

INTERVIEW

Epistemology, Activism and Entanglement

– Rethinking Knowledge Production

INTERVIEW WITH NINA LYKKE
BY LEA SKEWES AND STINE W. ADRIAN

INTRODUCTION

Nina Lykke is Professor Emerita at the Unit of Gender Studies, Linköping University, Sweden. She has been an engaged feminist researcher, educator, and activist since the 1970s, during which time she has developed important critiques of epistemologies in science and technology. She has covered topics as diverse as the space race, reproductive technologies, cancer, and death. Lykke has published widely in both Scandinavia and internationally within the field of feminist cultural studies of technoscience. Her most well-known publications within the area include the monographies *Cosmodolphins* (2000) co-authored with Mette Bryld, and *Kønsforskning* (2008) (in Engl: *Feminist Studies* (2010)), as well as the edited volumes *Between Monsters, Goddesses and Cyborgs* (1996) co-edited with Rosi Braidotti, *Bits of Life* (2008) with Anneke Smelik, and *Assisted Reproduction Across Borders* (2017) with Merete Lie. She has been pivotal in establishing the Unit of Gender Studies at Linköping University, with which she has been affiliated since the unit's inauguration in 1999. She has played a major role in the development of the PhD programme in interdisciplinary gender studies at Linköping University, which has a strong profile within feminist STS. In 2007, she started the *Center of Gender Excellence* GEXcel, initially funded by The Swedish Research Council, Vetenskapsrådet, and later by the participating Universities, Linköping University, Örebro University, and Karlstad University, Sweden. She has also been the director of the *Nordic Research School in Interdisciplinary Gender Studies* 2004-2009, and from 2008-2017 she was the director of *InterGender*, the Swedish-International Research School in Interdisciplinary Gender Studies. We met with Nina Lykke in Copenhagen, in order to let her unfold how her own interest in Feminist STS/Feminist Technoscience Studies emerged, and how she has put feminist cultural studies of technoscience to work from the 1980's until today, through research, teaching, and activism.

TAKE THE EDUCATION AND RUN!

STINE W. ADRIAN: How did you become involved with feminist theory, technology, and science?

NINA LYKKE: I think first of all I came to it from a starting point in feminist epistemology. For example I found inspiration in Sandra Harding's book *The Science Question in Feminism* from 1986 which had this basic, foundational, radical critique: that all the sciences had to be changed in order to be liberating instead of oppressive. The critique that the sciences were oppressive came from the feminist movement, in which the Boston Women's Health Collective book *Our Bodies, Ourselves* (first published in 1971, and later translated/reworked in many languages, including Danish) played a major role. This critique made it possible to understand that it was not just medical doctors systematically misrepresenting women's health problems, but also the science behind the doctors that needed to be criticized and changed. There were also links to the struggle for free abortion, which was an important political issue when I started as a feminist activist in the beginning of the 1970's. Abortion was made legal in Denmark in 1973, pushed by this movement. Moving from activism to questions of the epistemologies behind the system has framed my feminist approach ever since. This, at least in retrospect, is my interpretation of the common thread. I might have articulated it differently back then. But both for me and others, these links between the women's health movement, the abortion issue, and the questions surrounding science, technology, and epistemology were important, and made a need for a fundamental and radical change of science explicit and visible.

I think the link between activism and epistemology is key. But for me there was also what you might call a mixture of pragmatics and a very idealistic drive. In 1981

when we started the Centre for Gender Studies at Odense University (which was called the Centre for Women's Studies back then), I wanted to establish an education, a degree programme, and have students. I was not so interested in teaching in programmes that were part of other disciplines, but rather wanted to do a degree programme specifically in gender studies, which was related to activism and forged a close link to feminist theory and epistemology. In Denmark, at least back then, the Ministry of Education had to approve degree programmes, and basically, our applications to the Ministry were met with responses such as "A degree programme in Women's Studies! What the hell? This is completely crazy! You can teach a bit of women's literature within the Department of Nordic Studies, or you can teach a bit of women's history within the History Department. That is acceptable. But to make an entire degree programme will not prepare the students for any jobs. So, it is completely out of the question". However, at Odense University, there was also a centre for telematics which started at about the same time as our gender studies centre. The people in charge of telematics were basically the only leftwing people at the university, besides us at the gender studies centre. Therefore, we thought, why don't we strike up an alliance with telematics! We thought that if we did this, then perhaps we could persuade the Ministry of Education that the candidates could get jobs, because at the time there was this hype about women students to prepare themselves for moving into technology-related sectors of the academic labour market. So we thought that the combination of gender studies and telematics would give us an argument in the struggle to be allowed to establish a degree programme.

This was the ways in which we mixed idealistic long term goals and pragmatics. I have for years had the slogan: "Take the money and run!", when doing research ap-

plications, i.e. speaking the language of the institutions, but with a feminist twist. So, in this case it became: “Take the degree programme and run!” We did succeed in setting up this programme, called “Women’s Culture and the Culture of Technology” (which started in 1984). It was pragmatics, alliances, and navigating through institutions, and of course combined with an idealistic motivation – I really wanted to set up a degree programme. Back then, I was also inspired by the TEMA department at Linköping University, because people there ran a research programme (which started in 1979 with a grant from the Swedish Foundation for the Humanities and Social Sciences), called *Women’s Culture, Men’s Culture, and the Culture of Technology*. We were inspired by this programme at Linköping University when we made our degree programme at Odense University.

CRITIQUES OF EPISTEMOLOGIES – RETHINKING THE UNIVERSITY

STINE W. ADRIAN: For you it was about the epistemological discussion. What kind of political issues did you find within those types of epistemological questions? What potential was there in teaching students about these kinds of questions?

NINA LYKKE: For me, as a feminist student, researcher, teacher, and activist, politics were tied to a need for a radical change of the university, including the way in which the university was divided into disciplines, because of the problematic tunnel visions these divisions created. For me the shift in knowledge production towards a radical trans- and post-disciplinarity has always been a question that is relevant both inside the academic ivory tower (which people have sometimes accused me and other academic feminists for spending too much time in) and outside the ivory tower, because it has key political importance in a broader

sense. The aim is to change knowledge production and the way knowledge production is organized. It’s about thinking differently, which means doing science and technology differently; doing medical interventions and research differently; doing humanities and social sciences differently. Scientific knowledge production is a powerful actor in society. Therefore, I think that Donna Haraway’s *Cyborg Manifesto* (which was first published in 1984) spoke to me and a lot of others, exactly because the manifesto addressed the intertwinement of the macro level, which related to the need for major changes in thinking around science and technology, and the micro level of the concrete bodily subject. The *Cyborg Manifesto* brought these things together in a more juicy and sophisticated manner than the feminist technoscience critiques, which I had studied before reading the manifesto.

Regarding the degree programme, we were allowed to set up a programme for so-called mature students. These students already had a job. Many of them were nurses, social workers, and teachers. And especially the nurses, when they read the *Cyborg Manifesto* – even though they sometimes found it difficult to read – they were like: “Wow, this is precisely what we need to be doing! This is precisely the critique we need in order to do our jobs as nurses in a different way, making care and technological interventions go hand in hand”. They felt that it had this very concrete impact on their professional identities, and for their wish to do things differently.

RETHINKING SCIENCE – A COLLECTIVE ENDEAVOR

STINE W. ADRIAN: You stated in the introduction to *Between Monsters, Goddesses and Cyborgs* (1996) that critiques of epistemologies in the natural sciences came a little later than feminism in other areas, why do you think there was this delay?

NINA LYKKE: Because there were very few women within the natural science disciplines in the 1970's. We were a small critical mass of feminist students and teachers in some humanities disciplines and in some social science disciplines. But the feminists in the natural sciences were really isolated, and it is a collective thing to establish this kind of science critique. You need other people to discuss it with. You need some kinds of networks, or structures – and the critical mass did not exist in the natural science disciplines.

At that time, the feminists from the natural sciences also felt marginalized in the emerging women's studies movement, because there was a majority of people from the humanities and the social sciences. I think that even though there were these links between the women's health movement, activism, and epistemology, the feminists from the natural sciences wanted to frame key issues differently. But they did not have a platform to do this from. I can mention my friend and feminist colleague from Sweden, professor Lena Trojer as an example.

Lena is a chemist by training as well as a feminist. I met Lena, when the gender studies centre at Odense University organized a big Nordic conference in 1983. Mette [Bryld] (my life partner) and I were in the organizing committee, and we really wanted people from the natural sciences to attend. Therefore, we invited Lena Trojer to give a keynote, and at first she said; "I can take part, but I don't have anything to say". Lena and I have talked about this many times since – and I also told the story in the "Homage Volume" for Lena when she retired in 2016 – about how the invitation to give the keynote on gender and the natural sciences prompted her to not just be a feminist politically, which she had been before, but to also seriously try to integrate feminism into her scientific research and teaching. She gave a fantastic address, which is published in the book from the

conference *Kvindespor i videnskaben* (1985). This was the first time Lena started linking her feminist engagement with her science critique, showing how we might go about changing the sciences. She later became a professor of feminist technoscience studies, first at Luleå Technical University in Sweden, and then at Blekinge Institute of Technology. Lena has really had a great impact on gender studies in Sweden, and on the building of feminist techno-science studies there.

STINE W. ADRIAN: So, you considered these kinds of networks and this kind of community building crucial in re-thinking science from a feminist perspective?

NINA LYKKE: Definitely! Because to initiate this rethinking of science was a fundamentally collective endeavor. People can be feminists (like Lena) but to start thinking feminism at a theoretical level in relation to a critique of the sciences takes the discussions to an entirely new level. Even in the humanities and social sciences, gender studies would not have emerged without the movement, the activist relation, the critical mass of feminist students and researchers. I think this collective aspect is really important, though often forgotten. The story is often told as if gender studies somehow springs out of some kind of liberal thought which is already distributed all over society – and I think nothing could be further from the truth. It was a completely different and politically driven dynamic. The intertwinement of the radical socialist students' movement and feminist activism was crucial, and this was embodied in organizations such as the Nordic Summer University where we met across the Nordic countries to discuss the intersections between socialism, feminism, activism, psychoanalysis and Marxist theory. We wanted to "pose feminist questions and give Marxist answers", as one of the major inspirational figures at the time Juliet Mitchell ar-

ticated it (in 1971). I think the collectivist and activist dimension is fundamentally important in terms of re-thinking epistemologies, and by consequence also science and technology.

QUESTIONING EPISTEMOLOGIES
IN PRACTICE
– FROM OUTER SPACE TO CANCER

STINE W. ADRIAN: You have covered many different topics, focusing on space travel, cancer cultures, reproductive technologies, animal studies, queer death studies. How have you chosen these topics? Why have you chosen these particular areas?

NINA LYKKE: There are different reasons, and it is not easy to pinpoint briefly. My doctoral dissertation on feminism, psychoanalysis, and Marxism focused very much on feminist theory, ontology, and epistemology. Before that I had done more political historical research, for example on the conditions for feminism in the Russian revolution, with a focus on the socialist feminist Alexandra Kollontaj. However, my first bigger empirically grounded project within the field of feminist technoscience studies was the research I did together with my life partner Mette Bryld (who passed away in 2014) for our book *Cosmodolphins*. Mette was a scholar of Russian Culture and did feminist cultural studies of technoscience related to Russian culture. The genealogy of how we came to do *Cosmodolphins* was pretty complicated. We started out wanting to do a critical feminist cultural study of the space race and its intersections of major politics, technoscience, colonial mind-sets, and Cold War nationalist cults of masculine heroes.

But it became much more complicated along the road, when we took astrology and dolphins on board.

I think when people read the book today, it does perhaps not seem so strange.

But back then, it did. I mean, today, many people in posthuman studies are doing ‘weird’ things. It is no big deal anymore, when people do cultural or philosophical analyses of for instance bacteria or viruses. So, today, rather than finding the whole project ‘weird’, people might ask: “So, why did you focus on large, ‘attractive’ animals like dolphins? Why did you not pick insects or something like that?”

The reason why we came to dolphins was indeed related to the ways in which dolphins – that were assumed to be able to somehow stand in for aliens from outer space in early space research – were used for experiments in trans-species communication. It is a very violent and sad story which we tell in the book. Anyway, after *Cosmodolphins* Mette and I actually did also do a study on insects, and how they are portrayed in science documentaries.

STINE W. ADRIAN: When I read *Cosmodolphins* the first time I thought it was the most radical book I had ever read!

NINA LYKKE: Thank you. A lot of people have definitely said so. We were very inspired by Donna Haraway. She had a certain legitimacy in terms of doing ‘weird’ cultural studies on animals, technology, and science, because she is a biologist and could claim: “This is my training”. Of course, she did not formulate it like that, she just talked about intersections of biological science, romantic and economic discourses.

Another inspiration for us, was Carolyn Merchant’s *The Death of Nature* (1990). We were very inspired by this book, which is not mentioned much anymore, even though it was a really great, deeply eco-critical, historical account of the transition from an organic to the modern mechanic world view. However, our main inspiration for doing these ‘weird’ things definitely came from Donna Haraway. We wanted to do research on some kind of science and technology issue, because we found them

politically important. We also wanted to do research where Mette's background as a scholar of Russian culture would be relevant, so we were looking for a topic which had a relation to Russia. We were hoping to do something together that took a point of departure in a feminist technoscience critique. We stumbled over the topic of the space race when we attended The Women's Worlds Conference in New York in 1990. We went to a session on women and technology. At this session, a woman from NASA was giving a talk on the US space programmes, and she was discussing NASA's policies to make women gain more access to the space programmes. At the same panel, there were a lot of women from NGOs in different African countries, who attacked the woman from NASA fiercely: "Why the hell do you throw billions and billions of dollars into putting a man on the moon? Why do you not give the money to projects, helping poor people in Africa?" I think it was the first time I really experienced this kind of strong post-colonial confrontations within the feminist movement 'live'. There were not so many of these kinds of protests in Denmark. Mette and I thought there was a lot to be thought through here, and that is how we first got to focus on space flight. We included astrology due to inspirations from Carolyn Merchant's discussion of the organic world view which existed before the mechanical one of modernity. The dolphins were drawn into the project by Mette, who was so good at finding weird and politically relevant stories. We were thrilled by the strangely absurd fact that dolphins were involved in early space flight research as stand-ins for aliens. Some people in the US space programme got the idea that if they could learn to talk with dolphins then they could also learn to communicate with aliens and this assumption was combined with an expectation that the time where humans would meet aliens in outer space was soon to come.

The research I am doing now is also related to cultural studies of technoscience. My current research is dealing with cancer, mourning, and death in queer-feminist, new materialist, posthuman, and decolonial perspectives. I came to this topic from a very personal point of departure, because Mette died of cancer some years ago. I really think that my critical insight from feminist technoscience studies has helped me to come to terms with these difficult issues around cancer, death, and mourning.

WHOSE KNOWLEDGES COUNT?

STINE W. ADRIAN: All these research projects in which you have been involved have had a common denominator in terms of challenging existing, dominant epistemologies. The implicit question at stake here is *whose knowledge counts?* In feminist technoscience studies this is a very central issue, because it questions how knowledges are produced, and whether or not knowledge is defined by specific scientific practices. You have already touched upon this discussion, but can you unfold it further? Why has this become a reoccurring theme that comes back to you in different ways?

NINA LYKKE: I think it started with an awareness of and attentiveness to the ways in which technoscience has been immensely oppressive. I think this pointed towards the necessity of decolonializing technoscience. But how can we achieve this decolonialization? How can we learn to un-learn? My colleague and friend, Madina Tlostanova, who is a professor of postcolonial feminisms at the Gender Studies Unit at Linköping University wrote a book together with Walter Dignolo, called *Learning to Un-learn* (2012). In this book they suggest to use unlearning as a decolonial approach. This "learning to unlearn" has become very important for me in terms of really trying to understand in-depth how there are vast

amounts of knowledges that, today, do not count, but ought to count. You can think about this problem from a decolonial perspective, related for instance to indigenous knowledges that do not count. You can also relate it to trans- and genderqueer perspectives, and focus on the ways in which the disciplines of psychiatry and psychology have deemed vast amounts of knowledges of genderqueer individuals invalid. These are examples which clearly show how epistemological critiques and the question: “whose knowledges count?” are intertwined. Against this backdrop, I find it really important to try to make sure that other knowledges are offered space to unfold. In my research on cancer cultures, I (amongst others) focus on the ways in which we have been seduced into the idea that a ‘war’ on cancer has to be fought by a sovereign heroic ‘I’. This has led us to focus on individual causes of cancer in the form of genetics and lifestyles, instead of thinking along the lines of the kinship of many kinds of vulnerable human and non-human bodies, that are suffering from the toxic effects of the chemical modernity. I think the issue of decolonializing knowledge is both about offering platforms for various kinds of subjugated knowledges, and about unlearning tunnel visions produced by privilege, as well as being aware of what feminist theorists Shannon Sullivan and Nancy Tuana talk about as “epistemologies of ignorance” (2007).

Technoscience critiques are important, because technoscience has seduced us into epistemologies of ignorance. And when I say ‘critique’ here, I would like to emphasize the intersectional linking of feminist, posthuman, ecological, decolonial, genderqueer and crip critiques. These different, but intertwined lines of critique are all tied to the question of whose knowledge counts, and of how we can make other types of knowledges count.

DIFFERENCES IN LATITUDE ARISING FROM RECONFIGURATIONS OF SEX AND GENDER

LEA SKEWES: This question of whose knowledge counts has also been central in relation to controversies regarding how sex/gender can and ought to be conceptualized. Who has the defining power? In your chapter in *Between Monsters, Goddesses and Cyborgs* which you co-edited with Rosi Braidotti in 1996 you mention that there are gains to be achieved from the distinction between sex and gender. Could you elaborate on what we have gained from this distinction, but also what is now the hindrance or the problem that this distinction is causing?

NINA LYKKE: Let’s start with the gains. The whole issue of separating sociocultural gender from biological sex back in the 1970’s aimed at denaturalizing the stereotypes of femininity and masculinity which were really strong at the time. Just to offer a personal example, my stepfather and my mother were both medical doctors, yet my stepfather never did any work in the kitchen. My mother had to do all the work at home on top of her full-time job. I had two half-siblings, so we were three children in the home. Both my mother and stepfather had full-time jobs as doctors, but it never occurred to my stepfather that he could or should contribute to anything in the kitchen. In his understanding of the world, this was simply not his job. This was not extraordinary – it was just the way it was.

I really think that these stereotypical and naturalized perceptions of gender were ingrained in people’s lives, pervading their imaginaries and bodies. Saying that this was a social and historical construct was really radical back then. Donna Haraway also makes this point about sex and gender in the famous blank space quote where she talks about gender as the ‘fragile’ and very necessary platform for social construction-

ism to unfold, while warning against reducing the body/sex to a “blank page for social inscriptions” (1988). The sex/gender distinction was liberating because it made it possible to deconstruct the stereotypes. So there was definitely much to be gained from it.

However, there are also several problems with the sex/gender distinction. First of all, the problems are tied to the reproduction of an enormous mind-body split which is unsustainable. Many feminist techno-science scholars, for example Nelly Oudshoorn (1994) and Lynda Birke (1999) commented on this early on, underlining that it was a bad idea to leave the issues of biology in the hands of conservative biologists. Therefore, a feminist engagement with sex, or more specifically with the interconnections and intra-actions (in a Baradian sense) between sex and gender was considered an important issue already early on.

A second reason for focusing on interconnections between sex and gender is that right-wing anti-feminists often use the purely constructionist perspective to ridicule and delegitimize feminist theory, claiming that feminists argue that *everything* is constructed, and that biology does not play a role at all. Lynda Birke and other early feminist critics of the sex and gender distinction made the important point that if we do not address biology from a feminist point of view, then conservative biologists, like for example Danish Helmuth Nyborg [a psychologist who has argued strongly for how sex difference impacts IQ] cannot be challenged. If feminists only base their arguments on social constructionism, they cannot intervene critically in discussions promoting reductive and stereotypical essentialism founded on conservative interpretations of biology.

With this in mind, I think there is a lot of things to be gained from investigations of the complex entanglement of sex and gender, from an entanglement perspective which many feminist scientists (biologists,

medical doctors, neuroscientists, etc.) are applying today. You can challenge and discard the arguments of biological determinism through a biologically grounded, scientific perspective. You can show that biology is *not* a static entity or a stereotypical essentializing mirror of something called femininity and something called masculinity. Biology – and its intertwining with culture – moves far beyond and is much more complex than such essentialist tunnel visions allow people to see. So you simply gain strong arguments – and promote a better, less reductive science – when you incorporate a dynamic intra-action between sex and gender in your understanding.

A third reason why the sex/gender distinction became problematic relates to the posthuman feminist discussion of the human relationship with the more than human world, because sex in many of these discussions came to stand-in for materiality more broadly. So the claim of an intra-acting relationship between sex and gender is closely related to broader posthuman feminist theorizations of intra-active relations between gender, subjectivity, embodiment, trans-corporeal relations, and hence kinship with the more than human world. The entanglement interpretation of sex and gender offers us the opportunity to move beyond the dichotomous sex/gender, mind/body, and nature/culture splits of modernity.

RETHINKING INTERSECTIONALITY THROUGH ASSEMBLAGES AND EVENTS

LEA SKEWES: You have also written about how this entanglement perspective (that we cannot separate sex and gender, body and mind, or nature and culture) means that we ought to understand sex/gender as intersectional and you have linked this to the Baradian term of *intra-action* rather than *inter-action*. Can you unfold this further?

NINA LYKKE: I have argued for *intra-action* since I wrote my first article on intersectionality in 2003, and I think this article has been read very much – at least in Sweden (it is published in the Swedish Gender Studies journal, *Tidskrift för Genusvetenskap*). My article has been criticised for claiming that different aspects of intersectional identities could be separated. However, I have always felt that the critiques missed my main point, because none of the critics focused on my definition of intersectionality inspired by Barad's term *intra-action*, which was meant to theorize that separation was *not* possible!

I wrote this article in tandem with an article on animal performances (co-authored with Mette Bryld and Lynda Birke). We were very inspired by Barad's article *Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter* (2003). I thought Barad's article helped define intersectional interplays, the analysis of which I, along with the PhD students I supervised in Linköping, struggled a lot with at the time. I found that Barad's concept of *intra-action* was key here, in terms of being able to appropriately frame the ways in which social power differentials are entangled in addition to helping conceptualize the intertwinement of subjectivity and materiality (which Barad herself talked about). Therefore, I would have liked to see Barad's notion of *intra-action* integrated much more in the ways in which people use the concept of intersectionality.

Luckily, Jasbir Puar later came up with the idea to link intersectionality to the notion of *assemblages*, which also reconfigures the unfortunate grid-like structures that somehow often slips into intersectional analyses. Puar also used Brian Massumi's notion of 'affective event'. Her article *I would rather be a cyborg than a goddess* (2012) made the point that intersectionality needs to be revisited from the point of view of assemblages and events. She sug-

gests that the concepts of *assemblages* and *events* are a way of re-thinking intersectionality. She is deeply critical of the grid-like structure that has been embedded in the way people think about intersectionality – and she has been advocating for *events* and *assemblages* as more open-ended analytic tools than the grids and positionalities, which often are mobilized in intersectional analyses. This was also what I had in mind, when I suggested Barad's notion of *intra-action* as a lens for intersectional analysis.

I think it is important to rethink whiteness, cis-normativity, and privileges more generally along the lines of *intra-acting* power differentials and intersectional assemblages. I definitely take the point that I can pass as a cis-woman even though I identify as a queer femme, while a lot of people cannot pass. The intersections of my whiteness and my ability to pass as a cis-woman gives me a lot of privileges, which I need to take into account. I think it is important to take privileges and lack of privileges as a point of departure, and to try to transgress epistemologies of ignorance through an attentiveness to *intra-actions* of intersectional assemblages.

TRANSDISCIPLINARY CHALLENGES – OVERCOMING DISCIPLINARY BORDERS

LEA SKEWES: The need to avoid what you, inspired by Bruno Latour, have labelled 'purification' – the illusion that we can talk about sex separately from talking about gender – is relatively well-accepted within feminism and within the humanities today. However, within the natural sciences, sex is often assumed to be 'pure', in contrast to gender. Scholars within the softer sciences often challenge this contrast, by intentionally applying the term 'gender' in contexts where natural scientists might refer to sex. This often just prompts natural scientists to question why we are using the term *gender*, when we are really talking about *sex*? This

kind of problem with hearing and being heard across disciplines is common. How can we get a dialogue to work across disciplinary borders?

NINA LYKKE: By making an analysis that makes that exact point; that you cannot separate sex and gender. I mean an analysis that really spells this point out through empirical examples. Due to a problematic division of labour between what is considered to be '*theoretical*' and '*empirical*' studies, I think that some people from the 'hard' sciences see empirical data and not theory as valid science. So to convince these scientists of the entanglement of sex and gender, you need to show it very concretely in an empirical analysis. I think that is the way to break through and achieve a dialogue. And in order to achieve this we need collaborations across disciplinary borders. One of the collaborations I am in right now is with the feminist neuroscientist Gillian Einstein who is a Professor of Women's Brain Health and Aging at the University of Toronto, and a Guest Professor of Neuroscience and Gender Medicine at the Gender Studies Unit at Linköping University. She speaks the language of science, because she is a neuroscientist, and she uses tools from the 'hard sciences', like statistics, but she also understands the broader epistemological discussions in feminist theory. So she is able to bridge the gaps. When she talks about sex and gender, other scientists are actually listening.

The research we are currently doing in Linköping with Gillian Einstein as PI is a project on physical and mental well-being and health care for women with genetic risk for developing breast cancer (the BRCA1 & 2 mutation). These women have their ovaries removed before so-called 'natural' menopause for preventive reasons; because the prophylactic resection of the ovaries reduces the cancer risk considerably. However, a consequence of this treatment is that the women are pushed into

menopause, due to the abrupt estrogen deprivation the oophorectomy entails, which may have a lot of unwanted side-effects, for example in the brain. In this research project, it is a key point to develop a truly transdisciplinary approach (including neuroscience, gynaecology, oncology, immunology, brain imaging, neuropsychology, philosophy, cultural studies, and gender studies). The transdisciplinary approach makes it possible for us to look at organs, such as the ovaries, in the specific context of the whole body, and to look at the whole body in its broader sociocultural and philosophical context as well. Both the scientists and we who have a background in the humanities, are thrilled by this collaboration, because it brings us all to new unexpected insights. I am doing qualitative interviews with some of the patients who have volunteered to be in the project, and when I present my part of the research to the medical scientists, they suddenly understand the patients in a new way, which is important for their part of the research, too. I think that Gillian Einstein has built a very concrete bridge between the hard and the soft sciences with this project. I have collaborated with medical scientists for many years, but this particular project is the first that really has moved the discussions beyond multidisciplinary – in which you just add perspectives from different disciplines without integrating them – and towards a truly transdisciplinary and integrative collaboration.

When talking about transdisciplinarity and the crossing of disciplinary borders, I would however also like to comment on another question, which doctoral students sometimes pose when we discuss post-constructionism (i.e. the term, I use in *Feminist Studies* (2010), to characterize approaches such as Barad's and Haraway's endeavours to take into account both discursive constructions and how matter matters). This is the question of whether you can work along these post-constructionist

or new materialist lines – which implies transdisciplinary outlooks – when you are limited by your training in one discipline or main area, for example the humanities? My answer is a cautious yes – and I think that a lot of important post-constructionist or new materialist work is being done by philosophers, social scientists, cultural studies people etc.

Just to mention one example among many: a very good article by feminist sociologist Myra Hird (*The Corporeal Generosity of Maternity*, 2007). In this article she focuses on motherhood and she presents a very comprehensive reading of scientific studies of all the bodily, biological exchanges between the mother-body and the foetus/child-body. Hird reads these studies philosophically and cultural analytically as a critique of the ways in which the gift has been conceived as a rational exchange where you give something and get something in return. Against the backdrop of a study of diverse scientific sources, Hird shows how the bodily exchange is much more comprehensive and ‘generous’ on the part of the mother-body, and goes far beyond a rational, conscious, and calculated giving and receiving. The article is an interesting example of a new feminist reading of motherhood – an often discussed feminist issue – from a post-constructionist and new materialist perspective.

I am trying to work along such post-constructionist lines myself with my current research on queering of cancer, which I do together with artist and doctoral student in curatorial practices, Camila Marambio from Monash University in Melbourne, Australia. We reflect on the question: how can we understand cancer biologically when we are not trained as oncologists? But we also turn the question around and ask: How can an oncologist understand cancer in a philosophical context?

While we, as people from the humanities, may be limited in our understanding of the biology of cancer, the oncologist

may be limited in the understanding of the philosophical implications. But our conclusion is that to get further, we really need to try to go beyond our limited disciplinary understandings. We need to use transdisciplinary knowledge to be able to understand how cancer cells disrupt the boundaries between the self and the other, which is so fundamental in the Western conception of the sovereign subject. And against a backdrop of close readings of transdisciplinary research, we dig deeper into the paradoxical question of how the configuration of mainstream cancer discourses casting a sovereign subject waging a ‘war’ against cancer can be expected to work, when such a war cannot be won because the ‘enemy’ actually is part of the embodied subject itself! I think that a lot of people in feminist technoscience studies are struggling with these questions regarding the limitations of their disciplinarily defined knowledge bases. However, through these struggles they produce new questions and new interesting knowledge, which is important both for the humanities and the sciences, because they lay grounds for new emergent transdisciplinary methodologies.

LEA SKEWES: The entangled or intra-action approach to sex/gender makes research on this topic extremely complex – like in your example from the project with Gillian Einstein where you describe how each organ is bodily contextualized, and each body is socio-culturally and philosophically contextualized. This complexity challenges the hard sciences much more than it challenges the soft sciences. Because the hard sciences have more focus on what your operational definition of human behaviour, or the human, is. What does it do to gender studies when sex/gender is this complex? How can we study it if it becomes everything? If we lose these nice neat distinct entities that the hard sciences prefer to work with? If we lose the possibility of defining exactly what a human is, and exactly what the task is that

this particular human is carrying out in our experiment? If the neat categories and the scientific tools start to slip through our hands?

NINA LYKKE: The way you speak of this reminds me of lots of discussions that I have had with my friend and former colleague at Linköping University, Professor Emerita of Gender and Medicine, Barbro Wijma. I have discussed this with her many times, when we have been setting up collaborative projects: She'll say "But we need to define it, we need to start with a definition". Then I'll say "Okay, but I want to start with a challenge to the definitions". And then she'll say "But we need to start with definitions in order to challenge them". I have often had these circular discussions, when starting collaborations with medical researchers. And of course, we cannot remove ourselves from the ways in which we have been socialized intellectually and academically by particular disciplines. There is no 'neutral' transdisciplinary space from which we can start from scratch in our collaboration. But I think that a very useful concept in terms of trying to overcome this dilemma is Karen Barad's concept of *agen-tial cuts*. I think that if you can agree on a definition, understood as a momentary agential cut, and not as a stable entity, this may create some common ground. You can explain to the scientists what an agential cut is, and have the cut as a common ground to build from. The scientist will then get the definitions as a starting point (we need to define the cut), and I will in my capacity of feminist post-constructionist with a background in the humanities not be confined by a fixed entity as opposed to an open-ended and unstable phenomenon in-between subject and object, because the cut is defined as only momentary and temporary. In other words, when using Barad's concept of *agen-tial cuts*, all collaborators will have to argue concretely for *this* particular agential cut, as well as defining its limi-

tations, and instabilities – what it can and what it cannot do. In this way, I think the agential cut is a really good tool for integrative transdisciplinary collaborations that intend to move beyond a mere additive multidisciplinary.

LEA SKEWES: Because it becomes legitimate to define the object so that there is an additional awareness about the cut being *artificial*?

NINA LYKKE: Not artificial, but *arbitrary and contingent*. This implies that you could have made another cut, that would have made just as much sense, but which would have other consequences. And furthermore, you need to argue for why you chose *that* particular cut out of all the ones you could have chosen. The agential cut is temporary, momentary, contingent, and context-dependent; it is not a universal cut. Next time you collaborate you can do a different cut, and discuss the consequences of that new cut.

TOWARDS IMPROVED METHODOLOGICAL APPROACHES WITHIN TRANSDISCIPLINARY RESEARCH

LEA SKEWES: So, the concept of *agen-tial cuts* can facilitate a transdisciplinary collaboration by offering the hard scientists some definitions to start from, while ensuring for the soft scientists that these definitions are understood as temporary and context-dependent. Beyond this Baradian concept of agential cuts, are there any particular methodologies that fit better with a transdisciplinary approach to sex/gender?

NINA LYKKE: I think that methodologies need to be unfolded and developed in transdisciplinary collaboration. There are tons of methods that are made for particular disciplines or particular ways of working from within a discipline. But we need to go

beyond these and develop new transdisciplinarily adapted methods in order to take seriously that you cannot separate nature/culture, sex/gender, mind/body. In other words, we cannot do the purification trick, which a lot of the disciplinarily developed methods presuppose that we can. Therefore, I do think that most existing methods are bad when it comes to addressing complex transdisciplinary problems, and I think that they lead to science which is blinded by tunnel visions and epistemologies of ignorance. I think that new methods, methodologies, and methodological thinking in general are urgently needed. And in order to achieve this methodological development, I think it is productive to work with the concept of *emerging and mixed methods* within the framework of a post-constructionist epistemology. This is complex, but to make a long story very short, what I refer to here is a way of working, inspired by Karen Barad's conceptualization of the intra-activity between discourse and matter, the entanglement of the ways in which discourse comes to matter, together with the ways in which matter comes to matter. This post-constructionist approach is also inspired by Donna Haraway's conceptualization (which I love so much) of *the apparatus of bodily production*. It prompts us not to simply discard, for example, discourse analysis or narrative analysis when working on new materialist grounds, but to use these kinds of analysis in intra-action with other methods in order to explore how matter 'kicks back', as Barad articulated it.

STINE W. ADRIAN:: I am glad that you mention Haraway's figuration of *the apparatus of bodily production*. It is one of the core feminist figurations you have been engaged with in conversations with both Haraway and Braidotti. The work of figurations is a methodology in itself. In the book *Between Monsters, Goddesses and Cyborgs*, which you have co-edited with Braidotti, you engaged with these three figurations, which enable

three different types of understanding of technology that challenged it from either a technophobic or a technophilic position, and that also pointed in the direction of rethinking nature/culture. This book is from the 1990's, what theoretical and political intervention did you think these three figurations did at the time? Because they were alive at the same time.

NINA LYKKE: Yes, they were alive at the same time. I am not quite sure whether they did the same thing for other people as they did for me. I mean the cyborg was hyped – this was the peak of the queer and feminist cyborg fascination that followed in the wake of Haraway's *Cyborg Manifesto*. Everybody in feminist STS, but also way beyond feminist STS circles, were reading the *Cyborg Manifesto*. I think there was a techno-optimism also in feminist circles. The idea of changing gender online was really on the agenda. At the same time the goddess was thought to be 'out'. So, I think the goddess was the difficult figuration of the three. I felt pretty much alone – in cyborg loving circles – with my fascination for the goddess figure. I mean most people in these circles would "rather be a cyborg than a goddess", in accordance with the last line of the *Cyborg Manifesto*! The goddess was associated with a sort of radical and very much US-based kind of eco-feminism (an example among many is Charlene Spretnak's *State of Grace* from 1991), which was perceived by cyber- and cyborg-feminists to be very essentialist. In other words, the goddess was representing everything that the cyber and cyborg feminists did NOT want to identify with. As a figuration, the goddess was identified with radical essentialist feminism, and with the hype of feminine values, as those proposed also by the Indian ecofeminist Vandana Shiva, whom I've never met, but who might have been a good interlocutor as regards the goddess figuration.

For me, my goddess interest came out of

my reading of Carolyn Merchant, and her ecofeminist take on ecological issues, which in fact also inspired part of Mette's and my own research for *Cosmodolphins*. We were interested in going against what Donna Haraway criticized as 'productionism' in techno-feminism and other techno-circles; i.e. a focus on human production and human forming of the material world, without taking the agency of the more-than-human-world into account. So the figuration of the goddess was for Mette and me a way to think through the agency of the more-than-human-world, i.e. of that which with a very ethnocentrically loaded and problematic word has been called 'nature'. With this figuration, we wanted to think through how the forces of 'nature' are stronger than 'we' as 'humans' are, or more generally as vulnerable organisms, human or non-human. But there were very few other people interested in the goddess figuration within the techno-feminist circles, where the cyborg figuration was discussed. So, in this sense, it was difficult to claim the goddess. The third figuration in the title of Rosi Braidotti's and my book, *monsters*, was again easier – like the cyborg. There was a lot of monster research at the time, and a fascination for the monster as an in-between-figure – in-between the human and the non-human, quite like the cyborg. The monster and the cyborg resonated a lot with each other. But the goddess was the odd girl out.

STINE W. ADRIAN: How was that perceived when the book came out?

NINA LYKKE: The editors at ZED books in London made sure that the goddess on the cover was wearing sun glasses and looked a bit digitalized, and I think that this cyber-goddess image sugar-coated the message a bit.

STINE W. ADRIAN: Today the figurations are still alive – at least the monster seems to have come back.

NINA LYKKE: Yes, the monster has come back. The cyborg has reemerged as a dog in Donna Haraway's book *When Species Meet* (2008) and later as a spider in her recent book *Staying with the Trouble* (2016). *Staying with the Trouble* also returns to the goddess. Haraway is actually reclaiming Gaia, the Greek earth goddess and referring more broadly to the multiplicity of goddesses in indigenous cosmologies. So the goddess has reemerged. The only dead figure is the cyborg. Too bad for the cyborg. Perhaps, the cyborg became too much of a terminator, when trolling sexist and racist harassment took over on the Internet after the first euphoric genderqueer moments of digital transformation in the 1990's. I might not have had so many problems with the goddess today, as I did in the 1990's.

FEMINIST STS "AT WORK" TODAY

STINE W. ADRIAN: During this conversation, you have mentioned Karen Barad often, but you drew on Haraway and Harding very early on. How has it added to your work to be engaged with theories of new materialisms?

NINA LYKKE: When I look back at the things that I was doing in terms of my commitment to feminist technoscience studies and epistemological reflections against this backdrop, I think that it is fair to say that I have been into 'new' feminist materialisms for a very long time. I have, indeed, also been into 'old' feminist materialisms, because I started doing research in the 1970's from a feminist Marxist point of view. What I find interesting today, is that new and old feminist materialisms perhaps have started to enter into more promising conversations than before. I recently co-supervised a doctoral dissertation at Humboldt University in Berlin on egg donation in South Africa. The author, Verena Nam-

berger, goes back to Marxist labour theory and looks at the labour implied in being an egg donor. This results in a very untraditional Marxist notion of labour, which Verena Namberger very successfully diffracts with new materialist theories on the body and embodiment, establishing a sophisticated and promising dialogue between ‘old’ and ‘new’ feminist materialisms. I think a broader trend is underway here. Donna Haraway’s critique of the Anthropocene concept (coined on the basis of discussions of a new geological era, characterized by planetary scale human marks on the planet), and her suggestion to focus on the Chthulucene kinship instead, which includes a rethinking of the goddess figuration, is also an example of new conversations, where old divisions are being revisited in new and promising ways. I think there is a lot of political and theoretical potential in this. We really need to un-learn the command-control paradigm which modern technoscience has been so embedded in – and which the Anthropocene concept, according to Haraway, uncritically reproduces. We need to rethink what Haraway talks about as a planetary kinship, which somehow was part of early ecofeminism as well.

I think there is a lot of political potential in the recent turn of feminist technoscience studies towards a critical engagement with the Anthropocene discussion. As an example of the potentials, let me give one more brief reference to my current research on cancer. One aspect of this research is a critique of the epistemologies of ignorance that accompany the focus on genetics and lifestyles in so much Western cancer research. I pinpoint how this approach leaves a lot of cancers out, such as for example virally induced liver cancers, which first and foremost affect people in rural Africa and South East Asia. I interpret the many ‘forgotten’ cancers as well as the very insufficiently controlled spreading of carcinogens by the agro-chemical industry as part of a global, Anthropocene necropolitics. But I

also use the feminist critique of the Anthropocene concept to suggest an analysis of cancer from the point of view of Haraway’s alternative concept of Chthulucene. I suggest a Chthulucene ethics, building on a planetary scale kinship of vulnerable human and non-human bodies, trying to strike up alliances in terms of learning to live more sustainably on a ‘damaged planet’. I do this with inspiration from Haraway’s use of feminist techoscience scholar Anna Loewenhaupt Tsing et al’s important book *Arts of Living on a Damaged Planet* (2017).

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