of the analysis has investigated a different empirical setting, allowing us to examine "the particular sort of engagement it enabled or delimited" (Gomart and Hajer, 2003: 47). The Mejlflak project's EIA process, marked by uncertainties and by one hard fact, the location of the wind farm, created opposition on Samsø. So did the project's commercial character and the project developers' reluctance to involve the local communities. These practices, which stand in sharp contrast to the islanders' experiences with the community-oriented RE Island project, sparked resistance and undermined the project developers' wish to create "a locally anchored project" (JRE, 2012). A desire that finds expression in rhetoric but not in practice. The newspaper debate and public hearing process offered different channels through which the public could voice their concerns and critiques; channels of publicity which have given the Mejlflak project its public image of a controversy.

The problem with NIMBY is that it is a fundamentally unexperimental and depoliticizing move: by reducing all arguments to the positioning of the actors expressing them, it prevents us from learning from opposition and appreciating the situatedness of local responses. In this article, I have attempted to treat resistance as valuable expressions that might contribute to our understanding of the phenomenon of resistance. Large-scale RE projects carry with them great potentials both for strengthening local democracy and communities and for developing more environmentally sustainable societies, but they also embody the potential of the tyranny of the Good. When the voice-over in the Mejlflak project's promotional video says "The wind turbine guild of the Bay of Aarhus is for *you*", one remember Stengers' question: "[H]ow to design the political scene in a way that actively protects it from the fiction that 'humans of good will decide in the name of the general interest'?" (Stengers, 2005: 1002).

My proposal is that we try to pay attention to the attachments articulated by the implicated. Taking the attachments of the involved seriously involves a reweighing of the issue and a redistribution of the dichotomy around which 'NIMBY' conflicts tend to unfold, particularism vs. the public good. By re-opening a space of contestation, questions of whether and how to approach large-scale energy projects become political once again, and new knowledge is generated. This new knowledge could then be put to use in future RE projects.

The RE Island project developers on Samsø accomplished this: they learned how to listen

to the various interests of the islanders; they found ways to get those different interests to work together, and they built a stronger local community on the basis of those differences. I do not believe that this approach or the case of Samsø is specific to the Danish context. With governments all over the world setting CO_2 reduction goals and formulating aspirations to embark on renewable energy transitions, if project developers do not practice responsiveness and willingness to learn from citizen reactions, many projects will likely come to nothing or be realized against the public will, making the future even more difficult. But the analysis has also demonstrated the malleability of resistant publics. As the setting of the controversy changed from one format of publicity and participation to another, so did the responses and reactions, even the composition, of the public. A public is not a fixed entity that cannot be swayed or transformed, on the contrary, publics are ever-changing, and so are the issues they engage with. This points to the potential of learning that is inherent in all controversy.

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Notes

1 This is not to say that there never was conflict in the years 1997-2007, only that the conflicts that might have been have not carried into the present and have been widely forgotten.

2 A crucial difference between this endeavour of 'tracing the political' as opposed to classic actor-network theoretical interests in 'tracing the social' is that the purpose of the analysis of the political is not to reach any (if momentary) stabilization of the network(s) analysed, but rather to point to the fluidity and changeability of the political issue.

3 See also Barry et al., 2008; Cass & Walker, 2009; Devine-Wright, 2007; Devine-Wright, 2009; Freudenburg & Pastor, 1992; van der Horst, 2007; Walker, 2008; Warren & McFadyen, 2010; Wolsink, 2007; Delicado et al., 2014; Walker et al., 2010b; Devine-Wright, 2011; Roberts et al., 2013.

4 The EIA is conducted by consultants hired by the project developers and has yet to obtain its final approval by the Danish Energy Agency, among other reasons because porpoises have been observed in the area, complicating the analysis (VAAB, 2014).

5 'Experimental' or 'trial projects' are, according to the Danish Ministry of Climate, Energy and Building, smaller projects designed to test new types of wind turbines and other technologies and procedures related to the development of wind energy. Such projects go through a strict application procedure as there are substantial state subsidies connected to the status of 'experimental project' as these are not expected to function on market conditions (Energistyrelsen [the Energy Agency], 2011).

6 There is an uncertain relation between the official governmental screening report of possible areas for nearshore wind farms (created by the Danish Energy Agency) and the Mejlflak EIA: the plans for the project and the preapproval of the Mejlflak wind farm came before the rules regarding nearshore wind farms had been settled. Great uncertainty therefore prevails as to which rules pertain to the Mejlflak wind farm.

Rethinking Therapeutic Misconception in Biobanking – Ambivalence Between Research and Treatment

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Abstract

Some authors have noted that in biobank research participants may be guided by what is called therapeutic misconception, whereby participants attribute therapeutic intent to research procedures. This article argues that the notion of therapeutic misconception is increasingly less justified when evaluating biobanks. We present four examples taken from recent developments in biobanking to argue why the notion of therapeutic misconception is problematic in that biobanking practices are increasingly seeking to bridge research and treatment in different ways. In this article we explore examples where the boundary between research and treatment become increasingly blurred, as well as the contextual significance of healthcare systems and their prevailing ideologies in healthcare management. We argue that biobanking practices are challenging the use value, as well as the philosophical and ethical underpinnings for the need to separate research and treatment, and thus the notion of therapeutic misconception in the first place. We call this tension between research and treatment ambivalent research advancement to highlight the difficulties that various actors have in managing such shifts within the healthcare-research systems.

Keywords: biobanks, therapeutic misconception, treatment, individual research results (IRR), incidental findings (IF), healthcare policy.

Introduction

A number of recent commentators have noted that in biobank research participants may be guided by what is called *therapeutic misconception*, whereby participants attribute therapeutic intent to research procedures (Zawati & Knoppers, 2012; Forsberg et al. 2009; Appelbaum et al., 1982).

In participating in research, some participants may indeed feel that they are receiving some type of treatment or therapy despite the fact that they are given an informed consent form to read and sign, which has stated that this is not the case. A number of studies have shown how the informed consent procedure is problematic, especially concerning biobanking studies (Skolbekken et al., 2005; Hoeyer, 2003, 2008; Hoeyer & Hogle, 2014). Other studies, however, have demonstrated that people are motivated by participating and contributing to a common good and do not expect direct benefits for themselves – even though they would prefer the benefits (Snell et al., 2012; Pellegrini et al., 2014; Wallace & Kent, 2011). Furthermore, in a number of studies where tissue samples, as well as health and lifestyle information is gathered, such as longitudinal cohort studies, people do receive immediate feedback and information on their health. These include blood pressure, body fat levels, sugar levels and other pertinent health related information, which is often experienced as care. The process of participation in itself is often seen as an opportunity to interact and discuss personal health related matters with healthcare professionals, which further compounds the notion that participants are receiving health related treatment, as opposed to participating in research (Nobile et al., 2013). Some have argued that it is not a misconception to assume one will receive good care during research, but it is a misconception if one believes that the purpose of the research is to provide treatment rather than conduct research (Henderson et al., 2007; National Bioethics Advisory Commission, 2001). It is clear, however, that people's expectations about research are not straightforward as is not the relationship between research and care.

The interest to maintain a distinction between research and treatment and the role of the research subject vs patient has been a long-standing issue within medical ethics. The roots of this lie in important policy documents, such as the Belmont report (1979), which sought to protect human research subjects from unwittingly becoming enrolled within research projects, but also to ensure that research participants are able to make an informed decision (Halverson and Friedman Ross, 2012). The dichotomy between research and treatment has been well established and rigorously defended from a philosophical and ethical perspective, whereby the practice of maintaining this distinction has been meant to protect patients from possible harms, which may come about through enrolling in research without being fully aware of the consequences.

The debate of separation of research and treatment has, however, had a somewhat different tone in relation to biobanking. Commentators have sought to point out how biobank research differs fundamentally from other types of clinical research, such as drug trials, in that it does not require further intervention into the human body (except for the drawing of blood for cohort studies, for example) (Deschênes et al., 2001; Hansson et al., 2006; Cambon-Thomsen et al., 2007). Some have also suggested that biobank research ought to be comparable to registry-based research in that samples drawn from patients are comparable to any other type of data collected on the patient (Aromaa et al., 2002). Such positions have sought to argue that biobankers can withdraw from an ethical debate relating to therapeutic misconception, whereas in fact biobanking is increasingly collapsing research and treatment in novel ways. This collapse in the distinction between research and treatment is giving rise to novel forms of responsibility and ambiguity to various practitioners, such as physicians, biobankers, as well as laboratory technicians (cf. Wadmann & Hoeyer, 2014). Indeed, there are increasing examples of the difficulties that states, for example, have in trying to define the scope of responsibility between, patients, research subjects, physicians, and biobankers when it comes to managing findings (Tupasela, 2015; Tupasela & Liede, 2016).

As such, the notion of therapeutic misconception, which is used to describe scenarios and situations where patients may become unwittingly research subjects, also falls under question as a useful theoretical and analytical tool for understanding the ways in which research and treatment are changing with relation to biobanking. As Dresser (2002: 276) has noted, "intentionally or inadvertently, they [researchers] encourage participants' therapeutic expectations in numerous ways. Some encouragement comes from the consent forms that are supposed

to explain how research participation will differ from ordinary patient care." For new biobanking practices, however, the situation is further compounded by the very context in which the distinctions between research and treatment are becoming increasingly blurred.

This article contextualizes this discussion within a broader framework where it is increasingly difficult to maintain a useful distinction between research and treatment in relation to the biomedical collection and use of tissue samples and data, or biobanking. We provide four international examples, which highlight the ways in which research and treatment are encroaching and blurring this supposed boundary as a result of new ways of studying disease and combining information gained from tissue sample collections and other pertinent medical information. Much like the artificiality of the boundary between basic and applied research that has been criticised by Stokes (1997), we wish to suggest that the distinction between research and treatment is increasingly problematic and fails to reflect the rapid changes taking place in the research and treatment interface. These changes are taking place in both the public and private sector, and reflect a broader systemic shift in the way research and treatment are being organized in relation to biobanking.

The Nordic countries, in particular, have been able to capitalize on their ability to collect and compare information gained from tissues with registry data. Some have gone as far as to claim that the whole population serves as a type of cohort in some cases (Frank, 2000). We thus seek to question whether the notion of therapeutic misconception is useful anymore in relation to developments in biobanking since biobanking is seeking to collapse the two together. This also has important consequences in relation to a re-definition and redistribution of responsibilities among the actors. This approach is based on the understanding that research fields, which rely on biobanks for example, are not just governed from above. Instead, we would like to suggest that research drawing on biobanking is also giving rise to novel forms of medical intervention and treatment where the relationship between treatment and research is by design iterative and reflexive, as opposed to distinct and separate. The rapid development of biobanking during the past decade has brought with it a number of challenges for both the medical research system, as well as the delivery of healthcare in general. At the heart of this challenge lies a progressive ideology regarding the way in which medical research is conducted, as well as the ways in which illness is detected and treated.

In the following, we will seek to contextualize how we see developments in biobanking as problematizing the very notion of therapeutic misconception through four examples. We argue that rather than seeking to continuously uphold the dichotomy of research and treatment, one should begin to recognize the myriad of ways in which biobanking practices, as well as some policies, are giving rise to novel ways of treating people, and developing ways in which practices can be accounted for and recognized in legal and ethical discourse. Although some of these approaches are problematic, we nonetheless consider it an important policy step to try and account for this change as opposed to fight it.

Methods and Materials

This research is based on a two-year project, which sought to understand the forms and styles of engagement that various biobanks undertook in six countries: USA, Canada, UK, Spain, Finland and Iceland. Although the main remit of our research was to focus on engagement strategies of biobanks in these different countries, our data also produced results on the ways in which biobanks come about, as well as the multifaceted contexts in which they operate. This broad variation provides a contrast to the general international policies and guidelines regarding the separation of research and treatment. It became evident during our research that a number of biobanking constellations were in fact blurring the boundary between research and treatment, whereby it became increasingly difficult for actors to justify the existing dichotomy. In conducting our research, we did 26 interviews with relevant personnel from different biobanks, as well as biobank networks in six different countries. We also conducted interviews with policy makers and regulators in the various countries to develop

a broader picture of the nature of biobanking in the various countries. Our interviews were based on a semi-structured interview framework where we focused on specific themes relating to sustainability and engagement practices. In this article, we focus on examples whereby we highlight and problematize some of the issues that are faced in biobanking today in relation to maintaining a distinction between research and treatment.

In examining our data, we came across situations in which the boundary between research and treatment was blurred and the usefulness of the notion of therapeutic misconception was becoming an increasingly problematic conceptual tool to understanding the role of the patient in the research system vs receiving treatment. Here we present four examples that are drawn from three countries; two from Finland, one from the UK and one from the USA. Although one may say, that these cases represent 'special' cases, and are not representative, we argue that they are indicative of the direction in which research, using biobanks, is increasingly moving in. The possibilities that are becoming available to researchers in such new configurations are substantially more competitive and productive than conventional research settings. We see an increasing pressure for research systems to move towards constellations where there is increasing iteration between the research and clinical settings.

Biobanks and Ambivalent Research Settings

A central problem related to the therapeutic misconception relates to the ways in which information derived from biobank research is, or is not, communicated with research subjects, as well as the expectations that research subjects may have in relation to participation in research (Eriksson, 2004). Miller et al. (2008) have noted that there has emerged a new ethical imperative whereby researchers are increasingly expected to communicate the results of their research to participants. Similarly, Smith and Aufox (2013: 7) have noted that "new paradigms are currently needed for understanding and relaying research results made possible by current and future genetic technologies as they evolve." On a more general level, the changes taking place in the biomedical field reflect a broader shift in the way data is collected and used. As Rodriguez (2013: 2) argues, society is becoming increasingly "data rich and dependent." As a consequence of this proliferation and dependence on different types of data, biobanking applications and uses are having profound effects on the way medical research and treatment is being organized and delivered.

Two aspects, in particular, have played an important role on the discussions related to therapeutic misconception; the return of incidental findings (IF) and the return of individual research results (IRR). A number of recent studies have identified inconsistencies between international norms and guidelines on the return of IRR and IF, and the practices associated with biobanking. The studies note that there is no international consensus on the ways in which information from biobanking research should be returned to individuals (Wolf, 2013; Zawati & Knoppers, 2012; Bledsoe et al., 2013; Forsberg et al., 2009). Many of these studies have called for international guidelines regarding the return of IRR and IF (Zawati & Knoppers, 2012). The ambiguities associated with whether or not information ought to be shared with research participants highlights the tenuous relationship that biobanking is producing in relation to its research population in general. As biobanks continue to develop into more sophisticated systems for the collection and analysis of information, so too develops their ability to speak back to participants and society in general in relation to the health risks that individuals and populations may have. We call this development *ambivalent research advancement* in that increasingly actors involved and surrounding biobanking – researchers, policy makers, ethics committees, etc. - inhabit an ambivalent position in relation to how information ought to be managed and disseminated. In these new constellations between research and treatment biobanks serve as intermediaries through which the traditional boundary between research and treatment is becoming increasingly blurred. Biobanks are hailed as important sources of material and data for research, but increasingly the ability of researchers and doctors to glean immediate benefit for patients and research subjects is

becoming clearer. In this sense, we argue that the advancements in research are also producing a type of ambivalence in that the notion of therapeutic misconception plays an important part in the research ethos, whereby researchers and doctors still try to maintain a boundary, albeit false in many cases, between research and treatment.

In part, it is understandable that research participants may be guided by the therapeutic misconception given that there appears to be a great degree of professional ambiguity, as well with regards to the ways in which genetic research results ought to be managed. Pullman and Hodgkinson (2006), for example, have argued that although there is increasing literature regarding the duty of physicians to warn at risk relatives in the context of genetic testing (cf. Tupasela, 2006; Offit et al., 2004), not enough has been discussed in relation to the management of genetic research results. More recently, the American College of Medical Genetics (2013) published a recommendation on reporting on clinical exome and genome sequencing results of 24 conditions. The report was met with criticism in that some felt that it went too far in terms of setting a requirement for labs and doctors to report on incidental findings. These examples regarding return of individual research results and incidental findings highlight the ways in which participation in biobank research is raising a number of concerns, which even professional groups are unable to address in a clear manner since biobanks play an important role in practices related to genetic research. The patchwork of practices related to reporting has contributed, we would argue, to an ambiguity in which the delineation between research and clinical practice is often difficult to ascertain.

Zawati & Knoppers (2012) have recently noted that "it is important to encourage endeavours that aim to provide a clear set of definitions related to the return of IRRs and IFs at the international level." This, according to them, will allow for much needed consistency in international norms and will reduce ambiguity and contradictions." (Zawati & Knoppers, 2012: 488) Although their approach is commendable, we believe that it misses a crucial perspective related to some more recent trends in biobanking research and treatment, namely that biobanking practices and the forms of research that are aligned with them are giving rise to novel forms of intervention where the distinction between research and treatment is increasingly blurred. We argue that seeking to set standards and guidelines before we know and see the ways in which biobanking can change the ways in which research is done and healthcare delivered might lead to more problems than what is actually solved. A number of examples can be drawn on where the iterative process between research and treatment is becoming increasingly intermingled.

There is also a problem with the notion of therapeutic misconception in relation to the development and philosophical assumptions enshrined within new personalized medical technologies (European Commission, 2013), as well as health care technology management systems. This is because much of new personalized medicine being developed is founded on the idea, to some extent, of an ongoing iteration between the patient and the research where biobanks play a critical role (Yuille et al., 2008; Riegman et al., 2008; EU workshop, 2003; OECD, 2001). In this sense, the separation of research and treatment is being brought together as a means of overcoming methodological and data problems in biomedical research. In order to develop more accurate data on and for the patient or patient populations, the patient and the research population need to be brought in closer within the 'fold' of research practices.

Furthermore, with the rise of personalized medicine as a major policy program for most Western countries there is an increased interest in the acceleration of the translation of knowledge gained from biomedical research into treatment. Biobanks are seen as a critical element in this process in that they will provide the basis from which actionable biomarkers can be identified for selecting the right drug targets, as well as the development of new drugs in the first place (Hewitt, 2011). Some commentators have noted that biobanking needs to focus increasingly on being evidence based and geared towards customer satisfaction in order to ensure long-term sustainability (Simeon-Dubach and Watson, 2014). Together these factors are influencing the ways in which research and treatment are configured, and subsequently to the development of therapeutic

misconceptions among biobanking research subjects.

In the following we will discuss four examples which derive from policy and legal changes, as well as practice-based contexts, which provide concrete instances where the distinction between research and clinical care are becoming increasingly blurred. We believe that these examples are indicative of an increased tension between research and treatment involving biobanks. From these arguments, we seek to criticize the usefulness of therapeutic misconception as a useful category through which to critique biobanking practices. We argue that biobanking is increasingly transcending the boundary, which has been enshrined within medical research ethics.

The Finnish Biobank Act

Our first example regarding the blurring distinction between research and treatment comes from a recent development in Finland regarding biobanking. Finland is a small Nordic country that has a long tradition of registry-based research, as well as collecting tissue samples for research (Tupasela, 2004). The Nordic countries have in general collected and maintained numerous registries and collections related to human health that can be cross-referenced using a unified social security number system In this sense, the Nordic countries maintain somewhat of a unique position internationally with regard to their collections. A number of these countries have also been early movers in terms of setting up major biobanking initiatives within their borders. The Norwegian HUNT Biobank, for example, has a collection of over 250 000 DNA samples, whose physical management and analysis is highly automated (HUNT Biobank, 2015).

In a similar vein, Finland has also been seeking to develop and bolster its use of exiting tissue sample collections and related registry and health information. In doing so, it has implemented a new Biobank Act, which according to Soini (2013) is the only one of its kind in the world. The Act brings under one legal instrument all biobanks, including clinical, research, public or private. Besides its broad scope, the novelty of the Biobank Act lies in its position regarding the right of participants to gain access and information regarding their samples, which appears to go against international trends regarding return of IRR (Tupasela, 2015). Burke et al. (2014: 107) have, for example, argued that "the weight of bioethical and researcher opinion argues against granting research subjects an unrestricted right to demand return of individual research results." In Finland, however, the broadening of the ability of researchers to access samples and health related data has been met with increased responsibility to provide information on actionable findings if a participant requests it.

Against this backdrop, it is rather surprising that in its Biobank Act (688/2012), the Finnish legislature went against the international norms and guidelines by including the following section in the Act:

> A registered individual has the right to receive, upon request, information concerning his or her health as determined based on a sample. When providing information determined based on the sample, the person must be provided with an opportunity to receive an account of the significance of the information. A fee may be charged for clarifying the significance of the information that, at maximum, corresponds to the expenses incurred by providing the clarification. (Biobank Act 688/2012 Section 39.)

From a practical perspective, this would mean that if a person were to know that a sample from them has been collected, then they would have a right to know if that samples has been used in research, as well as what types of research it has been used in. Furthermore, they would also have the right to know – at their own expense – what the significance of the research findings have in relation to their own sample. This position has been further clarified to mean that biobanks need only report on significant and actionable results if any are found in the studies. This is the first time in which, at a national level, biobanks have been required to provide people whose samples have been used with an explanation of the significance of the existing findings in relation to their sample if it is actionable. This move fundamentally alters the nature of research and the dynamic of participation in that with the new Act, research partici-

pants can expect that they have a legal right to request information if it is actionable.

This requirement, however, is not without its problems. As one administrator noted, the law raises a number of problems in relation to the operation of biobanks and the delivery of healthcare in society:

> You can think of it by imagining that the younger, healthier and more active you are, then the more information they can get during their life from that biobank. They can go to the biobank and get all the information that they want, they can ask. These possibilities have been made available to them through the broad consent. But if they are active in getting this information then there are also going to be problems, if they suddenly want to know all their risks if the sample has been used for some research study and then returned back to the biobank. (Interview with hospital administrator, FI 2013.)

The interview excerpt highlights a new type of concern for Nordic countries in relation to equality in relation to healthcare access and information, whereby younger generations may be more active in seeking information on their health based on samples being used in biobank research.

Another interviewee was more critical in relation to the practical implications that it had for biobanks and the people working in them:

> But now it is in the law that people should get all of their results – it is a catastrophic passage! We don't want to attract anyone to participate in that way, because it is enormously laborious to explain to them what there has been found. (Interview with biobank manager, FI 2013.)

This legislative requirement places a heavy burden on the biobank to develop an infrastructure that would be able to manage research subject requests on a practical level. To our knowledge, the biobanks that have been set up thus far in Finland have not been faced with such a situation. Most participants are not aware of either the new law or the fact that their samples could be used for further research, but it is inevitable that someone will sometime in the future request information regarding the use of their sample, the research findings, as well as a translation of the significance of those findings to themselves.

We consider this to be the first substantiation, at the national level, and codified in law, whereby individuals whose samples have been stored in a biobank have the right to gain information regarding their samples and the research that has been done on it. This legal move can be seen as a major challenge to the traditional dichotomy between research and clinical care. Furthermore, it raises serious questions as to the functionality of the notion of therapeutic misconception since the law seeks to provide a loophole of types for research participants to request actionable health information based on research conducted on their tissue sample.

Hospital-based Biobank Research

The second example we draw on comes from the changing role that hospitals are embracing in relation to the, often large, clinical tissue sample collections, as well as health records that they maintain. During the past decade, the proliferation of biobanks around the world has been significant. The range and scope of newly formed biobanks is also quite broad. One new type of biobank operation is that which is nested in existing hospital systems whereby either old diagnostic collections are re-purposed into new biobanking facilities, new collections are begun or a combination of these two models is adopted (Wilson et al., 2014). Some institutions have stored or archived tissue samples for more than 100 years (Eisemann & Haga, 1999; Strong, 2000) and it is becoming an important asset, which hospitals can draw on for developing treatments and studying disease in the population. Unlike population cohort studies, which capture a random sample of the population, large hospital systems will have a different picture of the health and disease burden of the local population, as well as a different capacity to react to new findings. In this sense, hospital-based biobanks inhabit a unique place in the healthcare-research nexus. This is particularly so in the Nordic countries where the hospital and healthcare system is largely a publically funded system. Although private medical treatment is available, most serious illnesses and demand-

ing procedures will be taken care of in the public healthcare sector.

One example of the re-purposing of diagnostic sample collections, which we studied in our research is the Auria Biobank[1], which became the first clinical biobank established in Finland. The biobank was established by the University of Turku and the hospital districts of Southwest Finland, Satakunta, and Vaasa at the beginning of 2014. The re-purposed biobank obtained a permit from the National Supervisory Authority for Welfare and Health (Valvira) to set up a biobank into which the diagnostic collections from these hospital collections could be transferred. Most of the samples in the collection (about 80%) are samples from cancer patients, but the research of the biobank will also focus on diabetes and cardiovascular diseases.

In its implementation, however, the use of clinical samples and related health information the question related to therapeutic misconception becomes increasingly challenging for hospitals to manage since entering the hospital for diagnosis and treatment will also entail becoming entered within the hospital biobank system. Although patients receive an informed consent form before coming to the hospital in which they can choose whether their samples will be entered into the biobank, the case is indicative of the ways in which hospitals are increasingly embedding biobank research infrastructures within their healthcare systems. It also raises a number of challenges in relation to the return of IRR and IF as well. In implementing the re-purposing of clinical samples, the hospital is also creating a research environment where the distance between patient samples and information and the patient becomes increasingly blurred. In a number of our interviews in Finland this issue was discussed. The idea is to "capture all incomers" which means that when patients are called for an elective procedure at the hospital they are sent the invitation along with a consent form so that samples can be entered into the biobank. Once they have consented, every time they come to have a procedure done or a test, an extra sample may be collected and entered into the biobank. Samples are collected or accrued in one of two ways: they are either collected through the lab, which is conducting a test on a patient and the lab screen also includes a request to have a sample collected for the biobank (this may include extraction of plasma or serum etc.). The second route into the biobank is through the operating room where they can get different biopsies from patients.

The integration of everyday hospital routines related to testing and medical procedures to include collection and storage activities is central to the blurring of the boundary between research and treatment in everyday medical practice. In one interview where we were discussing hospital biobanks and the re-use of existing clinical samples, a hospital administrator noted that:

> …it would mean that a citizen would not know that they are the object of research, if we were only studying their medical records without their consent, but with a permit from the authorities. (…) in a way it would be more of a survey research - despite the object being a group of patients – where one would not be doing medical research where you would not need to physically interact with the patient, but rather using their information to study them. (Interview with hospital administrator, FI 2013.)

The interview highlighted the way in which the role of the patient vs research subject becomes increasingly complex in relation to the double role that begins to emerge. Hospitals are trying to define the boundaries between whether the information and samples they have from patients ought to be managed as information or samples, and whether their patients are patients or research subjects. We see this as an example of ambivalent research advancement, where institutions are seeking to re-define the boundaries and definitions of what it means to be a patient and a research subject within the hospital system. Furthermore, the interview highlights the way in which tissue samples are conceptualized as a form of information to which other criteria for access – such as research access to survey data - could be applied in contrast to medical research permits, which usually assume some form of medical intervention (such as drawing blood). In Finland, this approach is not new in relation to biobanks, but rather has been presented earlier whereby tissue samples have been compared to any other type

of survey or statistical data on populations to which a different set of re-use criteria should be applied in relation to medical research (Aromaa et al., 2002).

Hospital managers are increasingly grappling with the difficulties and challenges of redefinitions of their patient populations and the samples and information that they manage, as well as the storage policies they ought to develop (Nørgaard-Pedersen & Hougaard, 2007). Current policies and guidelines are not clear as to what the status of patients is with regard to their samples and data. As Douglas et al. (2012) have noted in relation to the secondary use of dried blood spots there is increasing pressure to find uses to existing collections to make them more productive. At the same time, there emerges an ambiguity as to the re-definition of patients as research subjects within the healthcare system and the ways in which information and samples on patients ought to be defined and managed.

UK Biobank Imaging Study

The third example regarding the difficulties of maintaining a distinction between research and clinical care and the challenge it poses to the notion of therapeutic misconception comes from the UK. The UK Biobank is a major collaborative undertaking, which recruited half a million participants aged between 40-69 years from 2006 to 2010 (Wallace, 2005). The people were recruited from across the country to take part in this project through general practitioners. One of the cornerstones of the UK Biobank project has been that those people participating in the study by providing tissue samples, as well as health and lifestyle information, will not receive any personal research results or incidental findings (Barbour, 2003).

Recently, however, the UK Biobank and its associated Ethics and Governance Council have had to make an exception to this rule with regard to the commencement of an imaging study that they are undertaking. The study requires a body scan (MRI) which measures accurately body fat and tissue composition, which will be analyzed in relation to other markers and lifestyle and health information. According to UK Biobank:

> The imaging study will involve magnetic resonance imaging of the brain, heart and abdomen, low power X-ray imaging of bones and joints and ultrasound of neck arteries. The feasibility phase is scheduled to start in 2014 in a dedicated UK Biobank imaging facility at its Coordinating Centre in Cheadle, near Stockport. (UK Biobank, 2014.)

The problem that has arisen with regard to the imaging study is that the radiologists who conduct the imaging will be able to make other pertinent diagnoses based on the scans and x-rays. Due to their professional ethical guidelines, however, those doctors are required to inform patients of any life threatening or serious conditions that may be identified through the imaging. As a result, the UK Biobank has had to undertake a review of its policies, as well as conduct a study regarding IF and return of IRRs.

> UK Biobank is working with social scientists and health economists to gain a better understanding of the risks and benefits associated with providing feedback of potentially serious incidental findings to UK Biobank participants during the imaging pilot study. In some cases, these incidental findings can have serious health implications; in others, the medical implications are less clear, and many potentially serious findings may – after further investigation or the passage of time – turn out not to be of concern after all. The impact that feedback of information about potentially serious incidental findings has on participants has not been well researched. This work is important because there is currently no consensus in the research community on which (if any) incidental findings should be fed back and the best methods for doing this. (UK Biobank, 2015.)

The need to re-asses the UK Biobank policy on IF as it relates to the imaging study is an example of the difficulty that some biobanks face in terms of maintaining the distinction between research and clinical care. The case of the UK Biobank imaging study suggests that even the most determined attempts to maintain this distinction may fail due to the innovative possibilities that biobanking research is allowing in relation to the combination of a multitude of different research approaches. In some cases, however, these approaches introduce different criteria of care and treatment with regard

to the patient population, whereby different ethical and legal standards come into conflict with those which the biobank has sought to follow.

Given that hospitals are increasingly setting up biobanks as part of their routine sample and data collecting processes there also emerges the further problem of defining the limits of responsibilities related to the responsibility of doctors towards their patients. Since organisations representing medical professions, such as the World Medical Association (WMA) are issuing guidelines on biobanking, it is relevant to note that the blurring of the treatment and research boundary within the hospital setting may prove ethically challenging for doctors treating their patients. Furthermore, there is an increasing convergence between the ethical concerns of physicians, nurses, researchers and even lab technicians with regard to emerging biobanking practices. This may arise if important information becomes available through biobank research, but which the treating physicians do not communicate to her patient. An important question, which arises then is the extent of the physicians' responsibility in seeking out information on the patients that they treat, as well as the responsibility of other actors in the biobanking knowledge production process. Limiting physician liability and responsibility may become a necessary move in countries where disputes are settled through costly litigation processes, such as the US.

A further problem relates to the notion that biobanks, in general, are able to control the ways in which their patient populations are studied. Much of the function of informed consent is to control and standardize the ways information gained from samples is managed (i.e. what information is allowed to flow and not flow between the research subjects and the researcher). Yet this case and others like it suggest that the flow of information between various stakeholders is far more porous than what informed consent forms are able to account for (cf. Hoeyer et al., 2015).

The question of professional and ethical guidelines of radiologists, however, raises an even more important question in relation to the role of lab technicians and other research staff who may possess highly specific skills and know-how in relation to making diagnosis based on information derived from genetic tests and other genome sequence processes. Although a great deal of the work that takes place within laboratories where sequence data is being analyzed remains mundane, there is an increasing ability of lab technicians and other research staff to look at data derived from a single person and identify a possible serious life threatening condition. Although these researchers and lab technicians may not be bound by a code of medical ethics to help patients when possible, some commentators have noted that there is a moral responsibility within the research community to work towards informing individuals of the likelihood of a serious condition (Miller et al., 2008; Fernandez et al., 2003). As the development of whole genome and exome sequencing continues to improve and becomes less expensive, so does the accuracy of predicting more conditions become increasingly likely. The policy of UK Biobank to not provide any feedback to participants, however, has come under question in relation to this particular study and it remains to be seen whether future studies will also have to be evaluated on a case-by-case basis as new findings and possibilities arise.

23andMe Genetic Self-testing

Our final example relates to the American genetics company 23andMe, which has been providing genetic self-tests that can be ordered over the internet. 23andMe provided consumers with health information on 254 diseases and conditions, information on genealogy, as well as non-disease traits (Zettler et al., 2014). The genetic tests that they provide are an exemplar of a growing field in the biomedical industry known as consumer medicine (Tupasela, 2010) where companies provide analytical services to consumers on various aspects related to their health based on their genetic profile. Recently, however, the Food and Drug Administration (FDA) has ordered the company to halt their operations regarding their self-test services due to the lack of clinical evidence as to the validity of their claims to health benefits (Prainsack, 2014). The case of 23andMe is instructive in relation to the ways in which private companies have sought to capitalize and develop services which provide both medical information regarding one's health (based on a genetic test), as

well as collect and study data that is provided by customers who have taken the genetic self-test. The service that 23andMe offered would allow for customers to answer a broad range of health and lifestyle related questions which would then be used to further study correlations between disease and single nucleotide polymorphisms (SNPs). The trouble with their method, according to the FDA and critics of 23andMe, was that in many of the cases the correlations on which they were basing their health risk assessments on lacked clinical validity and were thus misleading consumers.

Curnutte and Testa (2012) have argued that direct-to-consumer (DTC) genetic tests are indicative of a conspicuous instance of co-production where genetic knowledge and biological citizenship become articulated around the genetic consumer. We would further argue that what has made the case of 23andMe so significant is not really the issue of whether its tests are able to provide clinical validity in relation to their significance (although that is certainly an important concern), but more importantly the way in which 23andMe has sought to combine genetic-self tests with their own research. Although 23andMe is one of many other companies that have offered such tests to consumers (others include deCodeMe, Pathway Genomics or Interleukin Genetics) what has made 23andMe of interest in relation to our work is the ways in which it seeks to blur the boundary between research and treatment (in this case genetic risk profiling). The FDA's reasoning for forcing 23andMe to stop offering its test had nothing to do with the model it was using to study people, but rather was focused on issues of validity.

The model that 23andMe developed relied on two types of iteration between their customers and the samples that they had provided. *First*, as new studies became published related to different genes that were implicated with various conditions and disease, 23andMe would update the profiles of its customers to reflect either and increase or decrease in their risk profile. *Second*, based on the information that the customer provided concerning their own health and lifestyle 23andMe would conduct its own research into correlations between genes, environment and lifestyle. Again, these results would feed back into the risk profile that the company would calculate for each customer. It is this closeness between a customers' samples and the information that is produced and gleaned from other publically available studies, which has made 23andMe of interest in relation to the notion of therapeutic misconception. The model that they use seeks to be a combination of the two by collapsing the dichotomy between research and treatment (in this case genetic risk profiling).

McGowan et al. (2010: 261) have noted that "early users approach personal genome scanning with both optimism for genomic research and scepticism about the technology's current capabilities." This would seem to suggest that users are very wary of the type of service that they are receiving as well as the context in which it is being conducted. The fusion of genetic analysis and research through questionnaires does not necessarily, therefore, need to be a problem, as may be suggested by the notion of therapeutic misconception. Although arguably the case of genetic-self-testing is unique compared to clinical research conducted in hospitals the issue of combining testing and research in DTC companies does not appear to produce misconceptions. Instead it serves more of a proof of concept that other practitioners may seek to harness in a more clinically valid and useful manner.

Although the risk profiling services offered by 23andMe are no longer allowed by the FDA (in the USA), we argue that the time it took for the FDA to force the company to halt its services, combined with the model that the company developed, is a sign of what we have called ambivalent research advancement in that it challenges the existing and traditional ways of conducting research and it elicits a certain level of uncertainty from regulators as to the appropriate response. Furthermore, it signals the challenges and tensions, which policy makers confront when having to develop guidelines with such novel approaches to research.

Discussion

A number of recent commentators have noted how the distinction between research and treatment in biobanking is becoming increasingly difficult to delineate (Burke et al., 2014; Wadmann and Hoeyer, 2014; Smith and Aufox, 2013; Pullman and

Hodgkinson, 2006) and that this may in fact be contributing to what has been termed therapeutic misconception. Zawati and Knoppers (2012) have suggested that international norms ought to be set up to guide the return of individual research results and incidental findings based on biobank research as one way of ameliorating some of these problems arising from this misconception. We argue, however, that attempts to set up international norms and guidelines fail to address the fundamental change that is going on in medical research. The distinction between the two categories (research and treatment) are becoming increasingly blurred, whereby research and treatment are being reconfigured in a myriad of different ways to such a degree that their regulation through policies might be difficult, as well as futile during a period when development and change is so rapid. We have called this development ambivalent research advancement in that it signals changes within the relationship between research and treatment in such a way as to elicit tensions between existing policies and new practices. This ambivalence also gives rise to new configurations and distributions of responsibility and authority, which are not clear in all circumstances. Hoeyer (2008) has pointed out that traditionally the ambiguities related to biobanking have sought to be mitigated through the practice of informed consent, which he argues, is not a good medium through which rights, responsibilities and obligations can be managed. We would agree with this assertion and like to suggest that institutions (hospitals, insurance companies) and state organisations begin to discuss whether the dichotomy between research and treatment within biobanking is any longer a useful distinction.

A number of recent commentators have suggested that biobanks begin to develop new ways of dealing with findings, which may have significance to sample donors (Wolf et al., 2012). This line of thought has been derived from previous experiences of developing ways of warning at-risk relatives of a serious or life-threatening condition (Offit et al., 2004; Tupasela, 2012). Although this could be arguably viewed as setting policies and guidelines for the return of incidental findings and individual research results, we suggest that it highlights the problematic notion of therapeutic misconception in the first place. In many cases, it does not recognize sufficiently the changing relation and role played by research subjects and patients within new configurations of biobanks and healthcare systems. We have furthermore suggested that this tension between policies and practice can be called ambivalent research advancement because the roles and duties, which have traditionally been ascribed to patients and their privacy, are becoming increasingly contested and problematic. This line of argumentation also follows on from the recognition that research subjects and patients can have a broad range of different expectations related to participation in research, as well as medical treatment.

Following Dressers' (2002) idea where research may indeed be contributing to notions of therapeutic misconception, we would like to emphasize that within recent biobanking developments the concept of therapeutic misconception is increasingly problematic. This is due to the ways in which biobanking research is increasingly envisioned where the border between research and treatment is in fact blurry and deconstructed in many ways. We suggest, therefore, that instead of discussing issues of IF and IRR in relation to therapeutic misconception we begin to understand the myriad ways in which biobanking practices are constructing novel relationships between research and treatment. Through this understanding we can begin to develop a new theoretical understanding of the changing role of the research subject, the patient and the research-treatment system into which they are embedded.

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Notes

1 See www.auriabiopankki.fi for further information.

Forms of Articulating Epistemic Critique: the Necessity and Virtue of Internal Skepticism in Academia

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Abstract

For many years now, there has been a vivid debate on contemporary forms of articulating epistemic critique, especially concerning the peer review mechanism but also dealing with fund mechanisms and, in some cases, focusing on book reviews. As reviews become more frequent and continue to exert considerable influence on the political landscape of academia, it is increasingly apparent that a fundamental understanding of the internal structure of articulating epistemic critique long overdue. Against this background, the aim of this article is to put forward two arguments. First, we argue these forms of articulating critique should be distinguished in regard to their distinctive characteristics and respective relations to academia as a whole. In doing so, we construct a research heuristic based on two dimensions, the opportunity to participate and the opportunity to react. Second, in response to an ongoing debate in Critical Policy Studies we conducted a small explorative empirical case study about on how scientific critique is articulated in book reviews. Besides providing a new overall perspective on how to categorize these forms of critique we found notable differences corresponding to the varied characteristics of the publication process in two disciplines (sociology/chemistry). We identified three dimensions as central for determining the quality of the expressed critique. As these differences might be related with underlying types of scientific communication, we finally argue that there is a necessity to take a closer look at how configurations of the different forms of scientific critique should be analysed and to address these in their full scope as 'cultures of critique'.

Keywords: epistemic culture, critique, institutionalized scepticism, book review, chemistry, sociology

Forms of and Changes in Epistemic Critique

Within the last 20 years the system of articulating critique within science has undergone fundamental changes. These changes are mainly related to debates about the political reorganization of science, the call for output evaluation of science for allocating resources, the flaws of peer review under the influence of economic or political interests (as the 'Climategate' case indicates, wherein climate scientists involved in IPCC suppressed information) or the critique articulated by scientists themselves who are concerned about the changes in peer-review processes that are currently taking place. In 2013 the Nobel laureate Randy Schekman announced that he would no longer publish his work in the highly ranked journals "Nature" and "Science".[1] He explained his decision by criticizing the strategy of these journals to look for the most impressive stories rather than the scientifically most important ones. According to him, this orientation would diminish the importance of epistemic critique and lower the quality of scientific work. This announcement is only one exposed example of an ongoing process. This is the process of criticizing and reorganizing forms of epistemic critique itself. Cases in point are the debates about useful indicators (cf. Bornmann & Marx, 2013) or transparent systems, like open peer-reviewing (cf. Harnad, 1979; Lee, 2012). These debates are correspond to and in some cases are provoked by the problematic side-effects of the peer-review process or the call for transdisciplinary forms of knowledge production. Forms as well as boundary-conditions of articulation of epistemic critique become visible as central parameters which, however, are currently in flux.

'Organized skepticism' (Merton, 1938, 1942) is certainly an indispensable asset for amassing and consolidating a shared stock of knowledge, which is essential for research communities. As the debates on re-organizing peer review impressively indicate, there are changes taking place with regard to the forms and functions of this way of critique articulation. Nevertheless, even though peer review is the most exposed form of articulating critique (cp. Chubin & Hackett, 1990; Lee et al., 2013; Luukkonen, 2012), it is important to look at the whole picture of critique articulation within science in order to analyze the ongoing changes. Here, we can observe an important lag and one-sidedness of the scientific debate as it mainly focuses on peer review. In light of these circumstances, we would like to put the argument forward that an analysis of the changes within the system of 'organized skepticism' has to take a closer look at the different ways that epistemic critique is articulated and it has to interpret these as a complex set, taking the ways they might interact with each other into account as well. The aim of this article cannot be to offer a comprehensive answer to this question but to suggest a starting point for research and discussion. We will attempt to do this by exploring two arguments. First, we systematically specify forms of epistemic critique. Second, we will offer empirical proof of relevance by examining book reviews as one important but not widely discussed form of articulating critique.

Within this context, in a first step, we develop a typology of forms of critique by taking into account two analytical dimensions: the opportunity to participate and the opportunity to react. In this sense, we will outline our suggestion for systematizing phenomena of epistemic critique by relating them to different *forms* of critique. Second, we will take a closer look on book reviews as a specific form of critique. After some pointed conceptual considerations of relevant dimensions and criteria for this specific form of articulating epistemic critique, we will present the findings of an explorative empirical study on book reviews in German chemistry and sociology. Finally, we argue that the differences uncovered here may point to more basic distinctions between 'cultures of critique' which should be addressed by further research.

Articulating Epistemic Critique in Academia

Drawing from the considerations presented above, we would like to outline our case for a systematized approach to studying the differences between scientific cultures of critique. In order to do this, we will now introduce two ideal type distinctions. The first basic distinction, regarding

Table 1. Forms of practicing critique according to participation and reaction potential (each exemplified by one typical situation).

	Opportunity to participate		
		Low (non-public)	High (public)
Opportunity to react	Low (non-reactive)	*Referee system*	*Book reviews*
	High (reciprocal-reactive)	*Informal exchange*	*Debate*

the modalities of critical comments in scientific contexts, is rooted in the assumption that there is some set of rules that determines the *opportunity to participate* in critique. We know of forms of public criticism, which offer a higher chance of participation, as well as forms of non-public criticism, where possibilities for participation are often very limited. The criteria-conditional parameters of the participation dimension can be regarded as consisting of the terms 'public' and 'non-public'.

The second basic difference refers to the *opportunity to react* which is afforded to criticized scientists in their respective settings. The reaction opportunities dimension describes the range of possibilities for a criticized author to participate in the debate or – conversely – the likelihood with which he will be excluded from it. The rules of whether and how to react can be highly formalized and restricted. This is the case with peer reviewed publications, peer reviewed grant applications and book reviews. Rules however can also be more open, resembling – in its form and structure – everyday practices. Examples are less explicit (and therefore more informal) commentaries. We can therefore distinguish between forms of non-reactive critique and forms of reciprocal-reactive critique.

Based on these two fundamental distinctions and their respective dichotomous values, we can create a contingency table (Table 1). It serves as a heuristic to cover the different modes of commenting in a scientific context. All these forms of articulation – although they may serve other functions as well – are selection mechanisms for the production of scientific knowledge and therefore carry out a memory function as well as an orientation function (cf. Gläser, 2006).

First, we turn our attention to those forms of critique that leave only little chances for the criticized party to react. Located in the protected space of non-public articulation of scientific skepticism with only very little chances to react, we find a number of assessment and evaluation processes which fit the definition of *(unpublished or prepublication) peer review*. Peer review is seen as the 'gold standard' of critique, because the anonymous interaction is presumed to create a high level of objectivity, balance and comprehensiveness in articulating critique (though even here, social order is more complex than is implied; see Laudel, 2006). High (i.e., public) participation opportunity and low reaction opportunity form the defining characteristics for the genre of (*post publication) book reviews*. Reviewer and reviewee are aware of each other, resulting in a higher inner complexity of the social practice of critique, made evident by a variety of styles and gestures expressed in comments or critique.

Second, we take a closer look at those forms of articulating critique that imply a reciprocal-reactive option for criticized persons. This represents the essential situation of articulating critique while addressing the respondent who is invited to react, what can be described as public scientific *debate*. Such a situation allows for both high chances to participate in critique as well as high opportunity to react to it. One widespread form is the discussion following presentations at scientific conferences. In addition to questions of comprehension, this offers the chance for supplemental comments or remarks which further one's own profile or position. *Informal exchange* is the final combination of different levels of opportunity to participate and react presented in table 1. This includes conversations held in confidence at conferences, privately voiced critique regarding presentations as well as the common practice to ask 'critical friends' for their comments and feedback. This informal commenting practice is difficult to grasp empirically since this method of articulating skepticism is non-public.

A brief look at these different forms and forums of critique is enough to gain the impression that the thorough study of these forms constitutes a research program in and of itself. Regarding some aspects of forms of critique, a substantial body of research literature already exists, especially on peer review procedures (e.g., c.f. Hirschauer, 2010; Bornmann, 2011; Lamont & Huutoniemi, 2011; Lee et al., 2013; Squazzoni et al., 2013). Within this debate the exposed as well the somewhat contested role of peer reviews is addressed and it points on the ongoing changes and side-effects as peer review e.g., is heavily expanded due to political needs. Accordingly, this system depends on a complex, large-scale cooperation process, which is sensitive to forms, motivations and institutional contexts. Interestingly, in the course of this debate not only the search for productive forms for re-organizing peer review is expanding but also the differences between scientific communities are addressed. In contrast to this lively and multifaceted debate, the scientific attention to other forms of critique is at its beginning (e.g., cf. Kriwy et al., 2012). We would argue that with regard to the overall understanding of critique and scientific work this situation is unsatisfactory. For this reason, we suppose that a sufficient understanding of critique is only possible by taking into account the interplay of the different forms of and arenas for articulation of critique. Therefore, the debate about re-organizing peer review would profit from a more thorough view on other forms. In this context, we took a first step in this direction by analyzing book reviews.

Exploratory Analysis of Book Reviews: Sociology and Chemistry

With regard to form and function of book reviews, there was an interesting short debate in the journal "Critical Policy Studies". Heiminio Martins (2010) was the one to start the debate by taking a closer look at book reviews, concluding that the negative tone of critical comments – paired with the lack of opportunity to respond to criticism – is wholly unproductive. He argued that reviews are reduced to serving as mere weapons in academic 'wars' for status and recognition and should be regulated by institutionalized procedures (Martins, 2010). There are two reactions to Martins' suggestions in the same volume. Richards (2010) insists critical engagement, both positive and negative, cannot be separated from science and must, indeed, be welcomed. He argues that every academic has not only already been at the receiving end of negative reviews, but that they are also able to accept and understand criticism in its proper context (Richards, 2010). Finally, Mandell and Coulter (2010) invoke empirical arguments and criticize that Martins neither provides appropriate data nor clear definitions for his objections. Their own small-scale, ad-hoc study including 91 review articles in U.S. sociology journals concludes that very disrespectful or unfair reviews would appear to be quite rare in any case (Mandell & Coulter, 2010). Both of the aforementioned articles criticize the suggestions made by Martins, while nevertheless calling for more research on the subject of academic review to expand the limited data on this topic.

From our perspective, two aspects appear to be essential in order to continue this debate. First, empirical data concerning academic book reviews must be systematically expanded. Second, the analysis of book reviewing must be approached from a more comprehensive point of view on the subject, i.e., in the greater context of peer critique in academia, since book reviews are simply one specific form of articulating criticism. Keeping the discussion initiated by Martins (2010) in mind, we will begin with a two-step analysis of the practice of book reviewing. To offer a contrasted view, we take two distinct disciplines into account. Sociology and Chemistry each use systematically different forms of publication; whereas in sociology books play a major role, the standard publications in chemistry are research articles (Fleck, 1981; Alexander von Humboldt Stiftung, 2009). Therefore, we should expect to find significant differences in the articulation of critique in book reviews. First, we will outline book reviews as a genre of organized internal skepticism within science and put forward a suggestion for its systematization. By doing so, we refer to specific findings from a short explorative qualitative analysis. Secondly, we will present the findings of our own small-scale empirical survey.

Categorizing Reviews as a Genre of Epistemic Critique

The rise of scientific journals led to the establishment of a general practice: New publications were to be read and evaluated by a member of the respective scientific community and a summary of their assessments had to be published. The benefit of these early reviews was not so much a well-founded critical appraisal, but rather the summary and consolidation of a steadily increasing number of publications and the circulation of their central ideas in compressed form. The art of detailed summary can therefore be seen as an early reaction to the rapid growth in production, documentation, and distribution of scientific information (cf. Burke, 1997). Some quite informative insight into the history of book reviews can be found in Johann Christoph Greiling's treatise, '*Einige vorläufige Gedanken zu einer Theorie der Recensionen*' ('Some preliminary thoughts toward a theory of reviews'), published in 1797 in the *Philosophisches Journal* and inspired by Immanuel Kant (Urban, 2004). It offers a first definition of the genre, but does not distinguish between literary and scientific reviews.

It is remarkable that at this early stage already Greiling (1797) criticized the lack of rules for giving reviews and formulates general review principles which can be interpreted as an attempt to standardize the genre. Greiling's code of standards consists of several guidelines, e.g., he emphasizes the public nature of reviews as a definitive characteristic of the genre. Accordingly, the assessment and appraisal of any published work should therefore also be made available to the public. Also, the review should only refer to the actual work in question and not to the author personally. These and other aspects together should allow the reviewer to act as the 'voice of science' and bound to the high ethical standard of this duty (Urban, 2004: 22). Additionally, Greiling required that the reviewer should not merely summarize the debated work, but offer a competent appraisal of 'objective and universal status' (Urban, 2004: 21). Greiling further specified the style or tone of a review: It should be noble and dignified. Expressions such as 'mannered presentation', or 'nobility and certainty' are contrasted by manners of speech to be avoided such as a 'derisive', 'haughty', or 'arrogant' tone, 'wanton criticism', or 'surliness, rudeness, or rowdiness' (Greiling, cited in Urban, 2004: 23). In short: Critique was regarded to be created "completely free of influence, taking no heed of external circumstances" (Urban, 2004: 19), to involve objective, careful analysis and to lead to a mannered presentation *and* evaluation of content. Reviews were seen as an instrument of critical scrutiny in the spirit of the Enlightenment.

There is little research on review criticism until yet in the sociology of science,[2] but inspiration comes from the analysis of evaluating systems in science. In their article on the structure and functions of the referee system Harriet Zuckerman and Robert K. Merton (1971) touch the topic of book reviewing, which can be seen as analogous to judging the acceptability of scientific manuscripts in the publishing process. After analyzing data from the archive of *The Physical Review* they inquired the influence of aspects of the academic social structure – like status differences – on the number of rejections for a submitted paper. Beyond motivational arguments that may inform a critic the functional analysis shows structural effects and determinations on the formation of critique as a specific form of selection. The referee-system evaluates the quality of role-performance in the social system of scientific discourse and so the review critic, but his or her judgment has additional functions. Because of its visibility the book review is itself a scientific statement that provides a summary and evaluation of the reading experience for others.

Looking at the whole picture, we first have to consider on the object side – or the form side respectively – of the expressed critique as it is represented in Martins' portrayal of a deficient review system which is very much in line with Greiling's thoughts. Secondly, this form-perspective is to be aligned and systematically connected to a Merton-inspired perspective of structural influences on the process of articulating critique. Against this background, we propose to put forward three dimensions of review-based critique that outline the full spectrum of critique in review practice. In doing so, we refer to the findings of an explorative qualitative investigation based on interpretative analysis of six book reviews respectively in a sociological and a chemists' review

journal. The interpretative work was carried out in reference to hermeneutic methods that lead to typification (e.g., cf. Reichertz, 2004).

The first dimension represents skepticism regarding scientific content. As this type of skepticism is based on scientific criteria that are considered to be legitimate in discourse, it can be treated as expressing a *criteria-conditional* dimension of criticism. A critique may be identified as *criteria-conditional* if the underlying criteria for its valuating statements have been disclosed and accepted. The most important criteria – which also were represented in the corpus of the book-reviews analyzed – are:

(1) *Progress*: To what extent does the reviewed work represent an innovation or progress for the discipline to which it refers?
(2) *Compatibility*: To what extent does the reviewed work take previous works of other scientists into account and is consistent with their findings?
(3) *Comprehensiveness*: Is the author able to completely examine his subject or to narrow it down and completely examine the defined segment?
(4) *Rigor and plausibility*: Are the arguments developed sensibly and described comprehensibly (theory, methodology, and method)?
(5) *Formal aspects*: Does the written form of the author's reasoning meet an informed reader's expectations (editing, material layout etc.)?

These aspects may be understood as criteria-conditional sub-dimensions. They serve as evaluating criteria in a positive (praise) or negative (rebuke) way. Using these criteria, even unfavorable critique is considered to be constructive and must be accepted as such by the criticized party.

In contrast to the purely content-related style of critique, a second dimension of academic criticism can be identified: *affectual* or emotional critique. This includes not only the reaction toward the reviewed work, but also the reaction toward the reviewed author himself. Affectual critique is mainly expressed through tone. Empirically, this dimension can be made visible by analyzing evaluative-emotional semantics. With regard to this, not only did we find in our analysis expressions between exalted praise and harsh rebukes within a continuum of acceptance–neutrality–rejection, but more interestingly sarcasm or irony. These evaluative semantics can be referred to as affectual because they use language to contour and sharpen critique by means of specific emotional connotations. We found criteria-conditional arguments presented very strongly as well as very weakly regarding their affectual nuances or 'spin'.[3] By contrasting chemistry and sociology it was instructive to see that the overall tone of critiques was quite different, in many cases a 'warm welcome' in chemistry contrasted with a broad and nuanced spectrum of affectual articulations in sociology. Nevertheless, it has proven difficult to assess the affectual dimension of a review, i.e., to reach a conclusive and convincing verdict about its 'tone' or degree of politeness, on the basis of statements of approval or disapproval contained within it.

The third dimension, *relational* critique, cannot always be found within the text itself, at least not entirely. For some reviews, it is possible to conclude the author's presumable, underlying motives from their inherent information, often in the form of paratext (Genette, 2010): e.g., by taking into account the author's gender, status, organizational affiliation or affinity to a certain school of thought. This can only be uncovered by searching beyond the original text. The relational dimension stands in sharp contrast to the demand for a neutral position that is solely dedicated to the interests of the scientific community. In light of a growing acceptance of strategic behavior in scientific contexts, this aspect of manipulative critique – which has traditionally essentially been considered taboo – is expected to become more relevant for analysis. Previous analyses provide the following considerations:

- Convergence/divergence of *segmented* positions: reviewing works that match one's own research interests can raise attention for a particular field. Conversely, distancing oneself from other work and drawing boundaries of opposition opens up the opportunity to sharpen the contours and visibility of one's own profile in a debate and weaken opposed

positions (mainstream effect vs minority strategy).

- Convergence/divergence of *stratifying* positions: the positional relation between reviewer and reviewee can inform certain tendencies of critique; e.g. when a 'master' reviews a 'novice', an 'established scholar' reviews an 'outsider'/'newcomer', or when a 'renowned' scientist reviews another, who is 'unrenowned'. In case of status equality, this can also indicate efforts to cooperate with or distinguish oneself from other researchers or theoretical approaches (positional power).[4]
- Convergence/divergence of *ascriptive* characteristics: relational preferences resulting from ascriptive characteristics such as gender or nationality. This category would ideally not be of any relevance in scientific contexts that actually address content irrespective of the personal qualities of the contributor. However, denying the existence of ascribed characteristics is not an option if the eradication of *de facto* inequalities and disparities that exist in academic practice is to remain a goal.[5]

Differences Between the Review Systems of Chemistry and Sociology

In our preliminary qualitative and quantitative empirical study, we investigated book reviews. We analyzed the selected material itself hermeneutically, but we also used easily accessible context information in order to address positional considerations. The text material was sampled from one renowned German journal of each discipline: the review sections of five volumes of the prominent journals *Kölner Zeitschrift für Soziologie und Sozialpsychologie* (KZfSS) and *Zeitschrift für Angewandte Chemie* (AC). This resulted in a data set of 230 sociological and 331 chemistry texts. A quantitative analysis was carried out for the whole data set, whereas the hermeneutical analysis and interpretation focused on six sociological and six chemistry texts. This analysis was conducted by a team of qualitative data interpreters. Results were complemented and supported by four expert interviews with reviewers or scientists that take part in the review system, two each in the fields of sociology and chemistry. Even within this limited range, this interdisciplinary comparison provided a fertile basis for the formulation of several hypotheses.

Apparently, a review sample from five volumes of one sociological and one chemical journal respectively is neither representative nor complete. Nevertheless even this precursory, exploratory approach led to the insight: There are significant differences between disciplines that matches with some aspects of our relational dimension of review critique. First, it is noticeable that the observed values seem to be much more heterogeneous for the field of sociology than for the field of chemistry. This suggests that review practices in chemistry – at least for the journal in question – follow clearer rules than in sociology.

Furthermore, we found noticeable differences between the disciplines regarding the variation of reviewers' level of qualification (table 2) as well as reviewers' and reviewees' gender (table 3):

The disciplinary comparison reveals clear differences between sociology and chemistry for all qualification levels (stratified positions). Recent graduates (and to a lesser extent postdocs) far more often write reviews in sociology than in chemistry. This suggests that it is uncommon in the field of chemistry to write reviews at this qualification level. This finding appears to be inverted among professors. Particularly conspicuous is the difference among full professors. Our sample

Table 2. Distribution of reviewers according to academic qualification and discipline.

		Disciplinary affiliation (percent)	
		Sociology (n = 230)	**Chemistry (n = 331)**
Level of qualification	Graduate (Master's degree or equivalent)	13,7	1,0
	Postdoc (PhD)	26,9	16,6
	Assistant/Associate professor (Habilitation)	8,8	10,9
	Full professor	48,0	66,5
	Emeritus	2,6	5,1
	Total	**100**	**100**

Table 3. Distribution (in percent) of reviewers regarding gender and disciplinary affiliation.

		Disciplinary affiliation (percent)	
		Sociology (n = 230)	**Chemistry (n = 331)**
Gender	Male	71,6	92,6
	Female	28,4	7,4
	Total	**100**	**100**

therefore suggests that reviewing is practiced by different groups in sociology and chemistry: The field of sociology shows a more or less even distribution of review activities for all qualification levels, whereas in the field of chemistry, reviewing seems to be mainly practiced by (full) professors.

Regarding the subject matter of reviews, our data clearly shows that monographs/books written by graduate students are reviewed with a disproportionate frequency; the same is true for textbooks written by professors, which are also overrepresented. Textbooks and edited volumes published by postdoc researchers as well as monographs by professors are, by contrast, underrepresented.[6]

The second difference that would support discipline-specific cultures of critique is a noticeable gender effect (ascriptive characteristics): In general women are highly underrepresented among reviewers (in total, only about one fifth of all reviewers in sociology and chemistry are female). Further though, there are indications suggesting that gender practices of critique differ between sociology and chemistry (see Table 3). The table shows that the number of female reviewers in sociology accounts for nearly a third of reviewers (28 percent), whereas only about seven percent of the reviewers in chemistry are female.

Based on the assumption that the quality of a review increases with the reviewer's experience and assuming systematic, gender-related differences in the articulation of critique between men and women we can derive some initial conclusions: There do exist distinct disciplinary cultures of critique. These differences become evident when the findings for both disciplines are analyzed separately. All in all, sociology gives a far more heterogeneous impression regarding its review practices than chemistry.

It is evident that in chemistry women with lower level of qualification invest a higher amount of work in writing a review than their male colleagues of 'equal rank' (Pearson .268, $p < .000$). This pattern is less marked in the field of sociology (Pearson -.215, $p < .000$). Additionally, female chemists tend to form review teams more often than female sociologists (Pearson .223, $p < .000$). Further it is noticeable that within sociology men tend to review works written by men more often, and women those written by women (Pearson .213, $p < .012$).[7]

Since our data sample is highly limited in its prospects for generalization, these findings can only serve as a first indication of possible structural differences. An initial impression from the comparison of book reviews in both journals (*KZfSS* and *AC*) is that sociological reviews seem to be considerably more heterogeneous regarding the aspects developed above. First, this is due to the fact that the conditions for reviewing published work differ significantly between the disciplines and the associated, analyzed journals.

Second, there seem to be fundamental disciplinary differences in the importance or role of reviews, reviewed works (books) and reviewer selection. More specifically, sociology is much more a 'book science' than chemistry. In sociology, it is very common to publish research and conference proceedings as well as qualifying texts in book form, whereas chemistry seems mainly limited to textbooks and overviews of the current state of research. Also, the publication of sociological books is often initiated and partly financed by the authors themselves, whereas books in chemistry are mostly commissioned by publishing companies.

Consequently, reviews differ strongly and fundamentally in character: In German sociology, the literary market is a highly contested arena and reviews can serve as an instrument for allocating attention. Additionally, they can become weapons in conflicts between different (theoretical) positions. This struggle is carried out by

assessing criteria-conditional categories and with an occasionally high level of affectual involvement. Regarding the relational dimension, the affinity to certain theoretical and methodological approaches or research institutes are important factors, as are the positional and status differences of reviewer and reviewee.

In chemistry though, they lack relevance as an arena for relational conflict. Hence reviews in this field tend to be a sort of 'friendly content summary' that represent relatively subtle self-positioning attempts by the reviewer. These reviews are not very differentiated regarding criteria-conditional aspects, generally have a moderate tone and refer to clear relational contexts, i.e. scientists review peers of equal rank and with similar research interests. As these differences might be explained by the difference between a 'journal science' and a 'book science', a closer look at the overarching setting of forms of critique in different disciplines is needed.

Outline for an Inquiry into 'Cultures of Critique'

These first findings clearly show that a deeper and more differentiated analysis of academic review would overcome the limitations of a debate like the one of Martins and colleagues in 'Critical Policy Studies'. In order to better understand reviews, we consider it necessary to distinguish three dimensions in the relation between reviewer and author. These are interwoven, each referencing the other. This means that the *criteria-conditional*, *affectual*, and *relational* dimensions of critical expression are to be analyzed as complementing aspects of forms of critique. Such analyses lead to a differentiated understanding of academic review as a system of statements. However, from a review-research point of view, understanding book reviews in their entirety is no longer necessarily the immediate goal. Whether a standard form of reviews exists or to what extent it is adhered to is in itself not very enlightening. This kind of assessment depends primarily on the formal specifications of each journal or whether or not the reviewer bases his review on the common form 'intention–summary–assessment–overall appraisal'. In light of Martins' (2010) recommendations toward a more 'civilized' institution of academic review and the rebuffing reactions by Richards (2010) as well as Mandell and Coulter (2010), we would argue for a closer investigation of general forms of epistemic critique before implementing incentives for action.

By looking at the comparison of the disciplines of sociology and chemistry, the divergence seems to be rooted in *systematical* differences. To find out more about these differences it is important to take a closer look at the structure of the practices of critique in relation to the emphasis a specific form is given in the communication infrastructure of a discipline. Therefore, we argue that it might be fruitful to distinguish between different cultures of critique. Such cultures are representing the divergent conditions and requirements for academic practices of articulating epistemic critique related to different disciplines. A systematic analysis of 'cultures of critique' would not only address the four typologically differentiated forms of articulating critique, but especially look at the interplay of these different forms.

The argument for such an analysis of cultures of critique in the sense we propose here refers to social change in academic institutions, which affects how peer comments and quality control are handled and also how far their influence extends. Evaluations that are institutionally required (e.g. for grant allocation or peer-reviewed articles) often lead to direct repercussions for available research funds. The increasing importance of reviews has a direct influence on the social order of epistemic critique. In times of exponential growth and therefore stronger competition for resources within the academic system, academics may react more sensitively to criticism and tempers may be more likely to wear thin.

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Notes

1 Cf. Available at: https://www.theguardian.com/science/2013/dec/09/nobel-winner-boycott-science-journals (accessed 6.1.2017).

2 The case of reviews in medicine was investigated by Andrew D. Oxman and Gordon H. Guyatt (1993), who alleged a shift from authoritative reviews to systematic reviews.

3 The term is derived from the affectual type of rationality as discussed by Max Weber. The reviewer does not act in an affectual manner per se, since his or her formulations have a goal-oriented purpose. However, he or she can intentionally evoke an affectual impression in the sense of focused rhetoric: "Affectually determined behavior is the kind which demands the immediate satisfaction of an impulse, regardless of how sublime or sordid it may be, in order to obtain revenge, sensual gratification, complete surrender to a person or ideal, blissful contemplation, or finally to release emotional tensions." (Weber, 1962: 60; Weber, 1972: 12).

4 Cf. Zuckerman and Merton (1971), who show that there is no effect between referees and submitting authors concerning their relative status within physics, but maybe there is a difference between different epistemic cultures.

5 Cf. the theory of the academic field respectively the theory of practice by Pierre Bourdieu (1990).

6 The Pearson correlation coefficient for the variables 'reviewee qualification' and 'genre of reviewed work' indicated a weak correlation of .236, $p < .001$.

7 For this analysis we filtered results according not only to discipline, but also according to single authorship for both the reviewing and reviewed parties in order to present connections and relationships more clearly.

Waltraud Ernst & Ilona Horwath (eds.) (2014). Gender in Science and Technology. Interdisciplinary approaches. Bielefeld: transcript.

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A couple of weeks ago, in November 2016, I went to the kick-off event of a transdisciplinary research project on security for people in cyberspace. Researchers in mathematics, computer sciences and engineering, who have been working for decades on securing the digital society, felt their efforts to compute 'the human factor' have failed and will cooperate with linguists, psychologists, anthropologists and other social scientists. My friend, who participates in this research project, is a professor of anthropology of knowledge. At the dinner later that evening, she told me of a PhD job interview she held for this project. A male candidate, a trained computer scientist, addressed my friend's male colleagues by their titles and names, but my friend only by her first name. The candidate immediately corrected himself and apologized noting that he is not used to women being professors. I found this anecdote interesting for it points to a continuing easy and pervasive blindness to the working of categories of an analytic social awareness amongst mathematicians, computer scientists, and engineering — and that is worrying.

The question of gender participation in science and technology has been discussed widely, but how to address it without contributing to a binary gender distinction and stereotyping? This is the starting point for the book edited by Waltraud Ernst and Ilona Horwarth. The book emerged from a lecture series conducted in 2011-2012 at the Johannes Kepler University in Linz, Austria. Written by authors of which each has a background in at least one scientific discipline, the book provides an introduction to analytic approaches from feminist technoscience to different fields of scientific research and technological innovations. If widely read by mathematicians, computer scientists and engineers, it has a capacity to make a difference.

The table of content specifies eleven chapters grouped in three parts. The first part, "Gender in design processes" is guided by the question of how new technology can be developed to foster equal opportunities for all genders. The second part, "Gender in epistemological foundations of science and technology", discusses how gender becomes an issue in scientific research. Research on un/equal participation is designated to the third part, "Reflecting un/equal conditions for participation". Among the eleven chapters, are many of interest for researchers in the STS. I chose to discuss two of them.

Els Rommes's chapter "Feminist Intervention in the Design Process" is among the chapters of the first part. She follows the question 'Is it enough to design products that include more women, or should feminist designs include efforts to proceed for changes in gender relations?' (2014: 41). Part of her chapter is presenting results of a previous research project about technology designs such as computer games, websites and mobile phones, which was conducted within the European research project "Strategies of Inclusion; Gender in the Information Society (SIGIS)" (2014: 41). She explores what it is that is referred to by gender-inclusive design and asks for design

methodologies which will lead more easily to gender-inclusive products (2014: 42). Rommes discusses the term 'gender-inclusive' which she opposes to 'feminist products'. By claiming that gender-sensitive products may reinforce sex stereotypes, she argues for products that display gender as dynamic and fluid, which are gender transgressive rather than reinforcing stereotypes. She also presents her categorized strategies by which gender-inclusive and gender-transgressive products were designed.

One of the strengths of Rommes' chapter is her commitment to the concept of gender transgression. She describes how different strategies of designing gender-inclusive or gender-transgressive products lead to a variety of gendered products. She shows what is at stake when one design strategy is applied or another. By doing so, she wonderfully emphasises the ontological politics (Mol, 1999) of the design processes. I enjoyed reading this chapter, yet, I would have wished for more situatedness in order to understand the options in the decision making processes. By situating her research data and her own position she would have responded to my questions which were raised when she asked "Is it *enough* [for whom] to design products that include more women, or *should* feminist designs include efforts to proceed for changes in gender relations [in order to do or to attain what]?" (my emphasis and insertion).

My criticism of lacking situatedness is directed to various chapters in the book and it's also my main criticism of the book. While some authors develop their claims by acknowledging their impact on the knowledge, I was left with a sense that not just the claims of those authors, but most claims in the book are too general for a STS readership. Often, it remains unclear if they are supposed to have validity beyond the actual research situation, and if so how the claims' transfers from one situation to another is managed. Another, rather disturbing, consequence of lacking situatedness is that 'gender inequality' becomes a vague, all-purpose concept and by this it appears removed from the experiences of those written about.

Wendy Faulkner's chapter "Can Women Engineers be 'Real Engineers' and 'Real Women'? Gender In/Authenticity in Engineering" pays tribute to this experience. It is the first of three chapters of the third part 'Reflecting 'unequal conditions for participation'. Faulkner argues for multiple, fluid and relational genders in engineering while describing the making of the duality of men and women. She faces this challenge by pointing to the practices and dynamics that constitute femininities and masculinities in engineering. Faulkner describes how women engineers were made visible as women and invisible as engineers by applying the concept of 'gender in/authenticity'. Faulkner coined this concept to highlight *"the apparent congruence or non-congruence of gender and engineering identities for man and women engineers respectively"* (emphasis in original, 2014: 189). This concept provides a sensitive framing of gender-constituting interactions and their consequences for engineering identities. By describing these practices, Faulkner shows how specific genders were performed. Yet, I would have wished for more visibility of materiality in the chapter; and not only in this chapter. Other chapters too mention a rather abstracted materiality - abstracted brains and abstracted hormones. Although they criticise understandings of technology as gender neutral, materiality's contribution to gendering is barely discussed.

The editors (and authors) did not set out to address researchers in STS as their primary readership. Instead, "the book was written especially for those students and scholars of science and engineering who are ready to confront unreflected assumptions about women and men and who want to learn about methods and strategies to develop research and innovation serving all genders and enable them to collaborate on equal terms" (2014: 8). For me, the book provided insights in currently conducted research projects on gender in science and technology and theoretical tools. It has encouraged me to frame the aforementioned scene between my friend and the applicant from computer science as one offering itself as a site for generating a new ordering of genders in the technosciences. The book provides inspirations to work towards a more differentiated understanding of the interactions of genders in the working of the technosciences. It is an effective contribution, and I feel that I now have a book that I can recommend to my friend, suggesting she in turn recommends it to her fellow technoscientists.

Reference:

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Noortje Marres (forthcoming, March 2017) Digital Sociology: The reinvention of social research. Cambridge: Polity Press.

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In Digital Sociology Noortje Marres invites us to ponder over the impact of social media research on sociology and over how sociology is transformed by digital research methods. She does this by opening up a conversation with classic voices in sociology, Durkheim, Weber, Garfinkel, and others, whereby she offers insights into some of the methodological roots of digital methods. The book is guided by a desire to explore and clarify what research, with and against digital infrastructures might mean for contemporary sociology, media studies and STS. One of the central tenets is that innovation in big data and computational social science needs sociology's capacity for methodological innovation.

In the book, digitized social research is exemplified through cases and research conducted by Marres and colleagues over the past 5-8 years. Descriptions of to teaching situations and workshops offer lightness and liveliness to the theoretical argument. Only little is presented with regards to specification on how to design or carry out digitized social inquiry. Still, Digital Sociology comes across as a practical book, which is quite an achievement given its theoretical ambition. This is clearly an effect of Marres' capacities as a writer and of her skill in bringing digital technologies to life in text. But the book's practice-orientation touches on a more profound issue. To this reader it is a 'factoid' (Haraway, 2015) of social research of infrastructures more generally.

Digital infrastructures are recursive in the sense that they are simultaneously social phenomena worth of exploration and offer means of researching such phenomena (see also Jensen and Winthereik, 2013). Thus, we are required to work with their embedded capacities and shortcomings and *make* them into research tools and objects of inquiry. This is not unlike ethnography where the means of achieving knowing about sociality hinge on skills that are themselves 'social', like conversation and observation.

Conceptually, Marres specifies social research with and against digital infrastructures as *interface methods*. Rather than a set of methodological guidelines, interface methods is an approach that recognizes how, in the words of Marres:

> important social research methods are already built into digital infrastructures, devices and practices, even if they currently tend to serve other-than-sociological ends (2017: 13).

She argues that it is the non-trivial task of social theorists to

> test and develop the capacities of these methods-devices for social inquiry, so that they may better serve its purposes. While digital architectures constrain social research in many ways, they are also to an extent configure-able: the digital application of method requires a continuous mutual adjustment of research question, data, technique, context and digital setting. (2017: 13.)

Interface methods are presented as a practical-theoretical instantiation of a device-aware sociology. Such device-awareness offers substantive insight into how digital infrastructures and other mundane instruments both persistently participate in contemporary social life and must be allied with to *know* about sociality.

And questions of epistemology and epistemic practices are pivotal for Marres. How to know digital methods? How to know about the controversies they have spurred, their publics, their histories, and the ends to which they have been put, their politics? The book offers comprehensive answers to such questions. It makes the point, repeatedly and in varied ways, that there is no way around technology for sociology. One of the most clearly stated points is that the reason for this is that technology problematizes the social in way that can be transformative for critical thinking. Technology, and digital infrastructure specifically, problematizes knowledge, sociality and politics.

Investigating the knowledge dimension of digital social inquiry, Marres (2017: 217) argues, brings into focus a much wider potential transformation of digital social life and social research than what can be contained in issues we recognize as ethical, legal and social. Thus, technical apparatuses of social life and social research must be specified for us to be able to critically scrutinize them. To explore the medium-specificity of digital societies, experimental and uncanny methods are needed as they may help us see the social at one and the same time both ordered and emerging

One direction in which this reader would like to explore further, with Digital Sociology firmly stuck into the travel pack, is how to better describe and re-narrate online data with ethnographic sensibility, in order to build an audience, and let the ethnographic exploration with and against digital infrastructure continue into writing. Unlike any other book in the field Digital Sociology offers a license to conjure up sociological objects of research with digital actors, that busy themselves with knowledge, sociality and politics.

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Science & Technology Studies

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