

The Promise of Vaginal Microbicides  
Configurations of Women's Empowerment in a Time of HIV

by

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## **Abstract**

### **The Promise of Vaginal Microbicides *configurations of women's empowerment in a time of HIV***

In this thesis I offer a feminist theorisation of the development of vaginal microbicides: female initiated HIV prevention methods (vaginal gels, films, sponges and rings) developed explicitly to empower women in the HIV pandemic. They are currently being tested within clinical trials which have produced mixed results and are on-going.

In this thesis I reflect on the development of vaginal microbicides as a biomedical intervention that promises a transformation of gender dynamics voiced in terms of women's empowerment as well as a material protection against the HIV virus. I approach the development of vaginal microbicides as a feminist-biomedical process constitutive of the microbicide/woman they investigate and advocate. As such, I aim to contribute to theoretical debates surrounding female-initiated HIV prevention by suggesting a different set of theoretical tools in order to capture the various modes of enactment at stake.

To this end I set out a performative approach to the body and scientific development, through Donna Haraway's 'cyborg myth' and Karen Barad's 'agential realism'. Building on the arguments of various Science and Technology Studies scholars such as Bruno Latour, Annemarie Mol and Nelly Oudshoorn, I conduct a textual analysis of clinical trial reports, advocacy documents and various journal articles based on social science studies. I argue that biomedical process tends to constrain what I understand as the microbicide's 'material-semiotic potential' and the configuration of its potential user. Moreover, the trials themselves operate with a conception of power, and of the trial, that does not allow them to consider biomedical investment as itself constitutive of women's vulnerability. Ultimately, the thesis presents and critiques what happens to feminist ideals in the trials, and concludes that despite those ideals, and despite the ethical concerns with women's vulnerability within the trials, the pursuit of the promise of microbicides has not engaged with the full complexity at stake.

**Declaration by Candidate**

I hereby declare that this thesis is my own work and effort and that it has not been submitted anywhere for any award. Where other sources of information have been used, they have been acknowledged.

Signature:

Date

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**Chapter 1.**  
**Introduction**

In this thesis I seek to offer a feminist theorisation of the development of vaginal microbicides. Vaginal microbicides are topical pharmaceutical compounds (applied to the surface of the body in contrast to a systemic intervention such as an oral pill) that have been tested in clinical trials since the early 1990s in a variety of forms; creams, gels, films, sponges or rings, which women can apply vaginally to protect themselves against HIV infection. (GCM 2009a) Vaginal microbicides are developed, explicitly, as female-initiated HIV prevention. In light of the increasing feminisation of the HIV pandemic, the development of vaginal microbicides carries the promise of women's empowerment.

I aim to contribute to feminist critiques of materiality by focusing on the microbicide as a biomedical intervention that incorporates both ideals of women's empowerment and a material protection of the female body against the HIV virus. As such, the microbicide as an object invites new ways of thinking women's bodies in explicitly sexualised ways at the very centre of power relations and the possibility of their transformation. Furthermore, in this thesis I aim to contribute to theoretical debates surrounding female-initiated HIV prevention, by shedding light on the intimate relations between the body, feminist theory and biomedicine which characterise the field of microbicides.

In this thesis I will compose a critical intervention into the theoretical or conceptual HIV debates concerning women's empowerment within the biomedical development of female-initiated HIV prevention.<sup>1</sup> I will reflect on the fact that the campaign for microbicides has been voiced as an explicit feminist campaign, largely fuelled by an understanding of gender dynamics that speaks in terms of women's empowerment, and aims – beyond the fact of HIV prevention as it were – to transform gender and sexual power relations.

I understand the idea of a microbicide to have generated a complex object that is aimed at protecting women against the HIV virus by engaging their specific physiological vulnerability while intervening into the power relations that place women at risk of HIV infection, through its specific incorporation into women's sexual practices. However, this idea has come to be enacted and articulated through biomedicine and consequently it has materialised into various microbicide candidates through the various scientific mechanisms that make up the biomedical field. Although this engagement with biomedicine has generated the promise for the materialisation of an efficacious microbicide, I will argue that biomedical process – its practices and imaginaries – functions as an interference into the complexity the microbicide gathers and the imaginative potential this object wields.

After nearly 30 years of microbicide testing, there still is no effective microbicide to

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<sup>1</sup> As for instance Amy Kaler's work on women's empowerment and the female condom (Kaler 2001, 2004)

date. Although the field is marked by a certain failure, it has managed to persist. I will argue that the field's various biomedical mechanisms, that might very well aid its persistence, have eroded what I understand as the microbicide's 'material-semiotic potential' and the configuration of its potential user and as such the microbicide's transformative potential. Ultimately, the thesis presents and critiques the consequences of materialising feminist ideals through biomedical process and the clinical trials specifically, and concludes that despite those ideals, and despite the ethical concerns with women's vulnerability within the trials, the pursuit of the promise of microbicides has not engaged with the full complexity at stake. I will argue that in order to engage the various modes of enactment at stake in the field of microbicides, in all their ethical complexity and transformative potential, a different way of thinking the field is pertinent, an analytical toolkit, or certain imaginary, attuned to the complex relationality this field generates.

### **Empowerment a vehicle of inclusion**

In order to contextualise what I shall propose is a highly innovative material achievement of feminist theorising in the form of research into topical vaginal microbicide, it is useful to set out how an alliance between feminism and biomedicine came to be forged and how this alliance construed an intricate relation between the concept of women's empowerment and biomedical intervention, fundamental to the field of microbicides. To do so I will give a brief overview of a cluster of documents published in the late 1980s and early 1990s that I understand to have set the scene for the microbicide to emerge as an intervention specifically aimed at women's vulnerability.

The development of vaginal microbicides is closely tied to the increasing feminisation of the HIV pandemic and the perceived need of women's empowerment herein. According to UNAIDS statistics, worldwide there are around 33.3 million people living with HIV (UNAIDS 2010: 7), of which women and girls make up more than half (UNAIDS 2010: 10). Globally, the number of women living with HIV has been on the rise since the early 1990s. This increase is more prominent in some parts of the world than others. For instance, in Sub-Saharan Africa young women are eight times more likely to be HIV positive than men their age (UNIADS 2010: 10). Since the early 1990s feminists in women's health started advocating for a HIV prevention option specifically focused at women's needs and specific vulnerability.

This inclusion of women's needs is rooted in the conception that women are subject to a lack of power in their gendered lives across many societies and that this distribution of



power fuels their vulnerability to HIV infection. This is a mainstream discourse in the global field of HIV prevention now. However, women were not always a visible risk group within the global field of HIV prevention.

To exemplify, on the 12<sup>th</sup> of June 1988 at the fourth International Conference on AIDS in Stockholm Jonathan M. Mann, the director of the World Health Organisation's Global Programme on AIDS, presented a talk entitled "The Global Picture of AIDS". This talk was an effort to look back on the pandemic's brief history and set out a trajectory for the years ahead. Significantly, at that time, women as a group vulnerable to HIV infection were virtually invisible in the HIV/AIDS pandemic. To the extent that women were included, they were included as transmitters of virus, as prostitutes and mothers transmitting the virus to their clients and children. It was only at the beginning of the 1990s, that women became recognised as a vulnerable group at high risk of HIV infection and could slowly come to be included in global health discourse on HIV prevention. I suggest that the concept of 'empowerment' functioned as a vehicle for women's inclusion into global HIV prevention discourse.

In the early 1990s, coinciding with the time women entered global HIV discourse, two large scale events, namely the International Conference on Population and Development in Cairo in 1994 and the Fourth World Conference on Women in Beijing in 1995, set the stage for the intimate relation between women's health and women's empowerment. Women's empowerment became a central issue in Cairo as for instance the report on this conference states that "*[t]he empowerment of women and the improvement of their political, social, economic and health status are highly important ends in themselves. We further believe that human development cannot be sustained unless women are guaranteed equal rights and equal status with men.*" (United Nations Population Information Network and UN Population Fund 1994: paragraph 7). Furthermore, during this time women's health was a main feature at the World Conference on Women: "*Women have the right to the enjoyment of the highest attainable standard of physical and mental health (...) Women's health involves their emotional, social and physical well-being and is determined by the social, political and economic context of their lives, as well as by biology.*" (UN 1995: 39) In other words, the concept of women's empowerment started entering the sphere of global health.

During this time, the idea of a vaginal microbicide came to the fore. I will contextualise the emergence of microbicide development efforts more specifically, by briefly exploring three main documents provided by the World Health Organisation in the early 1990s. Firstly, a report of the meeting on research priorities relating to women and HIV/AIDS held in Geneva, November 1990; secondly, the 1992 *Global AIDS Strategy*; and thirdly *Women and AIDS: Agenda for Action* which was drafted in 1994.

From the very beginning of women's inclusion in WHO's engagement with the HIV pandemic, empowerment increasingly emerged as a central theme. In the 1990 meeting, a discourse on women's empowerment surfaced as the transformation of those socio-

economic circumstances hindering risk-reducing behaviour, as it explicates:

[t]he need for research on women and HIV/AIDS to contribute to the empowerment of women, because the low status of women increases their risk of acquiring HIV infection and acts as a constraint on the behavioural changes necessary in AIDS prevention. (WHO 1990: 9)

The outcome of this meeting was most of all a call for more gender specific research into women's socio-economic circumstances, sexual behaviour and sexual practices that leave them at high risk of HIV infection. Furthermore, it called for possible strategies for women's empowerment, as for example, "*promoting financial independence for women and improving their sexual negotiating skills*". (WHO 1990: 8) This relation between women's socio-economic circumstances and sexual behaviour that leaves them at high risk of HIV infection found its way into the 1992 "Global AIDS Strategy" where empowerment was directly and explicitly tied to the socio-economic circumstances in which women are understood to have relatively little power to instigate safe sex practices. Specifically, as a way to meet the pandemic's new challenges it made explicit "*a reduction of the special vulnerability to HIV infection of women and their offspring through an improvement of women's health, education, legal status and economic prospects.*" (WHO 1992: 1)

Women's specific vulnerability was seen in terms their socio-economic and sexual subordination, which led to women's socio-sexual powerlessness and consequently their lack of control over their sexual practices. This understanding was of central importance in the 1994 *Agenda for Action* as is seen in the document's summary which states that "*the bleak reality is that the sexual and economic subordination of women fuels the HIV/AIDS pandemic. In order to break the cycle of neglect which affects women across their life span and across generations, it is essential to undertake actions which will allow women to make informed choices and enable them to improve the quality of their lives. Women must empower themselves by networking, forming alliances, and advocating for change.*" (WHO 1994: summary) Empowerment came to be understood as a transformation of women's social vulnerability.

However, since the early 1990s a discourse on women's specific biological vulnerability has been running alongside discourses on socio-economic risk of HIV infection. In the 1990 WHO meeting, the need to investigate the natural history of HIV in women was brought to the fore by the participants. It was argued that the exclusion of women from HIV/AIDS research had led to a gap in knowledge about the progression of HIV in women. It was understood that the history of the virus in the male body could not just be transposed to the female body. Consequently, and in line with the feminisation of the pandemic, the history of the virus needed to be analysed in relation to sexually differentiated bodies. The female body was understood as a specific body, its vulnerability

different from the vulnerability of men. Women's specific physiological vulnerability to the HIV virus came to be articulated as a specifically vaginal vulnerability, which leaves them more vulnerable than men. For instance, the WHO's 1994 *Women and AIDS: Agenda for Action* states that "[w]omen are biologically more vulnerable than men to HIV infection and other STDs. Studies in many countries have found that male-to-female transmission of HIV appears to be 2-4 times as efficient as female-to-male transmissions." (WHO 1994: 5)

I suggest that the manner within which women's vulnerability was understood created a rift between their physiological vulnerability and their socio-sexual circumstances that leaves them at risk. This dualistic understanding of women's vulnerability to HIV infection, in which the socio-sexual circumstance that leaves women at risk are articulated as separate from women's physiological vulnerability, came to be reflected in the manner within which an intervention into these vulnerabilities was understood, i.e. alongside the social transformation of subordinating gender structures ran a call for biomedical interventions that should be under female control:

In theory, sexual transmission requires the active participation of both partners and hence should be preventable by either one. However, such social and economic realities as poverty, a low level of education and subordinate social status may leave some individuals with little power or freedom to refuse intercourse or insist on the use of a condom. Women in particular tend to be at higher risk of acquiring HIV infection through sex engaged in for economic survival or imposed by men in or outside marriage. The global strategy thus calls for the social and economic empowerment of women, *while acknowledging the importance of shorter-term goals* such as support to women's groups, *the development of effective preventive technologies* (e.g. vaginally applied virucides, female condoms) that can be controlled by women, and the encouragement of safer sexual behaviour by men. (WHO 1992: 2 emphasis added)

Although the need for female initiated HIV prevention was recognised in early 1990s global health discourse, most attention was given to women's socio-economic empowerment initiatives and condom logistics. This is the point where the development of vaginal microbicides critically set its own direction, as they took up biomedicine as a way to transform women's vulnerability to HIV infection and expand an understanding of women's empowerment towards biomedical intervention into the female body.

## Theoretical Context

The field of vaginal microbicide development pays heed to both the specific vulnerabilities of the female body that make women more susceptible to HIV infection as well as the gendered power relations that leave women at a higher risk of HIV infection within the power dynamics of their sexual relationships. This mutual engagement places the field at a fascinating juncture. Because the idea of a microbicide constitutes the female body as the site of power transformations, the microbicide signifies and materialises a disruption of dichotomous or dualist thought. However, this is not how the field conceives of itself as it is grounded in women's health, and its conceptualisation of women's "empowerment" in which a distinction between natural sex and cultural gender is key.

Women's empowerment is a concept that runs through feminist writing in what is often referred to as the second wave resurgence of feminism in the early 1970s and will be discussed at some length in the following chapter. Here it is important to note that this mode of feminist thought was aimed at women's emancipation or, more radically, a feminist revolution through social change and furthermore, this mode of thought was marked by its distinction between women's sex and gender. Specifically, women's empowerment was articulated as social change and as such the power dynamics that comprise notions of women's oppression were understood to reside within 'the social'. Consequently, this mode of thought was marked by a blind spot in relation to how dynamics of power are invested in women's bodies and physicality to which the category sex was understood to refer.

This dualist mode of thought has affected the way in which power is understood to function, i.e. a separation between nature and culture in which only the realm of culture is understood to be ridden with power relations and nature is understood to pre-exist culture and is thereby removed from processes of power. Secondly, this dualism has had direct effects on the role ascribed to science and especially the natural sciences. As nature is pre-existent and devoid of power relations, the natural scientists show us 'the real' that pre-exists their investigations, which cultural practices then inscribe and social sciences can remark upon. In short, a nature/culture dichotomy and the dualist thought that ensues is a mode of thought that does not 'enter' scientific process itself, but rather upholds the authority of the natural sciences to determine 'the real'. Therefore, the manner in which the field articulates their own engagement, true to their binary thinking, leaves women's socio-sexual vulnerability to HIV infection under the representation of the advocacy campaigns and the physiological receptivity of the female body to the HIV virus under the auspices of biomedicine.

I argue that although the field of microbicides, rather ironically, maintains an imagined separation between nature and culture through their understanding of women's empowerment and the conception of power that underlies it, they enact a complex

relationality between nature and culture. This enactment takes place through the location of women's bodies as sites for the transformation of power relations. In this sense, the development of vaginal microbicides shares much with the school of feminist poststructural thought that understands the body to be "*the crucial term, the site of contestation, in a series of economic, political, sexual, and intellectual struggles.*" (Grosz 1994: 19) Therefore, in this thesis, I will position the microbicide at the centre of various feminist debates engaging the intimate relationality of nature/culture, discourse/matter and the role of science therein, in order to show the complexity this object has gathered and generated.

In order to both problematise the field's own conceptions of their investments into the feminisation of the HIV pandemic, as well as give an analysis attuned to what I understand to be at stake within the development of vaginal microbicides, the concept of performativity is central to this thesis. To this effect I will follow Judith Butler in foregrounding the body as an effect of various practices - social, sexual and material. Through a notion of performativity women's bodies take centre stage and perform in such a way that the boundaries between the social dimensions of gender/sexuality and the natural pre-given status of the sexed body are placed under interrogation. Within this investment, women's bodies are positioned as the site where patriarchal power relations are played out, while comprising the site where these relations can be transformed. Through a performative scope, bodies are always constructed by various mechanisms of power. However, as the body is performed, it acts, it is agentive, an active component within its own construction. Therefore the sexual norms and fleshed materiality that constitute this body can be performed differently and as such the women bodies construed in the field of microbicides can be understood to be transgressive bodies.

The field of microbicides engages the sciences as a mode of transformation, in which the transformation of power relations is sought not in antagonism to science, but *through* science. Consequently, the sciences are an inherent part of the performative processes at stake in the development of vaginal microbicides. Therefore, I will extend the concept of performativity to what Karen Barad calls 'intra-action' in order to be able to engage more directly with the scientific development of vaginal microbicides.

In this account, the primary ontological units are not biological bodies, or scientific objects of any kind, rather, it is within phenomena that these entities gain their ontological 'thereness', through intra-action. There are no pre-existing female bodies and microbicide candidates that interact with one another, rather, it is through their intra-action that these relata come to be. As such, Barad's framework of thought sets the stage for an analysis in which the social and the scientific, the cultural and the natural, the discursive and the material are tied together within the scientific processes that make up the field of microbicide development.

Positioning the body as a product of biomedical knowledge seeking processes, its discourses, its modes of accessing the body, opens the female body up as a site of

contingency and contestation, as Jacobus et al state:

... however imagined, the feminine body, thus defined, allows some things to appear settled even as it unsettles (...) To analyze the work performed by the languages and representations of science, in both traditional and popular forms, is to begin to unravel the ways in which gender functions to sustain what we think we know – and hence, to begin to unthink it, to imagine other ways of thinking of the social and political body, together, and altogether. (Jacobus, Fox Keller and Shuttleworth: 9)

The field of microbicide development provokes a questioning of women's bodies within biomedicine, it invites different ways to rethink this body, *to begin to unthink it, to imagine other ways of thinking of the social and political body, together, and altogether*. This imagination does not position feminist analyses outside of scientific development. On the contrary, imagination functions as a point of access into the natural sciences' claim to the natural sexed body. Imagination is not foreign to scientific endeavour, but rather inherent in a biomedical claim on the 'real' of the female body, its vulnerability to HIV infection and the microbicide as an effective intervention: "*imagination – as a mode of thought contrary to the presumptions of objective scientific knowledge – is always present and inherent to what we take to be an external, unmediated "real".*" (Rosengarten 2009: 21) There is nothing irreducible about the biology of female sexed bodies, rather these bodies are products of the natural sciences' various enactments. Imaginations pertaining to why women are in need of a microbicide, how a microbicide should intervene into their lives and what its 'empowered' consequences should be all feed into these enactments. However, the microbicide is a technology aimed at protecting women against HIV infection, which signals a fleshed reality or materiality that is very much at stake within these feminist-biomedical enactments. In short, I propose that within the field of microbicides imagination and materiality are on intimate terms.

As a feminist-biomedical alliance, I will engage the development of microbicides as a feminist inhabitation of biomedicine. In order to map out this collaboration and reflect on its performative effects, I will build significantly on Donna Haraway's myth of the cyborg. The idea of a vaginal microbicide resonates with what Haraway mused about in her "Cyborg Manifesto" written more than 20 years ago. I do not think there is a figure that encapsulates the microbicide's potential transformation of power relations as eloquently as the cyborg myth does. Haraway foregrounds imagination as a point of entry to inhabit the natural sciences as a feminist politics, made evident through her focus on myth. The cyborg myth pertains to science and technology's imaginative potential to break down the boundaries between women and technology as a figure of feminist transgression. In her work, a certain feminist imagination and inhabitation of the sciences is central, a

coalescence I find a most fruitful base for my feminist analysis of microbicide development.

However, I am also deeply concerned with the specific practices that comprise the field of microbicides and their performative effects of how both the microbicide is construed as an intervention as well as how women's bodies emerge in the process. The female bodies constituted in microbicide science have an imaginative dimension, but they are also real, fleshed and emerge from practice. This is where Barad's focus on the performativity of scientific practice is incredibly valuable. By amalgamating Barad's agential realism and Donna Haraway's cyborg myth in this thesis, I am concerned with how women's bodies in the field of vaginal microbicide development are imagined, configured and constructed in biomedical, feminist, material and imaginative ways. An agential realist conception of the field of microbicides looks to what appears to be given in scientific discourses as effects of various performative practices. One of the questions I shall explore bearing in mind the relationality between imagination and practice that both Barad and Haraway set out is to what extent, if at all, the development of the microbicide is within the parameters of how this object was initially conceived by those women's health advocates who campaigned for it early on. The engagement with biomedicine enabled a materialisation of the initial idea of a microbicide, but how has this imaginative and material investment developed over time?

For the analysis in this thesis I have assembled a diverse collection of texts attuned to the field's complexity including clinical trial reports, advocacy documents and a range of articles based on so-called acceptability studies conducted within and outside the Randomised Controlled Trials (RCTs). It is no coincidence that I place clinical trial reports together with acceptability studies and advocacy documents. I aim to show the complexity of the field of vaginal microbicides, the different meanings and materialisations that have been construed by the wide variety of actors that comprise this field. As such, I aim to engage in a mode of critique that shows the frictions and relations between multiple actors in their aim to develop a technology to protect women against HIV infection while furthering ideals of women's empowerment. Indeed, I am focused on the differences and similarities between women's health advocacy, biomedicine and acceptability studies to show the differences in how the microbicide is articulated to intervene into women's bodies and socio-sexual lives. Especially in light of the increasing authority of biomedicine to determine the path of microbicide development, I suggest it is important to show interference and show how these differences have been made to matter. In the words of Haraway: "*It's simply to make visible all those things that have been lost in an object; not in order to make the other meanings disappear, but rather to make it impossible for the bottom line to be one single statement.*" (Haraway 2000: 105)

In more particular terms, in the following textual analysis I will highlight various themes and concepts through which the field's enactments of the microbicide and the women its design implicates are articulated. The field of microbicide development consists of a wide variety of articulations, conceptions, enactments and figurations of what is at

stake in the development of vaginal microbicides as an intervention into women's vulnerability to the HIV virus. My performative approach to these articulations insists that they do not merely reflect or represent the problematic the field engages in. Rather, the multiple articulations that make up this field are constructive, they constitute what is at stake within the field of microbicide development, the microbicide as a technology and the women implicated in its intervention.

Building on the arguments of various Science and Technology Studies scholars such as Bruno Latour, Annemarie Mol and Nelly Oudshoorn, I will look for the articulations of scientific practices, feminist representations, women's sexual enactments and biomedical truth claims to see how the imagination of different actors, especially in terms of their normative dimensions, matters for how science is done, how the women are represented as being in need of microbicides and how women participants incorporate the microbicide candidates within their sexual and intravaginal practices. Bearing in mind the arguments of Annemarie Mol elaborated in Chapter Three which would suggest that the field of microbicide development consists of heterogeneity and hence a multiplicity—namely, different collectives that have a very different understanding of the microbicide as an intervention—I will investigate what makes the field of microbicide development persist and 'hang together' as if a singular coherent entity. More specifically, I ask by what mechanisms does the field persist in conjunction with the multiplicity it constitutes? Moreover, I will set out to ask, how do the effects of this persistence compare to and impact on the promise of vaginal microbicides as an intervention into women's physiological and socio-sexual vulnerability towards a different empowered future?

## **Chapter Overview**

The first two chapters of this thesis build on the theoretical context set out above. Chapter Two seeks to contextualise and elaborate Donna Haraway's cyborg myth by exploring various feminist conceptions of science, power and the female body. I will expand my critique of the 'second wave' conception of empowerment and move towards feminist science studies that instead of bracketing the female body approach the natural sciences as a powerful mechanism in its production. Haraway's cyborg myth is embedded in this effort, with the exception that she does not critique the natural sciences from the outside but understands this field to embody the possibility of feminist transformation. This will lead me to Michel Foucault's *History of Sexuality vol. 1* and the analytics of power set out therein and Judith Butler's notion of performativity as an extension of this project. I will conclude this chapter with a return to the cyborg myth, but in collaboration with Karen Barad's



‘agential realism’, as a mode of thinking the biomedical development of a feminist ideal in performative terms in which the real and the imaginative, the material and the discursive, the textual and the fleshed are co-constitutive for the bodies that come to matter.

In the third chapter, these theoretical deliberations are made more workable in a methodological sense. I will propose an analytical framework in which I will be able to engage the relation between specific scientific practices and materiality inherent to the field of microbicide development by reading this field as what Karen Barad has called an ‘apparatus of bodily production’. However, Barad’s use of this concept is very abstract and at times unspecific. Therefore, I will elaborate this notion with Latour’s understanding of ‘the collective’ as a scientific and political assemblage of human and nonhuman actors, which engage in specific performatives (mediation and purification) through which scientific phenomena emerge. Following Annemarie Mol’s conceptualisation of ‘the body multiple’, Barad’s apparatus of bodily production can be understood to consist of multiple collectives with different enactments and as such the scientific phenomenon at hand multiplies but hangs together nonetheless.

Furthermore, in order to engage the aforementioned relation between imagination and materiality inherent in the fields of microbicide development I will return to Haraway’s figure of the cyborg and introduce what she has called a ‘material-semiotic actor’ as a way to engage the microbicide as a scientific object. However, in line with the agential realist cyborg myth set out in the previous chapter, I will elaborate these concepts with a performative approach to science provided by the work of Nelly Oudshoorn and Madeline Akrich. As such, I will put the microbicide forward as a gendered artifact, an object that carries normative gender scripts pertaining to women’s bodies, sexuality and relationships that configure its potential user in particular ways. Moreover, I also suggest that the microbicide as a material-semiotic actor enables unimagined enactments of these normative domains, enabling a (re)configuration of women’s sexualised bodies.

The fourth chapter opens with Zena Stein’s initial conceptualisation of a female-controlled prophylaxis, an idea that bears some striking similarities with Donna Haraway’s cyborg myth. Stein put forward the idea of a female-controlled prophylaxis in an effort to include the social problematic of women’s specific vulnerability to HIV infection into biomedical HIV prevention, articulating this idea through the concept of empowerment. In this chapter, I will trace how this idea has come to be articulated in advocacy discourse, focusing on the feminist-biomedical alliance between Lori Heise and Chris Elias, various documents published by the *Global Campaign for Microbicides* and a small selection of hypothetical acceptability studies. In this chapter I argue that through the various ways within which the advocacy field has taken up Zena Stein’s initial idea of a female-controlled prophylaxis a certain ‘vulnerable woman’ was performatively construed. I suggest that this notion of the vulnerable woman is both potentially transformative as well as highly problematic. In this chapter I will ask, how has microbicide advocacy articulated the

microbicide as an intervention into women's vulnerability towards a different empowered future since Zena Stein's initial conceptualisation?

In Chapter Five, I will engage the biomedical process of vaginal microbicides by discussing the clinical trials within which the microbicide candidates Nonoxynol-9, SAVVY, Carraguard and Cellulose Sulfate were tested. Biomedical process is central to the promise of vaginal microbicides and as such this promise does not merely pertain to the idea of a microbicide, but the field's search for an efficacious candidate. In this chapter I argue that the microbicide candidates and women participants these compounds are tested on do not pre-exist the various practices inherent in the RCT and the various articulations of what is at stake within the RCT. Rather, these practices and articulations construe the candidates and women participants in specific ways. This chapter discusses the trials and shows how advocates, trial participants and scientists have different stakes in the development of microbicides which do not always add up. Rather, I will suggest that the differences between these enactments are such that the microbicide candidate in relation to the bodies under trial multiplies. However, this multiplicity is intimately related. I will suggest that especially surrounding women's vulnerability within the RCTs, the RCT provokes a set of relations, within which the various enactments of scientists, trial participants and advocates tie together. Foremost, in this chapter I will argue for a more 'relational ethics' by questioning, what is at stake in the clinical trials and for whom?

Chapter Six asks the question whether the development of microbicides as it stands now has materialised the promise of cyborg embodiment that the initial idea of a microbicide held. To answer this question I will discuss the microbicide candidate PRO 2000, which I understand to mark a significant moment in the development of vaginal microbicides. I suggest that the moment of PRO 2000 (here discussed through the HPTN 035 trial and the MDP 301 trial) effected both an increased biomedicalisation of the field by promising efficacy, while it also increased a space for complexity in line with the cyborg myth through an increase in social research. As such, I will show how women's sexual behaviour became quantified and regulated within the RCTs through various mechanisms, a trend that continues to this day and will become apparent in my discussion of the CARPISA trial testing Tenofovir gel. Furthermore, I will focus on social research conducted as part of the MDP 301 trial (here discussed by research done by Stadler and Saethre 2010, 2011) by focusing on how women incorporate the microbicide into their intravaginal practices as a material-semiotic actor which carries the promise of cyborg embodiment. Specifically, I argue that the biomedicalisation of microbicides, in remarkable contrast to what social research endeavours show, increasingly foregrounds efficacy and adherence to product use to the detriment of the complexity of enacting a microbicide as a transformative intervention into both women's bodies and socio-sexual relations. Ultimately, I will suggest that this biomedical promise constrains the configuration of the microbicide's potential user as well as the microbicide's material-semiotic potential.

**Chapter 2.**  
**Towards an Agential Realist Cyborg Myth**

In this chapter I review feminist conceptions of the body, the distinctions between nature and culture, and most importantly, power. To do so, the chapter is roughly divided into two sections. The first section sets out early second wave feminist arguments, which can be broadly characterised as resting on a nature (sexed body)/culture (gendered subject) distinction with power understood as a repressive force. To exemplify this mode of thought, I will discuss Kate Millett's theory of patriarchy and her focus on the social as both the realm in which power functions as well as the sphere of possibilities for transformation. Furthermore, I will discuss Shulamith Firestone's approach which at first glance appears to be radically different as she foregrounds not sociality, but female physiology as the fundamental cause of women's oppression and suggests that technological innovation will remedy this biological disadvantage towards a more liberated future. However, what these theories have in common is that they bracket the female body understanding it as pregiven, outside power and exterior to feminist critique.

The second section sets out an alternative approach, most readily characterised by more recent feminist theories which contest the nature (sexed body)/culture (gendered subject) distinction and rethink power as immanent to the sex/gendering of bodies. However, it is important to note that this feminist debate is not linear and some of the arguments that will be important to this thesis were made in the same 'historical moment' as those I wish to critique. Most notable are the feminist engagements with science of this time made within feminist science studies and specifically the cyborg myth set out by Donna Haraway. The cyborg myth along with other poststructural feminist critiques, in particular the theory of performativity of Judith Butler and Karen Barad's agential realism will feature throughout this thesis. I focus on Haraway's cyborg myth, because in this work she positions women's bodies at the centre of power relations inherent to science and technology. Furthermore, it is exactly through this positioning that women's bodies are rendered not only the site of possible domination or oppression, but also of transformation of these power relations. In other words, the cyborg is a transgressive figure on the terrain of power.

As such, I aim to complement Haraway's cyborg myth with the works of Michel Foucault, Judith Butler and Karen Barad. Haraway is deeply involved with the ways power functions within and through scientific practice, but in line with the tone of her work she does not give an explicit analytics of power in order to explain through which specific mechanisms power invests women's bodies within science. It is here that Foucault's *History of Sexuality vol.1* (1976/1998) is helpful and relevant. It is clear that Haraway's implicit

conception of power builds on Foucault's work. However, in *The History of Sexuality Vol. 1* Foucault sets out an explicit analytics of power inherent to science and its investment in the sexualisation of bodies.

Furthermore, as the cyborg is a transgressive figure, she is caught within relations of power but embodies the capacity to transform these relations as well. The cyborg is not a passive or subjected figure, but finds ways to subvert those relations through which her specific embodiment is produced. It is here that I turn to Judith Butler's work as a way to put the cyborg forward as an active component in the process of her own production. Specifically I will look on Butler's theory of performativity as she foregrounds the specific investment of normative power mechanisms through which bodies simultaneously materialise and emerge as meaningful.

I will close this chapter by returning to Haraway's cyborg myth, this time however, through an agential realist scope provided by the work of Karen Barad. Karen Barad elaborates Butler's conception of performativity, but whereas Butler focuses on discourse, Barad is more attuned to the sciences in order to explain how matter comes to matter than discursive processes of meaning and language systems that dominate Butler's work. Barad and Haraway have many affinities and Barad often refers to Haraway in her own work. However, although Haraway's cyborg is mentioned in Barad's work she does not foreground this figure as a mode of embodiment, an effect of human-nonhuman intra-actions. Therefore, although connections between Haraway and Barad have already been established, I will focus on an amalgamation of the work of Barad and Haraway to come to an agential realist cyborg myth.

By introducing these areas of feminist debate, I am able to create a framework for analysing the capacity of a vaginal microbicide to empower women as claimed by the Global Campaign for Microbicides. The concept of empowerment can be traced back to these second wave understandings of power, sociality and women's bodies and as such it functions as a framework for the analysis to be set out in Chapter Four. By framing this effort in terms of the nature/culture distinction and the feminist debates on materiality that circulate this dichotomy, I am able to problematise the field's understanding of empowerment and its impact on what they are trying to achieve.

Furthermore, as I will come to reflect on in the conclusion of this thesis, through engaging these feminist debates surrounding the materiality of women's bodies as a site of transformation, I aim to position my analysis of microbicide development as an invitation for a provocative imagination of women's sexualised bodies within the field of HIV prevention.

## Problems with the Sex/Gender Dichotomy

One is not born, but rather becomes, a woman. (de Beauvoir 1949/1997)

As mentioned in the introduction to this chapter, the separation between sex and gender, nature and culture and the specific understanding of power that invites this mode of dualist thought can be traced down to an understanding of power characteristic of the second wave resurgence of feminism in the late 1960s and early 1970s. This wave of feminism, especially in the U.S. had its roots in the activist women's movement and was in a way removed from a more academic style of feminist writing.<sup>2</sup> That said, although Simone de Beauvoir was embedded in French academia, her statement that one is not born, but rather, becomes a woman, is central to second wave feminist thought.<sup>3</sup>

This statement allowed an interrogation of the foundations of women's oppression, in which the separation between sex and gender was key. Simone de Beauvoir's work allowed for a radical interrogation of biological reductionism by introducing the social dimensions vital for an analysis of who Woman is and these social dimensions, in turn, were translated into the category 'gender'. Women's oppression was positioned as inevitable in biological reductionist arguments, but *through* a separation of sex and gender, the biological category sex was no longer able to function as the irreducible cause of women's situation. Simone de Beauvoir's statement placed the biological irreducibility of the foundations of women's oppression under scrutiny.

The label 'second wave' is a conflation of many different feminisms, academic as well as activist, European or U.S. based, Marxist or liberal, and so on. However, the second wave feminists I engage here share a focus on 'the social' as an explanation and site of transformation for women's oppression. This analytical framework fundamentally argues that a conception of women's oppression is not merely a 'wrong' one individual inflicts upon another, although most second wave feminists certainly are not shy in pointing towards men as the ones wielding power, but rather women's oppression is understood to be structural, i.e. a social structure called 'patriarchy'. In an important article of the time named *On Patriarchy* published in the journal *Feminist Review* the British feminist Veronica Beechey describes:

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<sup>2</sup> Feminist writers in the US at that time were more focused on activist writing, revolutionary writing, a good example of this is Anrea Dworkin who writes the opening paragraph of *Woman Hating*:

This book is an action, a political action where revolution is the goal. It has no other purpose. It is not cerebral wisdom, or academic horseshit, or ideas carved in granite or destined for immortality. It is part of a process and its context is change. It is part of a planetary movement to restructure community forms and human consciousness so that people have power over their own lives, participate fully in community, live in dignity and freedom. (Dworkin 1974: 17)

<sup>3</sup> Haraway makes a similar point in the *Cyborg Manifesto* (1991: 130)

...theoretically the concept of patriarchy has been used to address the question of *the real basis of the subordination of women*, and to analyse the particular forms which it assumes. Thus the theory of patriarchy attempts to penetrate beneath the particular experiences and manifestations of women's oppression and to formulate some coherent theory of the basis of subordination which underlies them. (Beechey 1979: 66 emphasis added)

In other words, instead of a presupposition of a natural real that grounds and serves as an unquestioned foundation of women's oppression, this 'real' is understood to be rooted in 'the social'.

Indeed, central to this mode of thought is the search of a foundation for oppression and its possible transformation, which does not resort to biological reductionism. Here I want to focus on the theory of patriarchy set out in Kate Millett's *Sexual Politics* (1969) and Firestone's engagement with the reproductive body in *The Dialectic of Sex* (1970). Both try to find a foundation of patriarchy in order to signal some transformation of this foundation towards women's empowerment. However, their mode of analysis is very different as Millett focuses on the social construction of gender and Firestone on the female body.

### *Social Transformations of Cultural Gender*

In *Sexual Politics* Kate Millett argued that patriarchal ideology is woven through all aspects of society, every "*avenue of power within society*" (Millett 1969: 25), which gives it its force, its credence, and therefore its solidity. As such, Millett endeavoured to come to a theory of patriarchy (1969: 24) in which she understands the category sex to have an inherent patriarchal function.

Millett recognises the role biology plays within patriarchal power relations, through its ideological complexity. It is difficult, if not impossible, to distinguish purely physiological sex characteristics from psycho-social gender behaviours, as the former is used to substantiate the latter. Biology is not in itself enough to justify gender temperaments, roles and status, she argues, and as such it constitutes an inadequate foundation. For Millett this, on the one hand, means that women's biology is an invalid justification of women's oppression in patriarchal society. On the other hand, the fact that biology cannot justify women's oppression functions to highlight the power of the socialisation of men and women into the patriarchal gender system.

...we are left with the realities of sexual politics, still grounded, we are often assured, on nature. Unfortunately, as the psycho-social distinctions made between the two sex groups which are said to justify their present

political relationship are not the clear, specific, measurable and neutral ones of the physical sciences, but are instead of an entirely different character – vague, amorphous, often even quasi-religious in phrasing – it must be admitted that many of the generally understood distinctions between the sexes in the more significant areas of role and temperament, not to mention status, have in fact, essentially cultural, rather than biological, bases. (Millett 1969: 28)

Women's oppression cannot be explained through sex, sex is a biological category saturated with patriarchal power. Sex alone is not enough to explain women's oppression, rather, what is at stake in the foundations of women's oppression is a question of gender that only appears as naturally given. The force of this argument is that gender becomes a function of social patriarchal power structures, it therefore does not refer back to a solid biological foundation and as such gender becomes a site on which structural transformation or *empowerment* is possible. In fact, Millett explicitly argues that empowerment would require a structural change as she writes, "... *a sexual revolution would bring the institution of patriarchy to an end, abolishing both the ideology of male supremacy and the traditional socialization by which it is upheld in matters of status, role and temperament.*" (Millett 1969: 62) However, although I appreciate the notion of transformation this argument makes possible, problematically, this structural change pertains only to a restructuring of patriarchal ideology and resocialisation of men and women. As such, it constitutes a framework of thought for the transformation of power relation that Moira Gatens has called "*a programme of 'degendering'*" (1996: 7) merely focused on 'the social'.

Indeed, through this understanding of empowerment via a degendering of men and women, Millett's ideological theory of patriarchy has a very awkward relation to the sexual specificities of bodies. In fact, she avoids any engagement with the physical altogether. As Elizabeth Grosz characterises this critique:

Presuming that biology or sex is a fixed category, feminists have tended to focus on transformations at the level of gender. Their project has been to minimize biological differences and to provide them with different cultural meanings and values. There also remains the possibility of the equalization of relations between the two sexes only if the psychological functioning of each – gender – can be understood and transformed. Equalization does not require a transformation or supersession of the body. The body itself, in the strongest version of this position, is irrelevant to political transformation, and in the weakest version is merely a vehicle for psychological change, and instrument for a "deeper" effect. What needs

to be changed are attitudes, beliefs and values rather than the body itself.  
(Grosz 1994: 17)

In the feminist mode of thought set out through Millett's *Sexual Politics*, patriarchy consists of the unequal distribution of power between men and women and as such empowerment is understood as an equal distribution of power through degendering the social power relations of which this inequality is an effect. The problem lies herein: if empowerment is understood as a resocialisation towards a cultural equality, women's biologically sexed bodies are positioned outside of power relations and excluded from feminist analysis.

### *Technological Transformations of Biological Sex*

In contrast, Shulamith Firestone in *The Dialectic of Sex* takes the sexual specificity of the female body, as the foundation of patriarchal oppression, as her focal point, emphasising the reproductive function of women's bodies. For Firestone, the female body invites women's subordination through its biological reproductive function. Specifically, this reproductive function is acted out within the patriarchal family, an institution at the root of women's socio-economic oppression as she writes:

Unlike economic class, sex class sprang directly from a biological reality: men and women were created different, and not equally privileged. Although, as De Beauvoir points out, this difference of itself did not necessitate the development of a class system – the domination of one group by another – the reproductive *functions* of these differences did. The biological family is an inherently unequal power distribution. (Firestone 1970: 8)

In Firestone's line of thought, women's oppression might be rooted in nature but this does not determine their role in society. Regardless of biology, women can be liberated. In engaging women's sexual specificity Firestone turns to technology and the potential of technological advance. For Firestone, the advances in technology inspire change in women's oppression as a liberation from the reproductive function of their sexed bodies. Her envisioned revolution pertains to a biological transformation. She continues to explicate what a feminist revolution should envision or be aimed towards. As the inequality between the sexes, rooted in nature, is the core problematic of women's oppression, so women's liberation will consist of the elimination of the very distinction between the sexes, through a neutralisation of sexual difference. In fact, Firestone states that, "*the end goal of feminist revolution must be, unlike that of the first feminist movement, not just the elimination of male*



*privilege but of the sex distinction itself: genital differences between human beings would no longer matter culturally.*" (Firestone 1970: 10 emphasis omitted)

Although I appreciate the centrality of the sexed body in Firestone's account, I also propose that this mode of thought is problematic in terms of a framework for a feminist analysis. Firstly, Firestone's neutralisation of sexual difference is problematic, because it fails to take into account the normativity that underlies this claim. In the words of Moira Gatens: "*What Firestone overlooked is that the desired neutrality was not a neutrality at all but a 'masculinization' or 'normalization' (in a society where men are seen as the norm, the standard) of women – a making of 'woman' into 'man'.*" (Gatens 1996: 17) Furthermore, I argue that Firestone's mode of thought is highly problematic as she looks on the sciences to attain this neutralisation, but does not explicitly take on board the power dynamics that reside within scientific process. Women's liberation consists of transforming women's bodies through technology as an equalising process and as such, problematically, Firestone does not interrogate the body that the natural sciences present and describe, but rather takes this body as the unquestionable ground of women's oppression. In other words, Firestone engages the sexed body but takes science at face value.<sup>4</sup>

#### *The Female Sexed Body Between Brackets*

Both Millet and Firestone attempt to give theoretical or philosophical grounding to patriarchal structures in society through an understanding of power in which a separation of sex from gender is key. Millett amplifies the force patriarchal powers wield in societies to determine the role of women, to such an extent that this determination of gender fully envelopes and encompasses women's sexed bodies. She emphasises social dimensions of patriarchal power to the neglect of the physical. Firestone engages women's reproductive bodies as fundamental for the shape patriarchy takes. Women's reproductive biological function, for Firestone, consists of an unequal distribution of power between the sexes which constitutes the foundation of, and further strengthens, women's subordinate roles in patriarchal society. Technology will restructure women's biology towards an equal distribution of power between the sexes' reproductive functions. Technology would be able to alleviate the physical burden of the female body and as such she emphasises sex over gender in an ironically reductionist way.

The works of Millett and Firestone differ strongly in their understanding of both the foundations of patriarchy as well as the manner in which they imagine the transformation of these foundations. However, I suggest that both feminist analyses consist of a search for the foundations of patriarchy in which the biological body is bracketed.<sup>5</sup> In other words,

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<sup>4</sup> Donna Haraway criticised Firestone for her mode of engaging science as a fetishisation (Haraway 1978), which functions "*by agreeing that "nature" is our enemy and that we must control our "natural" bodies (by techniques given by biomedical science) at all costs to enter the hallowed kingdom of the cultural body politic as defined liberal (and radical) theorists of political economy, instead of by ourselves.*" (Haraway 1978: 23)

<sup>5</sup> Ann Oakley's influential essay *The Difference Between Sex and Gender* is another strong example of 'bracketing the biological

both Millett and Firestone posit the biological body between brackets in an effort to avoid its reductionist foundation, and as such ironically reintroduce the body as an unquestionable ground. Nelly Oudshoorn, to whose work I will return, explains this irony as such:

...the sex-gender distinction did not challenge the notion of a natural body. Although the concept of gender was developed to contest the naturalization of femininity, the opposite has happened. Feminist theories of socialization did not question the biological sex of those subjects that become socialized as woman; they took sex and the body for granted as unchanging biological realities that needed no further explanation (...) In these studies, the concept of sex maintained its status as an ahistorical attribute of the human body and the body remained excluded from feminist analysis. (Oudshoorn 1994: 2)

As a consequence of a separation between sex and gender, the biological body is bracketed, has to be bracketed in order not to restore some form of biological reductionism, Firestone's accidental reductionism is a good example of this. Elizabeth Grosz explains the problematic of a sex/gender binary through the notion of a Cartesian duality which affects how the body can be engaged within feminist thought. (Grosz 1994: 8) To paraphrase her argument, either the body is seen as an object for the natural sciences (Firestone), or the body is seen as an instrument or tool at the disposal of a conscious subject (Millett). Both modes of thought problematically bracket the body as either an object for the natural sciences or a substance inscribed or disciplined by social structures. As power and empowerment are understood to refer to social dimensions, the body is indeed excluded from feminist analyses. Furthermore, as feminist investment is solely focused on the social, these efforts are separated from the scientific investigations into the physicality of the female body. Thus, feminist endeavours can only consist of different understandings of gender based on a pre-existent body, sexed by the natural sciences. Problematically, a feminist analysis *of* the female body is foreclosed.

However, not all feminist efforts of this time neglected an analysis of the scientific construction of the female body, as feminist science studies since the late 1970s directly engaged the natural sciences and refused to deal with the body as pre-existent. It is important to note that this mode of feminist thought, although engaging science and

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body' as she writes:

While our society is organised around the differences rather than the similarities between the sexes, these two extremes of masculinity and femininity will recur, so apparently confirming the belief that they come from a biological cause. *Whatever biological cause there is in reality*, however influential or insubstantial it may be, thus tends to become increasingly a rationalisation of what is, in fact, only prejudice. In this matter, human beings are probably more conditioned by their own gender-differentiated upbringing than they are able, or would care, to admit. (Oakley 2005/1972: 10 emphasis added)

technology, is different from Firestone's approach. Feminist science studies engages the natural sciences in an effort to destabilise the presupposition of sex as natural biology and contest the truth that speaks through, what Haraway has called, the ventriloquist-scientist as the voice of authority (Haraway 1997b: 24). In other words, these feminists did not take science at face value, but rather engaged its discourses and practices to render the 'truth' it speaks as radically contingent.

### **Feminist Investments in Science the power of the cyborg**

It goes without saying that the body, whether masculine or feminine, is imbricated in the matrices of power at all levels, and not just, or even primarily, on the level of theory; but the feminine body, as the prime site of sexual and/or racial difference in a white, masculine, western political and sexual economy, is peculiarly the battlefield on which quite other struggles than women's own have been waged. It is for this reason that attempts to reclaim the feminine body – whether through the aegis of 'choice' or by way of constructivist accounts – have played such an important part in the liberatory as well as liberal discourse of contemporary feminism. (Jacobus et al 1990: 2)

The feminists studying science who I will discuss here have the female body as their point of focus and read the female body as a site where patriarchal power is invested and played out. Contrary to the theories discussed above, feminist science studies, turned (and continue to do so) to the natural sciences and the authority these sciences wield to show how they construct these sexed foundations that appear as natural and therefore the unquestionable grounds for women's oppression by showing their dependence on social and cultural constructions of gender that feed into their representations of the female body. Specifically, they look to scientific development as a mechanism of power, a productive process that produces the bodies it claims to discover and describe.

However, it is worth making explicit that the label 'feminist science studies' does not refer to a homogenous field of academic engagement as this field includes a vast array of different feminist views, theoretical backgrounds, methodologies and subject matters. Especially in early feminist science studies, two major modes of thought can be roughly carved out for their different understanding of power and its purchase on scientific investments into women's bodies. Namely, a mode of engagement which seeks to include

women and women's voices into the natural sciences and a mode of thought that looks to detangle the specific ways power functions within and through scientific enterprise.

The 'inclusion project' explicates a critique of the exclusion of women scientists from the sciences (see for instance Harding 1986: 21) as well as the exclusion of women's needs and voices within the natural science's various projects. In this mode of thought, patriarchal power functions to exclude women from the sciences and this exclusion, in turn, necessarily leads to a sexist science. Particularly, because what is defined as a problem in need of scientific investigation is understood to be utterly removed from what women need and want. As such, the answer is then, the inclusion of women within the process of science. Evelyn Fox Keller has called this mode of thought "the liberal critique" stating that "*This kind of criticism does not touch our conception of what science is, not our confidence in the neutrality of science. It may be true that in some areas we have ignored certain problems, but our definition of science does not include the choice of problem – that, we can readily agree, has always been influence by social forces*". (1996/1982: 29) In other words, women's perspectives have been excluded from scientific accounts of the natural world and therefore, the project is to include them in order to go towards what Sandra Harding would call "better science". She explains that these feminists "*propose to provide empirically more accurate and theoretically less partial and distorted descriptions and explanations of women, men, gender relations, and the rest of the social and natural worlds, including how the sciences did, do, and could function.*" (Harding 1991: 1)

In a slightly more radical way, feminist standpoint theory has a place within this 'inclusion project'. Feminist standpoint theory first emerged in the early 1980s at the nexus of "*the production of knowledge and practices of power*" (Harding 1995: 1) and focused on illuminating women's specific histories as a way to resist patriarchal power in knowledge production. Women's experience, autobiographies, story-telling, to name a few methods, all find their place within this venture. As a feminist epistemology standpoint theory concerned itself with women's "*privileged knowledge*" (Hartsock 1995: 245). It explicates that knowledge is never neutral, but is and has always been socially situated and as such it is women's experience as dominated, subjugated others that gives them access to a different knowledge, as Harding explains:

As science, standpoint projects were to see "beneath" or "behind" the dominant sexist and andocentric ideologies that shaped everyone's lives to the relations between, on the one hand, the actualities of women's everyday lives and, on the other hand, the conceptual practices of powerful social institutions, especially including research disciplines. (Harding 1995: 6)

For feminist standpoint theory, women's experience is key and, consequently, the

standpoint approach to the natural sciences is therefore the inclusion of women's experience within scientific practice towards better science. Sandra Harding's 'strong objectivity' is a good example of this mode of thought (Harding 1996). Once again, in line with the second wave feminists discussed in the previous section, power is understood to function through social mechanisms which are deemed external to scientific process itself. In other words, the capacity of the natural sciences to reveal a pre-critical 'real' is left untouched, it is the choice of whose reality that is problematised.

However, the strand of feminist science studies within which I situate my own work does not understand power within scientific knowledge production to function in terms of the exclusion of women. Rather, it is exactly within the production of scientific knowledge of what is deemed 'natural fact' that power resides and functions. In other words, in line with this mode of feminist thought, I understand the power inherent to the natural sciences to be productive of 'the female body' as we come to know this 'sex' and furthermore, I understand this knowledge to be intimately related to oppressive power structures.

In more particular terms, this school focuses on a critique of scientific representations of sex and gender within the natural sciences and as such engages scientific discourses. The role of scientific language, imaging and the power of metaphor are central to this mode enquiry, or, as Sandra Harding explained this engagement: "*to "read science as a text" in order to reveal its social meanings*" (1986: 23). The work done by feminists who come to science as a discourse is vast and diverse, however a few figures are central to the early days of this mode of feminist science studies, such as Evelyn Fox Keller, Emily Martin and Donna Haraway (whose work I will come to discuss extensively in this thesis). These feminists looked at how power feeds into what becomes 'natural fact' by showing the socially and culturally laden meanings that saturate the manner within which these facts are put into discourse and represented. For instance, Evelyn Fox Keller engaged psychoanalysis to tease out the phallogentric thought inherent to scientific discourses (see for instance Fox Keller 1996/1992). Another example is Emily Martin who looked toward the representation of the female reproductive system to see how these configurations repeat gender stereotypes (Martin 1996).

In light of the present discussion it is important to see how the natural sciences were put forward as a field in which nature becomes gendered and sexualised and social and cultural meanings pertaining to sex and gender become naturalised. This mode of feminist thought, importantly, took on science as a point of entry into the unquestionable 'nature' of the female body by placing under interrogation the boundary between nature and culture. As such, the female sexed body became radically contingent and open to feminist critique. In short, this engagement with the constructive capacity of the natural sciences has opened the door for a feminist interrogation of the sexed body. For instance, in 1978 in the feminist journal *Signs* published a themed volume called "Women, Science, and Society" in which Donna Haraway writes:

The union of the political and physiological is the focus of this essay. That union has been a major source of ancient and modern justifications of domination, especially of domination based on differences seen as natural, given, inescapable, and therefore moral. It has also been transformed by the modern biobehavioral sciences in ways we must understand if we are to work effectively for societies free from domination. The degree to which the principle of domination is deeply embedded in our natural sciences, especially in those disciplines that seek to explain social groups and behaviour, must not be underestimated. In evading the importance of dominance as a part of the theory and practice of contemporary sciences, we bypass the crucial and difficult examination of the *content* as well as the social function of science. We leave this central, legitimating body of skill and knowledge to undermine our efforts, to render them utopian in the worst sense. Nor must we lightly accept the damaging distinction between pure and applied science, between use and abuse of science, and even between nature and culture. (Haraway 1978: 22)

The theoretical effort to breach the separations between nature and culture is not merely an abstract move. Rather, it is an effort to place the authority of the natural sciences to determine material reality under scrutiny. As such, it is an effort to break down the boundaries surrounding the natural sciences and create a point of entry into this field of knowledge production through which feminist critique can travel.

Donna Haraway indeed has a special place within feminist science studies, for she does not merely critique the natural sciences from the outside but inhabits the natural sciences as a feminist politics. Haraway's work is central to this thesis and specifically, her engagement with science as a feminist project which she set out in her *Cyborg Manifesto* (1991a). The cyborg myth articulates scientific enterprise as an authoritarian force wielding strong mechanisms of power detrimental to women's lives. Indeed, the cyborg manifesto is in a sense very much of its time, embedded in early feminist science studies and critical of the role the natural sciences played within women's oppression. However, and this is what sets Haraway's work apart, through the figure of the cyborg, the natural sciences are positioned as the locus of a feminist transformation of power relations as well.

### *A Cyborg Feminism*

For Haraway, the cyborg is female, though not in any essentialist way. There is nothing that intrinsically binds women together, as Haraway describes, her engagement with science and scientific embodiment is part of "...a feminism that does not embrace Woman, but is for women." (Haraway 2004: 329). She endeavours to give a reading of

science in such a way that power's material effects on women's lives are not lost in abstraction. Indeed, the political force of the cyborg resides in its fleshed figuration, an embodiment of women's lived reality and the political hope for a more liberated future. Specifically, she builds on Trinh Minh-ha's concept of inappropriate/d others to embrace an understanding of women as the subject of her political feminism that steers clear of any essentialist notion of Woman.

Rather to be an "inappropriate/d other" means to be in critical, deconstructive relationality, in a diffracting rather than reflecting (ratio)nality - as the means of making potent connection that exceeds domination. To be inappropriate/d is not to fit in the taxon, to be dislocated from the available maps specifying kinds of actors and kinds of narratives, not to be originally fixed by difference. (Haraway 1997b: 69 emphasis added)

Inappropriate/d others are neither as "self" nor "other" (Haraway 1997b: 69), which inspires Haraway to take this notion further to place under interrogation the distinction between humans and nonhumans. Haraway constructed the myth of the cyborg, to give voice to this posthuman embodiment. In this cyborg myth, the networks of women's lives (always in relation to science and technology) are understood to form a patchwork reality that constitutes the material ground of their embodiment. Cyborgs are hybrids made of flesh and machine *through* their inappropriate otherness, the patchwork of realities from which they emerge. Furthermore, through a connection between human and machine - a fundamental evaporation of the boundaries between nature, culture and technology - Haraway commits herself to a political effort to instigate a different feminist future through science and technology.

Cyborgs are hybrids of flesh and machine, i.e. chimeras floating across the boundaries between nature and culture, public and private, politics and science. In this sense, cyborg embodiment is intended to give shape to a perverse identity, made up of the addition of flesh and machine. The cyborg is a matter of boundary breakdowns and ontological indiscretion, the evolutionary breakdown between animal and human, the technological leakage between animal-human and machine and the ethereal distinction between physical and non-physical. As machine and flesh merge a definite boundary evaporates, Haraway questions:

Why should our bodies end at the skin, or include at best other beings encapsulated by skin? (...) For us, in imagination and in other practice, machines can be prosthetic devices, intimate components, friendly selves. We don't need organic holism to give impermeable wholeness... (Haraway

1991a: 178)

As a “...cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction” (Haraway 1991a: 149), the cyborg’s posthuman body inhabits the space between reality and fiction. For Haraway scientific development is the space where a certain feminist imagination can potentially be materialised. The cyborg myth “...is about transgressed boundaries, potent fusions, and dangerous possibilities which progressive people might explore as one part of needed political work.” (Haraway 1991a: 154) This interpellation forges a connection between socially embedded and embodied lives lived and an imagination for a more liberated future. Discourse and materialisation, language and flesh, imagination and a certain ‘real’ are intimately related through power mechanisms of bodily production, whilst simultaneously articulating the possibilities for a different future. The body becomes the site where imagination of a different future is made possible, through scientific (re)configuration.

The cyborg as an inappropriate/d other embodies the potential to configure a different feminist future, precisely because of her inessential ontology. However, this leaves open questions of what this ‘inessential ontology’ constitutes. In this light, it is quite telling that (as mentioned above) for Haraway the cyborg is female, but not in an essentialist manner, that she argues for “...a feminism that does not embrace Woman, but is for women.” (Haraway 2004: 329) There appears to be an important difference between Woman and women that Haraway through her cyborg myth is deeply invested in. However, what this difference and thereby political investment entails remains aloof. In a similar vein, Vicki Kirby acknowledges the transgressive potential of the cyborg myth because of its radical anti-essentialism, but challenges Haraway for her lack of analysis of the processes of differentiation of the cyborg from its essentialist other.

Haraway’s insistence that “[t]he cyborg skips the step of original unity” forgets that it is against the unity of “the before,” the purity of identity prior to its corruption, that the cyborg’s unique and complex hybridity is defined. Haraway doesn’t interrogate the nature of the interface between the cyborg and its “other,” or the implicit temporal and special hierarchizations of this differentiation. Haraway’s “disassembled and reassembled” recipe for cyborg graftings is utterly dependent upon the calculus of one plus one, the logic wherein pre-existent identities are *then* conjoined and melded. The cyborg’s chimerical complications are therefore never so promiscuous that its parts cannot be separated, even if only retrospectively. Put simply, for Haraway, there once was not a cyborg. (Kirby 1997: 147)



Haraway posits the interface between technology and women's bodies as a prosthetic relation that implicates an ontology of addition "a calculus of one plus one". Indeed, one can make the critique, following Kirby, that this prosthesis re-iterates the essential and is therefore not as monstrous as Haraway claims this inappropriate/d other to be.

However, Haraway is notoriously difficult to pin down in terms of any settled theory or logic, this is not her project. Furthermore, she is explicitly political in her toying with nature and in this engagement a politically laden irony is central, an irony that Kirby in her cutting critique does not take on board. Cyborgs are inappropriate/d others as they inhabit the power relations of science in an inappropriate/d manner, i.e. they are embedded within networks of power that might very well be oppressive, but these networks also create the conditions of possibility of their transgressive power. As Haraway writes: "*My focus is the figure of a broken and suffering humanity, signifying - in ambiguity, contradiction, stolen symbolism, and unending chains of no innocent translation - a possible hope.*" (Haraway 1991a: 48)

Despite this footnote on Haraway's irony, Kirby does touch on a gap in Haraway's cyborg myth. It is clear that Haraway's cyborg is positioned amidst myriad power relations within a context of scientific development. But how do power relations within scientific practice constitute cyborg embodiment? And, how can the cyborg transform these relations in a transgressive manner?

In engaging these questions I will turn to Foucault's *The History of Sexuality vol. 1*. Although it is evident that Foucault's understanding of power has inspired Haraway in her own work, I suggest that the analysis set out in *The History of Sexuality vol. 1* can be used as an elaboration of Haraway's cyborg myth. In this context, I find it particularly pertinent to focus on Foucault's explicit analytics of the productivity of power within scientific discourses as they pertain to the body and its various sexualisations.

#### *A Power-Knowledge Nexus*

A feminist "body politics" addresses this possibility of change, contesting the inevitability or naturalness of supposedly "scientific" definitions of women's bodies by showing how the discourses and narratives of science not only construct but depend on the very institution of gender which scientists claim to discover or observe. (Jacobus et al. 1990: 7)

The Foucault of *The History of Sexuality vol. 1* and the feminist engagement with the natural sciences discussed above (to interrogate the construction of women's sex and gender) share similar stakes. Foucault questions the ahistorical facts of sex, by showing their historical contingency as a very specific function of power. As such, *The History of*

*Sexuality* is a genealogy of sex, i.e. "...a form of history that can account for the constitution of knowledges, discourses, domains of objects, and so on, without having to make reference to a subject that is either transcendental in relation to the field of events or runs in its empty sameness throughout the course of history." (Foucault 1977/1994: 118) By showing the historicity of the notion of "sex" it is shown to be a discursive effect and therefore radically contingent. As such, this work is a valuable point of departure for centralising power and the female body in an analysis of science. For above all, *The History of Sexuality* is a treatise on power, its deployment through sexuality and its sexed bodily effects. This work is well known for the analytics of power set out herein. However, in light of the present discussion, I want to focus on Foucault's engagement of science and its purchase on the sexualisation of bodies.

Foucault has called this a *scientia sexualis*, a collective of scientific apparatuses put in place to produce discourses on sexuality and sex. These apparatuses producing the discourses on sex and sexuality are to be found within the field of knowledge production. Through specific sciences focused on sexuality that Foucault takes from the Victorian era (physiology of reproductive anatomy and psychoanalysis specifically), sex became something that should be taken into account, analysed, classified. A *scientia sexualis* does not merely record, transcribe, listen to a sexual truth emerging from their objects of study. Rather, through specific scientific discourses on sex, a *scientia sexualis* in fact produces the sexualities, sexed bodies and desires that are set in place as their objects of study. These objects of study do not exist as such before this scientific incitement to sexual discourse.

This process of construction hinges on what Foucault calls 'the power-knowledge nexus', which consists of specific mechanisms, discursive apparatuses, put in place by scientific endeavour.<sup>6</sup> These sexual sciences constitute a complex relation to truth for these scientific apparatuses are discursive formations that consist a power-knowledge nexus, i.e. what McNay has defined as a symbiotic relationship between the material and the discursive (McNay: 27). Furthermore, in this symbiotic relation of power and knowledge, an intricate linkage is forged between the body and truth as the power-knowledge nexus constructs 'the truth of the body'. In a similar vein Grosz has argued that

It is not simply that power uses knowledge; power and knowledge are both made possible and actively feed into each other through shifts and realignments in those mobile forces that are their conditions of existence. Power and knowledge are mutually conditioning. Power does not function to distort knowledge, to produce illusion or ideology, for power's most privileged vein of functioning is within the order of truth. Power, in its

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<sup>6</sup> In Foucault's case this entails a hysterisation of women's bodies, a pedagogisation of children's sex, a socialisation of procreative behaviour, a psychiatrisation of perverse pleasure. These discursive apparatuses construct their objects of knowledge: in Foucault's example, the hysterical woman, the masturbating child, the Malthusian couple, and the perverse adult.

capacity to bring together or to sever words and things, is the condition under which truth can be distinguished from falsehood, error and fiction. But, in its turn, knowledge is one of the conduits by which power is able to seize hold of bodies, to entwine itself into desires and practices: knowledge devices methods for the extraction of information from individuals which is capable of being codified, refined, reformulated in terms of and according to criteria relevant to the assessment of knowledge. As legitimized and sanctioned knowledge, discourses are then able to feed back into regimes of power which made them possible and to enable power to operate in more subtle or systemic, more economical or vigilant, forms. (Grosz 1994: 148)

Indeed, for Foucault discourses are productive of truth and falsehood, but they are not true or false *in themselves*. There simply is no such thing as a scientific truth that isn't already a mechanism of power. As Foucault explains: "*I believe that the problem does not consist in drawing the line between that which, in a discourse, falls under the category of scientific or truth, and that which comes under some other category; rather, it consists in seeing historically how effects of truth are produced within discourses that, in themselves, are neither true nor false.*" (Foucault 1977/1994: 119)

Consequently, following Foucault, sex is discursively produced as a matter of truth, productive of specifically sexualised bodies. As the scientific investigation of these bodies, constituting a power-knowledge nexus, is productive of the truth of the sexed body, this truth is an effect of power but no inherent bodily property. In other words, sexualised bodies do not exist as such before science's will to knowledge is invested in them and as such these bodies are fully contingent of specific deployments of power.

To understand this productivity of power it is important to notice that for Foucault, power is relational, and importantly, there is no outside to power, power is immanent. The point is not to read scientific practice as one person wielding power over another, knower over known, scientist over research subject. "*Power is everywhere; not because it embraces everything, but because it comes from everywhere.*" (Foucault 1976/1998: 93) Relations are always saturated with power forming a complex network or web of power relations.

At the end of *The History of Sexuality vol 1*, Foucault pushes the productivity of power one step further into what he came to call '*biopower*': a concept that signals a historical shift from the sovereign power over death to the modern power over life. It is in this context that technologies of power are wielded and scientific deployment of bodies can be understood as a life-administrating power. A power "*...directed toward the performances of the body, with attention to the processes of life - characterised by a power whose highest function was perhaps no longer to kill, but to invest life through and through.*" (Foucault 1976/1998: 139) Specifically, Foucault locates sexuality at the core of this life

administering power, as Grosz explains: “*Sexuality is not a pure or spontaneous force that is tamed by power; rather, sexuality is deployed by power to enable it to gain a grip on life itself. Sex becomes not just something people do but the secret heart of life.*” (Grosz 1994: 152)

In a Foucauldian understanding of power, it is not the case that the natural sciences are oppressive through highly visible processes of exclusion in which power functions in a top down manner and consequentially the mere inclusion of women will alter these power dynamics as the ‘inclusion project’ discussed above seems to suggest. Rather, I suggest that a Foucauldian understanding of power elaborates the cyborg myth precisely because in this framework of thought, power is not merely an exclusive or repressive force, but a productive force, to such an extent that it invests life and/as the very materiality of bodies. Consequently, the sexed female body within the natural sciences does not refer to any ‘real’ but rather becomes “...*the most speculative, most ideal, and most internal element in a deployment of sexuality organized by power in its grip on bodies and their materiality, the forces, energies, sensations, and pleasures.*” (Foucault 1976/1998:155) To position the scientific engagement of the female body, cyborg embodiment, as a *scientia sexualis* means that the female sexed body they investigate and aim to intervene in does not pre-exist their interventions. Rather this scientific deployment becomes a mechanism of power and the ontology of this body as it pertains to sex and sexuality becomes fully contingent on the mechanisms employed, indeed sidestepping any claim of ‘original unity’. However, a Foucauldian understanding of power leaves pertinent questions surrounding the possibility of thinking the female body as a site of a transformation of power relations *through* scientific engagement, a question of vital importance in my present focus on cyborg embodiment.

### *Transforming Power Relations from the Inside*

The deployment of sexuality, as one of the finer and more successful threats that bind knowledge-power to bodies, is not the promise of liberation but a way of tying individuals and groups even more firmly to the biopolitical control of bodies. (Grosz 1994: 155)

Feminist science studies often critique the natural sciences from the outside. This is the case for both the inclusive programme as well as the strand that reads science as a discourse. However, Haraway’s cyborg myth challenges this approach as she engages the sciences as a mode of transformation, in which the transformation of power relations is sought not in antagonism with science, but *through* science. Scientific investigation into the female body is not solely a dominating enterprise. Rather, these bodies are produced through the sciences while creating the possibilities of a transformation of sexualised power

dynamics. However, this enterprise, in all its potential pertaining both to a physical and well as a socio-sexual mode of resistance, does not occur *outside* networks of power. This feminist inhabitation of the natural sciences compounds the need for a subtle but explicit understanding of the resistance of power relations or the transformation of power relations within the terms of power itself.

A Foucauldian understanding of power is not incompatible with conceptions of resistance, rather, “[r]elations of power-knowledge are not static forms of distribution, they are “*matrices of transformation*”. (Foucault 1976/1998: 99) As there is no outside to power, there is no sphere of sex, gender and sexuality that exists outside of power relations, which is sequentially the object of scientific investigation. “*Between techniques of knowledge and strategies of power, there is no exteriority, even if they have specific roles and are linked together on the basis of their difference.*” (Foucault 1976/1998: 98) Importantly, in a Foucauldian conception of power, there is no power without its resistance, resistance is possible at every location of power, as power is a web of relations spun between multiple points and as such resistance is possible, in myriad ways. However, as there is no outside to power, resistance is always already caught up within the relations of power it resists. In short, resistance is a transformation of power, not the absence of power, i.e. resistance and power do not exist in a relation of exteriority to one another.

As, for Foucault, the body is produced by discursive mechanisms of power, the resistance to these mechanisms finds its place within the body as well. As Foucault concludes his analysis:

We must not place sex on the side of reality, and sexuality on that of confused ideas and illusions; sexuality is a very real historical formation; it is what gave rise to the notion of sex, as a speculative element necessary to its operation. We must not think that by saying yes to sex, one says no to power; on the contrary, one tracks along the course laid out by the general deployment of sexuality. It is the agency of sex that we must break away from, if we aim - through a tactical reversal of the various mechanisms of sexuality - to counter the grips of power with the claims of bodies, pleasures, and knowledges in their multiplicity and their possibility of resistance. *The rallying point for the counterattack against the deployment of sexuality ought not to be sex-desire, but bodies and pleasures.* (Foucault 1976/1998: 157 emphasis added)

There has been a vast amount of debate in feminist theory about the use of Foucault’s work for feminism. These debates are vast and diverse. Some directly relate to the body<sup>7</sup>, some phrase this in terms of subjectivity<sup>8</sup>. Although it is not my intention here to

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<sup>7</sup> See for instance Susan Bordo’s work (1993), or in more critical fashion Nancy Fraser’s arguments (Fraser 1993)

rehearse these critiques, in light of the present discussion it is important to mention that most of these debates concern themselves with the possibility of transformation of power utilising Foucault's framework of thought.<sup>9</sup> For instance, in a rather cutting critique of Foucault Elizabeth Grosz wrote:

In Foucault, the body is the object, target, and instrument of power, the field of greatest investment for power's operations, a stake in the struggle for power's control over a materiality that is dangerous to it, precisely because it is unpredictable and able to be used in potentially infinite ways, according to infinitely variable cultural dictates. (...) In short, Foucault takes the body as a resistant yet fundamentally passive inertia whose internal features and forces are of little interest to the functioning of power. The body itself functions almost as a "black box" in this account: it is acted upon, inscribed, peered into; information is extracted from it, and disciplinary regimes are imposed on it; yet its materiality also entails a resilience and thus also (potential) modes of resistance to power's capillary alignments. It is a kind of passivity, capable of being mobilized according to the interests of power or in the forms of subversion, depending on its strategic position. (Grosz 1994: 146)

I suggest that Foucault does not turn to the body because it is exterior to current discursive regimes of power, on the contrary, bodies are preferable as sites of the greatest potential of resistance because regimes of power are invested within them so thoroughly. However, although there is a strong tone of resistance throughout Foucault's work, it remains unclear what this resistance should entail - how power relations can be transformed. This is problematic in terms of my aim to elaborate Haraway's cyborg myth. Although Foucault provides intricate insights as to how power invests bodies through science in overtly sexualised ways, the possibility of resistance within and through the power dynamics Foucault describes remains too opaque.

In the cyborg myth women's bodies are centralised amidst myriad power relations prevalent in science, but they are active components within these relations. As such, I understand cyborgs to be sites of the transformation of power relations as active components in their own construction. In order to flesh out this agentic character of the cyborg, I will turn to the concept of 'performativity', Judith Butler's notion of gender performativity in particular.

Judith Butler builds on Foucault by engaging in her focus on the sexualisation of

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<sup>8</sup> See for instance Sawicki (1996) and Deveaux (1996) and Nancy Hartsock (1996)

<sup>9</sup> Moreover, these debates tend to extend into a larger debate of whether 'postmodernism' (including poststructural feminism) is detrimental to any feminist project, as for instance Sheila Benhabib writes: "*The postmodern position(s) thought through to their conclusions may eliminate not only the specificity of feminist theory but place in question the very emancipatory ideals of the women's movement altogether.*" (Benhabib 1995: 20)

bodies and importantly the discursive mechanisms through which these bodies come to be constructed as such. She does so not through a focus on power relations in the natural sciences, but in political representations of Woman as the subject of feminism (specifically second wave social constructivist theories and identity politics). Through her notion of performativity Butler foregrounds bodies as active components in their own construction. In her own words, she engages “*the concrete and contemporary task of rethinking subversive possibilities for sexuality and identity within the terms of power itself.*” (Butler 1990: 42) In line with cyborg embodiment, she aims to open the body up as a site of resistance within a complex spectrum of power relations.

### **The Performativity of Sex/Gender**

It is not enough to inquire into how women might become more fully represented in language and politics. Feminist critique ought also to understand how the category of “women”, the subject of feminism, is produced and restrained by the very structures of power through which emancipation is sought. (Butler 1990: 4)

Butler’s poststructural feminist account does not seek foundations, but looks towards the specific mechanisms set in place and their specific effects. Butler’s valuable point is that these mechanisms and effects are inherent to feminism, instead of their outside object of critique. Butler allows for a subtle way of thinking the power relations *within* the field of feminist engagement *as* a movement for transformation.

In contrast to a second wave feminist framework of thought and its distinctions between sex and gender, Butler collapses these two categories by stating that sex is not the causal precursor to gender, but rather that gender and specifically the range of behaviours and discursive practices this category encompasses is constitutive of what we understand to be biological sex. For Butler, gender is the effect of a process of regulation in which discourses don’t describe or represent, but produce the effects that they name. As such, she destabilises the causal relation present in the sex gender binary, in which sex is the biological given and gender is the socially constructed meaning of this sex, but rather identifies sex as being gender all along. Indeed, the core of the notion of performativity set out in her work *Gender Trouble* resides in the lack of essence to which gender ascribes, as sex is always already gender, this essence is fabricated by “*a stylized repetition of acts*” (Butler 1990: 191).

... acts, gestures, and desire produce the effect of an internal core or substance, but produce this *on the surface* of the body, through the play of signifying absences that suggest, but never reveal, the organizing principle of identity as a cause. Such acts, gestures, enactments, generally construed, are *performative* in the sense that the essence of identity that they otherwise purport to express are *fabrications* manufactured and sustained through corporeal signs and other discursive means. That the gendered body is performative suggests that it has no ontological status apart from the various acts which constitute its reality. (Butler 1990: 185)

Specifically, through her notion of performativity, she not only understands, following Foucault, the body as the kernel of investments of power, but the body as agential, performative, which opens up the possibility of thinking the transformation of power relations through the body as an agential and therefore potentially subversive component of its own construction. In line with a Foucauldian analysis of power, the female body is a fabrication sustained *within* and *through* specific mechanisms of power and their normative regulations. I suggest that it is highly valuable to think the sexed body as performative, because this mode of thought does indeed imply that this body is always already constructed by various mechanisms of power, but it also breaks open ways of subverting these mechanisms. Because the body is performed, it acts, it is an active component within its own construction, and therefore the sexual norms that constitute this body can be performed differently.

To briefly return to a notion of cyborg embodiment, performativity gives this body its radical anti-essentialism, this body is both produced and productive on the terrain of power. However, the body's performativity as a stylised repetition of acts also raises pertinent questions of how the materiality of this sexed body can be accounted for. Indeed, what Butler takes on in *Bodies that Matter*, and has to account for after her notion of gender performativity in *Gender Trouble*, is the materiality of sex.

### *The Materiality of Sex*

In this sense, what constitutes the fixity of the body, its contours, its movements, will be fully material, but materiality will be rethought as the effect of power, as power's most productive effect. And there will be no way to understand "gender" as a cultural construct which is imposed upon the surface of matter, understood either as "the body" or its given sex. Rather, once "sex" itself is understood in its normativity, the materiality of the body will not be thinkable apart from the materialization of that regulatory norm. "Sex" is, thus, not simply what one has, or a static description of



what one is: it will be one of the norms by which the “one“ becomes viable at all, that which qualifies a body for life within the domain of cultural intelligibility. (Butler 1994: 2)

The question that haunts Butler’s performativity is how the materiality of sex is to be accounted for in such an analysis. For Butler, there is no subject that sequentially enacts its gender, there is no subject who pre-exists its agency. Rather, she turns this analytic upside down, stating that it is through a stylised repetition of acts that a subject comes into being at all. Specifically, in her concern with gender and sexed bodies, it is through the regulations of sex through mechanisms of power, that a body becomes intelligible in cultural life, viable for being. The problematic that Butler engages with through a return to the materiality of the body, resides within the prediscursive status this materiality is given. In contrast to bracketing sex, Butler sets out to ask the important question: “...*how and why “materiality” has become a sign of irreducibility, that is, how is it that the materiality of sex is understood as that which only bears cultural constructions and, therefore, cannot be a construction?*” (Butler 1994: 28)

Butler argues that the materiality of the body, perceived as pre-existent to discourse, is always first signified as such. The irreducible ontology of the body is therefore not a pre-existent cause, but the effect of a procedure that renders the body pre-discursive. This regulation, signification “*is productive, constitutive, one might even argue performative, inasmuch as this signifying act delimits and contours the body that it then claims to find prior to any and all signification.*” (Butler 1994: 30 emphasis omitted) Materiality appears as the *outside* to discourse *within* discursive formations. And, importantly, it is exactly at this moment, when matter appears as an outside pre-existing discourse that the regulatory mechanisms of power are at their most effective. “*“Materiality” designates a certain effect of power or, rather, is power in its formative or constitutive effects.*” (Butler 1994: 34)

The outside as which materiality appears is not an outside in any absolute sense, it does not precede or exceed discursive mechanisms of power, rather it is to be thought “...*as a constitutive “outside”, it is that which can only be thought - when it can - in relation to that discourse, at and as its most tenuous borders.*” (Butler 1994: 8) The constitutive outside, as the border of discursive intelligibility is of vital importance for Butler because this border makes visible the conditions of possibility for bodies to emerge, to exist, while others fail to matter, as the subtitle of *Bodies that Matter* already reveals, “the discursive limits of sex”. In this sense, the title *Bodies that Matter* is a pun playing upon the double meaning of the verb to matter, i.e. the bodies that materialise are the bodies that are intelligible, meaningful – significant. Consequently, as certain bodies matter, other bodies are excluded into unintelligible embodiment, they fail to matter. Butler writes,

Indeed, the construction of gender operates through *exclusionary* means,

such that the human is not only produced over and against the inhuman, but through a set of foreclosures, radical erasures, that are, strictly speaking, refused the possibility of cultural articulation. Hence, it is not enough to claim that human subjects are constructed, for the construction of the human is a differential operation that produces the more or less “human”, the inhuman, the humanly unthinkable. These excluded sites come to bound the “human” as its constitutive outside, and to haunt those boundaries as the persistent possibility of their disruption and rearticulation. (Butler 1994: 8)

What is at stake in the quotation above, is that through an exclusive system of intelligibility, those bodies that are unintelligible fail to come into being, they are abjected into unviable life, unliveable life. For Butler, those bodies that do not fit the sex/gender/desire logic of what she calls the heterosexual matrix, a Foucauldian web of power marked by heterosexual normativity. This process of abjection runs through the founding erasure of materiality as that which exists prior to discourse. This collapse has as its ontological consequence, that those lives that are rendered inhuman, humanly unthinkable are reduced to indefinable matter. They are constitutive of life but as its outside. Importantly, it is within this outside that the possibility of the transgression of those embodied norms resides. In the words of Vicki Kirby:

Butler’s analysis of corporeality focuses upon the repudiation of matter because its rejection is a key ingredient in subject formation and in the determination of the subject’s perceived value. Butler exposes the way in which difference from a valued norm is made synonymous with deficiency, such that deviation is moralized and pathologized as a flaw or as a fault. More importantly, the indebted nature of this valuation is denied. Butler explores the political implications of this denial, arguing that the mark of deficiency that attaches to certain bodies is made a convenient explanation for their abject status. The existence of these abject bodies is then considered beyond cultural intelligibility, beyond representation, and therefore outside the concerns of the democratic process. Refused entry into the domain of the fully human, these outcasts are then aligned with the unruly dangers of the natural, the brutish, and the animal - with the threat that is perceived to emanate from matter itself. (Kirby 1997: 106)

The constitutive outside consists of abjected matter, unintelligible, unliveable live, ‘that’ which is positioned outside of discourse. It is exactly here that problems arise for thinking the materiality of the body as a site of resistance or the transformation of power relations. Namely, as materiality is only readable within discourse, any productive way of

thinking the female body as a *material* site of resistance is foreclosed. Once again, to quote Vicki Kirby:

Our sense of the materiality of matter, its palpability and its physical insistence, is rendered unspeakable and unthinkable in Butler's account, for the only thing that can be known about it is that it exceeds representation. Beyond cultural intelligibility, the existence of this external stuff ensures that our understanding of an outside, inasmuch as it is discourse dependent, can only be the dissimulation of an outside that *appears* as matter (Kirby 1997: 108)

As the constitutive outside collapses with abjected matter an understanding of matter as a site for transformation of the power mechanisms that produced it as such is foreclosed. This is problematic in light of the present discussion, because within the cyborg myth, the female body is not abjected as flesh, but the female body in all its flesh and materiality is positioned at the very centre of powerful transformation, through scientific practices. Therefore, Butler generates a rich and subtle analytics for engaging the power relations intrinsic to feminist efforts. However, I understand her engagement with materiality to remain problematic as it severely limits the ability to analyse a scientific endeavour that seeks to construe women's bodies as sites for the transformation of power relations.

#### *A Critique of Anthropocentrism*

...even though the matter of matter turns out not to have been the object of Butler's analysis after all – and certainly not the matter of anything other than human bodies (and then only their contours and surfaces) – it is difficult to theorize human materiality without also considering how the boundaries between human and non-human are drawn up. (Fraser 2002: 614)

I find it interesting to see how the critiques of Butler's performativity in a sense regurgitate the critiques of second wave feminisms that bracketed the female body. Again concerns about women's physicality are raised, however this time in terms of materiality and its place outside discourse and the dominant position of language. Furthermore, once again feminists look on the natural sciences to include and engage the materiality of the body as the very centre of feminist critique. There is more at stake within scientific endeavours besides lingual and cultural performances. Science is more than "*an inevitable representation of cultural and political significance in the guise of natural qualities and*

*capacities.*” (Kirby 2011: 97) Indeed, Butler has often been criticised for passifying matter through focusing on discursive processes of intelligibility and bodily formation instead of how matter comes to matter.<sup>10</sup>

Butler’s emphasis on language as a function of cultural/human intelligibility and the force of this language over matter is not sufficient for thinking about the materiality of the sexed body and an engagement with scientific endeavour makes this perfectly clear.<sup>11</sup> In a reading of scientific development, where women’s bodies constitute a material reality, the emphasis on language’s constitutive powers inadequately grasps the problematic at stake. If we want to understand how bodies are produced and what indeed are the possibilities for a different production, Butler’s discursive understanding of performativity needs to be rearticulated. Specifically, an understanding of performativity as a process of cultural intelligibility dominated by language is too *anthropocentric* to study the intricacies of scientific articulation and materialisation as Pheng Cheah explains, “...*matter is invested with dynamism and said to be open to contestation only because the matter concerned is the product of sociohistorical forms of power, that is, of the human realm.*” (Cheah 1996: 5) In other words, materiality appears as an outside *within* discourse and as such there is no room for thinking matter’s dynamism outside some form of cultural articulation dominated by language. This, however, is highly problematic for an analysis of the materiality of bodies through scientific engagement as a lingual and cultural point of entry is not sufficient.

Karen Barad, whose work I will focus on at length in the next section, explicitly focuses on how matter comes to matter, its dynamic power. She criticises Butler for engaging with a theorisation of bodily production, which collapses materiality and signification in an anthropocentrism that only takes certain aspects of material production into account, thereby, failing to engage effectively with the causality between discursive practices and materiality.<sup>12</sup> Specifically, she criticises Butler for engaging with the discursive constituency of bodily contours, but not the very fleshiness of bodily being, its insides, its atoms and its capacity to act, its agency.

...Butler’s theory of materiality is limited to an account of the materialization of human bodies or, more accurately, to the construction

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<sup>10</sup> For instance Kerin explains Butler’s understanding of materiality as inert: “...limited in both character (dynamic insofar as a discursive object) and scope (only that which is within the realm of the intelligible can coherently be considered as dynamic).” (Kerin 1999: 99)

<sup>11</sup> See for instance Barad 2003, 2007; Kerin 1999; Rosengarten 2009

<sup>12</sup> Barad makes a similar point in relation to Foucault’s conception of biopower. She acknowledges the importance of Foucault’s definition of the power-knowledge nexus within scientific practices, but criticises him for not explicitly articulating the relation *between* discursive practices and the materiality of the bodies that ensue. Specifically, she criticises Foucault for his lack of analysis pertaining to

...a dynamic and agential conception of materiality that takes account of the materialization of all bodies (nonhuman as well as human and that makes possible a genealogy of the practices through which these distinctions are made); and the ways in which contemporary technoscientific practices provide for much more intimate, pervasive, and profound reconfigurations of bodies, power, knowledge, and their linkage than anticipated by Foucault’s notion of biopower (which may have been adequate to eighteenth-century practices, but not contemporary ones). (Barad 2007: 200)

of the contours of the human body. Moreover, as her reading of materiality in terms of Foucauldian regulatory practices makes clear, the processes that matter for her are only human social practices (thereby reinscribing the very nature-culture dichotomy she wishes to contest). (Barad 2007: 151)

In light of my continuing concern with cyborg embodiment set out in this chapter, it is important to come to a notion of performativity that is capable of being extended to scientific practices and that has a more robust purchase on materiality within the scientific configuration of bodies. To this end I will maintain the current line of argumentation on performativity but engage Barad's elaboration performativity into intra-action. Barad invites an understanding of the construction of bodies through specific scientific practices as sites of constraint and transformation within a complex field of power relations. As such I understand her work to be highly valuable, in particular in combination with Donna Haraway's cyborg myth, a merging of theories I will turn to next.

### **Cyborg Intra-actions**

... if agency is understood as an enactment and not something someone has, then it seems not only appropriate but important to consider agency as distributed over nonhuman as well as human forms. This is perhaps most evident in considering fields such as science, where the subject matter is often "nonhuman." For as surely as social factors play a role in scientific knowledge construction (they are not the sole determinant – things don't just come out any way we'd like them to), there is a sense in which "the world kicks back." (Barad 2007: 214)

I will conclude this chapter with a theoretical engagement that will remain central through this thesis, namely an amalgamation of Haraway's 'cyborg myth' and Karen Barad's 'agential realism'. Although Haraway engages a wider spectrum of science and Barad focuses on quantum physics (with some exceptions), they share an engagement with science through deep theoretical work. As such, their work is closely related, not so much in a practical way (i.e. how science can be done differently) but in a more philosophical sense. Science becomes a field through which we can imagine and, importantly, materialise the world differently. As such, in both accounts notions of transformation, or what Barad would call 'reconfiguration', into a more liberated future are central. I call my reading of

these theories together an amalgamation, because it is not my intention here to smooth over the differences between Barad and Haraway, but rather bring agential realism and the cyborg myth together in such a way that, each theory reinforces the other. An agential realist cyborg myth construes a rich framework for analysing a feminist inhabitation of science, a richer framework I believe than the two theories taken on their own.

To come to such a framework, in this section, I will focus more directly on Barad and highlight where I think she reinforces the cyborg myth. Although I value Haraway's cyborg myth I also see certain difficulties. One critique has already surfaced via Vicki Kirby's ontological questioning as to the manners in which and the extent to which the cyborg differentiates herself from the essential. It is here, I argue, that Barad's performative account is a valuable elaboration. Karen Barad takes Butler's performativity and rearticulates this theory to account for scientific practice. As such she not only aims to directly engage how matter comes to matter through scientific practice, she introduces the lack of essentialism that is so central to Butler's performative account into scientific practice. However, it is important to state, that although Barad brings much to the cyborg myth, the imaginative dimension of the cyborg myth remains of central importance. In particular, the political feminism of the cyborg myth, bring an overtly feminist tone and a centrality of women's bodies that agential realism in its focus on scientific practice, does not necessarily lacks but certainly neglects.

In short, intra-action gives the cyborg a performative ontology (or onto-epistemology to use Barad's conceptualisation) and the cyborg myth invites agential realism into an explicit feminist concern with and imagination of a different future. Through this amalgamation I aim to come to a solid framework fruitful for my analysis of vaginal microbicides in which imagination and performativity are both of central importance.

### *An Intra-Active Cyborg*

Barad's agential realism is a performative account which allows for understanding not just *that* discursive practices constitute or produce matter, but *how* these practices produce matter. The complex relations between matter and discourse established through scientific practice are a prime concern for Karen Barad. Importantly, in her framework of thought discourse and matter are both actively implicated and fully caught up with one another.

Agency, for Barad, is not a human prerogative, rather, she develops a performative account of materialisation that is open to intra-action with nonhuman entities, thereby paving the way for an analysis of embodiment that is indiscrete in matters of bodily contours and non-anthropocentric in its consistency. Barad writes,

“Human” bodies are not inherently different from “nonhuman” ones. What

constitutes the human (and the nonhuman) is not a fixed or pregiven notion, but neither is it a free-floating ideality. (...) material apparatuses produce material phenomena through which specific causal intra-actions, where “material” is always already material-discursive - that is what it means to matter. (Barad 2007: 153)

It is important to note that Barad emphasises intra-action as opposed to interaction as there are no pre-existing entities to interact with one another. In this account, the primary ontological units are not biological bodies, or scientific objects of any kind, rather, it is within phenomena that these entities gain their ontological ‘thereness’, through intra-action.

Following this line of thought, within scientific endeavours there are no pre-existing bodies, subjects and technologies that interact with one another, rather, it is through their intra-action that these “relata” come to be. As an important consequence and in line with cyborg embodiment, the boundaries between women’s sexed bodies, the apparatuses of scientific development and technology evaporate: “...*bodies are material-discursive phenomena that materialize in intra-action with (and, by definition, are indissociable from) the particular apparatuses of bodily production through which they come to matter (in both senses of the word).*” (Barad 2007: 209) As Mariam Fraser explains this investment: “...*Barad’s accent on the constructed-ness of phenomena does not distance her from matter, but rather returns her to it: it is the specificity of the ways in which matter materializes – whether that be tissue under a microscope or flesh under a tattoo artist’s needle (or indeed the phenomena which are the microscope or the needle) – that will affect how it is constituted as an object of knowledge.*” (Fraser 2002: 616)

Importantly, within this phenomenon bodies and objects gain their meaning and materialise in a specific way, through the manner they intra-act with one another. Phenomena come to be through a process of intra-action. There are no pre-existing relata and as such phenomena are constantly emergent.

This notion of phenomena constantly emerging is an important elaboration of notions of cyborg embodiment. Vicki Kirby criticised Haraway for maintaining a fundamental attachment to the essential by explicating cyborg embodiment through a calculus of one plus one. Rephrasing this critique through Barad’s language one could say that Haraway’s notion of prosthesis does not interrogate how the different relata that constitute the cyborg connect. In other words, Haraway’s cyborg myth does not give a robust enough analysis of how the different components that make up the cyborg are brought into being. Barad’s agential realism provides a way to sidestep this critique, as the components that make up phenomena do not pre-exist their intra-action. In Barad’s account the components that make up a phenomenon are entangled, which means they emerge in relation to one another, or as Vicki Kirby explains: “*Entanglement suggests that*

*the very ontology of the entities emerges through relationality: the entities do not pre-exist their involvement.*" (Kirby 2011: 76 emphasis omitted) Through amalgamating agential realism with the cyborg myth, the components that make up the cyborg as a phenomenon come to be through their intra-action, they do not pre-exist. As such, cyborgs become phenomena, constantly emerging from specific scientific practices.

Reality is composed not of things-in-themselves or things-behind-phenomena but things-in-phenomena. The world is a dynamic process of intra-activity and materialisation in the enactment of determinate causal structures with determinate boundaries, properties, meanings, and patterns of marks on bodies. (...) It is through specific agential intra-actions that a differential sense of being is enacted in the ongoing ebb and flow of agency. This is, it is through specific intra-actions that phenomena come to matter – in both senses of the word. (Barad 2007: 140)

Within an onto-epistemology of agential realism, (scientific) apparatuses have a central place because they are the site of intra-action. Boundaries between the component entities of the phenomenon are determined through the apparatus, they do not pre-exist. Apparatuses produce phenomena, they are embedded within phenomena and are phenomena themselves. Apparatuses are discursive practices, they are boundary-drawing practices, material configurations in which entities, *relata*, are produced, they are cut apart as such. This already makes evident that for Barad an apparatus is not purely 'scientific', it is not a mere laboratory set up, but a more complex and encompassing set consisting of myriad systems of meanings and materialisations (which will be discussed at length in the following chapter).

Transformation or (re)materialisation has an important part to play within Barad's work. Indeed, as Fraser suggests: "...*if technologies are intra-actively involved in the materialization and de-materialization of human bodies, then there is no reason to believe that they might not also generate the conditions of their transformation.*" (Fraser 2002: 618) The specific manner in which technologies intra-act with bodies, creates the possibility for a transformative intra-action. For Barad, as phenomena are constantly emergent they are radically contingent on the specific intra-actions through which they come into being. What underlies this contingency is a notion of *indeterminacy* that for Barad creates the conditions of possibility for the future to be radically open.

To elaborate, out of a context of indeterminacy, apparatuses construct the components of/within a phenomenon (such as for instance HIV virus, microbicide and woman) by cutting them apart as such. The components that make up a phenomenon are radically contingent, temporal determinations, resulting from a scientific process or set of practices what Barad has called an 'agential cut'. Barad writes,



...apparatuses are the material conditions of possibility and impossibility of mattering; they enact what matters and is excluded from mattering. Apparatuses enact agential cuts that produce determinate boundaries and properties of “entities” within phenomena, where “phenomena” are the ontological inseparability of agentially intra-acting components. That is, agential cuts are at once ontic and semantic. It is only through specific agential intra-actions that the boundaries and properties of “components” of phenomena become determinate and that particular articulations become meaningful. In the absence of specific agential intra-actions, these ontic-semantic boundaries are indeterminate. In short, *the apparatus specifies an agential cut that enacts a resolution (within the phenomenon) of the semantic, as well as ontic, indeterminacy.* (Barad 2007: 148 emphasis added)

It is through specific resolutions within phenomena that components come into being. These are resolutions in which the indeterminacy of matter and its meaning is momentarily stabilised. A phenomenon is a temporal determination of meaning and matter that emerges out of a basic indeterminacy. This (in)determinacy is important, because it construes the conditions of possibility for the transformation of power relations into a radically open future. It is through this notion of (in)determinacy that Barad opens the sciences up for reconfiguring new meanings and materialisations. Barad writes:

Intra-actions always entail particular exclusions, and exclusions foreclose the possibility of determinism, providing the condition of an open future. But neither is anything and everything possible at any given moment. Indeed, intra-actions iteratively reconfigure what is possible and what is impossible - possibilities do not sit still. One way to mark this is to say that intra-actions are constraining but not determining. But this way of putting it doesn't do justice to the nature of “constraints” or the dynamics of possibility. Possibilities aren't narrowed in their realization; new possibilities open up as others that might have been possible are now excluded: possibilities are reconfigured and reconfiguring. (Barad 2007: 177)

I suggest that Karen Barad's agential realism is incredibly valuable, because her engagement with science is indeed focused on specific scientific practices made evident in her emphasis on performativity. The notion of indeterminacy gives phenomena a radical contingency and creates the conditions of possibility for the future to be radically open. However, importantly, although there is this room for reconfiguration, Barad allows for a robust analysis of scientific practice. Barad allows language and systems of meaning

making to be inherent in scientific practices while never losing sight of a certain fleshed and material real.

This is an important point in terms of the present concern with cyborg embodiment. Transformation, the possibility for science and technology to configure a different future is central to both Barad and Haraway. However, how they engage transformation differs. Barad does not foreground imagination, progressive thought about the world or an explicit feminist concern in the manner she approaches science, in the same overtly political manner as Haraway does. However, through the notion of the apparatus as the site where matter and meaning are simultaneously construed and the central place apparatuses have in her understanding of science, I suggest that agential realism is open to the imaginative dimensions so central to the cyborg myth.

Haraway's interaction with the sciences is an effort to play the scientific game of knowledge production of "the real", by centralising imagination and myth making inherent to technoscience. Haraway's conception of the cyborg myth pertains to science and technology's imaginative potential to break down the boundaries between women and technology as a figure of feminist transgression. Myth-making is a way to foreground a certain feminist imagination in engaging scientific process. Haraway writes, "*The cyborg is a condensed image of both imagination and material reality, the two joined centres structuring any possibility of historic transformation.*" (Haraway 1991a: 151)

Irma van der Ploeg in her essay "Only Angels Can Do Without Skin" makes an interesting observation about Haraway's understanding of the cyborg. She writes, "...Haraway presented the cyborg as a positive, potentially liberating figure. This positivity, however, resided more in the potential it brought for rethinking and reformulating critical projects than in the cyborg figure itself. From its first formulation, it has been explicitly painted with a double face; one utopic, but the other definitely dystopic." (van der Ploeg: 154) The power of Haraway's argument stems from her drive to foreground feminist imagination within scientific contexts, an act that one could understand as transgressive in itself. Through myth-making she endeavours to inhabit the natural sciences with feminist thought. Moreover, by engaging science in this 'mythical' way, Haraway endeavours to make feminist imagination a serious part of scientific production. I suggest that Haraway brings a feminist imagination to agential realism that Barad's account neglects, but her focus on myth as a way to include imagination into the material lacks a robustness that agential realism brings to the table. This is exactly why I brought the work of Haraway and Barad together and will make both, together, central to my analysis of vaginal microbicides.

In this thesis, I argue that this framework is most fruitful for understanding the complexities of the microbicide as an object which emerges and matters in relation to women's bodies as a myth, a feminist promise and a scientific object. Promise is central to the field of microbicide development, as the microbicide is both a technology in the making, but also a technology for empowerment. Therefore, I propose it is important to be able to

engage both the scientific practices the field engages in, as well as the imaginative dimensions they invite through ideals of empowerment. I understand imagination to be an inherent part of the field of microbicides, made visible through ideas of women's empowerment, sex, gender and sexuality. However, this imagination is intimately related to the real and material which I will engage through a performative scope. In the following analysis I aim to engage both the field's imaginative investment into the promise of microbicides, as well as its scientific practices through which the woman in need of microbicides becomes-known: an engagement with both the *effects* of the field's performative practices and the *promise* of microbicides, and how their divergences come to matter.

### **Chapter 3.**

#### **Towards a Textual Analysis of Scientific Practice and Imagination**

One important route for reconstructing socialist-feminist politics is through theory and practice addressed to the social relations of science and technology, including crucially *the systems of myth and meanings structuring our imaginations*. The cyborg is a kind of disassembled and reassembled, postmodern collective and personal self. This is the self feminists must code. (Haraway 1991a: 163 emphasis added)

I concluded the last chapter by amalgamating Haraway's figuration of the cyborg and Barad's performative account of agential realism in an effort to create the analytical tools necessary to think of the women implied in the development of microbicides as specific figurations emerging from scientific practice. I have brought Barad and Haraway together in this particular way, because they enable me to engage with the performativity of scientific practice and feminist imagination simultaneously. Following the mode of thought Haraway sets out in the quotation above, in this chapter I aim to elaborate on the manner within which imagination is able to function as a point of entry into scientific process. I suggest that such an 'imaginative' point of entry is important, because it enables an analysis of the cultural and social power relations that feed into conceptions of the body. As such, an imaginative point of entry allows an interrogation of the natural, pre-critical and pre-cultural body the natural sciences present. In other words, through imagination feminist theory is able to inhabit the sciences and restructure the pre-critical real they present. However, in accordance with my effort of bringing Haraway and Barad together, my aim here is not only to include the imaginative into my analysis of the field of microbicides, but also engage with the specific scientific practices that make up the field of microbicide development.

As such, this chapter is divided into two parts in which Barad's theory of scientific practice and Donna Haraway's concern with imagination will be elaborated to make them more explicit methodologically. In particular I will extend their work here towards Actor Network Theory (ANT), to elaborate their abstract engagements. To this end I will engage the work of Bruno Latour, Annemarie Mol, Madeline Akrich and Nelly Oudshoorn. These works give me an analytical idiom to utilise for my analysis of the development of microbicides by looking at ANT's conceptual engagements with the objects under analysis.

In the first part of this chapter I take Barad's understanding of the sciences as consisting of apparatuses of bodily production and elaborate this notion with the work of Latour as well as Mol. Specifically, I engage with Latour's conceptualisation of 'collectives',

the performatives of mediation and purification and the construction of human-nonhuman matters of concern to give a more explicit account of the specific practices inherent in apparatuses of bodily production. Furthermore, I will build on Mol's conceptualisation of 'the body multiple' to open up ways in which to understand an apparatus of bodily production to construe its matter of concern as a multiplicity.

Secondly, I will return to Haraway and her focus on imagination, but now translate this notion into conceptions of 'meaning' as a methodological tool to show how imagination matters in scientific practice. By focusing on systems of meaning making inherent to scientific practices, Haraway opens a way for feminist critical analysis to be a part of scientific constructions of the body. By returning to Haraway I aim to set out the tools for an analysis of how ideas of women's empowerment, norms surrounding women's sexuality, relationships and embodiment come to be meaningful and materialise in biomedical endeavour. More specifically, my focus on engaging the imaginative dimensions of scientific endeavour through systems of meaning making will lead me to Donna Haraway's understanding of the material-semiotic actor and cyborg figuration within scientific practice and the articulations of these practices.

However, both concepts are deeply embedded in feminist theory and difficult to utilise as an analytical toolkit, as Haraway, true to form, does not give a clear cut explanation or recipe for analysis. Furthermore, in order to engage the scientific practices of microbicide development, I want to elaborate Haraway's conceptions of the material-semiotic actor and cyborg figuration with a performative approach to science. To this end I will engage the work of the Science and Technology Studies (STS) scholar Nelly Oudshoorn, following Akrich, and her understanding of scientific artifacts as carrying gender scripts that configure the potential user within scientific practice, notably the clinical trial. In this analysis technological artifacts are understood to carry normative inscriptions pertaining to its potential users and the social relations of their living environment. Specifically, Oudshoorn returns to Judith Butler, in asking how technological artifacts are a constitutive part of our gendered worlds. As such, in turning to Oudshoorn's work I am able to incorporate Butler's notion of gender performativity into a performative approach to science. This incorporation is important, because it allows an analysis of the specific sexualisations of women's bodies that are, I suggest, central to the scientific process of microbicide development.

## **The Field of Microbicides as an Apparatus of Bodily Production**

Apparatuses do not possess inherent outside boundaries limiting them to laboratory spaces or experimental practices. Indeed, a given apparatus need not be specifically implicated in any practice that goes by the name “scientific.” But neither are they understood purely as technologies of the social (as opposed to the natural) (...) Apparatuses are neither neutral probes of the natural world nor social structures that deterministically impose some particular outcome. Significantly, in an agential realist account, the notion of an apparatus is not premised on inherent divisions between the social and the scientific, the human and the nonhuman, nature and culture. Apparatuses are the practices through which these divisions are constituted. This formulation makes it possible to perform a genealogical accounting of the material-discursive practices by which these important distinctions are produced. (Barad 2007: 169)

I share Barad’s aim of unpacking the different apparatuses through which bodies become known, specifically by tracing the material and discursive relations that make up the field of microbicide development. Barad’s apparatuses of bodily production are performative mechanisms put in place by scientific endeavour. Importantly, as the above quotation shows, these mechanisms are not solely scientific, but include political, social, normative mechanisms that all feed into which specific phenomena are produced and which agential cuts are enacted to make the specific components of these phenomena emerge.

To exemplify, in *Getting Real* (2007) Barad explicitly uses an agential realist analysis to show how the intra-actions of scientific objects and bodies matter, in both senses of the term. Here she sets out to analyse the ‘piezoelectric crystal’ as a vital component of the observing apparatus of ultrasonography - the apparatus that is utilised to make a foetus inside a women’s body visible. In particular, she centralises the piezoelectric crystal within the larger apparatus of sonography, which then in turn constructs the foetus into an image. This analysis disrupts any clear cut boundary between foetus and technology. Barad reads the piezoelectric crystal as breaking down and remaking boundaries: “*a tool to explore the relationship between the material and the discursive.*” (Barad 2007: 191). Importantly, through this analysis the boundaries between the crystal, the sonogram, the foetus and the pregnant woman evaporate, and instead their boundaries are understood to be consequences or effects of specific material-discursive practices (agential cuts) within this phenomenon. This way of understanding both foetus and technology as part of the same phenomenon places the ontology of these different components under investigation. Moreover, Barad pushes this analysis beyond the science of the sonogram into ethical and

political terrains by suggesting that this phenomenon materialises and is made meaningful in different ways through, for instance, abortion law, notions of subjectivity, women's rights to bodily autonomy, etc.

In a similar vein, I understand woman and microbicide to emerge within a context of material-discursive apparatuses, such as women's health advocacy and biomedical clinical trials. Imagining the development of vaginal microbicides through an onto-epistemology of intra-action enables a different thinking of what a microbicide/woman is by making visible her different emergences, i.e. an interrogation of the different apparatuses through which this phenomenon becomes-known. Both women and microbicide are not pre-existing objects of investigation, but rather their coming together in the field of microbicide development constitutes them, together, as a phenomenon. Barad allows one to begin to imagine the complex ontology of the microbicide/woman by mapping out the intra-actions of the field's apparatuses of bodily production. In Barad's words, "*...to understand the complex nature of the phenomenon in question, it is necessary to understand the nature of apparatuses and the processes by which they are produced.*" (Barad 2007: 203)

In order to set out my analytical methodology in more detail, I want to elaborate Barad's account towards the ANT scholar Bruno Latour, in order to give a workable and more methodological conceptualisation of the apparatus of bodily production within microbicide development. Latour does not engage apparatuses of bodily production, this is not his language, but the assemblage of human and nonhuman actors (or actants) he calls 'the collective' has a similar function. As such, Latour enables an analysis of the field of microbicides as a collective (an apparatus of bodily production) in all its specificity.

#### *A Human-Nonhuman Collective*

For Latour there are no larger frameworks of explanation for the ways power works, rather, he traces the lines of power that the actors (human as well as nonhuman) in a network spin – ergo the name Actor-Network Theory. As he states: "*Domination is an effect not a cause. In order to make a diagnosis or a decision about the absurdity, the danger, the amorality, or the unrealism of an innovation, one must first describe the network.*" (Latour 1991: 130) By placing the construction of nature in broad daylight the authority of the scientists is put on trial, ANT is a contestation of their power: "*...the lab coats are the spokespersons of the nonhumans, and, as is the case with all spokespersons, we have to entertain serious but not definitive doubts about their capacity to speak in the name of those they represent.*" (Latour 2004b: 64 emphasis omitted)

Although including Latour in a feminist analysis is open to debate, which I will reflect on below, his contestation of the authority of Science and his disruption of the aforementioned dichotomies infers that he shares some important stakes with feminist endeavours that aim to place the nature/culture dichotomy under interrogation and

scrutiny. Latour's framework of thought, in the words of Irma van der Ploeg "...provides a most fruitful approach for feminist analyses of the relation between gender and technology, for it parallels the decades-old feminist effort to deconstruct the nature/culture distinction so central to many constructions of gender." (Van der Ploeg 2004: 153) Although Latour's work is descriptive, the act of tracing the networks of scientific practices is a politically and ethically engaged research practice in itself. He shows the contingency of scientific facts and thereby contests scientific authority.

Of vital importance for Latour's mode of thought is the engagement of scientific development as a political/scientific collective consisting of an assemblage of human and nonhuman actors, and in turn this collective is constitutive of the object under investigation. In other words, central to Latour's mode of thought are two sets of relations: human/nonhuman and science/politics.

Latour is frustrated with what he calls a 'modern' understanding of scientific practice in which nature is mute and only a few scientists have the power to speak in name of the real. In *We Have Never Been Modern* Latour sets out two sets of practices, one might say performatives, namely, the acts of translation (or mediation) and purification that are central to such a modern understanding of scientific practices. Latour explains:

...the word 'modern' designates two sets of entirely different practices which must remain distinct if they are to remain effective, but have recently begun to be confused. The first set of practices, by 'translation', creates mixtures between entirely new types of beings, hybrids of nature and culture. The second, by 'purification', creates two entirely distinct ontological zones: that of human beings on the one hand; that of nonhumans on the other. (Latour 1993: 11)

By thinking of these two performatives as part of the same scientific process, nonhuman objects and human bodies such as the microbicide and the female body lose their boundaries (mediation). Rather, their appearance as two distinct entities becomes an effect of scientific practice (purification). As such, Latour understands scientific practices to both engage in practices of purification in which nature is separated from culture, human from nonhuman, as well as construct networks of human-nonhuman "hybrids" (Latour 1993: 10). Importantly, this understanding of a hybrid can be read as very similar to Barad's 'phenomena' or Haraway's 'cyborg'. All three concepts signal a coming together of humans and nonhumans through scientific practices in which boundaries evaporate. The aim of an ANT analysis is then to trace the networks through which these hybrids are constructed and 'purified', to trace the intricacies of the apparatuses of bodily production.

Latour engages this process of construction through 'articulation'. Humans and nonhumans 'associate' (Latour 2004b: 70) through articulation, by which both are endowed



with speech and agency. Importantly, through this notion of articulation discrete boundaries between humans and nonhumans evaporate and they are regarded instead as forming human-nonhuman associations, assemblages, collectives.

Each discipline can define itself as a complex mechanism for giving worlds the capacity to write or speak, as a general way of making mute entities literate. It is odd, then, that political philosophy, so obsessed with its own logocentrism, did not see that the greatest share of the logos was to be found in laboratories. Let us remember that non-humans are not in themselves objects, and still less are they matters of fact. They first appear as matters of concern, as new entities that provoke perplexity and thus speech in those who gather around them, discuss them, and argue over them. (Latour 2004b: 66 emphasis omitted)

For Latour, mediation or translation is a performative articulation which takes place within scientific practices in which scientists enable nonhumans to speak, so they can speak back to them, listen to one another, respond. For Latour it is through apparatuses of scientific production, ‘speech prostheses’ that this association between humans and nonhumans is made possible, *“that allow nonhumans to participate in the discussions of humans, when humans become perplexed about the participation of new entities in collective life.”* (Latour 2004b: 67) Latour often uses what goes on inside the laboratory as an example as he writes; *“what is at stake here is only a simple translation, thanks to which things become, in the laboratory, by means of instruments, relevant to what we say about them. Instead of an absolute distinction, imposed by Science, between epistemological questions and social representations, we find in the sciences, on the contrary, a highly intense fusion of two forms of speech that were previously foreign to one another.”* (Latour 2004b: 67)

For Latour, *“[t]he main advantage of the word ‘articulation’ is not its somewhat ambiguous connection with language and sophistication, but its ability to take on board the artificial and material components”*. (Latour 2004a: 210) Indeed, most articulations take place within the laboratory setting as in the example above in which Latour is speaking of *“the training of ‘noses’ for the perfume industry”* (Latour 2004a: 206).

Importantly, articulation, for Latour, is a material and artificial practice to be observed within several scientific surroundings. I find Latour’s concept of articulation valuable because of its ability to engage scientific practices as specific modes of human-nonhuman mingling in which both human and nonhuman are active components in potentially new materialisations. As such, the ability to take on board the material and artificial in scientific practice is important, but for me, so is its association with language. The articulations I will analyse indeed entangle the human and nonhuman, but they are textual articulations which communicate the scientific practices that comprise the field of

microbicides through for instance the clinical trial report. In other words, the articulation I will analyse are indeed performative but not observable as practice.

My use of 'articulation' engages the materiality of the microbicide as an intervention into women's vulnerability to the HIV virus but also its ideas of sex, gender and sexuality. In other words, I understand the material discursive enactments within the field of microbicides to be *articulated through* the various texts I come to analyse. In the words of Karen Barad "*matter and meaning are mutually articulated.*" (Barad 2007: 152 emphasis added) I will return to the importance of matter and meaning in my discussion of Haraway and Oudshoorn below.

Latour shows how the sciences construct the natural 'facts' they supposedly discovered and in this construction politics and science, the social and the natural, are on intimate terms. A collective consists of an assemblage of actors, human as well as nonhuman, belonging to the scientific as well as political domain. Because the collective consists of a wide variety of actors, any actor who gets caught up inside the network is a constitutive component of the objects under investigation. The disciplines of science and politics, the realms of nature and society are inherently caught up with one another, making the objects under scientific investigation not only scientific and real but socially and politically laden. A separation between social problematic and what is deemed a natural fact is an effect of specific processes of purification the collective engages in, an artificial separation of the social and the scientific that never quite holds. In other words, collectives consist of a traceable network of human/nonhuman association that put forward (construct) not unquestionable matters of fact, but what Latour conceptualises as political/social/natural/scientific 'matter of concern'.

Latour understands matters of fact to be "*risk-free objects*" (Latour 2004b: 22) with "*clear boundaries, a well-defined essence, well-recognized properties.*" (Latour 2004b: 22) A matter of fact, he writes "*belonged without any possible question to the world of things, a world made up of persistent, stubborn, non-mental entities defined by strict laws of causality, efficacy, profitability, and truth.*" (Latour 2004b: 22) Importantly, once a matter of fact is clearly defined as such, the scientists and other actors that brought it to the fore disappear from view. Consequently, Latour explains, because of this essence and the invisibility of those who constructed the object, the consequences of matters of fact always belong to other dimensions, never to the object and those who brought it into being, after all, fact is fact. Latour writes, "*...this "risk-free object" brought with it some expected or unexpected consequences, to be sure, but these were always conceived in the form of an impact on a different universe, composed of entities less easy to delimit, and which were designated by vague names such as "social factors," "political dimensions," or "irrational aspects."*" (Latour 2004b: 23 emphasis omitted)

In contrast, matters of concern, are 'tangled beings' (Latour 2004b: 24) as they lack a clearly defined essence, boundaries and are in intimate relation to their environment – as

such form “*rhizomes and networks*” (Latour 2004b: 24). Furthermore, Latour explains the significance of the concept matters of concern as follows:

...their producers are no longer invisible, out of sight; they appear in broad daylight, embarrassed, controversial, complicated, implicated, with all their instruments, laboratories, workshops, and factories. Scientific, technological, and industrial production has been an integral part of their definition from the beginning. They have numerous connections, tentacles, and pseudopods that link them in many different ways to beings as ill assured as themselves and that consequently *no longer constitute another universe, independent of the first*. To deal with them, we do not have the social or political world on the one side and the world of objectivity and profitability on the other. (...) On the contrary, everyone paradoxically expects the unexpected consequences that they will not fail to produce – consequences that properly belong to them, for which they accept responsibility, from which they draw lessons, according to a quite visible process of apprenticeship that rebounds onto their definition and that unfolds in the same universe as they do. (Latour 2004b: 24)

This is not to say that matters of fact no longer matter, so to speak, but they are only one component of the more encompassing conception of what is at stake in scientific endeavours. As Latour explains in the essay *Why Has Critique Run Out of Steam?: “Reality is not defined by matters of fact. Matters of fact are not all that is given in experience. Matters of fact are only very partial, and, I would argue, very polemical, very political renderings of matters of concern and only a subset of what I would call states of affairs.”* (Latour 2004c: 232) It is interesting that Latour decides to speak of a shift from matters of fact to matters of concern in this essay where he questions what critique of the sciences should entail. I think Mariam Fraser is perfectly right to locate Latour’s moral and ethical engagement with what and/or who comes to enter the collective within his concept of ‘matters of concern’ (Fraser 2006: 48). Scientific objects (or quasi objects) as matters of concern contain a certain real, but are also deeply social and political. Therefore, importantly, for Latour, matters of concern do not belong to some newly discovered external reality where matters of fact are discovered. Rather, they emerge from the collective through practices of human-nonhuman mediation in which the scientific, political, natural and social are intimately related. Engaging matters of concern, instead of matters of fact, is Latour’s point of entry for academic critique of the natural sciences. In this point of entry, of course the social science’s focus on the social and politics is present, but importantly the scientific and a certain reality is still very much at stake.

Importantly, one can read Latour’s performatives of mediation and purification as

specifications of the processes at stake within Barad's apparatuses of bodily production. Intra-action is a practice in which mediation and purification are intimately related, where processes of mediation and purification are inherent in, constitutive of, the same phenomenon. In particular, apparatuses can be understood to constitute phenomena through mediation, and agential cuts can be understood as acts of purification *within* phenomena. Importantly, processes of mediation and purification show the radical contingency of assigning components of the phenomenon to either the realm of culture or nature. There is nothing inherently cultural or inherently natural about any object, subject, human or nonhuman, these ontologies are performed to appear as stabilised through specific purifying scientific practices. Purification and mediation will enable me to analyse how ideas of empowerment, technology and women's bodies come to matter within the field of microbicides, in more specific terms than Barad allows for. Following Latour, it will be possible to assess the human-nonhuman associations from which microbicides/women emerge and examine how HIV prevention technology, women's empowerment, women's bodies, scientists, advocates etc are an inherent part of what microbicides are. In this sense, microbicides/women may be viewed as tangled objects, matters of concern, which emerge out of a collective but never break loose from this constitutive environment.

For Latour, which matters of concern come into being depend on whether this matter is included into the collective. Latour speaks of trials of strength and levels of articulation for these matters to be included, i.e. trials of strength stabilise into the existence of an object, an appearance *of essence* until the next trial, because "...*once a form is stable, it no longer appears to be a trial of strength.*" (Latour 1988: 159) However, I suggest that questioning how the microbicide is enacted by this collective to intervene into the female body as a form of empowerment, engages a process too complex for a language of 'trials of strength' to answer. What if the actors in the field of microbicide development articulate the microbicide in different ways? These possible differences would not just be more or less articulate, they would matter for both the microbicide as an intervention into the female body and how this intervention, in turn, affects a transformation of gendered power relations.

Here certain difficulties arise when utilising Latour and ANT for a feminist analysis. Latour and ANT have been critiqued for their lack of engagement with social dimensions of power within scientific practices, as for instance Donna Haraway states:

The effect of the missing analysis is to treat race and gender, at best, as a question of empirical, preformed beings who are present or absent at the scene of action but are not generically constituted in the practices choreographed in the new theatres of persuasion. This is a strange analytical aberration, to say the least, in a community of scholars who play games of epistemological chicken trying to beat each other in the

game of showing how all the entities in technoscience are constituted *in* the action of knowledge production, not *before* the action starts. (Haraway 1997b: 29)

Latour appears to bracket important distinctions within the category 'human' that are both assumed as homogenous and removed from the analysis ANT might perform. Latour starts with the relation between the human and nonhuman and, consequentially, he sidesteps questions pertaining to the social and cultural processes inherent to scientific process which are constitutive of who and/or what comes to matter. As such, the cultural processes through which 'the human' is differentially constituted are neglected by Latour. In a similar vein Susan Star critiques: "*I think it is both more analytically interesting and more politically just to begin with the question, cui bono? than to begin with a celebration of the fact of human/nonhuman mingling.*" (Star 1991: 43) This neglect constrains the questions an ANT analysis is able to ask, in terms of the social and cultural processes through which 'the human' is made intelligible as a category. Furthermore, as Latour's central point of focus is the mingling of human and nonhuman actors, he is unspecific when it comes down to what makes one hybrid better than another in an ethical and political sense. As such, he leaves open the question "*of how to distinguish between hybrids from a critical perspective.*" (van der Ploeg 2004: 154) Consequently, an analysis of politically important formative effects that are at stake in how different matters of *concern* come to matter is foreclosed. The mechanisms of power that invest sex and gender, so central to the development of vaginal microbicides, remain occluded and a focus on mere human-nonhuman mingling fails to bring these to light. In short, Latour brackets important distinctions within the category 'human' both assumed as homogenous and removed from the analysis ANT might perform.

This critique ties into an important difference between Barad and Latour. Barad starts with the practices constitutive of "human" and "nonhuman", these entities do not pre-exist the material-discursive apparatuses through which they come into being as Mariam Fraser explains: "*Barad's theoretical framework extends to an analysis of power relations as well as to an analysis of the specific processes of materialization which themselves mark a distinction between what does or does not count as human.*" (Fraser 2002: 617) Indeed, what gets to count as human and/or nonhuman is contingent on the specific apparatuses through which these entities are constructed. Consequently, assemblages of humans and nonhumans differ according to the specificity of the apparatuses through which they are produced. Methodologically, this entails a shift from not only tracing the network constitutive of a certain phenomenon, but the difference between networks in terms of the different human-nonhuman phenomena they produce. Apparatuses of bodily production might very well be multiple and accordingly the phenomenon they constitute is not singular, rather its meaning and materialisation differs

according to the different material-discursive environments through and in which it emerges.

In order to consider this multiplicity more explicitly I now want to turn to the work of another ANT theorist, namely Annemarie Mol. Her work enables me to consider the possible different ways the field of microbicide development construes the microbicide as a technological intervention and what the implications of these differences are for the phenomenon under question. For Latour, an element is either inside the network or outside it, an actant is either inside the collective or outside it, i.e. there is no multiplicity of reality brought into being through different articulations. Instead, Mol focuses on the question of multiple networks. Multiple associations and the relation to their composite parts, multiple enactments of what *appears* to be the same hybrid can co-exist and need not rule one another out. Specifically, Mol allows me to think of the field of microbicide development as a set of collectives through which multiple microbicides/women emerge.

### *Multiple Collectives*

...any particular apparatus is always in the process of intra-acting with other apparatuses, and the enfolding of (relatively) stabilized phenomena (which may be traded across laboratories, cultures, or geopolitical spaces only to find themselves differently materializing) into subsequent iterations of particular practices constitutes important shifts in the particular apparatus in question and therefore in the nature of the intra-actions that result in the production of new phenomena, and so on. Boundaries do not sit still. (Barad 2007: 171)

For Barad apparatuses of bodily production intra-act, it is therefore the aim not to start from their distinction (as for instance advocacy versus biomedicine) but trace their intra-action and see how and to what extent they are distinct, what their specific material configurations look like. *“In my agential realist account, there is important reason to suspect that these different discursive practices [biology, anatomy, physiology etc] are not separate at all but entangled in specific ways; that is, these apparatuses of bodily production do not act in isolation from one another but rather engage in mutual intra-actions “with” one another.”* (Barad 2007: 211) In other words, collectives function in relation to one another. In a similar vein, Annemarie Mol in her study of atherosclerosis observes and analyses how this disease is ‘done’ in practice within its different environments in a hospital in the Netherlands (hospital Z). In this research she engages in field work, namely interviews and observations. She understands scientific processes as performative and as such analyses her research object by observing its different emergences, as she writes *“...ontology is not given in the order of things, but (...), instead, ontologies are brought into being, sustained, or*

*allowed to wither away in common, day-to-day, sociomaterial practices.*" (Mol 2002: 6 emphasis omitted)

However, in contrast to Barad who *extends* performativity into intra-action, Mol utilises the concept of "enactment" as a way to break free from the term performativity in an explicit effort to steer away from Butler's theoretical field and its surroundings. The term "enactment" is put forward to show how objects are enacted in practice, to study the different events in which these occur and as such 'touch' the object itself, instead of analysing its different meanings.<sup>13</sup> The term enactment is a way to talk about scientific or technological objects, like the microbicide in a manner less tainted by a focus on interior psychic processes and identity formation. Objects are enacted.

Through an explicit concern with how matter comes to matter, Mol moves away from the analysis of the discursive meaning of atherosclerosis leaving its materiality 'untouched', as she writes "*...the humane does not reside exclusively in psychosocial matters. However important feelings and interpretations may be, they are not alone in making up what life is about. Day-to-day reality, the life we live, is also a fleshy affair. A matter of chairs and tables, food and air, machines and blood.*" (Mol 2002: 27) Rather, Mol disturbs what she calls a distinction between knowing subjects and objects known by making human and nonhuman objects of knowledge active agents in knowledge production.: "*...to spread the activity of knowing widely. To spread it out over tables, knives, records, microscopes, buildings, and other things or habits in which it is embedded. Instead of talking about subjects knowing objects we may then, as a next step, come to talk about enacting reality in practice.*" (Mol 2002: 50)

For Mol, the scientific apparatuses through which atherosclerosis becomes known are central to her analysis of the objects and bodies she encounters within hospital Z. "*She stubbornly takes notice of the techniques that make things visible, audible, tangible, knowable. She may talk bodies – but she never forgets about microscopes.*" (Mol 2002: 33) In line with Barad, Mol engages in an onto-epistemological approach to scientific practice. The apparatuses through which atherosclerosis becomes known are a central part of what this object is. However, Mol takes this one step further in making the logical conclusion explicit, that as apparatuses differ between spaces (or between collectives), the object multiplies. She states:

If practices are foregrounded there is no longer a single passive object in the middle, waiting to be seen from the point of view of seemingly endless

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<sup>13</sup> Nevertheless, Mol does build on Butler's analysis of sex/gender when setting out her concept of enactment as she writes:

Because doing a woman is not the same thing in a supermarket as it is in the classroom, because staging a man in bed is quite different from staging a man at a professional meeting, it is possible to investigate what it is to perform this, that, or the other gender. (...) [I]t is contrast that makes it possible to be a good observer. (Mol 2002: 38)

Through this focus on "contrast" differences between enactments become *observable*.

series of perspectives. Instead, objects come into being – and disappear – with the practices in which they are manipulated. And since the object of manipulation tends to differ from one practice to another, reality multiplies. The body, the patient, the disease, the doctor, the technician, the technology: all of these are more than one. More than singular. (Mol 2002: 5)

Importantly, Mol's argument is not that the object of analysis is multiple in a divisional sense, that the object as multiple emerges as various discrete objects distinct from one another. As Mol writes, "[a]therosclerosis enacted is more than one – but less than many. The body multiple is not fragmented. Even if it is multiple, it also hangs together." (Mol 2002: 55) This is an important elaboration of Latour's work, for not only are hybrids or matters of concern multiple, the manner in which they differ and coincide is the central point of analysis. This is also an important point in light of the feminist critiques of Latour, as multiplicity opens up a space to analyse and interrogate the differences between matters of concern. Following Mol, I am able to analyse the field of microbicides not as a homogenous whole, but pay heed to the different ways in which the microbicide is understood as an intervention into women's vulnerability by the various actors that comprise the field. Mol's concept of multiplicity allows me to think microbicides and women's bodies in the field(s) of microbicide development as multiple, in order to then trace how they are held together and through which mechanisms and practices? Consequently, I am able to analyse the multiple emergences of microbicide/woman from the field.

However, this question also makes evident some important differences between Mol's study of atherosclerosis and my study of vaginal microbicides, mostly surrounding her practice of observation and my method of textual analysis. For Mol reality is enacted through various apparatuses of knowledge production, such as the microscope and the operating table, but text is not one of these mechanisms. For my engagement with the field of microbicides processes of materialisation and imagination are inherently caught up with one another. I propose that text is a way to engage the various dimensions of imagination inherent to the field of microbicides, by tracing the various meanings articulated herein. This makes clinical trial reports, advocacy documents and acceptability reports an important point of entry. Through these texts the fields of vaginal microbicides articulate their ideas surrounding women's empowerment, sexuality and more, and they articulate the manner in which these ideas have purchase on the materiality of microbicides as HIV preventative interventions. Mol does not engage with matter through textual systems of meaning making, on the contrary, she separates them as, for instance, becomes clear in the following quotation:

For by entering the realm of meaning, the body's physical reality is still left



out; it is yet again an unmarked category. (...) In a world of meaning, nobody is in touch with the reality of diseases, everybody “merely” interprets them. There are different interpretations around, and “the disease” – forever unknown – is nowhere to be found. The disease *recedes* behind the interpretations. In a world of meaning alone, words are related to the places from where they are spoken. Whatever it is they are spoken about fades away. (Mol 2002: 12)

Mol steers clear from what she calls “perspectives” of patients, doctors and the like, but rather endeavors to find her way “*into the disease itself*.” (Mol 2002: 12) She claims that observation of events and her analysis of events within the discourse of doctors and patients brings her in closer proximity to the materiality of her object. Therefore, it appears that processes of meaning making are not inherent to ‘entering’ materiality. I want to suggest that Mol’s focus on practice is a valuable point of entry and one that leads to productive insights on the multiple ontology of her research object, but this does not give her an unproblematic entry into matter.

It is here that I have trouble following Mol, as I had with Latour’s conception of articulation and his foregrounding of human-nonhuman mingling. Because microbicides pertain to both ideas of women’s empowerment and the physical prevention of HIV infection, a distinction between meaning and materiality is not easily made. Or in a more Latourian language, how matters of concern come to matter is not a process of mere human-nonhuman mingling, but the meanings that specific human and nonhuman components are ascribed. In more particular terms, because the pursuit of microbicides is so closely tied to feminist ideals, normative meanings pertaining to gender, sex and sexuality are of central concern, and as such have to be more foregrounded in an analysis of the field. It is important to be able to engage with the different meanings that are ascribed to the microbicide and how these meanings affect what this technology *is* and how it comes to matter. Meanings matter, ontologies are effects of processes both material and semiotic. In Haraway’s language, scientific objects emerge from material-semiotic enactments:

”Reality” is not compromised by the pervasiveness of narrative; one gives up nothing except the illusion of epistemological transcendence, I am consumed with interest in the stories that inhabit us and that we inhabit; such inhabiting is finally what constitutes that “we” among whom communication is to be possible. (Haraway 1997b: 64)

In this sense, how women’s empowerment, the female body, HIV infection and the like are understood will be ontological components of what a microbicide is and by

extension who its female user is. In this frame of mind I want to return Donna Haraway's work and specifically her notion of the scientific object as a "material-semiotic actor" and the "cyborg figures" who inhabit technoscientific worlds.

### **Material-Semiotic Actors and Cyborg Figurations**

In the introduction to this thesis I proposed that imagination is always part of scientific process. In this section I intend to unpack this notion further by engaging systems of meaning making as inherent to scientific practices. I indeed understand imagination to be an inherent part of the field of microbicides, shown through ideas of women's empowerment, sex, gender and sexuality. However, this imagination is intimately related to the real and material enacted in scientific practice.

Haraway, in her notion of the 'material-semiotic actor' and her methodology of 'figuration' centralises the ways in which imagination becomes meaningful and is made to matter through science and technology. Therefore, I will return to Haraway's work here and specifically her notion of women's bodies as cyborg figurations within text and her notion of the objects of scientific investigation as material semiotic actors. However, in line with the intra-active cyborg myth set out in the previous chapter, I want to make this focus on meaning an inherent part of performative process. To this end, I will engage the STS scholars Madeline Akrich and primarily Nelly Oudshoorn and her notion of genderscripts and the configuration of the potential user.

#### *A Material-Semiotic Actor*

Donna Haraway uses the concept of a material-semiotic actor to foreground the intimate relations between systems of meaning making and materiality inherent to scientific process. As such, she aims to engage the material-semiotic character of scientific process as well as the material-semiotic character of scientific objects. At the same time she understands scientific objects to have an agency of their own, to be an active component in how new meanings and materialisations are configured through science. It is worth noting that although material-semiotic actors figure throughout Haraway's work, a clear cut definition of this concept is incredibly hard to pin down. The closest to a definition can be found in the essay *Situated Knowledges* where Haraway writes:

I wish to translate the ideological dimensions of 'facticity' and 'the organic' into a cumbersome entity called a 'material-semiotic actor'. This unwieldy

term is indebted to highlight the object of knowledge as an active, meaning-generating axis of the apparatus of bodily production, without *ever* implying the immediate presence of such objects or, what is the same thing, their final or unique determination of what can count as objective knowledge at a particular historical juncture. (Haraway 1991b: 200)

A material-semiotic actor is an object of knowledge, which is constructed by scientific processes of investigation and development. What Haraway tries to conjure here, is an engagement with bodies and objects in scientific practice as both embedded within social and cultural systems of meaning making, without turning these bodies and objects into mere ideas or abstractions - they are very much fleshed and real. This focus on the material-semiotic character of scientific process allows for a reading of scientific practices as fully engaged in imaginations pertaining to the objects of science, but this does not make these objects any less real and material. This comes to the fore in the essay *The Promises of Monsters* where Haraway returns to this notion of the material-semiotic actor. Here, specifically to locate nature and the biological within discourses which are not merely inhabited by humans. Haraway writes:

Organisms are *biological* embodiments; as natural-technical entities, they are not pre-existing plants, animals, protistes, etc., with boundaries already established and awaiting the right kind of instrument to note them correctly. Organisms emerge from a discursive process. Biology is a discourse, not the world itself. But humans are not the only actors in the construction of the entities of any scientific discourse; machines (delegates that can produce surprises) and other partners (not “pre- or extra-discursive objects,” but partners) are active constructors of natural scientific objects. Like other scientific bodies, organisms are not *ideological* constructions. The whole point about discursive construction has been that it is *not* about ideology. (Haraway 1997a: 67 emphasis in original)

Haraway makes an important point here, by stating that biology is a discourse, not the world itself. I read this statement as implying that we cannot have an immediate access into the materiality, the fleshed stuff of nature, for this point of access (for instance through biology) is always already laden with historically specific, social and cultural meanings. This is exactly why I will find my way into science and the body through textual discourses, because systems of meaning making are so obviously present. A material-semiotic actor, exactly because of its material-semiotic character, can be found in discourses and texts. Haraway continues to state:

Elsewhere, I have used the term “material-semiotic actor” to highlight the object of knowledge as an active part of the apparatus of bodily production, without *ever* implying immediate presence of such objects or, what is the same thing, their final and unique determination of what can count as objective knowledge of a biological body at a particular historical juncture (...) bodies as objects of knowledge are material-semiotic generative nodes. Their boundaries materialize in social interaction among human and non-humans, including the machines and other instruments that mediate exchanges at crucial interfaces and that function as delegates for other actors’ functions and purposes. “Objects” like bodies do not pre-exist as such. (Haraway 1997a: 67 emphasis in original)

Importantly, Haraway here makes the statement that a material-semiotic actor is an active component in the apparatus of its own bodily production. This actor materialises meaning and makes different materialisations and meanings possible - a material-semiotic actor is a generative node. As an important consequence, although scientific objects emerge from scientific practices, the actors engaged in the constructing do not fully control what they create. There is a certain wiliness to scientific objects, they’re able to generate material-semiotic effects unimagined and unforeseen. “*Perhaps our hopes for accountability for technobiopolitics in the belly of the monster turn on revisioning the world as coding trickster with whom we must learn to converse.*” (Haraway 1997a: 68)

I suggest that microbicides are material-semiotic actors. They are objects that are enacted in practice and articulated in text; they are construed through ideals of women’s empowerment and the material real of HIV infection; they are generative of unimagined embodiments of sex, gender relations and sexuality.

Thinking of material-semiotic actors foregrounds the meanings of for instance sex and gender that feed into the microbicide as a scientific object and that come to be enacted through this object. Furthermore, because in this mode of analysis the boundaries between text, materiality, discourse, imagination are incredibly unstable - the microbicide’s ontology (mode of emergence) becomes a question of their relationality. This is an important point, because I will use texts and images as a point of entry into the field of microbicides to flesh out the specific imaginations that make up this field through the meanings articulated in text.

The concept ‘material-semiotic actor’ is closely related to Haraway’s understanding of the cyborg. In fact, cyborgs are material-semiotic entities “...*which emphasizes the absolute simultaneity of materiality and semiosis. The inextricability of these two elements as well as the deeply historical contingent quality of it all.*” (Haraway 2000: 137) I have written about the cyborg at length in the previous chapter. What I aim to do here, is set out how this coming together of a material-semiotic actor and the cyborg finds its place in

Haraway's methodology of figuration.

*Cyborg Figures within Text*

I learned early that the imaginary and the real figure each other in concrete fact, and so I take the actual and the figural seriously as constitutive of lived material-semiotic worlds. (Haraway 1997b: 2)

Figurations are performative images that can be inhabited. Verbal or visual, figurations are condensed maps of whole worlds. In art, literature, and science, my subject is the technology that turns body into story, and vice versa, *producing both what can count as real and the witnesses to that reality*. (Haraway 1997b: 179 emphasis added)

Cyborgs are material-semiotic entities, figures that emerge from various texts and images, yet espousing specific material realities. Within this thesis the value of what Michelle Bastian has called Haraway's technique of figuration (2006), is to engage the women within the development of microbicides as active components in the apparatus of their own production. Indeed, Haraway does not merely trace the network of scientific production, but seeks the stories therein, narrated by cyborgs who are witnesses to specific technoscientific realities without claiming an immediate access to this real. In a similar vein, I will focus on the manner within which women participants of the microbicide clinical trials articulate the enactments of a microbicide within their sexual relations, and how these articulations find their place within the texts I will come to analyse.

One might say that Haraway's work has a feminist standpoint theory background, in the manner within which she centralises a certain 'situated knowledge'.<sup>14</sup> However, what counts as a standpoint for Haraway is more a node within a specific technoscientific field than an experienced standing place that pre-exists its representation. Cyborgs are articulate entities, who narrate their 'situated knowledge' of their specific 'situatedness' in lived material reality, technoscientific process and systems of meaning.<sup>15</sup>

As such, I read Haraway's work as allowing a shift from women's experience towards

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<sup>14</sup> Kirsten Campbell makes a similar argument in her essay *The Promise of Feminist Reflexivities: Developing Donna Haraway's Project for Feminist Science Studies* (2004: 171)

<sup>15</sup> Haraway explains:

...it is very important to understand that "situatedness" doesn't necessarily mean place; so standpoint is perhaps the wrong metaphor. Sometimes people read "Situated Knowledges" in a way that seems to me a little flat; i.e., to mean merely what your identifying marks are and literally where you are. "Situated" in this sense means only to be in one place. Whereas what I mean to emphasise is the *situatedness* of situated. In other words it is a way to get at the multiple modes of embedding that are about both place and space in the manner in which geographers draw that distinction. Another way of putting it is when I discuss feminist accountability within the context of scientific objectivity as requiring a knowledge tuned to resonance, not to dichotomy. (Haraway 2000: 71)

figuration which is a posthumanising move that transforms standpoint theory's focus on experience into a textual analysis of 'cyborg narrative'. Figures tell a story and draw us in and although emerging from text, the figures in this thesis are intimately bound to the material reality of specific women's lives in a time of HIV and the incorporation of a microbicide candidate herein. Figures are textual entities, configured entities, embodied entities, visual entities. I suggest that a focus on figures allows a mode of thought that is able to pertain to a figure of speech, a visible figuration, a figure of a body and resonates with the configurations of scientific development. The cyborg as a material-semiotic figure entangles the real and the figural, the material and the semiotic, the textual and the embodied. Matter and meaning are intimately related in the development of microbicides as an intra-active process of scientific configuration. Moreover, this is a process of configuration that promises to open out into a different future for women within the HIV pandemic. This is the story the cyborg figures in this thesis articulate.

To understand scientific development as a process both material and semiotic is to play with the relation between meaning and matter. Haraway wrote that "*[f]igures do not have to be representational and mimetic, but they do have to be tropic; that is, they cannot be literal and self-identical. Figures must involve at least some kind of displacement that can trouble identification and certainties.*" (Haraway 1997b: 11) A figure stands for more than herself, she displaces meaning. The women figures in microbicide development as cyborg figurations are performative, intra-active. As such, they disrupt any literal meaning and defy any point of direct access to their materiality and meaning (material-semiotic character).

I understand figures to be powerful nodes of entry into the story of microbicide development because of the myriad worlds they inhabit and the 'situated knowledge' of the material-semiotic character of technoscience they are able to articulate. Figures are *complex* entities and this is exactly the point. To centralise figuration within research practice is to play with the complex interplay of the imaginary and the real in the material-semiotic world(s) of scientific development. Indeed, the texts I will come to analyse are inhabited by cyborg figures, women through which the boundary between body and technology, text and materiality, imagination and material reality are broken down.

However, in line with the intra-active cyborg myth set out in the last chapter, I want to elaborate Haraway's conceptions of the material-semiotic actor and cyborg figuration with a performative approach to science which is able to engage the specific practices of microbicide development. To this end I want to engage a school of STS which Oudshoorn and Pinch describe as engaging with a study of semiotics extended to 'things' (2003: 7). This school argues that ideas about the world feed into scientific practices. Scientific practices are therefore ridden with norms pertaining to both the user and the world s/he inhabits, norms that filter into the technology through the scientific practices through which it is produced. This process is what Akkrich has come to call 'inscription' which results in certain

'scripts' or 'scenarios' carried by the technology.

Importantly, Nelly Oudshoorn has gendered this notion of inscription. In Nelly Oudshoorn's words, "...*scientists and engineers configure users and contexts of use as integrated parts of the processes of technological development.*" (Oudshoorn 2003b: 12), with the important difference that norms surrounding sex, gender and sexuality are central to both the context of use and the user. Specifically, Oudshoorn engages the various enactments of sex, gender and sexuality and how these enactments affect the construction of technological artifacts and their 'potential user'. I understand the notion of technologies carrying gender scripts and their configuration of their potential user to resonate with Haraway's material-semiotic actors and cyborg figurations. However, Oudshoorn allows for a more explicit way of engaging how meanings matter in a performative sense and how women users are configured within specific scientific apparatuses, such as the clinical trial.

### *Gender Scripts and the Configuration of the Potential User*

For some time sociologists of technology have argued that when technologists define the characteristics of their objects, they necessarily make hypotheses about the entities that make up the world into which the object is to be inserted. Designers thus define actors with specific tastes, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science, and economy will evolve in particular ways. A large part of the work of innovators is that of "*inscribing*" this vision of (prediction about) the world in the technical content of a new object. I will call the end product of this work a "script" or a "scenario". (Akrich 1992: 208)

In the design phase of a technology, imaginations pertaining to the technology's potential user and the context of its use filter into the technology design. Specifically, within scientific practices, norms are inscribed into the scientific artifact because the designer imagines the user and the world around her in particular ways. Consequently, as Akrich explains, scientific artifacts are inscribed with meanings and norms that directly impact on the user, in both enabling and constraining ways (Akrich and Latour 1992: 261)

Scholars like Akrich (and Latour) who focus on 'the semiology of things' focus on the success or failure of user/technology. In more straight forward terms, for a technology to be successful it needs to be used. Oudshoorn is critical of this work for their neglect of the impact of technology on users' identities, especially in terms of gender. As Oudshoorn writes, "*This scholarship thus reflects a rather narrow view of technological development in which user-technology relations are restricted to technical interactions with the artifacts, thus neglecting the broader cultural dimensions of human agency.*" (Oudshoorn 2003a: 210)

Instead, Oudshoorn expands this understanding of inscription to include gender, voiced in terms of identity.

In order to 'gender' scientific artifacts, Oudshoorn takes the notion of script and the configuration of the potential user on board to specifically focus on how gender is inscribed into scientific artifacts, through research concerning what she calls 'genderscripts'. In other words, the different meanings scientific artifacts gain within different cultural environments are not gender neutral, rather these artifacts are in fact inscribed with gendered norms, built into their very design. Importantly, in this understanding of gender scripts and scenarios, scientific artifacts are understood to be both produced and productive in close relation to gender identity, as Oudshoorn explains:

The concept of (gender) scripts indicates two processes at work in the mutual shaping of gender and technological objects. In the first place, objects can become gendered because innovators anticipate the preferences, motives, tastes, and skills of the potential users, and the cultural norms in society at large. These views, subsequently become materialized into the technical design of a new product (...) In the second place, artifacts that incorporate a gender script can shape and define the agency of women and men. Due to the norms and values that are inscribed into a technical artifact, objects can attribute and delegate specific roles, actions, and responsibilities to their users. (Oudshoorn 2002: 473)

In this understanding, the design of a scientific artifact is of central importance, especially in relation to how its user is imagined: "...*the development phase of a technology becomes an intriguing location for understanding the co-construction of users and technologies.*" (Oudshoorn 2003: 213) However, users might not ascribe to the scripts coded into the artifact and change these scripts, re or de-inscribe the artifact. As an important consequence both users and designers are active agents in the inscription of the object. It follows that to understand the gender scripts of artifacts and their impact on society, we need to look both to the designer and the user as writers of script.

Oudshoorn builds on Butler's notion of performativity to suggest that "*the articulation and performance of gender identities of users is an important aspect of the development of technological artifacts. Technologies will only become successful if technological innovators configure gender identities of users and if future users perform the gender identities articulated by technological innovators.*" (Oudshoorn 2003a: 210) Therefore, she takes Butler on board in understanding that gender is done, but includes nonhuman actors, unlike Butler, into this doing. As Oudshoorn writes, "*I suggest that it is important to address the role of technologies as non-human actors in order to understand the processes*



*involved in producing and sustaining particular forms of gender. Technologies may play an important role in stabilizing or destabilizing particular conventions of gender, creating new ones, or reinforcing or transforming the existing performances of gender.*" (Oudshoorn 2003b: 13) In other words, the relation between gender and technology is co-constitutive in both constraining and enabling ways.

This way of thinking the co-constitute relationship between gender and identity becomes evident in Oudshoorn's work on the male pill. In *The Male Pill* she brings to light the social and scientific networks through which the development of the male pill is enacted through text and narrative. Oudshoorn writes that "[g]ender and technology are neither fixed nor univocal, but mutually constitutive." (Oudshoorn 2003b: 241) In other words, technologies need to be culturally embedded to be successful, used, and gender is central to this enactment. Therefore, instead, Oudshoorn looks at "*the identities of users constituted in the discursive practices*" (Oudshoorn 2003b: 12) of technological development and the "*cultural feasibility*" (Oudshoorn 2003b: 12) of technological artifacts. In her own words, she views "*the developmental phase of a new technology, therefore, as a cultural niche in which experts and other people participating in the testing of the technology articulate and perform non-hegemonic identities to create and produce the cultural feasibility of the technology.*" (Oudshoorn 2003b: 16) Specifically, she understands the clinical trial as a space in which participants are expected to participate in a predetermined manner effecting configurations of specific gender identities. In other words, the developmental phase of a new technology configures its potential user. In this sense, I will approach the clinical trials as a setting in which a variety of actors come together and the differences between scientists' imagination of the microbicide candidate's potential user and the women using the microbicide candidate in the trial become visible.

Oudshoorn's analysis of the male pill is very close to my analysis vaginal microbicides as we both analyse a technology in the making through engaging this pursuit as a material-discursive network articulated through text and narrative (though the narratives I will analyse do not stem from interviews I have conducted, but acceptability studies articulated through an array of research articles). As such she opens up a space to analyse how the field of microbicide development concerns itself with user perspectives and how it understands the cultural 'embeddedness' of a microbicide in terms of this technology becoming a successful intervention.

Oudshoorn allows for a reading of the microbicide as a gendered artifact, which configures its potential user. I suggest that this analytical framework resonates with both Haraway's material-semiotic actor as well as her methodology of figuration. In this analytical framework, normative meanings of the female body, women participants, female sexuality etc are invested in the microbicide. In other words, in line with a material-semiotic actor, scientific artifacts are both material and semiotic entities Furthermore, Oudshoorn engages her object through text and narrative but her approach is attuned to the

configurations that surround technologies in the making of which the clinical trial as a space is an important part. Oudshoorn's concern with how genderscripts configure a technology's potential user resonates with Haraway's figure of the cyborg, but is more explicitly related to the women participants of the microbicide clinical trials whose narratives I will come to read. In short, and in line with Haraway's work, Oudshoorn allows me to think not only biomedical apparatuses of knowledge production as constitutive of the meanings ascribed to the microbicide, the women participants give meaning and let the microbicide materialise within their sexual practices through generate meaning as well.

However, although Oudshoorn emphasises the co-constitutive relation between technology and gender, her language of 'inscription' makes this constitutive relation between designer and technology or user and technology appear as if one actor is always passivied, written *upon*. This is an important difference between Haraway's concept of the material-semiotic actor and Oudshoorn's artifacts inscribed with gender scripts. I want to loosen up the language of inscription and rather discuss the norms and meanings *ascribed* to the microbicide as a scientific artifact, in order to leave room for the microbicide's generative agency. In the following analysis I aim to foreground the intra-active relations in which all actors are active components. I am interested in the new unforeseen meanings that are materialised, an intra-action between a gendered artifact and its potential user, in which the artifact has an agency of its own. This agency and this 'wiliness' is what the concept of a material-semiotic actor provides. By thinking of the configuration of the potential users within for instance the clinical trial, Oudshoorn gives me a more practical tool to engage the intra-actions between the women for whom the microbicide is meant and who test this technology within the trials and the different enactments of sex, gender and sexuality they are able to materialise and make meaningful. Furthermore, by foregrounding the microbicide's generative agency as a material-semiotic actor, I am able to focus on the unimagined sexual scenarios women are able to enact through this technology.

Through the framework of thought set out in this chapter I aim to interrogate the field's imaginative investments into the microbicide as an intervention into women's vulnerability, laden with ideals of empowerment. Furthermore, I aim to analyse the specific practices through which the field enacts this investment, to show the field's performative effects. In my interrogation of the promise of vaginal microbicides set out in this thesis, I will concern myself with what the performative effects are of the field's various practices and, importantly, how these effects relate the ideas of empowerment that are promised. As such, in the following analysis I will ask various key questions, including how have the different collectives that make up the field of microbicide development articulated the microbicide as an intervention into the problematic of women's vulnerability to HIV infection? How have advocates, scientists and women participants articulated what is at stake in the testing of microbicide candidates in the trials? And, importantly, how have these various articulations effected the microbicide's material-semiotic agency and as such

its potential to generate a different future for women in the HIV pandemic?

**Chapter 4.**  
**A Promise of Empowerment**

In this chapter I will trace the history of the emergence of the idea of a vaginal microbicide in advocacy discourse. To do so, I will trace the idea of a microbicide from Zena Stein's prominent article published in 1990 *HIV Prevention: The Need for Methods Women Can Use* - where she sets out the idea of a female controlled prophylaxis as a transformative technology towards women's empowerment in the HIV pandemic - to an advocacy travelling exhibition put together in 2004 called *Giving Women Power over AIDS* (which I understand to put forward the advocacy promise of microbicides). Zena Stein's initial articulation of the need for women to have a tool they can control is of central importance in this chapter. I suggest that, in line with Haraway's cyborg myth, Stein provoked an inhabitation of biomedical HIV prevention as a feminist politics through her inclusion of women's empowerment into the field of biomedical HIV prevention and, her articulation of a female-controlled prophylaxis. My aim in this chapter is to set how Zena Stein's 'female-controlled prophylaxis for women's empowerment' has been articulated in three main areas central to microbicide advocacy, namely its relation with biomedicine (here set out as the collaboration between advocacy and biomedicine and the emergence of the Global Campaign for Microbicides), its concern with women's experience (here engaged through acceptability studies) and its upholding of promise (here engaged through the narrative set out in the aforementioned advocacy essay).

The texts under analysis here constitute a historic perspective of the emergence of the microbicide in advocacy efforts. Although the texts differ in terms of how they articulate the idea of a microbicide, they all articulate women's need for a microbicide, and construe this need as pre-existing their advocacy effort. My argument set out in this chapter is, that in contrast to the field's own articulations, 'the vulnerable woman' in need of a tool she can control does not pre-exist the field's various representations, but is rather construed through these efforts. This is not to say that a certain material reality is not inherent to this performative, it most certainly is. The question is not whether the reality is part of advocacy's performative articulations or not. Rather the question becomes one of how this reality becomes part of the figure of woman advocacy efforts put forward. As such, Butler's theory of performativity, as set out in *Gender Trouble* and *Bodies that Matter* will be the main framework for analysis. Through Butler's theory of performativity, the main questions I will engage throughout this chapter are: how has microbicide advocacy articulated women's need for a microbicide? And, what have the consequences been for how the microbicide is understood as an intervention towards a different empowered future?

Specifically, in order to engage the collaboration between microbicide advocacy and

biomedicine, I will analyse a paper published in 1994 by Lori Heise and Chris Elias called *Challenges for the Development of Female Controlled Vaginal Microbicides*. I understand this paper to be exemplary of this women's health advocacy/biomedicine collaboration which was formed in the early 1990s as an effort to materialise Zena Stein's idea through biomedical development. The paper under analysis here seeks to articulate the idea of a female-controlled prophylaxis through biomedical discourse. A collaboration that, I argue, has been of fundamental importance for the manner within which the Global Campaign for Microbicides has come to represent both women's vulnerability to HIV infection and the microbicide as an intervention herein. Therefore, in this chapter I will also turn to various factsheets published on the GCM's website. In these documents, the GCM sets out their understanding of a microbicide as an intervention into women's vulnerability and simultaneously its potential to transform women's vulnerability towards a more empowered future. In analysing these documents, I will ask: how has women's vulnerability and its transformation been constituted through advocacy's collaboration with biomedicine and its impact on advocacy discourse?

Secondly, I will look at how Zena Stein's initial conceptualisation of the need for women to have a tool they can control has been adopted by acceptability studies as well as the GCM documents based on these studies. I have found the acceptability studies I will come to analyse through the PubMed database, using a key word search of 'microbicide' AND 'acceptability study'. I then searched for the acceptability studies referenced in the articles I found via my PubMed search. When 'sexual practices' and 'intravaginal practices' and 'covert use' continuously came up in these articles, I conducted a PubMed search specifically focused on 'microbicide' AND 'sexual practice', 'intravaginal practice' and 'covert use'.

The acceptability studies I will discuss also have a strong advocacy tone, but articulate this tone through women's own experience of the microbicide and argue that this experience constitutes a reality which should be a serious part of microbicide development. They endeavour to give voice to specific women at a specific time in a specific place and how they understand the microbicide as it intervenes into their social surrounding and sexual practices. In this section I will ask, how has the woman in need for microbicides been construed through a concept of control in advocacy discourse?

I will conclude this chapter with a narrative that the GCM uses as a way to explain and advocate women's need of a microbicide. I suggest that in this essay women's vulnerability becomes tied to the promise of a different future, through the microbicide as a technology of hope. Therefore, I will engage this advocacy story to analyse how the above conceptions and articulations feed into the eventual promise the idea of a microbicide yields for the advocacy field, and importantly, how this promise figures the vulnerable woman in need of microbicides.

## **From a Female-Controlled Prophylaxis to a Microbicide**

Zena Stein used the concept of women's empowerment to articulate the social problematic of women's vulnerability in relation to HIV infection and the need for women to have a prevention option they can control. I suggest that his conceptualisation has provoked a complex idea of a prophylaxis that pays heed to both women's social and physiological vulnerability, while aiming to transform the power relations that place women at risk. In this section I will trace Stein's initial idea from her article published in 1990 to the emergence of the GCM and their articulation of women's risk of HIV infection and their understanding of the microbicide as an intervention herein. Specifically, here I am interested in what happened to the complexity of the idea of a female-controlled prophylaxis as it became articulated as a microbicide through biomedical discourse?

### *A Female-Controlled Prophylaxis*

When in the early 1990s WHO efforts focused mainly on women's behavioural change (see for instance WHO 1994, 1995), a movement was growing that took up biomedicine as a way to transform women's vulnerability to HIV infection and expand an understanding of women's empowerment towards biomedical intervention into the female body. Central to this initiative was, and still is, the argument put forward by the South African epidemiologist Zena Stein. In 1990, Stein published an important article in *The American Journal of Public Health* called *HIV Prevention: The Need for Methods Women Can Use*. The article is still widely referenced in publications focused on female initiated prevention in the HIV/AIDS pandemic. Written more than 20 years ago, her call for the prioritisation of female controlled HIV prevention still carries its relevance and significance for today.

At the time this article was written the concept 'microbicide' did not yet exist. Rather, Zena Stein called for the development of a female initiated barrier method – 'a vaginal virucide' - that would be under women's control and as such the idea of a *female-controlled* prophylaxis was put forward. What is important in this initial conceptualisation was an effort to pay heed to the social problematic of women's vulnerability and enable women to transform the distribution of power that leaves them at risk, not through behavioural change alone, but through a technological intervention into women's bodies. In particular, Stein used the concept of women's empowerment to entwine the social problematic of women's vulnerability to HIV infection with the idea of a HIV preventative prophylaxis, as becomes visible in the article's opening statement:

At present, the sole physical barrier promoted for the prevention of sexual

transmission of human immunodeficiency virus (HIV) infection from men to women is the condom. With condoms, active male cooperation is crucial. The proposition of this paper is that *the empowerment of women is crucial for the HIV transmission to women. It follows that prophylaxis must include procedures that rely on the woman and are under her control.* (Stein 1990: 460 emphasis added)

In global health discourse of this time (see for instance WHO 1990, 1992, 1993, 1994) a separation was made between the need to empower women as a behavioural change on the one hand and, on the other, women's physical vulnerability which was the domain of HIV prevention technology. Stein disturbed this dualist mode of thought surrounding HIV prevention for women. Instead of focusing on women's sexual behaviour as the locus of change, and seeing only the social as a realm of transformation, Stein introduced the gender problematic of women's vulnerability to HIV infection through technology and its effect on women's bodies.

In the same article, how the technology of a female-controlled prophylaxis is imagined as a technology of transformation towards empowerment hinges on a critique of the condom. Stein takes the condom as her point of departure. She critiques this object as not only inappropriate to women's needs but, itself, invested in patriarchal power relations. Stein is explicit about the condom's inadequacy to specifically meet women's needs in the following statement:

In the more developed world and the less developed world, a key problem with the condom from the point of view of the woman is that it calls upon the woman to assert dominance in the sexual act. Almost everywhere such dominance is not the traditional mode, and imposes unfamiliar behaviour on both members of the couple. Logic dictates that the educational message about condoms, to be effective, must be targeted at the man or couple. If targeted at the woman, she in turn has to persuade her partner, and therein lays the difficulty. (Stein 1990: 460)

Zena Stein criticised the centrality of the male condom in the field of HIV prevention and framed this object's inefficiency by making a distinction between the efficacy of a condom and its effectiveness. While a condom is highly efficacious on each occasion it is used in the prescribed manner, she wrote, its effectiveness is not merely dependent on the correct use of a working intervention. Importantly, a condom may be close to a hundred percent efficacious, but if a woman is unable to instigate condom use in her sexual practices, its effectiveness is nil: "*[e]ffectiveness requires acceptability and compliance as well as efficacy.*" (Stein 1990: 460) The condom might be efficacious when taken as a

technology on its own, taken out of women's sexual practices and gendered power dynamics in which it is used. Contrarily, when the condom is understood as a technology embedded in this socio-sexual context – which it must to be effective - it can fail as a preventative technology.

In fact, Stein took her critique of the effectiveness of the condom one step further by stating that “[t]he HIV epidemic has restored to men the locus of control over the consequences of sexual behaviour“ (Stein 1990: 461). Use of the male condom, by being a technology under male control, is repetitive of the norms that put men in place as the ones in control within heterosexual practices. Consequently, the condom as a technology through which male control is enacted is understood to be complicit in a distribution of power that is detrimental to women's ability to protect themselves against the HIV virus.

Stein put female controlled prophylaxes forward as devices that might very well be less efficacious than a condom, but more effective as they are tailored to meet women's specific needs. As a critique of the condom, a female-controlled prophylaxis would enable women to take control within their sexual relationships and furthermore provide protection against the HIV virus. In other words, the idea of a female-controlled prophylaxis is put forward as a transformative technology towards women's empowerment in the HIV pandemic.

In the second chapter of this thesis I introduced Donna Haraway and her *Cyborg Manifesto*, and made the claim that she has a special place within feminist science studies for not only critiquing the natural sciences from the outside, but inhabiting these sciences as a feminist politics. Although Zena Stein's work within epidemiology and Haraway's theoretical work seem worlds apart, there are some striking similarities.

Haraway criticised the natural sciences for being an authoritarian force potentially oppressive to women. However, through her cyborg myth Haraway looked to science and technology not only as an oppressive field, but as the locus of a feminist transformation of power relations. In a similar vein, Zena Stein took on women's bodies as her point of focus to analyse the social and physical effects of patriarchal power relations. Moreover, she did not only look on the physiological reality of HIV infection as an effect of patriarchal power relations, but engaged women's bodies as a site for the transformation of these patriarchal relations that put them at risk of HIV infection. In line with the cyborg myth, Stein criticised the condom as a biomedical intervention not only removed from what women need but complicit in oppressive relations that leave women at risk of HIV infection. Stein put forward the idea of a female-controlled prophylaxis as a transformative technology and, in line with Haraway, suggested an inhabitation of biomedical HIV prevention as a feminist politics.

Consequently, an intimate relation between women's HIV infection, empowerment and a female-controlled prophylaxis is forged through Zena Stein's text. The physical infection of women's bodies and a feminist idea of a redistribution of gendered power



dynamics are mutually implicated. As female-controlled prophylaxes are aimed at protecting women's bodies against the HIV virus and simultaneously further women's empowerment, Stein articulated an intimate relation between social dimensions of power and scientific interventions in the female body. She put forward a thoroughly complex way of understanding HIV prevention technologies aimed at women as both engaging dynamics of power, while protecting the body against HIV infection. Through advocating a female-controlled prophylaxis, these dimensions of the social and the physical become fully entwined and moreover, their relationality is desirable, strived after as an aid for women within the HIV pandemic. In other words, Stein's idea of a female-controlled prophylaxis opened the door for a materialisation of Haraway's myth of women's cyborg embodiment.

However, there are also some important differences between Stein's idea of a female-controlled prophylaxis and Haraway's cyborg myth. By articulating a female-controlled prophylaxis as a transformative technology through the concept empowerment, Stein's argument gets caught in a double bind. On the one hand, the concept empowerment enables her to put the idea of a female-controlled prophylaxis forward as a thoroughly complex object, that both entwines the social and physiological components of women's vulnerability to HIV infection. On the other hand, as she includes the social through the concept of empowerment, she introduces a nature/culture distinction that haunts this second wave concept, thereby separating the social from the physiological.

In the second chapter of this thesis I also discussed various second wave feminist arguments aimed at attacking misogynist and biological reductionist thought by including the social dimensions of women's oppression. As a consequence, the social became the site of the transformation of women's oppression. I argued, following Kate Millet and Firestone, that because these feminists foreground the social as the realm of oppression and the power dynamics this entails, the body is excluded from feminist analyses and as such 'bracketed'. Consequently, and ironically, the body is reintroduced as unquestionable nature, left for the natural sciences to discover. In other words, as feminist analyses are focused on the social and as such separated from the natural real the sciences discover, these analyses do not enter the sciences themselves and as such, ironically, the biological reductionist body is reintroduced.

Stein encounters the same double bind in the way she foregrounds the social, made visible in her critique of the condom. In this critique, she separates efficacy from effectiveness, nature from culture. This separation is peculiar, as it generates two distinct dimensions within which HIV preventative prophylaxes are understood to function. One dimension consists of the cultural context within this prophylaxis will be used, i.e. the cultural domain of gender and sexual power relations. Another dimension consists of the physiological effect of the prophylaxis on the HIV virus within the body, i.e. the natural domain of the technology's effect on the HIV virus and the female body removed from the complexity of the social. In other words, she articulated her aim through the concept of

empowerment and as such included the social by making a separation between the technology outside (efficacy) and inside (effectiveness) social contexts of use. By using the concept of empowerment and the dualist mode of thought this entails, she ironically introduced a conception of a pre-existent physiology, a natural body, through the backdoor. I understand this introduction to have a direct impact on the role ascribed to biomedicine.

### *A Biomedical Compound*

In the early 1990s Lori Heise, the future director of the Global Campaign for Microbicides, took up Stein's idea and presented it to Chris Elias from the Population Council, an U.S. based NGO with a biomedical and scientific focus on reproductive health research. This relationship formed the basis for the development of microbicides and is, in itself, a remarkable alliance. As in her analysis of the relation between women's health advocacy and the Population Council for their initial pursuit of a vaginal microbicide, Bell phrases the troubles of this collaboration as such:

The collaboration was risky for both sides. For women's health advocates, it represented entry into the process of development, diffusion, and continuing evaluation of reproductive technology and into serious dialogue with scientists and philanthropists. For the Population Council, it represented entry into a new area of research in women's reproductive health and into serious dialogue with feminist activists about it. For both, it represented an entirely new form of collaboration. (Bell 2003: 200)

In line with the 'risky collaboration' articulated by Bell above, the Population Council was active in the development of Norplant, a contraceptive that consisted of an under the skin implant, which was under feminist critique at the time for diminishing women's control of their bodies and prioritising population control over women's health (Boston Women's Health Book Collective 1984; Hardon 2006). The feminists of the early years of microbicide advocacy, such as Lori Heise, were directly involved in these debates (L. Heise: personal communication). This background already signals the possibility of vastly different conceptions between women's health advocates and biomedical scientists in terms of what is understood to be at stake within the problematic of women's vulnerability to HIV infection and how a microbicide as an intervention is to be articulated.

The alliance with The Population Council created an opening for women's health advocates to include women's needs and voices into biomedical HIV prevention research. However, especially in light of the Norplant back-story, this leads me to question the role ascribed to science and the effects of articulating and materialising a feminist idea through biomedical development.

To shed some light on this controversial alliance and its effects, I will focus on an article written by Elias and Heise, published in the journal AIDS in 1994 that specifically called for the development of microbicides: “*pharmaceutical products that would reduce a woman’s risk of acquiring HIV and, potentially, other STD when applied intravaginally*” (Elias and Heise 1994: 1). The argument set out in this article is in line with Stein’s call for more research focused on women’s needs and a tool they can control. However, it is much closer to the actual biomedical development of microbicides. This becomes evident in their articulation of “the principle challenge” (Elias and Heise 1994: 1) of microbicide development:

Globally, most women are at greatest risk of acquiring HIV infection through heterosexual vaginal intercourse with an infected man. To avoid infection via this route, a prevention method must establish *an effective barrier between the infectious elements in the male genital secretions/ejaculate and those cells of the female reproductive tract susceptible to infection.* (Elias and Heise 1994: 1 emphasis added)

“The principle challenge” within the problematic of women’s risk of HIV infection is articulated through efficacy, the success of a physical barrier to prevent HIV infection. As such, the problematic of women’s specific risk of infection is taken out of its social environment, sexual relationships and power dimensions and articulated as a problem of the female body, i.e. ‘the female reproductive tract susceptible to infection’. Elias’ and Heise’s main focus in this article consists of scientific issues and biological specificities still undetermined at this time. Indeed, the problematic at hand is articulated as an infectious relation between cells within the female body, in which the microbicide would then function as a protective layer.

Developing a new microbial compound for preventing the sexual transmission of HIV *depends on resolving a number of undetermined scientific issues.* These range from defining more precisely the *chemical and physical properties* of potentially microbial compounds and product formulations, to elucidating the exact biological mechanisms of HIV transmission. Despite a considerable amount of research effort, much remains to be learned about *the basic biology of the sexual transmission of HIV.* (Elias and Heise 1994: 2 emphasis added)

I propose that the consequences of this initial articulation are twofold. Firstly, the main aim is put forward as developing a protective layer and gaining more knowledge about the basic biology of the female body which, in turn, positions biomedicine as the authority

to discover and determine the 'principle challenge' of microbicide development. This conception has significant consequences in terms of the way in which the feminist ideals surrounding microbicide development are to be articulated and materialised. In particular, advocacy is positioned to engage the cultural complexity of women's sexual relations and biomedicine engages the real of women's bodies. Secondly, the above statement is in line with the nature/culture duality inherent in the concept of empowerment, which directly affects how a microbicide as a complex and transformative technology can be thought. To this effect, it is useful to look at Heise and Elias' closing statement:

It must be stressed, however, that *the complexities of AIDS will not be met adequately with a 'technological fix'*. Efforts to develop female-controlled prevention options must be complemented by more concerted attempts to address the underlying gender power imbalances that shape women's risk of STD, as well as their ability to protect themselves using the existing range of prevention strategy. [break] *Until women share power more equally with men* – in both the public and the private sphere – they will remain at heightened risk of AIDS. (Elias & Heise 1994: 80 emphasis added)

I suggest that this alliance with biomedicine, as a way to materialise the idea of a female controlled prophylaxis to further women empowerment, resulted in a separation between the social and physical aspects of such an intervention. Indeed, this separation is reminiscent of second wave feminist conceptions of women's empowerment, in which empowerment was understood as a social transformation and women's bodies were left to the natural sciences.

In the second chapter I divided feminist science studies roughly into two areas, one of which focusing primarily on women's inclusion into scientific endeavours. The engagement of women's health with biomedicine discussed here can be situated in this 'inclusion project'. As I explained in my discussion of early feminist science studies, within this inclusion project, what was understood to be at stake for a feminist engagement with the natural sciences was women's inclusion into scientific development. Following this line of thought, women's health advocates have taken the concept of empowerment as a way to include women into biomedicine, but not engaged the biomedical process itself. Furthermore, because of the conceptualisation of the problematic at hand in terms of empowerment, a fundamental binary notion of women's social empowerment and natural bodies was carried into their engagement with science. Consequently, science was set in place to discover the real of the female sexed body in relation to its vulnerability to HIV infection and assumed authority for showing the success of microbicide candidates intervention into this body. In this dichotomous scenario the microbicide cannot be a

“technological fix”, because this biomedical pursuit has become separated from the social problematic of power dimensions.

Thus, the engagement with biomedicine has amplified the separation between the social and the physiological that the concept ‘empowerment’ already invites. Central to this separation has been the presumption that there is a physiological real of HIV infection that pre-exists the social and cultural aspects of women’s risk of HIV infection. The question then remains, how has this dichotomy and the allocation of roles herein affected the manner in which the microbicide can be understood as a transformative intervention?

### *Social and Biological Vulnerability*

In 1993, in New York, the Population Council, Lori Heise and the International Women’s Health Coalition (IWHC) held an eight day consultation on microbicides. The group that assembled decided to form a coalition named Women’s Health Advocates on Microbicides, WHAM (GCM 2009d; Heise et al 1998). WHAM was an international group of women’s health advocates who endeavoured to make sure women’s perspectives were an inherent part of the biomedical development of microbicides. It was the first coalition for the advocacy on microbicides, “...a group of eleven women’s health organizations and networks worldwide that banded together in 1993 to work in partnership with the Population Council to influence the future course of the Population Council’s nascent microbicide research effort.” (GCM 2010d) Eventually, as the field pushed forward and the biomedical machinery is set into motion, it was no longer thought sufficient to have just one advocacy actor (GCM 2010d), WHAM was disbanded in 1998 at the AIDS Conference in Geneva. Most members of WHAM went on to work in the field of microbicide advocacy.

One of these initiatives, and a prime actor in microbicide advocacy, was the Global Campaign for Microbicides. This campaign was officially launched at the twelfth AIDS Conference in Geneva in 1998 (GCM 2009d). Although the GCM’s headquarters were based in the U.S., they described themselves as a – “broad-based, international coalition of organisations working to accelerate access to new HIV prevention options”. (GCM 2012a) Its main goal was “to focus world attention on the critical need for new HIV prevention options, especially for women.” (GCM 2007a, 2010d)

The Campaign represented women’s need for a microbicide, how microbicides will intervene in women’s lives and, importantly, how the microbicide will function as an empowering technology. The GCM explicitly set itself this task of representing women’s needs within in the HIV pandemic at large and the microbicide clinical trials specifically. The Global Campaign for Microbicides is the primary advocacy apparatus I will engage in this thesis and has been fully engaged with the biomedical field, endeavouring to make sure the trials are ethically sound and attuned to women’s needs. Here I will be concerned with the manner in which the GCM articulated the microbicide as an intervention into women’s

vulnerability.

The Global Campaign for Microbicides offered an understanding of women's social vulnerability that was repeated in one form or another in the various advocacy documents they published and made available on their website as a source of information. The GCM factsheet on *Women and HIV Risk* is exemplary in this regard, because it shows a repetition of the aforementioned separation between social factors and biological factors that are understood to put women at risk of HIV infection.

Biological factors contributing to women's risk of HIV:

- Women are more likely than men to contract HIV at a single exposure.
- The cervix is a site of particular vulnerability.
- Younger women are at even greater risk, since the cervix is physiologically less mature and therefore more vulnerable to infection.
- Women with asymptomatic STIs may not seek treatment, which can result in serious long-term consequences such as infertility, pelvic inflammatory disease, ectopic pregnancy, infant mortality, and cervical cancer.

Social and economic inequities also contribute to women's risk:

- The vast majority of women with HIV were infected during heterosexual sex – many by their husbands or boyfriends.
- Women may influence but do not control the sexual and/or drug-using behaviour of their male partners.
- Violence, coercion, and economic dependency in many women's relationships make it difficult to "negotiate" condom use or to leave a partnership that puts them at risk.
- In many societies, women and girls are discouraged from learning about their bodies and about sex in general.
- Often, women are socialised to leave sexual decision-making to men.
- Gender-based social norms often encourage men to seek multiple partners, while women bare the shame and stigma of disease.
- Growing economic inequality and eroding social support have driven many women into commercial sex work to support their families. (GCM 2009b)

In several of the campaign documents<sup>16</sup> these factors are articulated through

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<sup>16</sup> See for instance the GCM Factsheet: *Gender equality in AIDS Prevention: why we need prevention options for women* (GCM 2006a)

women's biological vulnerability and social factors are articulated through a lack of power or a power imbalance that leads to their inability to negotiate condom use. The above statement shows how the articulation of women's vulnerability to HIV infection becomes split between the factors that comprise the social dimensions of their increased risk and the biological factors of their physical vulnerability.

As discussed in Chapter Two, Judith Butler argued that 'Woman', as the subject of feminism does not pre-exist her representation (Butler 1990: 4). Rather this embodied subject is an effect of processes of regulation in which (feminist) discourses don't describe or represent, but produce the effects that they name. In a similar vein I suggest that there is no 'woman in need of microbicides' that pre-exists the GCM's advocacy efforts. In particular, there is no woman who exists split between her physiological and social vulnerability and whose needs the GCM then, in turn, represents and whose 'real' biomedicine discovers. Rather, the woman represented as in need of microbicides emerges in advocacy discourse and in particular through the specific manner within which the GCM articulates women's vulnerability to HIV infection. Importantly, both the dualist conception of empowerment as well as the nature/culture distinction inherent to biomedical discourse are rearticulated within this representation. Advocacy documents show a woman split between her physiological vulnerability given by biomedicine and the various social relations that put her at risk of HIV infection. I argue that this is a performative effect of both the use of the concept empowerment and its articulation through biomedical discourse.

Furthermore, I suggest that this performative effect of a split 'vulnerable woman' directly impacts on the idea of a microbicide as an intervention into both women's bodies and socio-sexual relations, in terms of its transformative potential. This becomes evident if we once again look at the Risk factsheet:

We must expand the range of strategies and tools available to women for protecting themselves. Education, economic and social *empowerment*, and the *transformation* of gender roles and norms that limit women's autonomy and decision-making are all critical. But these strategies are long-term. [break] In the meantime, we can add existing and emerging *prevention methods* for women to our current strategies, giving women the means to protect themselves, their children, and their partners from this devastating disease. (GCM 2009b emphasis added)

In other words, cultural norms that imply a power imbalance in terms of

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and *Violence Against Women, HIV and Microbicides* (this factsheet also mentions the increase in risk for women subjected to forced sex due to the possible bleeding and tearing of the vaginal and rectal area with facilitates easier access of the virus into the bloodstream (GCM 2006b)

heterosexual sexual practices and gender relations are understood to constitute women's social risk, once again separated into the social sphere of empowerment and transformation of power relations. Consequently, women's physical vulnerability is seen to belong to biomedicine. I suggest that this separation of vulnerability poses a limit on the potential of a microbicide to intervene not only into women's physical vulnerability, but socially and culturally embedded sexual practices. Women's physical vulnerability is separated from the socio-sexual factors that leave them at risk of HIV infection, and, within this binary the microbicide cannot be articulated as a biomedical intervention into a socio-sexual problem. In this specific instance, the microbicide is articulated as a short term solution for a more fundamental problematic of women's oppression for which social transformation would be vital. The microbicide is imagined to be capable to intervene into women's bodies, rendering them less vulnerable, but not in the power dynamics that leave them at risk. It follows that there is an underlying social inequity of power that a microbicide is unable to reach, intervene in and transform.

Interestingly, although the GCM's conceptions of empowerment and science are such that conceptions of the microbicide's transformative potential are curtailed, the campaign also shows another side that is invested in the natural-culture complexity of Zena Stein's initial idea of a female-controlled prophylaxis. To this end I want to return to Stein, but take a different route of development. This time not through biomedical discourse, but through acceptability studies that articulate a more complex notion of women's bodies and social dimensions by focusing on the microbicide as a tool women can control.

### **A Tool Women Can Control**

The GCM has a primary concern with representing women's needs and as such women's perspectives are central to the way they advocate for microbicides. In doing so, the GCM often, more or less explicitly, builds on acceptability studies conducted within the field. The studies conducted over the years show specific experiences and perspectives on microbicide use of particular women at certain times in various countries. As such, acceptability studies constitute a collection of very specific experience based viewpoints of a wide variety of women, a collection of voices and experiences ranging from for instance female sex workers in southern China (Weeks et al 2007) and Beijing (Han et al 2009), female drug users in Connecticut, Rhode Island and Puerto Rico (Hammett et al 2000), a group of seropositive and seronegative women in Zambia (Jones et al 2008), women visiting a gynaecology clinic in Texas (Auslander et al 2007) and a group of adolescent girls in Texas (Zubowicz 2006 and Short et al 2004), Black/African-American, Latina/Hispanic and White



women in Connecticut, Massachusetts, New York, and Rhode Island (Morrow et al 2007).

There are different types of acceptability studies in terms of how they engage microbicide use. Some are fully hypothetical, some use a surrogate microbicide, and some are a component of the clinical trials testing the actual microbicide candidates. Especially in the early days of microbicide development these studies would be done in a more hypothetical sense, i.e. focus groups or questionnaires in which women are asked what their views are on the idea of a microbicide. In these studies women share their ideas on possible microbicide use, but do not actually use a specific compound. This is different for the acceptability studies that use 'microbicide surrogates', i.e. various female controlled prophylaxes such as vaginal gels, spermicides, foams etc. Finally, there are acceptability studies conducted alongside clinical safety and efficacy trials in which women test the actual microbicide candidate. What I want to focus on here is the hypothetical and surrogate studies using various female-controlled prophylaxes. And, specifically, the more qualitative studies focused on women's perspectives and ideas of incorporating a microbicide into their sexual lives. I make a distinction here between hypothetical or surrogate studies and studies where the actual microbicide candidates are used, because conceptions of the possible effectiveness of the product is not at stake within hypothetical or surrogate studies, but very much so within the acceptability studies as part of the clinical trials. I will reflect on the acceptability studies linked to the candidate microbicides in the following chapters.

In an article published in 2001 in the *Journal of Women's Health and Gender-Based Medicine* Christopher Elias and Christina Coggins conceptualise 'acceptability' by making a statement similar to Stein's critique of the condom as they engage a distinction between efficacy and effectiveness. They explain that condoms are not *effective* to many women because they are not *acceptable* as protection methods for many women in their specific social environment and sexual practices. For a product, especially a female-controlled product, they write, "*product acceptability is the primary determinant of actual use-effectiveness.*" (Elias & Coggins 2001: 164) Therefore, for a product to be acceptable, not only the product characteristics are of importance, as for instance whether it is a gel, foam or other suppository. Rather, what is foregrounded is the manner within which women will use these products, understood to show how women will eventually use a microbicide and as such impact on "*their effectiveness in real life.*" (Elias & Coggins 2001:164) In other words, acceptability studies are understood to show the reality of microbicide effectiveness by making visible women's own experience of microbicide use and the specific ways they incorporate this technology into their socio-sexual relations. I suggest that acceptability studies have a feminist standpoint theory approach, by centralising women's experience and aiming to make women's voices a real part of the scientific machinery of microbicide knowledge production. They aim to show a reality to be included into microbicide development, to go towards a science better attuned to women's needs because it includes

women's voices. As such, and in line with the argument on the performativity of advocacy efforts outlined above, acceptability studies also presume that the need and perspectives of the women they report, pre-exists their engagement. They foreground women's perspectives and experiences in terms of how a microbicide will come to be effective in 'real life'. But this, in turn, presumes their advocacy follows pre-existing perceptions and needs.

Contrary to this presumption, I argue that acceptability studies (or more specifically, the published articles that discuss the results of these studies) and the GCM documents inspired by this research construe the woman conceived to be in need of microbicides. However, in contrast to my reading of advocacy discourse above, I suggest that acceptability studies position women's bodies at the very centre of normative power relations, within which women will come to use the microbicide. I suggest that through their conception of the microbicide as a tool women can *control* complex conceptions of how power invests women's bodies come to the fore, through the specific norms that are performed across culturally embedded sexual practices. Consequently, the women in campaign documents inspired by acceptability studies under analysis here emerge as complex figures with the potential to transgress power relations within the terms of power itself as the microbicide comes to be articulated as an intervention into power relations, bodies and sexualised practices.

It is no coincidence that I extend my argument on the performativity of advocacy into acceptability studies, as the two fields are closely related. In fact, on the one hand advocacy documents often more or less explicitly refer to these studies, and on the other hand an advocacy tone often slips into the articles analysing the study results. Because the articles based on these studies often adopt an advocacy tone, there is a certain mutual influence at stake between microbicide advocacy and acceptability studies. For this reason, I will focus on articles based on acceptability studies to examine more closely what is implied by the advocacy slogan *to give women a tool they can control*.

In particular, in articles based on acceptability studies women's perspectives are articulated through specific themes which are aimed at representing the women in need of microbicides. As such, I will look more closely at certain specific articulations of the microbicide as a tool women can control through analysing the problematic of 'covert prevention' and the articulations of 'user-initiated prevention' as an 'intravaginal practice'.

### *A Tool She Can Control*

Underlying gender power inequalities severely limit the ability of many women to protect themselves from HIV infection, especially in the absence of a prevention technology they can *use*, when necessary, without a partner's consent. The development of new prevention methods *controllable by women* would fill an important gap in the global response

to the AIDS pandemic. (Elias & Heise 1994: 1 emphasis added)

Topical microbicides, substances that are applied in either the vagina or rectum to reduce the risk of infection, currently hold great promise, in part because they do not require the active participation or even knowledge of the partner. Such innovations invite new decision-making strategies. *How a woman decides to use a new product is a complex process – a balance of her perception of risk, understanding of the product and how it works, anticipation of her partner's reaction to use and consideration of the relationship's balance of power.* Furthermore, even though these concerns are likely to be similar for women everywhere, socioeconomic status and social and cultural norms will influence the outcome of such decision-making. Use of microbicides, theoretically under a woman's control, may not be possible if she has no decision-making power in sexual activities. (...) Control may be accomplished through secret or hidden use, which carries its own risk should it be discovered. (Woodsong 2004: 94 emphasis added)

The idea of a tool women can control to protect themselves from the HIV virus has remained the central articulation of a microbicide as an intervention in the advocacy field. Zena Stein called for female-controlled prophylaxis towards women's empowerment in the HIV pandemic and, as the above statement shows, this conceptualisation was adopted by Lori Heise and Chris Elias. As already became evident in WHO discourse set out in the introduction of this thesis, as well as Zena Stein's conceptualisation of the need for a female-controlled prophylaxis, women's specific vulnerability to HIV infection is often articulated as their lack of power to assert themselves within their sexual relationships. As such, women are understood to lack the power to take control over their sexual relationships, as for instance instigating condom use. The microbicide is then put forward as an intervention under women's control, however as the above quotations already signal, exactly how women will assert this control through microbicide use is far from straight forward. To what extent women will actually be able to take control within their sexual practices is a central problematic engaged with in acceptability studies. In a similar vein, Tanner et al write:

Historically, microbicide development has been situated in the need for a woman-controlled method of protection against STIs, as it is suggested that underlying gender inequalities limit women's abilities to protect themselves and ensure condom use. (...) Thus, the anticipated arrival of microbicides, a woman-controlled method, is considered by many to be a

significant advancement in public health's efforts to control STI and HIV incidence. An inherent contradiction exists, however, in the promotion of a "woman-controlled" method to be used by a woman for the protection of her own body. *The rationale for microbicide development has been based on the assumption that women have less control than men in sexual decision making (...)* In suggesting that women actually do not have control of their bodies or their sexual behaviours, this argument implies that women may not, in fact, be able to effectively adopt a female-initiated method. (Tanner et al 2009: 15 emphasis added)

Indeed, the assumption that women have less control than men in sexual decision making, that women are more or less powerless within their sexual practices has fuelled the perceived need for vaginal microbicides. As such, women's vulnerability is understood as a lack of power, suggesting that power is something women either have or have not. In line with this understanding of women's vulnerability, Cynthia Woodsong, a researcher based in the nonprofit human development organisation Family Health International who is strongly associated with microbicide acceptability studies problematises the sexual norms that condone or favour men having several partners whereas the woman is expected to remain faithful:

Unfortunately, monogamy presents a myriad of problems. (...) Women who suspect their partner of infidelity may be unable to act on this suspicion, because in much of the world a double standard prevails—women are expected to remain faithful, whereas men are not. (Woodsong 2004: 95)

As women may not have the power to insist on the use of a microbicide, the field has opted that they could gain this control by using this technology secretly. This conception of a microbicide as a technology women can use covertly or secretly has been tied to the concept of a microbicide since its initial emergence. Covert use was already implied in Heise and Elias' article discussed above as they suggested women need "*a prevention technology they can use, when necessary, without a partner's consent*" (Elias and Heise 1994: 1). However, in contrast, articles based on acceptability studies argue that the idea of covert use is problematic and most likely not how women will eventually use a microbicide. By centralising women's own perspectives and practices, these publications reveal a conception of power that is a lot more complex.

To problematise covert use, I will focus on an article published by Koo and Woodsong et al in 2005 called *Context and Acceptability of Topical Microbicides: sexual relationships*. This article discusses the findings of their acceptability study called *Acceptability of Microbicides across Risk Groups and Time* which was conducted from mid

2001 to 2002. As they explain, this study was conducted on African American, Latino and Caucasian adolescents (aged 16-19) and 23 health professionals through conducting interviews, observations and focus groups. The research sites were STD and Family Planning Clinics in North Carolina (Koo et al 2005: 3). The women in the study were given the vaginal lubricant Replens (often used as a placebo in microbicide's RCT) and a suppository (Lubrin) to mimic the delivery systems of the microbicides most likely to make it to trial (Koo et al 2005: 4). Specifically, this article articulates whether women would be able to use a microbicide secretly or not as dependent on the type of relationship they were in – a casual or primary relationship. Central to these rationales are women's perceptions pertaining to norms surrounding the type of relationship. Within casual relationships the women in this study are put forward to be more open to secret use as they felt less of a responsibility towards a casual partner. However, within stable relationships microbicide use gets caught up in a complex web of norms.

Women's risk of HIV infection within their 'monogamous' relationships is a central theme in advocacy discourse. Accordingly, in this article Koo and Woodsong articulate the majority of participants as perceiving open introduction of the microbicide into these relationships as unacceptable precisely because it questions the monogamy of the relationship:

Specifically, participants felt that both men and women in established relationships would be concerned that talking about a protection product would imply infidelity and/or suspected infection of either partner. Several female participants stated that men would believe a woman was unfaithful if she introduced a microbicide product into a serious relationship (Koo et al 2005: 9).

Participants acknowledged that a woman's decision to tell her partner about her prevention concerns was closely related to the type of relationship, the personality of the man, her relative power in the relationship, and her own level of trust with that partner. Taking these factors into account, many felt that covert use of a vaginal microbicide would be easier than having to cope with suspicions and accusations that would arise from raising the issue of protection. (Koo et al 2005: 12)

In other words, it would be difficult to openly instigate the use of a microbicide as stable relationships are understood to be built on trust, and, consequently, introducing the microbicide into the relationship would be a token of distrust or a sign of infidelity. In this context, secret use might be an option.

Although the idea of secret use was initially put forward as a way for women to take

control within their relationships within a lack of power, Koo and Woodsong argue secrecy or covert use to be highly problematic. Specifically, the norms surrounding stable relationships relating to trust and honesty towards a partner are understood as such, that covert use would be unacceptable. Therefore, covert use is put forward to raise the complex contradiction, that on the one hand the women in this study felt they had a duty to tell their long terms partners and thus use a microbicide openly. While, on the other hand, the norms within their long terms relationships were such, that such an open introduction would place the partnership in question. I argue that this study inadvertently suggests that secret use would not take place outside power relations, but is rather fully enmeshed within them. Therefore, secret use and the distribution of power this conception is based on, has an awkward correspondence to how a microbicide would be embedded within women's specific practices which are indeed ridden with power relations and normative conceptions of sexuality and sexual relations.

Furthermore, Koo and Woodsong put the women of this study forward as thinking of ways out of the covert use contradiction within their monogamous relationships by shifting the meaning of a microbicide to correspond with the norms surrounding their bodies and sexuality. For instance, a product used for contraception or to enhance sexual pleasure. This way they can be open about its use, they don't need to hide the object, but rather shift the meaning of a microbicide to fit the normativity inherent in their sexual relationships.

A number of women suggested that they would be more likely to use microbicides if they could tell their partner that the product was providing contraceptive protection, perhaps as a back-up method to their regular birth control method. They also saw a potential for introducing a vaginal product as something to enhance the sexual encounter, which had the added side benefit of providing protection. They could thus circumvent the negative implications of introducing protection. ("The people you wouldn't want to tell I'm going to use this [vaginal protection product]—you can just say well we are going to use this cool thing [fun, flavorful lubricant]"; Caucasian teen female, focus group). These examples of indirect covert use point to the potential importance of being able to obscure the purpose of product use, rather than attempting to hide it altogether. (Koo et al 2005: 13)

Koo and Woodsong, contrary to the conception that women's vulnerability is due to a lack of power, articulate the manner in which women found ways to act, to engage the norms and social relations they live in. This understanding of women's agency within their sexual practices emerging from acceptability studies such as the Koo and Woodsong study discussed above, led the GCM in particular to steer away from understanding control as

covert use and focus more on the microbicide as a user-initiated prevention method as for instance the GCM stated “*user-initiated prevention doesn’t necessarily imply covert prevention*” (GCM 2010c). I suggest that, although the GCM did not rethink their conception of power, in part they enact it in the manner in which they changed their approach. In this new approach, there is no outside to power. As such, their conceptualisation of ‘user-initiated prevention’ is in line with a Foucauldian understanding of power, in which power is immanent. Furthermore, I understand ‘user-initiated prevention’ to be in line with a conception of Butler’s performativity as women find ways to transform power relations on the terrain of those power relations that leave them at risk of HIV infection.

I argue that women’s vulnerability to HIV infection does not reside within a lack of power, but rather within specific relations which may be understood as relations of power. In particular, they may be understood as relations that constitute women at risk of HIV infection. On the basis of this argument, it is possible to suggest that women embody the potential to transgress the relations that put them at risk. Women’s bodies become potentially subversive components within their own construction, through the manner in which they are able to include the microbicide into their sexual practices and are as such enabled to potentially transform those practices that leave them at risk and thereby their vulnerability. Therefore, importantly, within this potentially subversive embodiment, the microbicide as a technology is central.

I propose that the specific meanings women are able to ascribe to a microbicide are an important part of what a microbicide is, and the transformative potential it holds. As such, the normative investment of power into women’s bodies, sexuality, partnerships and so on, become a vital part of the microbicide’s potential to transform those power relations that put women at risk. The specific ways in which a microbicide becomes meaningful and materialises as an HIV prevention device and a transformative technology is not predetermined, rather the microbicide as an intervention becomes part of a performative process and is thereby intimately related to women’s bodies through the normative practices women already engage in. In particular I suggest that a user-initiated prevention method entails an understanding of microbicide use as an ‘intravaginal practice’.

### *User-Initiated Intravaginal Practices*

‘Intravaginal practice’ is a concept that continuously emerges within acceptability studies, as microbicide use is understood as a user-initiated practice, through which women can assert some form of control. Initially intravaginal practices referred to women’s specific ‘dry sex’ practices, which include inserting herbs or other substances to tighten and/or dry the vagina. However, in recent years the concept intravaginal practices has been broadened to include a variety of practices women engage in for sexual, health or hygiene

reasons.<sup>17</sup> Here I will discuss an article published by Braunstein et al based on a literature review and a series of in depth interviews with 13 “*key informants*” (Braunstein et al 2005: 425) such as researchers, professors, HIV/AIDS counsellors, research nurses and sex therapists (Braunstein et al 2005: 426) in Brazil, Burkina Faso, Senegal, India, Kenya, South Africa, Thailand, the United States and Zimbabwe. (Braunstein et al 2005: 425) In this article the researchers define intravaginal practices as such:

In the literature, vaginal practices have been described as cleansing the vagina and genital area with commercial and non-commercial products, wiping inside the vagina or inserting substances inside the vagina to remove vaginal fluids, and inserting herbal or nonherbal preparations or constrict or tighten the vaginal walls. Vaginal practices have been reported in sub-Saharan and West-Africa, the Dominican Republic, Haiti, Indonesia, Qatar, Thailand, and the United States. Women report a range of reasons for engaging in vaginal practices, including genital hygiene (by removing menstrual blood, vaginal discharge, and undesirable odors), to improve sexual pleasure (by drying, tightening, or warming the vagina in preparation of sex), to prevent accusations of promiscuity (by keeping the vagina dry), to prevent pregnancy (by removing semen after intercourse), to safeguard fertility, and to prevent or self-treat vaginal infections. (Braunstein 2005: 427)

*In Bodies that Matter* Judith Butler put the sexualisation of women’s bodies in all its materiality forward as an effect of regulatory practices. I propose that women’s intravaginal practices can be thought as such a regulatory practice, with the potential to subvert existing norms, but very much within the terms of these mechanisms of power themselves. Butler advocated for “*a return to the notion of matter, not as a site or surface, but as a process of materialization that stabilizes over time to produce the effect of boundary, fixity, and surface we call matter.*” (Butler 1994: 9 emphasis omitted) Following this line of thought, women’s intravaginal practices are normative practices, through which women’s bodies materialise in specific ways. The constant repetition of these practices is a process of materialisation, which produces women’s bodies as specifically sexed. In this sense, the manner within which a microbicide can be integrated into women’s sexual relations is understood to be contingent on the norms that invest the sexualisation of women’s bodies.

Interestingly enough, as became evident in the above discussion, the advocacy articulations through biomedicine construed a natural female body, pre-existing culture and relations of power. In contrast, I suggest that acceptability studies inspire a different

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<sup>17</sup> In an article co-written by Zena Stein and published in the *Lancet* vaginal practices are described as such: “*Commonly referred to as “dry sex” practices, a broader concept of intravaginal practices has emerged in recent years that encompasses wiping, cleansing, douching, or the insertion of substances into the vagina.*” (Myer et al 2005: 786)



approach, one that positions women's bodies at the very centre of normative power relations, within which women will be able or unable to use the microbicide in various ways. The important role women's 'intravaginal practices' play within acceptability studies is a lucid example of this concern with norms, and their possible transformation. As such, I propose that acceptability studies constitute an important space within which questions pertaining to the power relations within which microbicide will be used and the performative construction of women's bodies can be asked.

Furthermore, the acceptability studies discussed here not only pay heed to women's intravaginal practices, but how the microbicide becomes an internal part of these practices. Intravaginal practices are closely related to vaginal lubrication and how this lubrication is understood, specifically in terms of health and hygiene or sexual pleasure. The surrogates discussed here, and indeed most microbicides that made it to trial, are vaginal gels. This makes the meaning of vaginal lubrication within intravaginal practices of central importance, both for the extent to which a microbicide would enable women within their practices as well as how its lubricating effects would constrain its use.<sup>18</sup> In a similar vein, Braunstein et al explain:

Informants thought that norms regarding lubrication during sex and related vaginal practices might have implications for the acceptability of vaginal microbicides, although the influence could be bidirectional. On the one hand, norms that make only a very specific optimal amount of vaginal lubrication during sex acceptable, particularly if there are severe consequences for women who fail to achieve this optimal amount, may negatively affect acceptability. On the other hand, vaginal practices might support acceptability, as women who engage in such practices are likely more comfortable with inserting products into the vagina and with touching their genitals in general. A product that makes women and their

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<sup>18</sup> In the article published by Woodsong discussed above, the lubricating characteristics of microbicides were already problematised as the manner in which this lubrication is understood to become meaningful within women's sexual practices differs among women and across cultures. Specifically, women were put forward as voicing being afraid that extra vaginal lubrication would constrain covert use because it could lead to them being accused of being unfaithful or having a vaginal infection, while other women made clear that an increase in vaginal lubrication could be seen as beneficial.

Certain culturally prescribed sexual practices may make covert use difficult. In cultural groups that value a dry vagina during sexual intercourse, the lubricating qualities of microbicides may preclude covert use. The lubricating quality may make men doubt their partner's fidelity or suspect her of having a vaginal infection. Some women will fear a negative and perhaps violent response from partners who discover covert use.

In contrast, some women in one U.S. study believed that covert use might improve the sexual encounter for male partners, saying that the extra lubrication could heighten his feeling of prowess in sexually arousing the woman. Indeed, some men in the study whose partners used a proxy product were pleased that the extra lubrication freed them from extensive foreplay to stimulate their partners. Women said the additional lubrication made sex physically more enjoyable for them, and some reported a thrill from the act of secrecy itself. Since insufficient vaginal lubrication during sex is a common problem, microbicides could improve sexual intercourse for many women, regardless of the cultural preferences of men. (Woodsong 2004: 95)

partners feel clean or fresh during sex would likely be highly acceptable in areas where norms promote hygiene and genital cleanliness for sex. Several informants thought that users would likely perceive a product as clean that is clear or light in colour, that is formulated as a gel or cream rather than a suppository or foam, and that is odourless and tasteless. (Braunstein 2005: 430)

Importantly, the quote above articulates microbicide use *as* a vaginal practice, and as such what is foregrounded to be of dire importance for the effectiveness of potential microbicides, are the norms surrounding vaginal lubrication and the needed correspondence between product characteristics and the sexual practices in which the microbicide will be used. Understanding microbicide use *as* an intravaginal practice creates possibilities for understanding female-controlled prophylaxes to be embedded within the social and sexual norms surrounding the intravaginal practices women already engage in. Intravaginal practices are ridden with norms pertaining to women's bodies, sexuality, sexual pleasure and relationship dynamics and these norms are inherently tied to whether a microbicide would be an acceptable product for women to insert intravaginally. In other words, intravaginal practices are normative practices which enable or foreclose eventual microbicide use. Tanner et al describe this well, when they state that "*In order to address the complex integration of a microbicide into the sexual repertoire of young women, it is important to understand the meanings associated with their bodies, sexual behaviours, sexual partners, and the product.*" (Tanner et al 2009: 16) In a similar vein, one acceptability study on African American women's vaginal practices and prophylaxes acceptability states: "*Prevention of HIV sexual transmission does not occur in a vacuum.*" (Reiff et al 2008: 1350)

Therefore, I suggest that acceptability studies create a space through which microbicide use can be understood to be embedded within specific normative practices (such as intravaginal practices) and as such they create the possibility of analysing and understanding the socio-sexual normativity that will gather around microbicide use. Once again, microbicide use is fully embedded within power relations, which also implies that microbicide use in itself is not a subversive act. Rather, a microbicide has the potential to enable a subversive repetition of the power relations and normative practices that leave women at risk. In this sense, microbicide use can be understood to constitute, what Butler has called, "*a practice of improvisation within a scene of constraint.*" (Butler 2004: 11)

As mentioned above, acceptability studies researchers often adopt an advocacy voice, in relation to the potential of a microbicide to transform the power relations that put women at risk. Because a microbicide will be embedded within normative practices it is positioned in such a way that it has the potential to alter these normative scenarios. Indeed, the microbicide is put forward as an intravaginal practice that would have the potential to transform the power imbalances that put women at risk of HIV infection.

Microbicide use as an intravaginal practice is understood to impact upon women's lives, a possible change of their sexual relations: "*Topical microbicides could help balance inequities in sexual relationships by shifting aspects of relationship dynamics, power and control.*" (Woodsong 2004: 97)

Although the concept 'intravaginal practice' is not used within GCM documents, I suggest that their focus on user-initiated prevention allowed for a similar conceptualisation. For instance, the GCM in an advisory document for other advocates states:

Instead of interrupting passion, a woman could initiate the conversation in a neutral setting, simply as information sharing. Gaining a man's passive agreement to the use of a microbicide in that context might well be easier for many women than asking the man to either put on a male condom or allow insertion of a female condom during sex. Thus microbicides could enable receptive sex partners to manage their own protection without the need to negotiate or interrupt sexual spontaneity every time. (GCM 2010c)

The socio-sexual complexity put forward in the GCM statements inspired by acceptability studies, is in stark contrast to the dualist mode of thought discussed above. The manner in which the field analyses women's incorporation of the microbicide into their intravaginal practices already disturbs a conception where the power of transformation is seen to reside within the social and the matter of a physiological vulnerability to HIV infection within the physiological. These studies and the advocacy statements based on these studies articulate that there is something much more complex at stake.

Central to Donna Haraway's cyborg myth as well as Karen Barad's conception of intra-action is the boundary breakdown between embodiment and technology. I argue that these acceptability studies invite an understanding of the microbicide's transformative potential as construed through the intra-actions between this technology and women's specific embodiments. Importantly, acceptability studies do not put women's use of a microbicide forward in any predetermined manner, in terms of the meanings that can be ascribed to a microbicide as well as the specific ways in which a microbicide could materialise as an intravaginal practice. Rather, the microbicide and the specific sexualisation of women's bodies come to be in relation to each other, they are intra-active, or as Nelly Oudshoorn would say, "*mutually constitutive*" (Oudshoorn 2003b: 241).

## A Narrative of Promise

Understanding the world is about living inside stories. There's no place to be in the world outside stories. And these stories are literalized in these objects. Or better, objects are frozen stories. (...) This is the oxymoronic quality of physicality that is the result of the permanent coexistence of stories embedded in physical semiotic fleshy bloody existence. None of this is an abstraction. (Haraway 2000: 107)

Zena Stein put forward female-controlled prophylaxes as technologies for women's empowerment in the HIV pandemic. As such, she put forward a transformative technology which allows for a transformation of power relations that leave women at risk of HIV infection as they pertain to women's sex, gender and sexuality, thereby opening the door to a different future. I suggest that as an *intervention* a microbicide can indeed be understood as a transformative technology, and as a transformative technology the idea of a microbicide carries a certain promise of empowerment.

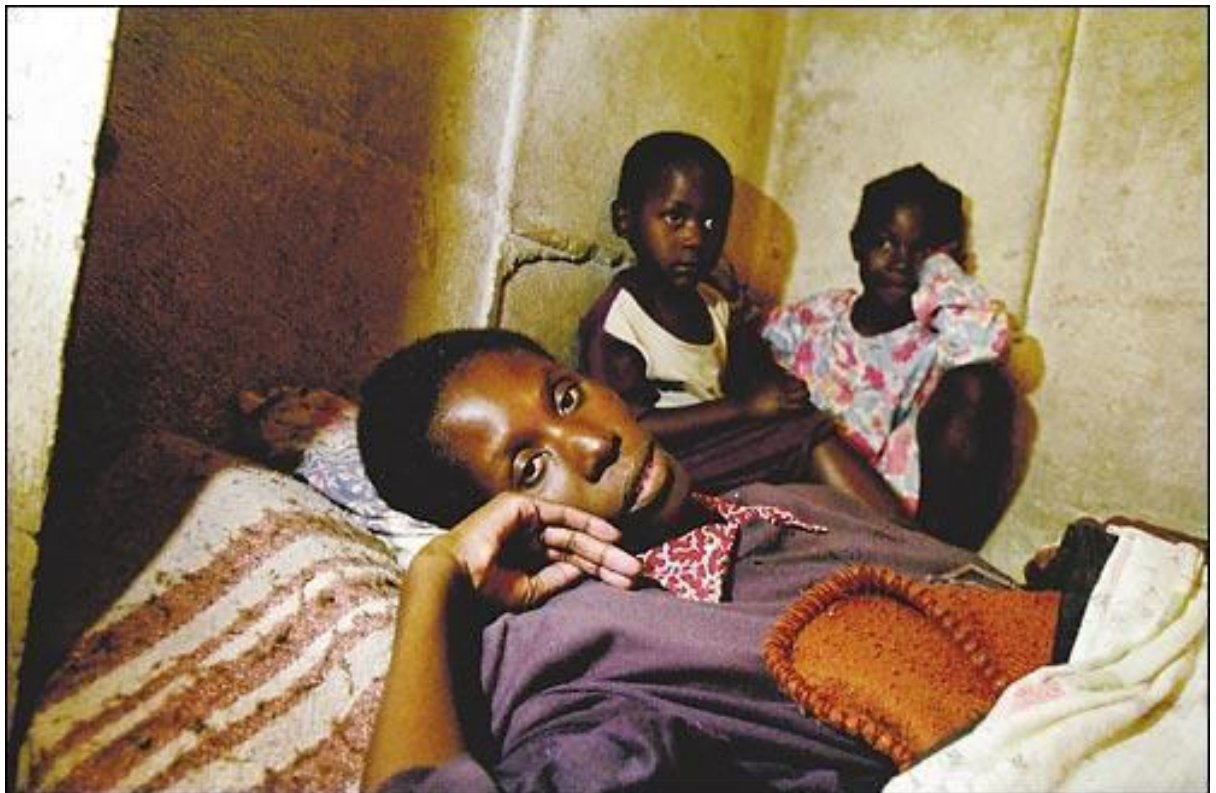
In order to look more closely at how the promise of microbicides is construed in the field of microbicide advocacy, I will specifically look to the photo essay *In Her Mother's Shoes* that was turned into a travelling exhibition by the Global Campaign for Microbicides called *Giving Women Power over AIDS*. It is not surprising that the GCM took up this publication to turn into an exhibition as the story gives a face to the need for a microbicide. It is a story about women's vulnerability, powerlessness and suffering, but it is also a story about hope and the possibility of a different future generated by the development of a microbicide. In the analysis below I want to focus on the two central figures of the story 6 year old Martha and her 24 year old mother Ruth. Through these figures both women's vulnerability to HIV and the hope for a different future central to the field of microbicide development becomes evident.

### *A Story of Vulnerability and Promise*

*In Her Mother's Shoes* was written by Paula Block accompanied by photographs made by Betty Udesden, published in the Seattle Times in 2004. The essay tells us that at the time it was written, 19.2 million of the 38.6 million people living with HIV/AIDS worldwide were women. (Block & Udesden 2004: 1) In Sub-Saharan Africa specifically 28.5 million people were infected with HIV and 2.3 million people died of AIDS in the year prior to when *In Her Mother's Shoes* was written (Block & Udesden 2004: 1). The aim of this essay was to give meaning to these abstract numbers through the figures whose lives were photographed and narrated in the photo essay. It is a story of a young woman's death and the days of mourning that followed and how her death affected her mother, siblings and

children. The women made visible through photographs give the narrative extra strength. They draw the reader into the stories told by each of the figures, their experiences, their knowledge of living with the AIDS epidemic in a township called Mabvuku in Harare, Zimbabwe.

In this advocacy essay, women's specific vulnerability to HIV infection is articulated through the figure of Ruth. Ruth is one of six children and lives with her mother, since her husband died. She traded small items across markets, to help her family earn more money, before she fell ill. Above all, her figure is one of powerlessness and vulnerability to the virus. Ruth is powerless to change her husband's sexual behaviour, his relationships outside of their marriage, powerless to protect herself from her HIV infected husband, and now, finally, powerless against the HIV virus. She articulates the lack of available options women have in their gendered lives to protect themselves against HIV within marriage. "*Ruth Chimuenji, AIDS victim.*" (Block & Udesden 2004: 2)



When Block and Udesden arrive at Ruth's house, she is lying in bed in a small room created by makeshift walls. Her stomach is running at both ends, she has no appetite, no energy; "*She is 24 and gaunt, with hollow cheeks and exhausted eyes.*" (Block & Udesden 2004: 2) Ruth is dying of AIDS.

The essays tells us that men might use condoms when visiting prostitutes but not in their intimate relationships with their wives and steady girlfriends. Consequently, most

women get infected in their 'monogamous' relationships. This problematic is articulated through Ruth's story of how she became infected.

Ruth was 17, Richard older than 30, when they met. She broke up with a boy from church to walk with him. He was suave, handsome, funny, a fine storyteller. He made good money trucking building materials for a multinational joint venture. He brought groceries for her mother, money for her father, a cassette player for her sisters.

After a year, Richard paid Ruth's parents a bride price of 9.000 Zimbabwean dollars and took her to Kuwadzana, a township 15 minutes from Mabvuku by car. Ruth became pregnant with Martha. That's when she found out Richard had four children by two other wives even though he said he'd been married only once before. He hung around bars, had girlfriends on the side and rarely allowed Ruth to visit home because he was jealous of her old boyfriend.

All this came as a surprise, but was not without precedent. Each of Ruth's three older sisters had become pregnant by men who tricked them and soon fled or died. (...)

Richard continued to stray; Ruth continued to forgive. Martha was born, then almost two years later, Tafadzwa. When the baby was just weeks old, Ruth and Richard came down with tuberculosis. Ruth responded to treatment and, with Tafadzwa swaddled on her back and Martha toddling at her feet, she cooked and cared for her husband for more than a year until he wasted to death in 2000. (Block & Udesden 2004: 12)

Ruth has been ill for two weeks. Her mother, Amai Cathy, takes care of her as best she can. The family is poor, there is not enough money for buying gloves to wear when cleaning her daughter's body, let alone medicine. Through the story we get to be a part of their intimate relationship, the moments towards Ruth's death which are marked by a lack of hope.

In the room where Ruth lies dying, it makes the afternoon hang heavy, the air unbearably clammy. Ruth tired from our talk. Her eyelids drop shut. She shudders, winces, looks up at the sooty metal roof. What does she dream?

*“I always dream if I was stronger as ever I would be doing A, and B, and C... selling things,” she says. “But now those dreams are nothing”. She struggles for breath. “Now... I... don’t... think... I’ll... do.... those... things.”*

Smoke drifts in from the dirt courtyard where cornmeal mush simmers in a black pot. Little Martha plays with her fingers, walking them along the stripes that edge her mother’s thin blanket. Outside, a cranky car engine revs. Chickens scrabble and coo. How the living live. And the dead?

*“Maybe they stay around a while,” Ruth says, her words barely there. “Like a spirit you hear in your sleep as if a voice is talking to you.”*

She looks at her mother, questioning. Amai Caty raises her head. In the weak yellow light, you can see the sweet sweep of her cheekbones, the lustre of her skin. You realize where Ruth gets her glow, and for a strange moment, the bedside tableau looks beautiful, a gauzy vintage ad for Ivory soap. But this is real life, real time, Zimbabwe in the age of AIDS.

*“When you die, you die,” the older woman tells the younger. “That’s it. You don’t come back.”*

Tafadwa wets his pants and cries, curling up like a potato bug and snuffling into his shirt. Martha tries to comfort him. Warm urine and cold sweat soak the blankets. (Block and Udesden 2004: 5)

Ruth died the next day. She passed away hanging over a squatting-toilet while Amai Caty cleaned the vomit and diarrhoea off her body.

Without doubt, Ruth is a figure of vulnerability and is positioned within the essay to articulate women’s need for a microbicide. In the previous discussion of GCM documents and their articulation of women’s vulnerability, I argued that this articulation is performative. That is to say, advocacy efforts are constitutive of the woman they represent to be in need of microbicides. By making this argument, I do not intend to underplay the material reality that constitutes women’s vulnerability to HIV infection. Specifically, my intension here is not to lessen the powerful and heavy real of Ruth’s story. In the essay, Ruth tells her lived reality of her vulnerability and powerlessness to the HIV virus and the specific socio-sexual relations that put her at risk of infection. Her story is not mere textual representation, but espouses a lived reality that reaches beyond the textual. What is at stake in my engagement with the figure of Ruth here, is the story Ruth tells of her material reality and how this real finds its place within advocacy discourse. Once again, following Judith Butler, I want to focus here on the figure of Ruth and specifically on her

performative function within the essay.

In *Frames of War*, Judith Butler calls attention to the performativity of framing images<sup>19</sup>. Butler writes, “*The “frames” that work to differentiate the lives we apprehend from those we cannot (or that produce lives across a continuum of life) not only organize visual experience but also generate specific ontologies of the subject.*” (Butler 2009: 3) When observing the image of Ruth through a performative scope, the question emerges of how the frames that encapsulate the image are constitutive of the figure of Ruth? Indeed, the way the image is framed in terms of its specific edges has a performative function in the advocacy discourse in which it is situated. Both children are looking another way, but Ruth is staring straight at us. The image appears as if we step into Ruth’s bed, where she lays with her two children. Ruth is a forceful narrator because she can be inhabited, she draws us in, inside her bed soaked with warm urine and cold sweat, alongside her two children. If we are drawn into her suffering and vulnerability to the HIV virus, we as the audience become interpellated into the need for a HIV prevention tool aimed at women. That is to say, Ruth’s story signifies the need for a microbicide, or a tool women can control, something, to shift or alter the relations of power that leave women vulnerable to HIV infection.

The introduction found on the GCM’s website to the travelling exhibition *Giving Women Power over AIDS* explicitly positions the microbicide as a preventative technology as a tool of hope, as it states:

The Global Campaign for Microbicides has transformed their remarkable photo essay into a photo exhibit that describes *what it means to be a woman in a world of AIDS* – a world where many women have no way to protect themselves against HIV and little say about relationships, about sex, about condoms. A handful of scientists and advocates are racing to curb the loss of future generations from this epidemic. Their ambition is to give women a way to protect themselves. *Their pursuit, a microbicide, could offer this hope.* (GCM 2011a emphasis added)

Prevention technologies find their place within the essay, through their focus on nonprofit organisations (like the global health NGO PATH (Program for the Introduction and Adaptation of Contraceptive Technology) and the non profit unit Women’s Global Health Imperative (WGHI)) that work on the development of female controlled HIV prevention methods. In the essay, the scientists working at PATH on female-initiated HIV prevention technologies are called “*high-tech tinkerers*” (Block & Udesden 2004: 6). When introducing these scientists, the essay invokes Amai Caty’s statement that “*when you die, you die...*”

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<sup>19</sup> Although this work is based on *Precarious Life* and sits within Butler’s more recent work which focuses on contemporary war efforts instead of gender and sexuality, her performative mode of thought is very similar to the Butler of *Gender Trouble* and *Bodies that Matter*, specifically in terms of her critique of representation and her ethical engagement with ontology - the conditions of possibility for a life to be deemed liveable. Butler writes: “*If certain lives do not qualify as lives or are, from the start, not conceivable as lives within certain epistemological frames, then these lives are never lived nor lost in the full sense*”. (Butler 2009: 1)



*That's it. You don't come back.*" Furthermore, her statement is placed alongside an image portraying a female 'high-tech tinkerer' making a female condom with the caption: "*The search for solutions has become a race against time and culture*". (Block & Udesden 2004: 6) The scientist is then quoted as saying "*We hear all these horror stories about women whose husbands refuse to wear male condoms but go out and use prostitutes and it makes you go, 'Oh boy, we really gotta do something.'*" (Block and Udesden: 6)

I argued that in the alliance of biomedicine and women's health advocacy a separation is construed between the social problematic of women's risk of HIV infection and the biomedical pursuit of a technology that is aimed at the physiological vulnerability of women's bodies. Here, Ruth's story functions as a context that scientific development is set out against. As such, the development of microbicides is set out against politics and culture and the power relations that make up part of the problematic at hand are understood to exist outside biomedical development. Accordingly, technology generates an opening into a different future for women vulnerable to HIV infection: "*[a]nd while it grows too late for Ruth's generation, they [high-tech tinkerers] look to the future, to little girls like Martha. The race to save them is a race against the virus, against hormones, against politics, against the clock.*" (Block and Udesden: 2) Here, in the manner within which science is positioned, biomedicine's authoritative role to discover and describe the material real of HIV infection free from cultural dimensions and power relations and its ability to materialise a technology that promises a different future come together.

The possibility for a different future figures strongly in the essay, through the figure of Martha. Martha is almost 6 years old. She likes dressing up in floral dresses, playing around the outdoor sink, pebble games and drinking tea with lots of sugar, if sugar is available in the house. Martha is still only a little girl, but the essay shows Ruth's worry for her daughter:

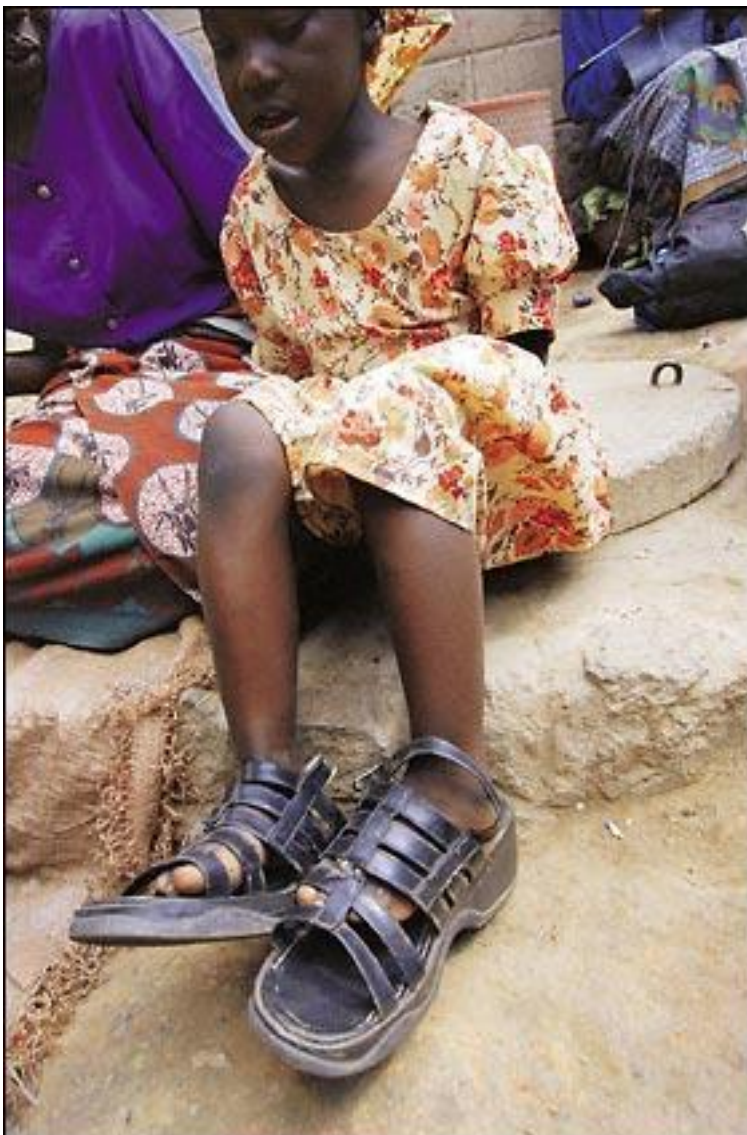
Who will protect her quiet daughter as she becomes a woman? If there is no food, no school, no jobs, what might Martha be forced to do to survive? What if she falls for the wrong man? Who will teach Martha about love?

*"I wish my daughter would grow up to be a big girl, get a proper education and get married to a husband who will take care of her,"* Ruth says, her voice a wisp. "*Not like what happened to me.*" (Block & Udesden 2004: 1)

In the days after Ruth's funeral Martha is playing around the house, together with children from the neighbourhood, in a new floral dress. When she finally gets tired she sits down next to her aunt Mercy, who promised Ruth to take care of Martha when she died. Mercy is wearing Ruth's clothes now, as well as Ruth's heavy black sandals which she kicks off as Martha sits down besides her.

Martha leans against Mercy, tracing the brown leaves on her dress. “*My mother,*” she says. “*My mother cooked my breakfast. My mother plaited my hair. My mother... I’m forgetting.*”

For a long while, she says nothing. She watches a bug crawl over a crack. She wiggles her toes. She notices her mother’s sandals askew next to Mercy’s ankles, and slips her small feet into them. They’re way too big. Hopefully she won’t grow into them anytime soon. (Block and Udesden 2004: 20)



The essay continuously makes the claim that it is too late for Ruth, but that there is still hope for Martha and her generation to be spared from AIDS (Block & Udesden 2004: 6),

i.e. the scientific development of female controlled prophylaxes is able to promise a different future for girls like Martha.

The image that portrays the figure of Martha differs from the image of Ruth in important ways. When looking at the image of Martha and her aunt Mercy, it becomes apparent that they are only partially within the frame. We are drawn into this image, but not through a figure who looks straight at us, rather, Martha is looking at her mother's sandals as indeed the central point of focus in this image is Ruth's sandals with Martha's little feet within them. I suggest that, the moment this image captures is not fully present or fully *of* the present. Martha's feet are still too small to walk in her mother's shoes, and the empty space in her mother's sandals constitutes a promise that she might not have to: "*hopefully she won't grow into them anytime soon.*" Indeed, the figure of Martha articulates a future that a female controlled prophylaxis could generate.

Promise and lived reality mark the mode of figuration in the field of microbicide advocacy. In advocacy texts vulnerability plays a central role, but so does, almost instantaneously, the transformation of this vulnerability, into the hope for a different future – a promise of vaginal microbicides. For Haraway, a promise for a different future is inherent to technoscience and as such becomes invested in the figures that inhabit these scientific terrains. As I discussed in the second chapter of this thesis, for Haraway, within the context of techno-science, the cyborg is a figure of *development*. Although the figures of Ruth and Martha are too far removed from the practices of the biomedical development of vaginal microbicides to fully analyse them in terms of cyborg figuration, they are certainly material-semiotic entities that articulate a material reality of AIDS, while espousing a promised future free from HIV infection. Indeed, this advocacy essay shows how women's vulnerability and the possibility of a different future become tied together through the microbicide as an articulation of hope. That the promise of microbicides is so closely related to ideas of women's empowerment, signals the intimate relation between a lived material reality and an imagination for a different future articulated through the scientific development of vaginal microbicides. As such, scientific development, biomedical process, is an inherent part of the empowerment the microbicide is promised to generate.

## **Conclusion**

### **The importance of science**

The advocacy texts and acceptability studies discussed in this chapter, constitute the various ways in which advocates have come to articulate the idea of a microbicide, and the promise this idea yields as an intervention aimed at women's specific vulnerability to

HIV infection towards a more empowered future. The advocacy conceptions set out in this chapter have shown how the microbicide as an idea has come about and, in particular, the manner within which this idea has been part of a performative process through which notions of women's vulnerability have emerged, both potentially transgressive as well as problematic.

I argued that Zena Stein opened the door to a feminist inhabitation of biomedicine. A feminist-biomedical alliance that, in accordance to the cyborg myth, would inhabit biomedicine as a feminist politics. Science is an inherent part of the empowerment a microbicide is able to promise. Indeed, Stein has set up an extraordinarily complex object with a lot of potential. This came to be reflected in the acceptability studies, which constitute a space of research and analysis that, contrary to biomedical articulations, shows the complexity the microbicide gathers as a physiological as well as social intervention. These studies left a complex performative of 'the vulnerable woman' in which women's own conceptions and performances were a central part of the figure who was construed.

This is in stark contrast to the influence of biomedicine or conceptions of science in advocacy discourse for what constitutes 'the vulnerable woman'. In GCM discourse this figure, contrary to the initial idea of a microbicide, came to be split between her physiology and her social vulnerability. I argued that in accordance to this split, biomedicine was positioned to show the real of women's physiological vulnerability as separated from the social complexity of women's sexual relations. Consequently, women's vulnerability was separated into physiological vulnerability and social risk and within this duality the microbicide came to be voiced as a short term physiological solution to a long term social problematic of women's disempowerment.

In line with the cyborg myth, the technology of microbicides in advocacy discourse is a way to inhabit science, to engage with the transformation of women's vulnerability towards a more empowered future free from AIDS. In this promise, science plays a central role. However, my analysis of the advocacy story showed how Ruth as 'the vulnerable woman' was set out against scientific development. In the advocacy essay, science was set out against the cultural processes that leave women, like Ruth, vulnerable to HIV. I propose that it is problematic to seclude science as 'the bearer of promise' from the social and cultural processes it is 'promised' to intervene in. What are the effects of materialising a feminist idea of empowerment – in which the social and cultural problematic of women's risk of HIV infection is vital – through scientific development, if science is set out against the social and cultural? To answer this question, and others, I will turn my analysis to biomedical process and, specifically, the field's search for an efficacious microbicide candidate.

## **Chapter 5.**

### **A Biomedical Promise**

The collaboration between women's health advocates and biomedicine generated the promise of a biomedical technology for empowerment but, as I argued in the previous chapter, this feminist-biomedical alliance is in itself not without its problems. The field of microbicide development is characterised by a coming together of women's health advocates and biomedical scientists. This alliance has triggered a process in which the concept of women's empowerment has seeped into biomedical enterprise, and biomedical engagement has become part of women's health endeavours instead of merely the object of feminist critique. Furthermore, as the microbicide candidates enter the clinical trials, women participants join this feminist-biomedical collective with their own conceptions and ways of incorporating the microbicide candidates into their sexual relations. In the previous chapter I put forward the promise of microbicides as a promise in which science is of vital importance. What characterises the field of microbicides (and makes it familiar to the cyborg myth), is that the transformation of power relations is sought *through* scientific practices. In this chapter I aim to interrogate the biomedical process that is inherent to this promise. In particular, in this chapter I suggest that the RCT brings together a wide variety of actors including advocates, participants and scientists that do not always share the same stakes in the development of microbicides. However, these different stakes come to be intimately related through the testing of microbicide candidates in the clinical trials, which I suggest, is a relationality that is of ethical concern.

In this chapter I aim to give some sense of the history of biomedical microbicide development since the late 1980s, but not in terms of a linear conception of scientific progress or what Barad would describe as a "...*convention of historical narrative forms that underlie stories of scientific progress: tales of the continuous accretion and refinement of scientific knowledge over the course of history, sagas of progress from an earlier time period to a later one punctuated with discoveries that lead the way out of the swamp of ignorance and uncertainty to the bedrock of solid and certain knowledge.*" (Barad 2010: 244) In fact, I intend to do the opposite. In the following analysis of microbicide development I aim to foreground the complexity of this field and as such I will endeavour to problematise any linear notion of scientific 'progress'.

The material discussed in this chapter consists of a variety of documents published between 1991 and 2008 that surround the microbicide candidates Nonoxynol-9, Savvy, Cellulose Sulfate and Carraguard. Specifically, this collection of texts includes documents published by the GCM (factsheets, a symposium report and clinical trial information), the clinical trial reports of the microbicide candidates under analysis (including colposcopy

photographs) an acceptability study of Nonoxynol-9, and an article written by the scientists involved in the Cellulose Sulfate trials. The GCM website has been of great use for my collection of both advocacy documents and clinical trial information. I often followed the GCM's dissemination of the clinical trials to find the biomedical reports they refer to (especially in the case of Nonoxynol-9 as the dissemination of these trials is a lot more chaotic than the candidates that were tested after). Furthermore, I collected the clinical trial reports through the PubMed database, entering each 'microbicide candidate' AND 'phase III', 'efficacy' or 'effectiveness' study as a key word search. Furthermore, I will once again focus on an acceptability study found through my PubMed database search mentioned in the previous chapter.

I will conduct my analysis through a performative scope focused on the microbicide candidates as scientific objects and as such I will return to the work of Latour and Mol. As discussed in Chapter Three, Latour engaged scientific endeavour in terms of political/scientific collectives consisting of an assemblage of human and nonhuman actors that are part of a performative process and are as such constitutive of the objects under investigation. Specifically, I will use Latour's conceptions of mediation and purification as specifying the performative practices within the scientific-political collectives that make up the field of microbicides. Through these performatives I will analyse how feminist concerns with women's empowerment were brought together with biomedical concerns focused on discovering the facts of the microbicide candidate under investigation. Latour's distinction between matters of fact and matters of concern will be of great value here. Utilising this distinction I aim to investigate the production of the facts of a microbicide candidate as the production of discrete objects, whose effects on the HIV virus and women's bodies are discovered and described by scientific engagement. Furthermore, and in contrast, I aim to analyse the microbicide candidates as matters of concern – objects that emerge in relation to the RCT and the social dimensions of women's vulnerability.

In order to investigate the similarities and differences between the manner within which different collectives enact the microbicide, I will return to Mol and her notion of multiplicity as discussed in the third chapter of this thesis. In line with Latour, Mol argued that scientific objects emerge from specific scientific practices, they do not pre-exist the various material techniques of investigation through which these objects become known. However, she elaborates this analysis to claim, unlike Latour, that as a scientific object is enacted differently across different collectives, the object multiplies. In a similar vein, I argue that through the different ways the microbicide candidate is enacted within the RCT, this object emerges as multiple. I suggest that this multiplicity raises fundamental questions surrounding what is at stake within the RCTs and for whom. However, before interrogating biomedical process and the multiplicity it invokes through discussing the candidates Nonoxynol-9, Savvy, Cellulose Sulfate and Carraguard, I will contextualise these issues through discussing the symposium on the ethical and practical dilemmas of

microbicide testing held in 1997.

### **A Symposium of Ethical and Practical Dilemmas**

To give an introductory background to the association between feminism and biomedicine in terms of the testing of microbicide candidates in the RCTs I will look at the report of the symposium held in 1997, convened by WHAM and the Population Council, to discuss the ethical and practical dilemmas of microbicide testing. This symposium brought together 55 experts in clinical, biological and social science and activists, biomedical ethicists from 15 countries in Africa, Asia, Latin America, Europe, and the United States. For three and a half days these participants gathered in the Ailie Retreat Center near Washington DC to discuss the dilemmas expected to emerge from the upcoming microbicide candidate clinical trials.

The report situates this symposium explicitly as a historical moment as different modes of engagement formerly thought apart were coming together. Significantly, the complexities that emerged from this coming together are still present in the biomedical development of microbicides today.

The symposium occurred as three significant trends in the history of women's sexual health and rights converged: donors' and programs' growing commitment to reach beyond contraceptive delivery to address the full range of women's sexual health needs; the emergence of HIV and other sexually transmitted infections (STIs) as substantial threats to women's health and well-being; and activists' and scientists' growing willingness to work together on issues of reproductive technology development. Consequentially the symposium both benefited from and advanced key historical currents that are redefining the boundaries between science, politics, and activism. (Heise et al 1998: v)

Within the symposium science, politics and activism came together and entwined which signalled a multiplicity of conceptions of what is at stake within the microbicide RCTs, both ethically and practically. The symposium took place when the concept of a topical microbicide was just taking shape, when boundaries between science and women's health activism were starting to become less rigid and the first Nonoxynol-9 based candidates were entering human clinical trials. This led to the rationale for the symposium to take place, to question and interrogate the practical and ethical dilemmas of the

microbicide clinical trials to come. As the report states: “[t]hese trials raise thorny issues about how to achieve scientifically rigorous results in an ethically sound manner.” (Heise et al 1998: VII)

### *A Space of Purification*

The report describes the background of the clinical testing of microbicide candidates in terms of the larger dynamics of power somewhat similar to the empowerment-focused campaign discourse encountered in the previous chapter.

In the long run, reducing women’s vulnerability will require more than a new technology. Ultimately, *empowering women to have more control over their sexual lives requires a fundamental change in male-female relations* and a concerted effort to eliminate the inequities that leave women economically and socially dependent on men. But such fundamental social change takes time – time that women at risk do not have. The AIDS epidemic therefore creates two imperatives: to work in earnest on *changing the underlying cause of women’s vulnerability, and to pursue vigorously every means to strengthen women’s immediate ability to protect themselves in the face of the social and economic forces currently allied against them.* (Heise et al 1998: 1 emphasis added)

I suggest that the two imperatives this statement poses, to change the underlying causes of women’s vulnerability as well as enabling women to counter their risk of HIV infection in a most immediate way, invites a coming together of feminist aims of empowerment and biomedical concerns with an efficacious technology. These two imperatives are not necessarily mutually exclusive, but rather invite a relational conception of what is at stake within the RCT, namely both the search for an efficacious candidate as well as an effort to engage the socio-economic power relations that put women at risk. However, the way in which empowerment is articulated in this statement creates a tension between these two imperatives as the fundamental power relations that result in women’s domination and risk of HIV infection are dislodged from an immediate protection against HIV infection, such as a microbicide. This understanding of power curtails the potentially relational manner of understanding both women’s socio-sexual risk of HIV infection as well as the microbicide candidate’s efficacy to be at stake within the RCT.

To exemplify, one can note how the symposium situates the clinical trial as embedded and active in power dynamics.



Microbicide research and development *should be embedded in a larger commitment* to address the full range of factors that place women at risk of sexually transmitted infections:

Although women need and deserve a technology they control, microbicide research should not be allowed to deflect attention from the underlying power inequities that put women at risk. *Microbicide research must be seen as part of an overall program of STI/HIV prevention that includes efforts to empower women* and to improve the detection and management of STIs among women, especially in resource poor settings. STIs other than HIV are the most common cause of healthy years of life lost among women of reproductive age in the developing world. (Heise et al 1998: VII emphasis added)

The symposium articulates that the development of microbicides should be embedded and directly engaged with a larger context of power dynamics. How the symposium articulates its task of engaging with the feminisation of the HIV pandemic directly entails an engagement with power dynamics as a process in which the RCT is an active component. I suggest that this statement explicitly posits the clinical trial as a site in which gendered power dynamics are played out and simultaneously a site through which gendered power dynamics can be transformed. What the clinical trial is understood to do entails more than testing for mere efficacy, rather the efficacy of the microbicide candidate becomes intimately related with power dynamics.

In order to analyse what is at stake in the biomedical process of microbicide testing in the RCTs, I will, as indicated in the introduction, use Latour's 'performatives' of mediation and purification as constitutive of matters of concern and matters of fact. In a similar vein, the above statement can be read as articulating that what is at stake within the RCTs is the microbicide's intervention into women's vulnerability to HIV infection. This puts forward a relational conception of the microbicide candidate, women's vulnerability and the RCT which together constitute a matter of concern. In particular, women participants, power dynamics and the social as well as physical complexity of HIV infection are related through the microbicide candidate as what Latour has called a 'tangled being' (Latour 2004b: 24). In other words, the microbicide candidate does not pre-exist its testing within the clinical trials, so to speak, but is rather construed as a tangled technology in relation to the clinical trial, social power relations and the physiology of HIV infection through the various practices inherent in the RCT.

However, through the manner in which power is understood and the authority ascribed to biomedicine, the clinical testing of microbicides is almost instantly separated from these more encompassing relations and power dynamics. Although the clinical trial is

put forward as an active component in women's gendered power dynamics and protection against the HIV virus, it is simultaneously understood as 'the gold standard' of microbicide testing. As the report states:

Randomized controlled trials are the most expeditious and reliable means of evaluating the efficacy of topical microbicides (...) Participants agreed that besides its limitations, a randomized controlled trial is the most appropriate way to establish whether a microbicide reduces STI/HIV transmission. (Heise et al 1998: 10)

Once again following Latour, I argue that the field of microbicide development engages in practices (performatives) of mediation as well as purification. The microbicide is mediated as a relational matter of concern, but instantly purified as a matter of fact. The problematic of women's socio-sexual relations that increase their risk of HIV infection is an inherent part of a microbicide candidate as a matter of concern. In contrast, the microbicide as a matter of fact purifies this hybridity into the microbicide's effect on the HIV virus. This performative purification creates the conditions of possibility for, and is simultaneously reinforced by, the maintenance of the RCT as the gold standard of microbicide testing.

Moreover, the upholding of the RCT as the gold standard for microbicide testing is directly related to the demands of regulatory institutions by which the candidate needs to be approved before a microbicide can be produced for large scale distribution, should the candidate prove efficacious. The report explains: "*The product registration rules of either the United States or the European Union will probably guide the initial testing and registration of new antimicrobial products, because organizations in these industrialized countries sponsor most product development research.*" (Heise et al 1998: 9) Of these institutions, the FDA (the United States Food and Drug Administration) is the most powerful actor to ascertain this approval. Although the FDA does not explicitly articulate the RCT as the gold standard for the testing of new drugs, their guidelines are interpreted as such that the field endeavours to answer to their requirements through the RCT:

The FDA regulations require developers wishing to obtain approval for a product to demonstrate that it is both "safe" and "effective" for the specific indication. "Adequate and well-controlled studies" are used as the "primary basis" for determining whether there is "substantial evidence" to support the claims of effectiveness for new drugs. The study must use "a design that permits a valid comparison with a control to provide a quantitative assessment of drug effect." Controls can be constructed in different ways, including providing the control group with a placebo or with the existing standard therapy or intervention. Traditionally,

randomized controlled trials have been viewed as the gold standard of clinical trial testing. (Heise et al 1998: 10)

In other words, the RCT is not just held as a gold standard by the field of microbicide development or an effect of performative practices only engaged with in this development. Rather, upholding the RCT as the gold standard is a larger network through which candidates must pass in order to be produced as HIV prevention methods available to women. In this way, the RCT as the gold standard of microbicide testing and the practices through which this standard is held are embedded within a more encompassing network that construes a process of biomedicalisation. Thus, while the symposium invites a relational understanding of the RCT, this suggestion is not further pursued. This process of purification, by which the RCT is removed from the social and devoid of power relations, stifles an interrogation of the aforementioned complexity of what is at stake within the clinical trials.

#### *A Space of Multiplicity*

One area of key controversy is the importance of HIV incidence and trial participant's HIV infection during the RCT, central to the conduction of the clinical trials. The efficacy clinical trials are only conducted on HIV negative women. The data of these trials is readable through women's seroconversions (HIV infections) as the number of HIV infections in the placebo arm shows how efficacious the microbicide candidate is. *"The higher the incidence of HIV in the host community, the smaller the number of participants necessary to detect a difference between a microbicide and a placebo. As incidence declines, the number of women necessary to detect an effect rises rapidly, making trials among low-incidence populations extremely cumbersome and expensive."* (Heise et al 1998: 18) Because of HIV incidence, the communities targeted for testing must answer to certain characteristics, this in turn impacts on which women are able to be included as trial participants.

The RCTs need to be conducted on populations with a high prevalence of HIV infections in order to gather enough data for a statistically significant analysis, which for the phase III trials especially would mean a multi site population. Statistical significance is a measure of certainty. If the data is not statistically significant the measured efficacy of a microbicide candidate could have been due to chance. In other words, statistical significance allows the trial to give objective data concerning the effect of the microbicide candidate on the HIV virus within the female body. Statistical significance remains *the* core aim for the success of a clinical trial in biomedical terms, as its success is understood as providing proof of the efficacy of the microbicide candidate, which is called 'proof of concept'. The report states: *"Establishing "proof of concept" – i.e., that a chemical barrier*

*method can help reduce one's risk of contracting HIV and/or other STIs – should be a high priority within an overall program of microbicide development.”* (Heise et al 1998: VI)

Because of the need for statistical significance to show the efficacy of the microbicide candidate, the population the microbicide is tested on is selected according to HIV incidence (the number of HIV infections across the potential trial population) and women's specific risk of HIV infection within their sexual relations (as opposed to for instance drug injection). These criteria are aimed at ensuring that the researchers know whether seroconversions occurred during vaginal sex and therefore, consequently, the measure of protection is due to the efficacy of the microbicide. This need of HIV infection leads scientists to enrol groups of women into the RCT who are highly vulnerable to HIV infection in specific ways. In particular, female sex workers or women who have difficulty negotiating condom use. In other words, precisely those women who are understood to be in need of a microbicide because of their vulnerability, are desirable participants of the RCT because their specific vulnerability will make the RCT more likely to produce a statistically significant result:

Trial participants should include diverse populations, not just sex workers; one option is to enrol women who have difficulty using condoms:

To date, researchers have emphasized sex workers as their population of choice for microbicide trials. Because the incidence of infection is typically higher among sex workers than among other women, the assumption has been that a trial conducted among sex workers can be many times smaller, and therefore less cumbersome and costly, than a trial conducted among the general population.

There are compelling reasons, however, to shift toward recruiting women from the general population, especially women in primary partnerships. Research suggests that women have a particularly difficult time enforcing consistent condom use with their primary partners; therefore, women whose primary risk comes from the behaviour of their boyfriends or husbands will be less likely to be able to consistently enforce condom use during the trial. *This reality helps ensure that despite the best efforts of trial sponsors to actively promote condom use in both trial groups, there will be some women who are unable to do so (making it easier to evaluate a potential microbicide).* This approach also increases the external validity of the trial, because the testing has taken place among the women most likely to be the ultimate users of such a product. (Heise et al 1998: IX)

I suggest that what this statement articulates, and what will be the central argument set out in this chapter, is that especially in terms of women's vulnerability within the trial, women participants, advocates and scientists have different stakes in the microbicide candidate's development, but these stakes are intimately related. Firstly, women participants are selected because of their high risk of HIV infection, consisting of their inability to negotiate condom use. Consequently, women participants will use a microbicide within a socio-sexual context in which they are at high risk of infection. Secondly, although biomedicine aims to show the effect of the candidate on the HIV virus within the female body as a matter of fact secluded from cultural power dynamics, women's specific socio-sexual vulnerability furthers the RCTs ability to show the efficacy of the microbicide candidate under trial. Thirdly, although biomedical development is inherent to the advocacy promise of empowerment, the central position that is ascribed to women's vulnerability in light of the trial's success is not easily reconcilable with the advocacy efforts in which women's needs, protection and empowerment are central.

In light of this discrepancy and relationality the symposium already remarks: *"...clinical trials of any candidate microbicide will, by definition, take place among individuals at substantial risk of HIV infection. Many women who fall into this category are multiply vulnerable, making issues of safety, informed consent, and distributive justice all the more acute."* (Heise et al 1998: VI) Indeed, women's vulnerability within the trials is understood to be an ethical matter. The way the report situates ethics has an explicit bioethical foundation and corresponds to the GCM's continuing engagement with ethics.<sup>20</sup> Although the GCM is ethically focused, their bioethical foundation leads them to focus mainly on informed consent and standards of care within the RCT. (see for instance GCM 2005, GCM & PATH 2010, Heise et al 2008) This leads them to continuously question to what extent the RCTs increase women's vulnerability and compound women's risk of HIV infection, but this interrogation never quite reaches the process of efficacy testing itself.

I am in agreement with the GCM's ethical understanding of women's vulnerability within the trial. However, throughout this chapter I will argue for a different approach. In the following analysis I suggest that to question what is at stake within the RCTs, is a question of the multiplicity and specific set of relations the RCT invites.

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<sup>20</sup> The symposium report states that the field of microbicide development understands their ethical guidelines and core principles (Respect for Persons, Beneficence and Justice) to be based on two primary bioethical documents namely The Declaration of Helsinki (World Medical Association 2008) and The International Guidelines for Biomedical Research Involving Human Subjects (CIOMS 2002). (Heise et al 1998: 6)

## **Microbicide Candidates within a Space of Purification**

### **the story of Nonoxynol-9**

Nonoxynol-9 based spermicides were the first agents to be considered for microbicide development. In fact, their testing commenced in the late 1980s as spermicides that might protect against HIV (see Kreiss 1992) even before the concept of a microbicide was articulated. Specifically, Nonoxynol-9 was a detergent that functioned by breaking down cell membranes. However, it raised concerns that it did not only break down cell membranes of the virus, but also of vaginal skin and the cervix. Nonoxynol-9 had been the active ingredient in spermicides since the 1950s and was approved for distribution before the FDA demanded any rigorous clinical trial testing. As a result, Nonoxynol-9 based spermicides were already available for use, but no one knew exactly how efficacious these spermicides were and, importantly, how safe they were.

Advocates wrote that the uncertainty of Nonoxynol-9's safety and efficacy against STDs including HIV was exasperated by public rumours that Nonoxynol-9 would be effective against HIV infection. Consequently, women and gay men were already using Nonoxynol-9 lubricated condoms for extra protection and Nonoxynol-9 sexual lubricants (in addition to its use as a spermicide). As a knock on effect manufacturers put Nonoxynol-9 on condoms and in lubricants to tailor to the needs of those using Nonoxynol-9 based lubricants (Heise et al 1998: 10 and L. Heise personal communication).

The report of the symposium articulates the message around Nonoxynol-9 as such:

If you are absolutely unable to use a condom, use a product containing nonoxynol-9, preferably with a diaphragm. There is some evidence that nonoxynol-9 helps protect against gonorrhoea and Chlamydia. Remember, the male and female condoms are the most protective methods you can use. But if you can't use these methods, using N-9 with a diaphragm or alone is better than using nothing. (Heise et al 1998: 44)

Nonoxynol-9 was understood to be a promising candidate by both the advocacy and biomedical field because at the level of in vitro research Nonoxynol-9 showed to be potentially effective against several STDs and possibly HIV, and furthermore, since Nonoxynol-9 based spermicides were already being manufactured it was viewed to be a potential microbicide that would be relatively cheap and easy to produce. (Roddy et al 1998, Cook et al 1998)

The context in which microbicides containing Nonoxynol-9 entered the human clinical trials during the late 1980s and were trialled for over 10 years, was marked by a high variety of candidates, trial designs and Nonoxynol-9 formulations. Different trial

designs were used, not all of the trials were randomised controlled clinical trials, the amount of Nonoxynol-9 differed from compound to compound (as much as from 50 mg to 1000 mg) and the suppositories differed, as some tested rings, some foams, some films etc. (Martin et al 1997, Van Damme et al 2002, Forbes and Heise 2000). Furthermore, the data produced by the safety trials as well as the efficacy trials was conflictual and was incredibly difficult to compare. Some small scale observational studies reported promising results and called for more studies in large scale randomised controlled trials to validate their findings (for instance Zekeng 1993). Other studies suggested the heightened risk increase of genital ulcers (for instance Niruthisard 1991, Kreiss 1992). Uncertainty within the scientific and advocacy field emerged around these safety issues, the association with vaginal ulcers and, furthermore, the association of vaginal ulcers and HIV infection. In turn, this uncertainty led to a dedication in the field for more and more research.

### *The Safety Trials*

The development of Nonoxynol-9 based microbicide candidates had continuously been marked by a worrying safety profile, in particular a concern for its association with vaginal ulcers, which could facilitate HIV virus in semen to enter a woman's body. Consequently, the use of Nonoxynol-9 based compounds would in fact increase women's susceptibility to HIV infection instead of providing protection and inflict harm on the women participating in the trials. A good example of this is the safety study of Nirunthisard et al, published in 1991 which was a small scale observational study conducted on a small number of women at low risk of infection recruited from a family-planning clinic in Bangkok, Thailand. The women participants were asked to insert the compound once per hour, for four consecutive hours daily for a period of two weeks. This study showed that Nonoxynol-9 had harmful effects, as the report states:

Six of the women or 43% (...) had physical findings that included disruption of the epithelium and/or bleeding. None of the women receiving placebo had abnormal physical findings. The break in the epithelium on the cervical squamous epithelium of four women appeared to be the result of a thin layer of cells sloughing; in some cases the layer of cells could be seen still partially attached. The epithelial sloughing appeared on the cervix in the area adjacent to the fornices and was not over the transformation zone. One woman had a severe reaction on the cervix that appeared similar to the strawberry cervix seen with trichomonas infection, but it was more severe and was bleeding and edematous. (...) One woman had physical findings that included bleeding and sloughing of the vaginal mucosa, which also occurred in the fornices. All of the symptoms and

findings of the women resolved within 1 week of stopping N-9 use. None of the symptomatic reports were considered severe enough by the women to cause them to stop using the suppositories. None of the women had any physical findings associated with the vulva, perineum, or anus. (Nirunthisard 1991: 177)

In a context of uncertainty about the safety of Nonoxynol-9, its possible future, rumours about its effect of the HIV virus and the fact that people were already using it as an HIV preventative gel, this study sought to determine some facts about Nonoxynol-9's safety. The damage this statement described is quite severe, involving the skin lining women's vaginas and cervix shedding (sloughing) in certain places and bleeding. A 'strawberry cervix' refers to a cervix that is damaged as such that it has a punctuated appearance, making it look like the skin of a strawberry. These strawberry cervixes were edematous, meaning they were swollen with fluid retention and were shown to be bleeding.

In the field of microbicide development, the clinical trial report is put forward to represent the facts, the real effects of the microbicide candidate on the female bodies under trial, that are understood to pre-exist the bioethical investigation that is 'reported'. In contrast, I suggest that the clinical trial report discussed here (and clinical trials reports in general) articulates this safety study through what Haraway has called a 'naked way of writing' in which 'the facts' are construed. Haraway describes this mode of representation as such: "*Only through such naked writing could the facts shine through, unclouded by the flourishes of any human author. Both the facts and the witnesses inhabit the privileged zones of "objective" reality through a powerful writing technology.*" (Haraway 1997: 26) Following this line of thought, through the naked way of writing set out in the report, the safety of Nonoxynol-9 is presented in a factual manner – what Latour has called a matter of fact. For Latour, matters of fact are not merely found, discovered and described by science, rather they are enacted as such through specific scientific practices. Therefore, through this performative scope, I suggest that although a matter of fact appears to pre-exist scientific engagement, it is the *effect* of the specific scientific articulations that comprise a clinical trial report. The report discussed here goes on to represent the facts of Nonoxynol-9's safety through colposcopy photographs (Nirunthisard 1991: 177).





Fig. 1. Colposcopic photograph of a cervix showing (A) the area exposed by sloughing and (B) the layer of epithelial tissue that has been sloughed. The tail of the arrows point in the direction of the cervical os. (Photograph by Dr. Niruthisard).

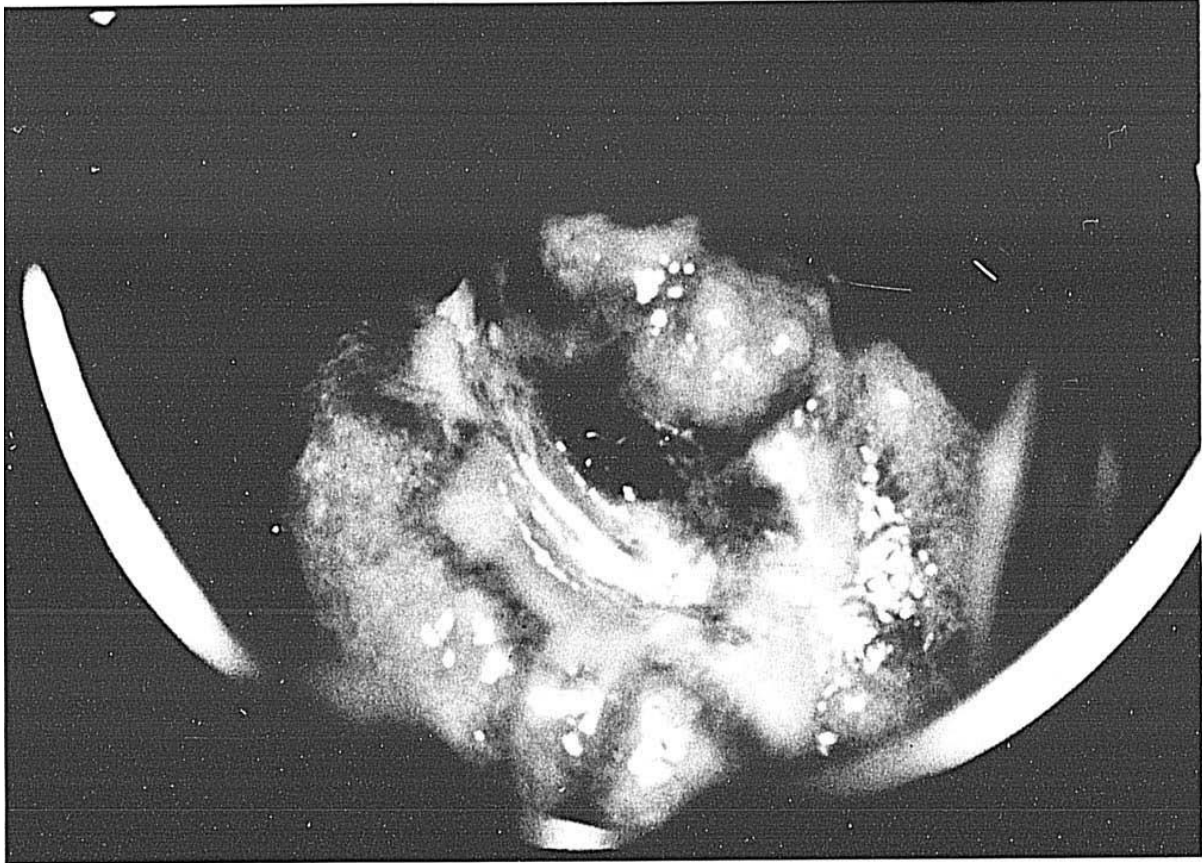


Fig. 2. Colposcopic photograph of a cervix with erythema, areas of edema, and bleeding. (Photograph by Dr. Niruthisard).

In this sense, the report and the photographs articulate this Nonoxynol-9 based candidate's safety as a matter of fact. Indeed, through this report and its photographs, we are drawn into a biomedical story of Nonoxynol-9's harm on vaginal skin and the cervix, articulated in a dry factual manner. Scientific practice and the articulation of these practices are inherent to a performative process in which the scientific object is enacted as fact. However, I suggest that we are not only dealing with how an object is enacted (as for instance both Latour and Mol engage the performativity of science), rather this enactment is inherently tied to a performative process through which a figure of 'Woman' is construed (a process of sexualisation much closer to Butler's notion of performativity). Specifically, through this way of writing and imaging, not only are the 'facts' presented, women's bodies and the effect of Nonoxynol-9 upon them emerge accordingly. In particular, the manner within which this study articulates its matter of fact, the women participants are brought into focus as *vaginal figures*, a reductive abstraction that only brings part of women's bodies, lives and practices into focus.

As discussed in the third chapter of this thesis, for Latour the manner within which hybrids come into being through trials of strength depending of which collective is the strongest, in which strength is understood as the amount of connections between human and nonhuman actors. I suggested in this chapter that a language of 'trials of strength' was

not in tune with the complexity of enacting a microbicide as an intervention into the female body and/as a form of empowerment. In a similar vein, I suggest that the specific relation between human/nonhuman, woman/Nonoxynol-9, that emerges from this trial can indeed be understood in terms of a Latourian 'hybrid'. However, vaginal ulceration and the abstraction of women participants into vaginal figures are central to the performative process through which this hybrid emerges.

Following Haraway (1997: 29), Star (1991: 43) and van der Ploeg (2004: 154), I criticised Latour for not engaging with the social and culturally laden processes through which hybrids are constituted, being inherent to scientific development. What is at stake here, is the manner within which a relation between the microbicide candidate and woman is made part of biomedical process. The abstraction that ensued is a formative effect pertaining to the manner in which the female body is made to matter within biomedical enterprise. This abstraction of women participants into vaginal figures, for whom vaginal ulceration is foregrounded goes in against the field's feminist efforts of making women part of scientific process as a form of 'empowerment.' Problematically, through this specific articulation, a biomedical 'naked way of writing' and its abstraction, the manner within which women were made a part of biomedical process remains occluded as a mechanism of power that invests a specific, and harmful, enactment of women's bodies.

The field of microbicides consists of a coming together of collectives, biomedical scientists and women's health advocates. In the previous chapter, I already touched on the problems of articulating, and materialising, a feminist ideal through biomedical process. The story of Nonoxynol-9 pushes this problematic to the forefront once again. In fact, the symposium report problematises the coming together of biomedicine and women's health (through a history of reproductive health matters, such as the Norplant controversy mentioned in the previous chapter) as the report states:

Until recently, population-related programming has focused on developing and delivering highly efficacious contraceptive technologies. The overriding aim of such programs has been to reduce fertility – meaning that concern about “overpopulation” has at times overshadowed concern for women's health and individual rights.” They continue: “This history has put contraceptive scientists and policymakers at odds with many in the women's health movement who have been critical of the field's focus on technology and its inattention to the broader range of women's reproductive health needs. The movement has also taken issue with the field's isolation from those its work affects. Although women are frequently the target of fertility-regulating schemes, they generally have had little or no say in the design of contraceptive technologies or in the programs created to deliver them.” (Heise et al : V)

A similar critique can be made in relation to the Nonoxynol-9 trials. The uncertainty of the Nonoxynol-9 context drove the field towards more research in an effort to uncover the facts. However, in this search, the need to construct a matter of fact often overshadowed the possible harm of vaginal ulceration and HIV infection their search entailed. That the search for matters of fact construed women participants into vaginal figures, in contrast to women's health goals and ideas of women's vulnerability and empowerment, signals that there are multiple stakes on the table here – a multiplicity that exceeds Nonoxynol-9 as a matter of fact.

### *The Human Efficacy Trials*

Between 1992 and 2002 three efficacy trials were conducted in which not only the effect of Nonoxynol-9 on women's vaginal cells was tested, but its effect of dismantling the HIV virus. The first was the Kreiss study testing a vaginal sponge containing Nonoxynol-9. This trial was conducted amongst 138 female sex workers in Nairobi, between January 1987 and June 1990 (Kreiss 1992: 479). The trial showed a significant increase in vaginal ulcers in the nonoxynol- 9 arm of the trial and was prematurely halted following the recommendations of the Data Safety and Monitoring Committee in July 1990 *“because the seroconversion results had become inconsistent with the hypothesis of clinically beneficial effects of the nonoxynol 9 sponge in preventing HIV seroconversion, because of concern regarding the adverse local effects of the nonoxynol 9 sponges as used in this study, and because of the possible relationship of these effects to HIV seroconversion.”* (Kreiss 1992: 479) The report continues to warn that

[i]t is possible that prolonged and intensive exposure to nonoxynol 9 results in compromising the vaginal and vulvar epithelial integrity (...). Alternatively, nonoxynol 9 sponge use may directly cause genital ulceration as a result of chemical toxicity or mechanical irritation. Reactivation of genital herpes simplex virus infection is another possibility that was not excluded. These findings are of particular concern because genital ulceration in women and men has been implicated as an important risk factor for HIV infection in both American and African populations. (Kreiss 1992: 481)

In 1998, the results of another efficacy trial were published, this time testing a vaginal film containing Nonoxynol-9 on just over 1000 female sex workers in Cameroon (see Roddy et al 1998). In line with the Kreiss study, this efficacy trial again showed an increase in vaginal ulceration. However, the trial did not show that vaginal ulcers in turn increased women's susceptibility to HIV infection. Interestingly, regardless of its findings that the

product increased vaginal ulceration this reports ends with a call for more research.

The particular product we tested did not show evidence of protection against sexually transmitted diseases, but the results cannot be overly generalized. Other formulations of nonoxynol 9, as well as additional microbial compounds with different mechanisms of action, need to be tested as prophylaxis against these diseases. Barrier methods controlled by women are urgently needed, and the efforts of the research community to provide women with multiple means of protection against sexually transmitted diseases should increase. (Roddy et al 1998: 509)

In the previous chapter I suggested that science is an inherent part of the promise of microbicides. Indeed, within the promise of vaginal microbicides the hope that biomedicine will materialise an efficacious matter of fact is central to the field. In part, the promise of vaginal microbicides is a biomedical promise of efficacy. The RCT is positioned as a space of science, where scientists seek matters of fact, a process of progress where what matters is always deferred into the future, promised. Haraway wrote that “[d]azzling promise has always been the underside of the deceptively sober pose of scientific rationality and modern progress within the culture of no culture.” (Haraway 1997b: 41) In a similar vein, I suggest that what characterises the role ascribed to science is its existence outside culture. The biomedical promise of efficacy is a promise of fact secluded from cultural relations of power. In this promise, the biomedical field is like an isolated space that pushes itself forward through more and more research towards that promised efficacious microbicide.

Finally, in 2002, the Van Damme UNAIDS sponsored research on the vaginal gel COL-1492, also called Advantage-S, resulted in significantly more women’s seroconversion in the product arm than in the placebo arm of the trial and associated Nonoxynol-9 with an increase in vaginal lesions and ulcers (although based on a safety trial that showed no harm (van Damme et al 2002: 975)). In other words, this study showed that frequent use of Nonoxynol-9 based vaginal gel increased women’s vulnerability to HIV infection.

This Phase III trial was conducted between September 1996 and June 2000. The population included female sex workers in South Africa, Thailand, Benin and Côte d’Ivoire. Across the sites 892 sex workers were enrolled, 104 women were infected with HIV during the trial, 59 of whom in the Nonoxynol-9 arm. The higher prevalence of HIV infection in the product arm was possibly due to the vaginal ulcers and lesions most likely resulting from the use of Nonoxynol-9. The level of vaginal ulcers increased with the frequency of use. As the report states:

Our results show that nonoxynol-9 increased risk of HIV-1 infection compared with placebo. Risk was especially high in women who used the

study drug gel more than 3.5 times per day and who also had a high incidence of lesions with epithelial disruption. This finding suggests that nonoxynol-9 has an adverse effect on vaginal integrity when used frequently, thus increasing women's susceptibility to HIV-1 infection. At low frequency use, nonoxynol-9 had no effect, either positive or negative, on HIV-1 infection. (van Damme 2002: 975)

After the Van Damme trial showing a higher amount of HIV infections in the Nonoxynol-9 arm of the trial, the World Health Organization released a statement in 2002 that Nonoxynol-9 is ineffective against HIV and might even increase women's vulnerability to HIV infection. "*Spermicides containing nonoxynol-9 do not protect against HIV infection and may even increase the risk of HIV infection in women using these products frequently (...)*" (WHO 2002: 1). Indeed, this statement marked the end of the development of Nonoxynol-9 based microbicides.

However, the Van Damme trial also showed that women's vulnerability increased with sexual activity and that Nonoxynol-9's effect was therefore related to how women used the microbicide candidate. After the Van Damme trial finished, a social research study was conducted that supports this suggestion. At the same site amongst a group of HIV negative women who participated in the Van Damme trial, namely a group of sex workers who worked at truck stops in Durban, South Africa. The primary aim of this study was to show the manner in which these women understood the gel's (placebo or Nonoxynol-9) effectiveness. This research showed that regardless of understanding the RCT's aim and protocol, these women articulated a belief and hope that they were using the Nonoxynol-9 gel instead of placebo and that the gel was effective.

I suggest that the participants' articulated enactments of the microbicide candidate as an effective technology, places the candidate as a matter of fact in question. Rather, it shows this Nonoxynol-9 candidate to be a tangled object in close relation to women's vulnerability to HIV, their specific risks, their sexual relations. How these women articulate this Nonoxynol-9 candidate as a matter of concern, what they understand to be at stake, differs significantly from biomedical conceptions. The study explains:

The gel took on added significance as a protective device in light of the fact that many women reported that some of their clients and partners did not want to use condoms. Some women were concerned about the condom's effectiveness and viewed the gel as providing better protection. Others believed that in the case of condom breakage, the gel would protect them:

*"Even if [the condom] bursts, we don't have any problems. We have our protector."*

At trial baseline, only 17% of the women reported that they were protected by condoms in more than 50% of the sex acts they engaged in. One woman told her clients who refused to use condoms that she was using the gel; she indicated that these men felt protected by the gel.

Belief in the gel's efficacy was further reinforced by the economic pressures on the women and their concerns about losing clients:

*“You try to force a person to use a condom but when you see this person really doesn't want to use it and is going to the next person who will sleep with him without a condom, and the money he has a lot, you just think that you have your gel, and you take the money.”*

One woman who knew that her main partner had other female partners convinced him to accept the gel by telling him that it protected against HIV infection. (Mantell et al 2006: 1075)

The women in this study enacted the candidate as an effective microbicide. Biomedical scientists and the women participants enact the candidate in such different ways, that the object multiplies. However, because both these modes of enactment are at stake within the RCT, the 'biomedical collective' and 'the collective of women participants' are not discrete and neither is the enacted multiplicity unrelated. Rather, the enactment of the candidate as their protector was provoked by the specific context in which these women struggled to negotiate condom use, namely the specific power relations between sex worker and client which put these women at risk of HIV infection. Moreover, this enactment furthers the extent to which scientists are able to show the candidate's efficacy, as this is based on women's HIV infections. The women participants' enactments of a microbicide candidate in a context where they are unable to negotiate condom use and are as such vulnerable to HIV infection is anticipated by the biomedical collective. This Nonoxynol-9 candidate as a women's protector and as an (in)efficacious compound were intimately related.

The extent to which microbicide testing increases women's vulnerability to HIV infections has always been phrased as ethically problematic in discussions surrounding the RCTs. This already became visible in the symposium and their acknowledgement that microbicide candidates will be tested on groups of women vulnerable to HIV infection. However, what makes the Nonoxynol-9 trials important in this sense, is that the possibility of harm is right at the forefront making the multiplicity of Nonoxynol-9 as a matter of fact and Nonoxynol-9 as a protector ethically pertinent.

## *Ethical Questions and Women's Vulnerability within the RCT*

Within the field of microbicide development, the GCM's ethical engagement looks to minimise harm and participants' vulnerability within the trial, but does not see the trial itself as contributing to this vulnerability. To exemplify, the ethical complexity surrounding the van Damme trial is compounded by the fact that the women who seroconverted in the van Damme Advantage-S trial, possibly due to the use of Nonoxynol-9 and the vaginal lesions and ulcers resulting from this, were not given access to anti-retroviral treatment. ARV treatment was not available in the countries participating in the study. Making this treatment available for the women in the trial would therefore, in line with bio-ethical standards of care, be coercive, as the report states:

We did not give antiretroviral treatment to participants in our study. When we implemented the trial, this treatment was not available in the countries participating in this study. During the trial, the Trial Management Committee decided not to provide antiretrovirals because this could be a coercive factor on study participation, since treatment was not widely available in those countries. (van Damme et al 2002: 976)

In other words, making treatment accessible for the women who got infected with HIV possibly due to Nonoxynol-9 induced ulcers becomes unethical according to a certain bioethical logic. In the clinical trials after Nonoxynol-9 as ARV treatment slowly became more accessible, this ethical standard has been changed and women in the trials now do have access to ARVs when they seroconvert. (UNAIDS and WHO 2000; Heise et al 2008; McGrory et al 2010) Although this protocol has changed, this mode of understanding ethics still looks to the results or effects of the trial but not the trial's implication in the vulnerability of its trial participants. In this light, it is interesting to see the advocacy response to the Nonoxynol-9 trials. Especially, the GCM and their explicit focus to strive for an ethical science.

After the van Damme trial, GCM advocacy efforts split in two directions. On the one hand they disseminate and make an effort to explain the complexity of the trial results. On the other hand, they increased their advocacy efforts after these results and mainly focused on the removal of Nonoxynol-9 lubricated condoms and sexual lubricants. The GCM did not publicly engage with the fact that the trial increased women's vulnerability to HIV and that the women who seroconverted were not given access to ARVs. Rather, the GCM's point of focus is the extent to which the trial was harmful to women. As such, Heise and Forbes published an article in *Reproductive Health Matters* entitled *What's Up With Nonoxynol-9?* (2000) and the GCM website devotes a page to Nonoxynol-9 in which they disseminate information. Both the GCM website and the article by Heise and Forbes first explain the



trial's results in the following way:

There are at least three ways to interpret the Advantage-S results:

1. The N-9 in Advantage-S product caused an increased risk of male-to-female HIV transmission. The irritating effect that N-9 can have on the vaginal mucosa, and the greater risk of genital lesions in this group, support this interpretation.
2. The Replens [placebo] could have reduced transmission risk either by creating a mechanical barrier that prevented genital trauma during intercourse, or by favorably affecting vaginal flora to resist infection. The hyperviscosity and the lower pH of Replens both support this interpretation.
3. Both can be correct at the same time. (GCM 2010f, Forbes and Heise 2000)

They continue to situate the difficulty of these biomedical results within a larger pandemic. Specifically, they make a statement that the RCT in itself does not increase women's risk. In other words, women's vulnerability within the trial is compared to women's vulnerability outside of the trial:

It should be noted, however, that the incidence of new HIV infections in both study groups was lower than that seen in the wider population of sex workers from whom the women were recruited. *This contradicts the fear expressed by some AIDS activists that participation in microbicide trials may in itself, increase women's HIV risk.* The challenges associated with designing ethical prevention trials are complex, given the fact that some sero-conversion among participants is likely to occur despite condom promotion and other safeguards. But they are not insoluble. (GCM2010f, Forbes and Heise 2000 emphasis added)

The extent to which the RCTs increase women's vulnerability to HIV infection, has remained the GCM's primary engagement with the biomedical field (see for instance GCM 2007b). They place the results of the trials under interrogation, either in terms of the scientific evidence it provides or in terms of the extent to which it increases or decreases women's HIV infection. However, what the GCM's ethical deliberations do not do is focus on the biomedical process of testing microbicide candidates through the RCT and, specifically, the set of relations this type of testing invites such as the need for women's HIV infection, the specificities of women's high risk behavior and the role the microbicide candidate necessarily plays (and for a part is anticipated to play) herein.

On the contrary, years later, in relation to the SAVVY and CS trials that I will discuss below, the GCM reflects back on the Nonoxynol-9 trials and argues:

...N-9 spermicides were already widely accessible. Prior to 2000, some people believed N-9 would provide some protection against HIV (based on data that N-9 killed HIV in the laboratory) and were already promoting it for HIV prevention. This made it critically important for research to establish clearly whether or not N-9 worked as a microbicide. Thus, the stopping rules for the N-9 trials were set so that the trial would stop prematurely only if it came to a clear conclusion in favour or against the product. (GCM 2007d)

This statement reiterates the biomedical imperative that continuously calls for more research to attain scientific certainty as the rationale the Van Damme report once again provides: “[b]ecause nonoxynol-9 is readily available, low in price, and has been on the US market as an over-the-counter product since the 1960s, we thought controversy surrounding the drug as a potential HIV-1 prevention method needed to be resolved.” (van Damme et al 2002: 971)

Contrary to the GCM’s bioethical (and to some extent biomedical) interpretation of the Nonoxynol-9 trials, I suggest that the story of Nonoxynol-9 shows how a large scientific apparatus was mobilised as part of a search for certainty which provoked a specific set of relations within which the Nonoxynol-9 based microbicide candidates, women participants, vaginal cells, cervixes, ulcers, blood, risk and vulnerability were brought together in such a way that the RCT was able to construct, or ‘purify’ Nonoxynol-9 into a matter of fact. In their essay *Rethinking the Bioethical Enactment of Drugged Bodies*, Mike Michael and Marsha Rosengarten have proposed an understanding of the RCT as “...composed of multiple relations with heterogeneous entities –human and non-human – through which medically drugged bodies emerge.” (Michael and Rosengarten 2009: 191) Following this line of thought, I suggest that the ‘facticity’ that is produced through the RCT occludes the relations that constitute the biomedical process of producing microbicide candidates as matters of fact. Of course, the field has had awareness of the ethical controversies of the trials, but the biomedical process inherent to the clinical trials and its specific practices through which matters of fact are constituted is not seen as part of what makes Nonoxynol-9 controversial. In order to grasp the complexity of what is at stake in these trials, I suggest it is the specific set of relations and the RCT’s role in provoking this relationality that should be the target of ethical deliberation, not merely the trial’s effects. Rosengarten and Michael propose that “there is ethical import in rethinking the relations of ethics and science not least because this affords access to the greater complexities embodied in drugged (...) bodies.” (Rosengarten and Michael 2009: 191) I suggest that such a ‘relational ethics’ is

indeed pertinent because it places under scrutiny the specific relations (or intra-actions) enacted within the RCT through which woman/microbicide emerges from the trial. In my reading of Nonoxynol-9 this hybrid was shown to be highly problematic, as it foregrounded vaginal ulceration and was presented as an abstracted vaginal figure removed from feminist concerns of women's vulnerability and empowerment. I will return to this more ethically focused argument and the discrepancy between biomedical and advocacy aims in my discussion of the Cellulose Sulfate trials below.

### **In Relation to Women's HIV Infections matters of fact versus matters of concern**

In this section I will elaborate my argument on the multiplicity provoked by the RCT through an analysis of the field's construction of matters of fact and matters of concern with a brief overview of the microbicide candidates SAVVY, Cellulose Sulphate and Carraguard. After the Nonoxynol-9 based microbicides, these three candidates went through phase III testing in close proximity to each other.

Both Savvy and Cellulose Sulfate had similar mechanisms of action as Nonoxynol-9 and consequently comparisons were made in both clinical trial reports and advocacy documents. Cellulose Sulfate especially provoked comparison with Nonoxynol-9, as these trials showed a possible harmful effect which was explicitly articulated as such by the trial researchers. The biomedical articulations of the trials and their effects show how the biomedical field asserts their authority to be the sole collective to discover and determine what is at stake in the clinical trials, by showing this to be a matter of fact. The SAVVY trials bring to the fore the importance of women's seroconversion (HIV infection) for the clinical trials to function, as they were prematurely halted when the number of HIV infections was not high enough.

The GCM, as will become apparent in this section, had an interesting relation to these biomedical conceptions. On the one hand, they abhor to biomedical authority, as their response to the SAVVY and Cellulose Sulfate trials will show. However, on the other hand they explicitly articulate the clinical trials as an active component in furthering women's ability to transform the sexual practices that leave them at risk and/as protection against HIV. The complexity they put forward as a matter of concern within the clinical trials is more than the mere testing of the efficacy of the microbicide candidate. Accordingly, they also manage to articulate the microbicide candidate in a thoroughly relational manner as their response to Carraguard will show.

I argue that within these trials a fundamental contradiction emerges between the

microbicide candidate's effect on the HIV virus inside the female body as a matter of fact and the reduction of women's vulnerability to the HIV virus as a matter of concern. Furthermore, I suggest that the manner in which the trials are conducted, these two enactments cannot co-exist, they rule one another out. This discrepancy leads me to ask: how has the field negotiated this difference as such that it managed to hang together and persist?

## SAVVY

Family Health International sponsored two phase IIb, safety and effectiveness studies of the microbicide candidate SAVVY in Ghana (Peterson et al 2007) and Nigeria (Feldblum et al 2008). Both enrolled just over 2 thousand women. The Ghanaian trial was prematurely halted after the Data Monitoring Commission (DMC) analysis and recommendation in November 2005. The preliminary results were conceived as such that the study would not be able to show whether SAVVY would substantially reduce HIV infection, as the report states:

We stopped this study prematurely following recommendations of an independent DMC because *the HIV incidence among enrolled participants was substantially lower than expected*; we therefore could not evaluate the effectiveness of SAVVY in preventing HIV as intended. Due to the small number of events available for analysis, this trial was *unable to meet the objective of assessing the effectiveness of SAVVY in preventing male-to-female transmission of HIV* (Peterson et al 2007: 10 emphasis added)

The Nigerian trial started in September 2004 and was prematurely halted in August 2006 after the interim analysis of the DMC. The data showed more seroconversions in the SAVVY arm (21 infections) than the placebo arm (11 infections). However, the report states that because of the small number of seroconversions, the data on the seroconversions is not statistically significant and could be due to chance. In fact, the report on the trial results explains that the trial was halted, once again, because of an insufficient amount of seroconversions among the women participants. In order to gather data that would be statistically significant, the DMC estimated that another just under 2000 women would have to enter the trial. As a result, the DMC recommended the trial to be prematurely halted.

What these trials bring to the fore is the essential importance of women's seroconversions for the RCT to be successful in showing the level of efficacy of the microbicide candidate. The SAVVY report explicitly problematises the increase in condom use as compromising the amount of women's HIV infections necessary for the trial to be

readable. Scientists are obliged by the ethical standards followed by the trial to provide women with condoms during the trial and provide safe sex counselling.

The following quotation suggests that although the trials put risk reducing measures in place, it is anticipated that women will be unable to negotiate condom use, regardless of these measures. In other words, within a clinical trial condoms and safe sex counselling are provided but for the trial to be successful this counselling cannot be too successful, its failure is an anticipated necessity. Therefore, ironically, when these preventative measures or risk reducing measures are too effective in the context of a clinical trial, the trial breaks down. This is exemplified by this statement of Family Health International:

...these studies tend to confirm that participants in HIV prevention trials tend to have lower rates of HIV infection than similar women in their communities who are not enrolled in trials. (In Nigeria, for example, 12 percent of the women screened for possible enrolment were HIV-positive and therefore ineligible for the trial.) The frequent HIV risk-reduction counselling that was offered to study participants, the treatment of sexually transmitted infections, and the provision of and education about condoms make it likely that potential HIV infections among participants in both gel groups were prevented. Women in both gel groups in Ghana and Nigeria reported that 80 percent to 90 percent of their coital acts were protected by condoms. *Those planning HIV prevention trials need to consider this phenomenon during the preparation phase.* (FHI 2007b emphasis added)

However, what the SAVVY trials also make evident is that women were in some way able to negotiate condom use within the trial. This is what Family Health International called a 'phenomenon' that researchers must be conscious of when planning a clinical trial, as it was the reason the SAVVY trials were prematurely halted.

This phenomenon consisted of various components coming together such as women's risk of HIV infection, condom use within women's sexual practices and the various risk reducing mechanisms set in place by the RCT in a way unanticipated by the RCT. What is at stake here, is that the various components that made up the SAVVY trial (most notably the women participants, the mechanisms of risk reduction, microbicide candidates, condoms, sexual practices) were brought together in such a way that they had the material effect of reducing women's HIV infection. In light of the conceptualisation of a microbicide to further both women's empowerment and protection against HIV, it is interesting to see that this phenomenon is problematised by the biomedical field. The biomedical understanding of this phenomenon as problematic is in direct contrast to the relational understanding of the

RCT mentioned in the symposium. The symposium stated that the RCT should be a part of the larger mechanisms to empower women within the HIV pandemic. These reports show that women were in fact able to use condoms and it could very well be that the RCT was an active component in enabling these safer sexual practices. One could say, that the SAVVY trials were successful in materialising this idea, however, ironically, this resulted in the trial breaking down.

I suggest that there is an outright contradiction between developing a compound to protect women against HIV and further their empowerment and engaging this development through a RCT which breaks down when women's protection against HIV infection and possible empowerment actually occurs. In the field's own vocabulary, if the RCT is *effective* in reducing women's HIV infection, the microbicides *efficacy* cannot be shown. This raises the pertinent question of what is actually made to matter within the RCT? And, furthermore, how this materialisation corresponds to feminist ideals surrounding the transformation of women's vulnerability to HIV infection?

Interestingly, the GCM did not engage this contradiction between their own ideals and the aims articulated by the biomedical field in relation to the SAVVY trials, but rather focused on the number of seroconversions and to what extent the trial was harmful. According to the GCM the SAVVY trial was prematurely halted because interim analysis showed that 21 women had seroconverted using SAVVY as compared to 12 in the placebo group. This is a different understanding than what was articulated in the clinical trial report. The GCM voices the premature closure of the SAVVY trials in terms of the microbicide candidate's possible harmful effect, in contrast to the lack of seroconversions which is the focus of the biomedical discourse surrounding these trials.

The phenomenon mentioned above would be in line with advocacy conceptions of the idea of women's empowerment, the advocacy aim of reducing women's vulnerability to HIV infection and the symposium's suggestion to position the RCT in relation to a social problematic of socio-sexual power relations. The problem is that the RCT does not function in relational terms for the biomedical collective. They do not engage relational, one might even say phenomenal, matters of concern, but matters of fact. The RCT is the gold standard of microbicide testing because of its ability to produce matters of fact, to prove or at least show the level of efficacy. As such, the RCT becomes a space of purification as it separates social problematic from scientific 'truth', it separates natural fact from cultural complexity. Once it is no longer able to keep this purification in check, the trial indeed breaks down. However, the microbicide's efficacy as a matter of fact and women's reduction of HIV infection as a matter of concern are both at stake within the field of microbicide development as a feminist-biomedical alliance and regardless of this fundamental contradiction the field manages to persist as one trial's outcomes is deferred into the next trial.

## *Cellulose Sulphate*

In 2007, the CONRAD sponsored phase III clinical trial of Cellulose Sulfate (also known as Ushercell) was prematurely halted (Van Damme et al 2008: 464; CONRAD 2007). The trial enrolled just over a thousand women at different sites in South Africa, Benin, Uganda, and India. The interim analysis of the Data and Safety Monitoring Board showed that more women seroconverted in the Cellulose Sulfate (CS) arm than in the placebo arm of the trial, although once again these results were not statistically significant. As the report of the trial results states:

A meeting of the independent data monitoring committee was convened on January 26, 2007, to review interim data collected (...) There were 35 HIV infections in the interim database (24 in the cellulose sulfate group and 11 in the placebo group) (...) The committee recommended that the trial be halted, and on January 29, 2007, sites were instructed to withdraw the product as soon as possible. (van Damme 2008: 468)

At the same time another phase III trial testing CS was on its way, another placebo controlled trial sponsored by Family Health International which started in 2004 in Nigeria (Halpern et al 2008). The interim analysis of this trial did not suggest that CS increased women's risk of HIV infection, nor did it show a statistically significant decrease in HIV infection. Out of pre-caution the trial was halted after the safety concerns of the CONRAD trial came to light. In contrast to the Nonoxynol-9 efficacy trials, the women who seroconverted in the CS trials were given access to HIV treatment and counselling.

Ethical controversy became evident after the Cellulose Sulfate trials. Since the controversy of Nonoxynol-9 these were the first trials that showed a possibility of harm to the women who enrolled in the trial. Moreover, although not statistically significant, more women seroconverted in the CS arm than in the placebo arm of the trial. The message to the press from the biomedical field was that the trial was closed due to an increase in HIV infections (Ramjee et al 2007: 1169). Lut van Damme is quoted in the Family Health International press release explaining:

*"The well being of the women who participate in clinical trials is, and always will be, our top priority, and we made the right decision to err on the side of caution when we halted the trial in January." Ushercell had undergone 11 safety and tolerance trials prior to the start of the Phase III trials to determine whether it might be effective at preventing HIV in humans. "While we are disappointed that cellulose sulfate was not found to be effective for HIV prevention," Dr. Van Damme continued, "with a globally devastating epidemic such as HIV, it is crucial to continue to*

*evaluate a variety of potential prevention methods, particularly those that are female-initiated.*" (FHI 2007a)

However, when the result of the CS trials came out, there was a vast amount of negative press surrounding these trials. For example the South African News Paper City Press published an article entitled *Medical Research Trial Guinea Pigs Contract HIV* in which the trial is accused of increasing women's risk. (Hlongwa 2007)

This led Gita Ramjee of the South African Research Council (HIV Prevention Research Unit) and colleagues to publish an article in *PloS Medicine* to explain the situation of the South African arm of the trial. In this article they comment on the failure of CS and its aftermath. What comes to the fore in this article is that the general public's criticism surrounds the extent to which the trial put women at risk. This becomes visible in Ramjee et al's description of their management of these accusations:

We had several meetings with political ward councillors, research communities, and other concerned stakeholders. (...)There were many irate people demanding answers to the following questions: (1) "Is it not unethical for researchers to ask innocent women to sleep with HIV-positive men so that we can test to see if the gel works?"; 2)"Is it true that gel increased the risk of HIV infection among innocent women?"; 3) "Why did researchers expose poor black women to the infected gel?"; and 4) "How did researchers explain the study to illiterate women? (Ramjee et al 2007: 1170)

These questions can be understood to articulate concerns pertaining to the process of clinical trial testing. I suggest that these concerns forge relations between the gel and social dimensions that biomedical scientists conceive of existing outside the trial. For instance, these questions relate the gel to an exploitative process concerning poverty and race. They question the ethics of testing a new drug on vulnerable women. They question whether the gel increases HIV risk and whether the gel itself is infected with HIV. Although there are certain assumptions within these questions that are not fully accurate, what is important in these questions is that they bring to the fore concerns with the power relations between the scientists and participants in terms of women's risk of HIV infection and the ethics inherent to the trial. Once again, we encounter a multiplicity in terms of what is at stake within the testing of a microbicide candidate. The matter of concern articulated through these questions is thoroughly relational, asking the specific relations of the gel and the trial to the larger social problematic of HIV infection. However, these matters of concern do not coincide with the biomedical focus on efficacy.

Indeed, within this article, these questions are not responded to in terms of power relations nor in the multiple ways the gel is embedded within those power relations. Rather,



these questions are understood to stem from misinformation. I propose that the authors' response is a lucid example of how the field negotiates a multiplicity, different conceptions between collectives such as the biomedical community and the public, which do not add up. Firstly, the authors of this article respond by making a case for the authority of biomedicine to understand and articulate what is at stake within the RCT. They state that the first lesson learned is the problem of their message to the press, namely that the trial was closed due to an increase in the risk of HIV infection as they write, "[t]he first lesson we learned is that the phrasing of the CONRAD press release was open for misinterpretation by the lay public." (Ramjee et al: 1171) The misinterpretation being that the RCT increased women's risk of HIV infection. They continue to make a case for the importance of the clinical trial, first in terms of its necessity for regulatory approval:

We have learnt that in addition to informing participant communities of the trial conducted in their community, it is important for us to provide them with an understanding of clinical trials in general. *They need to understand that new drugs and interventions can only be introduced if the country's regulatory authority is convinced by the evidence of the quality, safety, and efficacy of the new product, and that such evidence can only come from clinical trials.* They need to understand that clinical trials are particularly important if the product is designed for use by healthy individuals over a prolonged period of time, and that trials should preferably be conducted in communities that will use the product in case there are unforeseen pharmacogenetic interactions. (Ramjee et al 2007: 1172 emphasis added)

Thus, the authors argue that if a microbicide candidate will make it to market, it will need to be evidenced that it is safe and effective and the RCT is construed as the only way to do so. As such, the RCT is articulated as a gatekeeper towards the actual manufacturing and distribution of a new biomedical compound within a larger network of biomedicalisation.

The article continues to make a case for the RCT and the necessity of HIV infections and in this articulation, I argue, a certain slippage occurs. In the following statement, not only is the RCT constituted as the only way to assess the microbicide's efficacy under biomedical authority, the biomedical emphasis of women's HIV infections to attain statistically significant proof of efficacy comes to be translated into effectiveness. This translation of efficacy into effectiveness, poses efficacy based on HIV infections as the matter of fact, solely at stake in the RCT.

One of the major challenges in HIV prevention research is that there are

no surrogate markers for *efficacy*. The only way to assess *effectiveness* of products is to measure new HIV infections as an outcome. It thus becomes extremely difficult to make the lay public understand that in all prevention trials, participants are likely to become infected irrespective of the intervention, and it is not the researcher's aim to increase infection or risk of infection. Prevention packages are provided to avoid infection, including safe sex counselling, provision of male and female condoms, treatment of sexually transmitted infections, and intense scrutiny of safety markers such as ulceration and abrasions in vaginal microbicide trials in particular. Although such packages may reduce HIV incidence overall, it is our ethical imperative to provide as much preventive advice as possible to reduce the rate of new HIV infections. *One of the lessons here is to make the broader community understand more clearly that the only way we can test effectiveness of an HIV prevention technology is to assess the number of new HIV infections.* (Ramjee et al 2007: 1172 emphasis added)

The response in this article translates efficacy into effectiveness, as if they pertain to the same matter of fact. The relationality that effectiveness is understood to refer to is here rearticulated into a strict scientific mechanism of the level of efficacy shown statistical significance based on which HIV infections within the RCT and the larger biomedical apparatus of regulation. Furthermore, through articulating this response using concepts of 'misinformation' and the 'lay public', biomedical scientists are positioned as the authority who articulates what is at stake within the RCT, who gain knowledge of the microbicide within the RCT and who are able to bring a potential microbicide into being.

As argued in the previous chapter, the distinction between efficacy and effectiveness is peculiar in itself, as it creates the appearance as if the social can be separated from the scientific. In more Latourian terms, Stein's conceptualisation of effectiveness allowed for a hybrid understanding of a HIV prevention method, as a matter of concern enmeshed in the social. However, the distinction between efficacy and effectiveness enacts what Latour would call a purification, a bifurcation of HIV preventative prophylaxis into two distinct ontological zones, one pertaining to the physiological effect of the prophylaxis on the HIV virus within the body and another pertaining to the cultural context within which this prophylaxis will be used. This bifurcation creates the appearance that it is in fact possible to separate the physical effects from the sexual context within a RCT. What becomes apparent in the above quotation is that biomedical concerns with natural fact come to overlay the social dimensions of the trial. As a result, what is at stake within the trials becomes singularised as fact.

This understanding of fact is very different from advocacy approaches, which foreground the social and women's vulnerability herein. When the field refers to the RCT as

the gold standard of microbicide testing, they refer to this process of singularisation and the assertion of biomedical authority. The RCT as a gold standard overrides the social dimensions of the problematic of HIV infection. Consequently, this creates the appearance that matters of fact are all that is at stake within the trials and biomedicine has the sole power to discover and determine 'the facts'.

*The Campaign's response: the context of pre-existing risk*

The GCM explains the CS results in terms of a wider context of the HIV pandemic. This contextualisation and its purpose of ethical justification is similar as what became apparent in the Nonoxynol-9 trials as well as the SAVVY trials, insofar as it serves to show that the trials are not harmful in themselves. For the GCM, as the anticipated seroconversions are less than in the wider community, it shows that microbicide clinical trials are not harmful to the women participating (see also GCM 2007c).

Every single infection is a human tragedy, but we must also bear in mind that these trials were done in countries and communities hard-hit by the pandemic. In South Africa, for example, 48% of the women who volunteered for CS trials participation were unable to participate because they were already HIV positive at the time of their screening visit. In Uganda, the rate was 32% at screening, and in Nigerian recruitment for the Savvy trial, it was 12%. Thus, *each new infection that occurs during a trial must also be viewed in the context of women's pre-existing risk in their community.* (GCM 2007e: 2 emphasis added)

As already became evident in the above discussions, this is the main focus of the advocacy surrounding these trials: these trials might be based on women's HIV infections, but they do not put women at risk. In the discussion of the symposium above I argued that the field invites a relational understanding of what is at stake in the clinical trials, by seeing the RCT as an active component within the social complexity of women's sexual relations. The two imperatives proposed by the symposium, namely to change the underlying causes of women's vulnerability as well as enabling women to counter their risk of HIV infection in a most immediate way, invites a coming together of feminist aims of empowerment and biomedical concerns with an efficacious technology. However, the manner in which empowerment, and the conception of power relations that underlies it, are understood interferes with this relational conception. This already became visible in the symposium and is repeated in the GCM's response to the CS trials. The dualist mode of thought that separates the social from the natural and physiological, gives biomedicine the authority to solely engage the physiology of women's vulnerability to HIV infection and the microbicide's

efficacy herein. As a consequence, the GCM's engagement with the clinical trials separates this scientific endeavour from its social surroundings.

Specifically, the campaign's articulation of women's *pre-existing* risk has the effect that the RCT becomes separated from women's pre-existing risk in their communities. This articulation has the performative effect that women's risk is not engaged with within the trials. I suggest that by this specific articulation they mimic biomedical articulations and as such enact a purification that separates the RCT from its social surroundings. This, in contrast to the performative articulations set out in the previous chapter, which centred on a figure of the vulnerable woman and the promise of a microbicide to intervene in this vulnerability.

The GCM's mimicking of biomedical articulation is problematic in terms of the ethical questions the campaign wishes to raise, in particular their concerns with the extent to which trials are harmful to the women participants. Their ethical considerations never quite reach what goes on within the trial, as they do look to the trials results but not the effects of scientific process. Marsha Rosengarten and Mike Michael have critiqued a bioethical point of entry into the RCTs for obscuring "*a more complex, dynamic and multiple set of relations.*" (Rosengarten and Michael: 191) In a similar vein I argue that the GCM places the results of the trials under interrogation, but not the multiple matters of concern emerging from the RCT and the mechanisms through which microbicide/woman and the field as a whole manages to hang together and persist.

Understanding ethics in terms of the outside versus the inside of a trial, construes a certain boundary between the trial as a scientific space and its environment of women's risk of HIV infection and the social problematic this entails. This isolation results in an understanding of women's risk outside the trial and consequently this is understood as merely background of the trial, but not inherent in biomedical process. The clinical trial becomes like an isolated space in which the facts of microbicide efficacy are determined, but the RCT is closed off from the social complexity of women's risk to HIV infection and the power relations the campaign wishes to alter in terms of women's empowerment. In short, articulating their ethical concerns through women's risk as pre-existent reinforces the RCT as the gold standard of microbicide testing, but separates this gold standard from the social problematic a microbicide was promised to intervene in.

#### *Carraguard: towards a relational understanding of the RCT*

The GCM's response to the CS trials is in stark contrast to their understanding of the Carraguard trials. After the SAVVY and Cellulose Sulfate clinical trials were prematurely halted, the Carraguard trial was successfully completed, however this candidate failed to prove efficacious. The Carraguard trial clearly plays a much larger role within the advocacy field compared to the biomedical field and, interestingly in their articulation of these trial

results, the GCM maintains a relational understanding. What I want to bring to the fore in this discussion, are the differences between advocates and biomedical scientists in how they articulate what is at stake within the RCTs.

Carraguard was a microbicide gel that was tested in a phase III trial conducted by the Population Council. The trial was conducted between 2004 and 2007 in three different sites in South Africa enrolling just over 6000 women. On 18<sup>th</sup> of February 2007 the Population Council reported that the gel, although found to be safe, did not protect against HIV infection (Skoler-Karhoff et al 2008).

What is important about the Carraguard trial is that it was the first microbicide trial that was in fact completed. Therefore, despite the disappointing results, this trial is viewed in a positive, hopeful, light by the advocacy field. In fact it was seen as a successful trial which was made apparent by the reactions of several microbicide advocates: *“Microbicide advocates from three major non-governmental organizations hailed the completion of the first large-scale effectiveness microbicide trial as historic, despite the fact that the study showed the product does not protect women against HIV.”* (AMAG, GAF, GCM 2008a)

Importantly, in the discourse surrounding this trial, what it actually means for a trial to be successful was questioned. What we see in the two statements below, is that the clinical trial is taken into account in the context of women’s socio-sexual risk and an active component within the transformation of the sexual practices that leave women at risk. Consequently, in the field’s own vocabulary, what is understood to be at stake is not the microbicide candidate’s efficacy (after all Carraguard showed to be inefficacious) but the effectiveness of the Carraguard RCT (of which Carraguard as a microbicide candidate is of course an inherent part).

Ntoko Madlala of the South African-based Gender AIDS Forum acknowledged her disappointment at the Carraguard results. *“Here in South Africa, we were especially hopeful that the gel would be effective. Thousands of women in our country volunteered to test the product because of this hope.”* According to the researchers, the trial provided women access to state-of-the-art prevention services, including risk reduction counselling, testing and treatment for sexually transmitted infections, and free condoms. *“We know that STI rates went down and condom use went up among women in the trial, so at least they reduced their risk of HIV infection that way,”* Madlala observed. (AMAG, GAF, GCM 2008a emphasis added)

Microbicide trials help to save women’s lives in two ways: (1) by advancing the search for new HIV prevention tools and (2) by bringing health services to trial communities, including the trial volunteers, their partners and

those who are screened but do not enrol in the trials. (AMAG, GAF, GCM 2008b)

This way of understanding the RCT, does not construe it as an isolated space, cut off from its social surroundings. Rather, what is at stake in the RCT is in direct relation with the full complexity of women's risk of HIV infection. Within this line of thought, the RCT is put forward as an open-ended site in direct relation with the context of women's risk of HIV infection and the socio-sexual relations in which this risk takes place. The microbicide candidate is not a discrete object whose effect is tested on the HIV virus within the space of the RCT. The RCT is not seen as a scientific space, or a space of purification as I have named it above, cut off from its social surroundings. Furthermore, the women participants in the trial are not engaged with in any reductive or abstracted manner excluding the trials engagement with their vulnerability to HIV. Interestingly, the GCM here engages a similar phenomenon that Family Health International problematised in relation to the SAVVY trials, but rather sees it as an inherent part of microbicide testing and furthermore, this phenomenon is exactly what positions Carraguard in this positive light. Following this line of thought, I suggest that the RCT is put forward as what Barad has called an open-ended apparatus of bodily production (Barad 2007: 146).

### **Conclusion**

#### **an open-ended space of accountability and responsibility**

Accountability is a key aspect of our mission.

The Global Campaign for Microbicides is the only microbicide-specific entity that makes public accountability a cornerstone of its mission. We have a dual agenda: to accelerate access to a safe and effective microbicide and to transform how science is done. (GCM 2006c: 5)

We are accountable for and to not only specific patterns of marks on bodies – that is, the differential patterns of mattering of the world of which we are a part – but also the exclusions that we participate in enacting. Therefore accountability and responsibility must be thought in terms of what matters and what is excluded from mattering. (Barad 2007: 394)

An engagement with biomedicine has always been central to the Global Campaign's advocacy efforts. They ensure revenues for scientific development, to further scientific

progress from microbicide candidate to microbicide candidate towards eventually an effective microbicide. Furthermore, they aim to engage with the scientific process itself in order to ensure that the science being done has an ethical consideration with regard to women's needs. They understand this engagement with biomedicine to comprise an important component of their task of intervening in women's vulnerabilities and needs in the HIV pandemic. Primarily, women's needs and vulnerability within the trials has been a central aspect for the GCM, as the above quotation shows, they focus on aspects of accountability and transform how science is done. However, in order to do so, one must be able to enter biomedical process, so to speak. Because the GCM upholds the RCT as the gold standard of microbicide testing and abhors biomedical authority to articulate what is at stake in the trials they compare the trial to its 'outside' but never intervene in biomedical process itself. I argued that the manner in which the GCM enacts the microbicide in the context of the RCT mimics a biomedical enactment. As such, they reinforce biomedical authority and the maintenance of the RCT as the gold standard of microbicide testing. The enactments that maintain the RCT as the gold standard for microbicide testing allow for the biomedical promise of an efficacious microbicide to persist and as such moves the field forward from one trial to the next. However, a sole focus on efficacy, and the isolations of the RCT in terms of ethics, does not engage the complexity at stake.

Rather, to quote Rosengarten and Michael in their critique of a bioethical point of entry into the problematic of clinical trials, it shows "*that by enacting ethics – specifically, in the guise of more or less formalized "bioethics"- as a set of practices that deal with 'a problem' (...), the problem becomes contretisized in ways that exclude a more fruitful grasp of 'what matters ethically' and, thereby, medically, socially and politically.*" (Michael and Rosengarten: forthcoming) The GCM does endeavour to engage what matters ethically, medically, socially and politically by approaching science through a concept of accountability, a focus on how science is done and a conception of what is at stake in the RCTs in which the RCT is an active component. However, the role they ascribe to biomedicine and the biomedical promise of efficacy they 'protect' in order for the field to move forward constrains their questioning and makes their engagement with biomedical process less robust than it could be. Women's specific vulnerabilities are inherent to the trial in terms of which women are selected and how the microbicide candidates impact on their risk, both central to the success of the trial. I suggest that constituting the RCT as an isolated scientific space within women's pre-existing socio-sexual risk forecloses any form of questioning the extent to which biomedical process is accountable for women's vulnerability within the trials. This mode of questioning, I propose, is of vital importance to be able to engage the full ethical complexity inherent to the testing of vaginal microbicides through a biomedical process that centralises women's HIV infections and anticipates women's inability to protect themselves from HIV infection.

Interestingly, the GCM's engagement with the Carraguard trial showed not to mimic

biomedical articulation and opened the door for a more relational understanding of what is at stake in the RCTs. Therefore, I want to conclude this chapter with this conception and, following Barad, suggest that it opens the door to think of the RCT as an apparatus of bodily production. In an agential realist conception of the RCT as an apparatus of bodily production, this space becomes open-ended, a phenomenon within which the microbicide candidate, various scientific mechanisms, the women participants and specific socio-sexual power relations are all an inherent part. Within such a phenomenon the components that are brought together do not pre-exist their intra-action, they do not exist in isolation from one another. Furthermore, because it is through the scientific apparatus that these components are brought together as such and construe a phenomenon (a specific microbicide/woman hybrid), the apparatus is directly implied in the phenomenon in question. In less abstract terms, because the RCTs bring together the aforementioned components, the clinical trials are actively implied in the 'phenomenon' in question. This shifts an ethical focus from the outside and inside of the trial towards questions of accountability and responsibility for the microbicide/woman relationality that is an effect of the RCTs various mechanisms and practices.

In these apparatuses phenomena emerge and the ethical question then does not pertain to their outside, but rather becomes a question of relationality. The RCT is put forward as an open-ended space of intra-action, the women participants, microbicide candidates, vaginal figures, risk and vulnerability to HIV infection did not pre-exist the trial. Rather, through its various mechanisms the RCT construes these components as such. Consequently, ethical questions do not concern the vulnerability of these bodies in relation to the RCT's 'outside', but can be re-articulated into an agential realist questioning of the field's accountability and responsibility for the specific mechanisms through which these bodies emerge as more or less vulnerable. "*Accountability and responsibility must be thought in terms of what matters and what is excluded from mattering*" (Barad 2007: 394).

Throughout this chapter, I have foregrounded notions of multiplicity and relationality, to signal a shift in ethical thinking towards a focus on whether trial participants, scientists and advocates have different stakes in the development of microbicides and how these differences are made to matter within the RCT. More specifically, the RCT is held up as the gold standard of microbicide testing because it produces matters of fact. However, these matters of fact only bring the microbicide's effect on the HIV virus within the female body into focus. This is far removed from the more relational conception of matters of concern in which the social problematic of women's HIV infection is a central part. Through understanding the RCT as an open-ended apparatus of bodily production, both matters of fact and matters of concern can be understood to be part of the phenomenon that emerges. Importantly, an ethical engagement with the process of microbicide development shifts towards questions of accountability and responsibility for the ways in which facts and concerns are enacted within the clinical trials, for how they are



made to matter and, importantly, for whom.

**Chapter 6.**  
**A Cyborg Promise?**

Biomedicine's claim to represent the real of AIDS largely derives from its more general claim to know the real of sexed bodies, the irreducible processes associated with the biology of sexual differences. It is this global claim which facilitates its intervention in bodies and its right to adjudicate them, to produce them in various ways. (Waldby 1996: 7)

The argument set out in this chapter is based on the theoretical discussions of Chapter Two in which the natural body is put forward as an effect of various mechanisms of power inherent to science - a set of practices that signals what Michel Foucault has called a *scientia sexualis*. In more particular terms, I argue that the biomedical development of microbicides construes the female bodies that they place under investigation. That is to say, the field of microbicides constitutes the female body as a natural entity, pre-existing cultural power relations, as the unquestionable real of women's vulnerability to HIV infection. However, I suggest their engagement with the social and sexual dimensions of HIV infection construes women's bodies both as sites where dominating power relations are played out as well as the site of the potential transformation of these socio-sexual dynamics. The *scientia sexualis* of microbicide development is a space of constraint as well as transformation.

I will elaborate this conception of a *scientia sexualis* through the work of Haraway and Oudshoorn as discussed in Chapter Three. In this chapter I discussed Madeline Akrich work on the 'semiology of things' in which she argued that imaginations pertaining to the technology's potential user and the context of its use filter into the technology design (Akrich 1992). Nelly Oudshoorn, in turn, took up this mode of thought, but included Butler's notion of gender performativity herein, to argue that the various normative meanings ascribed to technologies construe "gender scripts" which in turn configure the technology's potential user. In an important sense, for Oudshoorn, gender and technology are mutually constitutive (Oudshoorn 2003b: 241). In the following analysis, I suggest that both the microbicide as a technology and its potential user emerge through a performative process in which both the enactment of this scientific object (following Latour and Mol) and the sexualisation of bodies (following Butler and Oudshoorn) is at stake. This argument is an elaboration on my discussion of the vaginal figures of Nonoxynol-9 in the previous chapter, as inherent in a performative process in which the objects are enacted as fact and women's bodies sexualised. However, in the present discussion I will focus on how women's sexual practices are articulated through biomedicine which allows for a more elaborate

argumentation of sexualisation.

In this chapter I will remain with the clinical trial testing of microbicide candidates, but reflect on their testing since the candidate PRO 2000 made it to trial. Specifically, I will analyse a variety of documents published between 2009 and 2012 surrounding the PRO2000 trials HPTN 035 and MDP 301, the CAPRISA trial testing Tenofovir gel and the trials currently in process, namely VOICE, FACTS 001 and ASPIRE. The documents I will analyse include clinical trial reports, an article articulating the MDP 301 study design, GCM documents surrounding the trials, press statements and factsheets of various stakeholders, and a set of articles based on social research conducted as part of the MDP 301 social research arm, namely Pool et al (2010) and Saethre and Stadler (2010, 2011). I have found these documents through in a similar fashion as the documents discussed in the previous chapters.

In Chapter Four I suggested that Zena Stein opened the door for a materialisation of Donna Haraway's cyborg myth in the early 1990s. It is exactly the aforementioned investment of women's bodies as the site of domination and transformation, biomedical materialisation and feminist imagination that is in line with the cyborg myth. In previous chapters, I already problematised the role ascribed to biomedicine, as well as the GCM's engagement with the idea of women's empowerment and a conception of ethics in relation to the clinical trials. Although these arguments will resurface here, my aim is to focus more specifically on how women's bodies are enacted and articulated within the field of microbicide development in order to reflect on the extent to which the field has been successful in materialising Zena Stein's cyborg promise. In other words, I will once again engage the development of vaginal microbicides as a performative process in order to make visible the effects of their performative practices in terms of both the microbicide as a technology and its potential user that they construe. I will focus on these effects, to then be able to compare them to the promise of microbicides as a cyborg promise of transformation. This comparison is important, because I propose that there is a tension between the feminist-biomedical promise of microbicides and the field's specific enactments inherent in biomedical process.

In order to contextualise this divergence between the effects of biomedical process and the initial promise of vaginal microbicides, it is important to note that women's sexuality has indeed been understood as a complex phenomenon within the biomedical field of microbicide development since the first candidate made it to trial. However, although women's sexuality is understood to be important for the testing of candidates, understanding and engaging its complexity is not understood to be the task of biomedical investigation. This is exactly where social research comes in, as was already made evident in the 1997 symposium:

Social science research is needed in a variety of areas critically linked to

microbicide development and introduction, including product use and preferences, sexual practices, understanding of HIV, HIV risk perception, and gender dynamics. These questions should be explored in a variety of cultural settings. (Heise et al 1997: 35)

Indeed, as became evident, social science has a part to play in the field of microbicide development primarily through acceptability studies as discussed in Chapter Four. Social science is seen to be of vital importance for understanding the complexity of women's sexual practices. However, what already became visible in the symposium is that as the RCT is construed and maintained as the gold standard of microbicide testing, the value of social science is secondary to the biomedical authority to show efficacy. Proof of concept, statistically significant proof of the efficacy of a microbicide candidate, attained through the RCT is deemed the highest priority of the testing of microbicide candidates.

To this effect, social research is often put in place as a substitute for what the field calls 'a reliable biomarker' for measuring women's sexual practices in which the microbicide has been used, as robust in biomedical terms as the statistical significance provided by women's seroconversion. Moreover, the trial's ability to show efficacy is given such a high priority, that even if the merits of social science are mentioned, they cannot counteract this search for proof of concept. The symposium already states: "*Ultimately, most participants agreed that clinical trials should include a social science component, but that it should not be allowed to overwhelm the primary purpose of the trial.*" (Heise et al 1997: 36) Indeed, the value is placed on furthering the prime purpose of the trial, which is efficacy.

The moment of the PRO 2000 trials is a significant landmark within the development of microbicides, in terms of what this technology was understood to promise. On the one hand, we see the field rapidly biomedicalising as the biomedical promise of efficacy already briefly set out in the previous chapter accelerated until a notion of efficacy invested the entirety of the female body. Specifically, I will return to the argument about the peculiar distinction between efficacy and effectiveness as a process of purification set out in the previous chapter, but this time show how the failure of upholding this bifurcation is put on women participants' sexual behaviour. This behaviour is then problematised in terms of 'adherence to product use' and consequently women's sexual behaviour becomes regulated to fit biomedical design and protocol. I argue that adherence to product use signals a performative process which involves both enacted purifications as well as performative sexualisations.

However, on the other hand, the moment of PRO 2000 was also where social research became a more serious part of the clinical trials which allowed for a complexity of thought in terms of the microbicide as a transformative intervention. Social research was employed to strengthen a biomedical claim on women's sexual behaviour, to engage a quantification of women's sexual practices and further the regulation of women's

microbicide use within the RCT. However, these same studies also show a complexity of women's incorporation of the microbicide, here discussed through a social research study conducted by Sadler and Saethre, which is understood to enhance the microbicide's potential. I propose that this research puts the microbicide forward as having an agency of its own, enabling women in this study to engage in unanticipated sexual enactments and transformations of power dynamics. As such, in this work the microbicide emerged as, what Donna Haraway has called, a *material-semiotic actor* (Haraway 1991b: 200, Haraway 1997a: 67) through which new configurations of sex, gender and sexuality were enacted. Importantly, the enactments articulated in the two articles I will discuss are unimagined by the biomedical setting, the microbicide here emerges as a wily actor that slips out from under biomedical control. I suggest that through these women's enactments and their articulations and the microbicide's wily agency and the material-semiotic configurations that ensue, a promise of cyborg embodiment was opened up.

Therefore, in this chapter I argue that, on the one hand, the field of vaginal microbicides is experiencing an increasing biomedicalisation enacted through the quantification and regulation of women's sexual and intravaginal practices by the RCT. A process that accelerated through the promise of efficacy PRO 2000 generated. However, on the other hand I argue that social researchers, specifically of the MDP 301 trial, question both the quantification and the regulation of women's sexuality. They emphasise the importance of women participants' own conceptions of the microbicide's effectiveness for the potential this technology wields. Furthermore, by centralising women participants as such they create a space in which to question biomedical process in terms of an accountability and responsibility for the manner in which women participants' vulnerability to HIV infection is managed within the RCT.

Therefore, in this chapter I will reflect on the moment of PRO 2000 and map out its consequences for what a microbicide is able to promise. In the following analysis I will trace this process of biomedicalisation and its interferences in more detail.

### **The Moment of PRO 2000**

Between February 2005 and September 2008 a phase IIb trial was conducted testing the microbicide gel PRO2000 and Buffergel, across different sites in Malawi, South Africa, Zambia, Zimbabwe and the U.S. and enrolled just over 3000 women (Abdool Karim 2011). On the 9<sup>th</sup> of February 2009 the U.S. National Institutes of Health announced that the PRO 2000 arm of the study showed 30 percent reduction of infections. (Buffergel did not show any protective effect.) These results re-invigorated the field of microbicides, advocates and

scientists alike, offering a sense of hope and investing the microbicide anew with a sense of promise. (see also IPM 2009a)

*The results on PRO2000 are a ray of hope for women (...) This is the first time that we have had human data actually showing that a vaginal gel can work to reduce infection. It is not a home run, but this “proof of concept” should invigorate the field.”* (GCM 2009h)

The press release continues by quoting dr. Samo Dube the GCM’s African Program Leader. *”Much remains to be done before we will have a viable product to distribute (...) But as an African woman, a physician, and a mother, my message is that this is a great day for women and for prevention research.”* (GCM 2009h) Furthermore, the Microbicides Trials Network releases a press statement saying:

A clinical trial involving more than 3,000 women in southern Africa and the United States has demonstrated for the first time the promise of a vaginal microbicide gel for preventing HIV infection in women. (...) *“These findings provide the first signal that a microbicide gel may be able to prevent women from HIV infection. Indeed, for the millions women at risk for HIV, especially young women in Africa, there is now a glimmer of hope.”* (MTN 2009c)

Before 2006 the trial was conducted by the HIV Prevention Trials Network (from which it gets its name HPTN) funded by the National Institute of Allergy and Infectious Disease, afterwards it was taken over by the Microbicide Trials Network. The HPTN trial was a phase II/IIb safety and acceptability trial to explore whether the compound was worth testing in a full scale efficacy trial. The HPTN 035 trial consisted of 4 arms, namely PRO 2000, Buffergel, a placebo and a no-gel arm (a so called second control group to test whether the placebo did not have any effect on women’s HIV infections).

HPTN 035 was presented as the first microbicide RCT to show proof that the concept of a microbicide is feasible. However, because of the small number of seroconversions, this reduction was not statistically significant and was understood to possibly be due to chance. (MTN 2009a, 2009b) At the time of the HPTN 035 trial the UK-based Microbicides Development Programme (MDP 301) was already conducting a phase III trial testing PRO 2000. MDP 301 was conducted across several sites in South Africa, Tanzania, Uganda and Zambia between October 2005 and September 2009, known as MDP 301 funded by the UK Department for International Development and the UK Medical research Council (McCormack et al 2010). While the US Institutes for Health released their statement on the promise of PRO 2000, this trial was in its final stages, expecting its results in November

2009. (GCM 2009c) Because this trial enrolled just over 9000 women, it would generate more data and was expected to be able to show exactly how efficacious PRO 2000 was. Indeed, the promising results of the HPTN 035 results blended into an anticipation of and a hope for the MPD 301 conclusions, in fact MPD 301 is explicitly mentioned in the report of the HPTN 035 trial results (see for instance GCM 2009e).

Across all sites of the MDP 301 trial 418 women got infected with HIV. The difference in the amount of infections between the microbicide arm (4.5 percent) and the placebo arm (4.3 percent) was too small to conclude that PRO2000 had any effect on HIV infection. In biomedical terms, the difference was not statistically significant. Therefore, on the 14<sup>th</sup> of December 2009, the MDP 301 trial results were announced. Disappointing results, as PRO 2000 appeared to be safe yet unsuccessful in its protection against HIV infection. (MPD 2009)

Although PRO 2000 eventually did not show to be successful in protecting against HIV infection, the results of the HPTN 035 trial brought to the fore the promise that a microbicide could actually materialise, a hope invested in the biomedical testing of MDP 301 and eventually deferred into the next generation ARV based microbicides (see for instance AMAG 2009; GCM 2009g; IPM 2009b; MTN 2009d) In line with the discussion set out in the previous chapter, biomedicine is looked upon as holding the promise of efficacy and the RCT continued to be held in place as the gold standard of microbicide testing through which an eventual efficacious microbicide will materialise, and as such biomedical mechanisms of establishing efficacy were foregrounded. The promise of efficacy that PRO 2000 generated accelerated a process of biomedicalisation that still marks the field.

However, the testing of PRO 2000 was also an important moment within the development of microbicides as the MDP 301 trial was the first RCT to include a large scale social research arm. In the context of making social research secondary to the primary purpose of the trial, the inclusion of a social research arm had a double edged effect. On the one hand, this arm was included to give more accurate data on women's sexual practices towards a more accurate marker of women's use of a microbicide. On the other hand, the social research conducted within this arm suggested that a quantification of sexual behaviour was highly problematic. Moreover, far removed from biomedical conceptions, this research articulated a rich complexity surrounding women participants' experience of their bodies, their sexual and intravaginal practices and how the microbicide was incorporated herein.

In this section, I will engage the literature surrounding the MDP 301 trial both in terms of its quantification as well as the complex interference social research invites.

### *Quantification*

Within biomedical documents, women's use of the microbicide and the

problematism of both women's sexual practices and intravaginal practices are articulated through the concept "adherence to product use". Adherence to product use is put forward by the field of microbicide development as one of the most pressing problems for showing the efficacy of the microbicide candidate in the clinical trials. (Adherence has also been problematised by the clinical trials discussed in the previous chapter, see for instance Feldbloom et al 2008: 11, Halpern et al 2008: 10) Adherence is understood to be essential for the trial as it allows scientists to know *how* and *if* women's seroconversions in the clinical trial were related to the microbicide candidate. What this concept means at baseline is that women need to use the microbicide in every sex act, and use it in the prescribed manner. This includes correct use of the applicator, timing and dosing, avoidance of gel sharing as well as the use of the microbicide candidate during vaginal sex only. (See for instance Family Health International and CARPRISA 2010a) Poor adherence or non-adherence to product use is understood to interfere with the efficacy shown in the data produced by the trial. For instance, as we have seen, if the trial results show the microbicide candidate not to be efficacious, the scientists need to know to what extent this is due to the candidate's effect on the HIV virus and to what extent this is due to women not using the product correctly.

The problematic of adherence to product use provokes a specific set of quantifications and regulations of women's sexual practices. Firstly, women's sexual practices are quantified through various measuring techniques, such as the counting of applicators translating women's sexual practices into 'sex acts'. Secondly, this quantification is then utilised to regulate women's sexual behaviour within the trial through various monitoring techniques on which I will reflect in the next section of this chapter.

MDP 301 had an explicit focus on adherence in terms of quantifying women's sexual practices. Interestingly, trial results are usually published in the form of clinical trial reports, fact sheets, press releases etc. in which the details of the trial results are discussed, but the trial design itself does not feature in any significant manner. However, the article published by Nunn et al that I will analyse below does discuss the MDP 301 trial design, and emphasises the difficulty of measuring whether and how women participants use the gel. In articulating the difficulty of measuring women's adherence to product use, once again a distinction is articulated between the microbicide candidate's efficacy and its effectiveness:

*Interpretation of the findings of the trial will depend on having reliable data on various aspects of behaviour.* First, documenting the demographic and behavioural characteristics of the participants is necessary to evaluate the likely generalisability of the results to women in other populations. Second, data on usage of gel and condoms is essential in interpreting the measured effectiveness of the product. The term *efficacy* is generally used



to denote the effect of an intervention under perfect conditions, for example *implying 100% adherence* and consistently correct use. In practice, such conditions cannot be achieved and microbicide trials will actually measure product *effectiveness*, this term denoting the effect under actual conditions of use. The level of effectiveness experienced in trials is, however, likely to be greater than that achieved in routine conditions. (Nunn et al 2009: 7)

Interestingly, this distinction between efficacy and effectiveness has surfaced twice before. Firstly, Zena Stein articulated a difference between the condom's efficacy and its effectiveness, in order to make a case for the social problematic within which HIV prevention devices are used. In other words, a condom might be close to 100% efficacious, but if women cannot use this device, its effectiveness will be close to nil. By creating this distinction she invoked a conception of HIV prevention divided into two separate domains, one pertaining to natural physiology and one pertaining to social complexity. Secondly, as the biomedical literature surrounding the Cellulose Sulphate trials already made evident in the previous chapter, this distinction does not hold when candidates are tested within the RCTs and as such enacted within the various social contexts trial participants will use the microbicide in. The literature surrounding the CS trials occluded the failure of separating nature from culture by translating efficacy into effectiveness and giving biomedicine authority over both the cultural and the natural processes at work.

In more Latourian terms, the distinction between efficacy and effectiveness is a process of purification, a specific performative enacted within scientific practices, which endeavours to create two distinct ontological zones. Namely, one zone includes the natural domain of the physiology of HIV infection and one includes the cultural domain of women's specific sexual practices. I argue that this distinction is not only an illusion forged by the manner in which a microbicide as an intervention is articulated, it is a bifurcation that does not hold outside these biomedical articulations. In particular, because the microbicide as an intervention engages in both the physiology of HIV infection and women's sexual practices, a nature/culture distinction does not grasp what is at stake in the sexual practices within which a microbicide candidate is used.

What the above statement shows, is that the failure of upholding this dichotomy is put on women participant's sexual behaviour. This distribution of failure creates the appearance as if women's sexuality is the cause of the trial's inability to show the microbicide's efficacy, but the bifurcation of HIV prevention into the physiological effects of a preventative method on the HIV virus and the separated complexity of social dimensions of power and sexual practices (efficacy/effectiveness, nature/culture), is not flawed or unattainable in itself.

I suggest that the manner in which biomedicine endeavours to isolate a matter of

fact, namely through quantification and regulation, construes women's sexuality in a specific manner – it has a performative effect that Latour's performatives of purification and mediation or the object-focused performative of Mol's enactment do not fully grasp. The field's measuring mechanisms are not only part of an enactment that puts the microbicide candidate forward as a matter of fact. In a more Butlerian sense, these measurements are also part of a performative process where women's bodies and sex acts come to appear as given, pre-existing their measurement.

Efficacy is articulated in terms of full adherence to product use, meaning women participants' use of the microbicide in the prescribed manner every time they have sex. As such, the RCT's ability to show the microbicide candidate's efficacy becomes contingent on the correct measurement of women's use of the microbicide within their sexual practices. This invites various mechanisms of quantification reinforcing biomedicine's authority to state and create what is at stake within the trials. To exemplify, the article continues to problematise women's intravaginal practices, which is immediately translated into a problem of measurement:

*Intravaginal practices*, such as vaginal cleansing, are known to be highly prevalent in some of the study populations and these may interfere with any protective effect of the gel. Although women are counselled not to engage in these practices at all, and especially not within one hour prior to applying the gel and for at least one hour after sex has occurred, it is recognised that they may not always comply with this guidance. Thus, measurement of these practices is also important. (Nunn et al 2009: 7)

As adherence to product use and the microbicide's efficacy are so closely related, the biomedical field is urged to gain knowledge on how the microbicide candidate is used within a RCT. Specifically, in the MDP 301 trial adherence to product use was measured through counting gel applicators and getting reliable data on women's sexual behaviour and intravaginal practices. Unlike the statistical significance of product efficacy, measuring women's microbicide use through what they themselves report is understood to be unreliable and the field continuously comments on the absence of a gold standard of measuring women sexual behaviour, a biomarker of adherence: “[s]elf-reported adherence has been high in all microbicide trials so far, but scepticism remains about reporting of adherence in the absence of a reliable biomarker.” (McCormack et al 2010: 8)

In the MDP 301 trial, women's use of the microbicide within their sexual and intravaginal practices was measured through a process of 'triangulation' which included the counting of used and unused microbicide applicators, structured questionnaires including a questionnaire “to capture data on additional sex acts, anal sex and intra-vaginal hygiene practices” (Nunn et al 2009: 10). Furthermore, “a random sample of at least 100 women at

*each site is asked to fill in pictorial diaries recording number of vaginal or anal sex acts, gel and condom use during individual sex acts, and intra-vaginal practices*" (Nunn 2009: 8). MDP 301 also included a social research arm of which in depth interviews were an important part.

A group of researchers (including Nunn and McCormack, as well as Stadler whose research I will discuss below) conducted a study as part of the MDP 301 social research arm which focused on a triangulation between the various measuring techniques engaged with in the MDP 301 trial to see if there are any inconsistencies between counting applicators, coital diaries and in depth interviews. This article illustrates the field's fixation on finding a reliable way of measuring behaviour as they write:

In the absence of a "gold standard" the collection of data on adherence, and sexual and other sensitive behaviour relies largely on participant self-reporting, the limitations of which are well recognised. In order to overcome these limitations (...) the Microbicides Development Programme (MDP) (...) developed a mixed method and triangulation model to collect data on sexual behaviour and adherence in the MDP301 trial. (Pool et al 2010: 2)

In the third chapter of this thesis I discussed Oudshoorn's work and in particular her focus on the development phase of technologies as an intriguing location for analysis, because it makes the differences visible between how users and scientists ascribe certain gendered meanings to the technology and thereby enact different notions of the sexual scenario within which this technology will be used (Oudshoorn 2003: 213). The research of Pool et al indeed found inconsistencies in women participants' reports on adherence between the questionnaire, applicator returns and in-depth interviews. This study showed that most inconsistencies were created by the presuppositions reflected in the RCT's measuring mechanisms and the different conceptions held by the women participants in terms of the meanings ascribed to both the microbicide and the sexual scenario in which it is used.

Specifically, this research showed that the biomedical quantification of sexual behaviour did not correspond with the complexity of women's sexual practices. One example of this incompatibility was the measurement of women's sexual practices through 'sex acts' as the article states:

...the behaviours being quantified are not easy to delineate. For example, even though the trial defined "sex act" as "a single act of vaginal penetration, with or without ejaculation," there is still much ambiguity regarding what counts as a sex act, and the overlap in meaning with local

concepts of “sex”, “days” (on which people have sex), and “rounds” (there may be numerous “rounds” of sex in a “day”) is only partial. As a result, *the ostensibly unambiguous numbers hide a more ambiguous reality.* (Pool et al 2010: 3 emphasis added)

The trial’s measuring techniques carry the presupposition that women’s sexual practices constitute a series of singularised acts of vaginal penetration, with or without ejaculation, which then in turn can be measured by the RCT. However, the inconsistencies reveal that women’s sexual practices do not correspond with the sex acts of the trials measuring practices, i.e. the scientists engaged in the trial and the women participants do not have the same conception of what constitutes the sexual scenario within which the microbicide is used. Biomedicine as ‘a culture of no culture’ is put forward as engaging the real of HIV infection and the microbicide candidate’s effect, outside normative dimensions of meaning. Consequently, the biomedical articulation of women’s sexual behaviour into sex acts is understood as a measurement that endeavours to reveal the real effect of the microbicide candidate.

In contrast to biomedical conceptions, I argue that through the concept ‘sex acts’ women’s sexual practices are articulated into quantified measurable data. This quantification is a process of purification which sustains the biomedical access to the physiology of HIV infection, but it is also part of a performative process which construes women’s bodies and sexuality as given, to be measured by biomedicine. This performative effect occludes the complexity of women’s sexual practices and the multiple ways in which a microbicide is used within this context: *the ostensibly unambiguous numbers hide a more ambiguous reality.*

This quantification becomes even more evident in the measurement technique of counting applicators as an objective measure to show whether women in the trial are using the microbicide with each sex act. Once again, Pool et al problematise this mode of measurement:

Participants sometimes used gel without having sex, and such use was usually not reported in the CRF [case record form] interview or the CD [coital diaries] as “gel use” (but did come up in the IDI [in-depth interview]). For example, some wanted to try out the applicator or demonstrate to their partner. Sometimes participants used gel to “cleanse” their vagina, and there were unsubstantiated rumours (in the FGDs [focus group discussions] and community ethnography) of some women using the gel as hair gel or skin cream. As a result, used applicators did not necessarily mean the gel had been used for sex. (...) Although they were not questioned explicitly about this, it seems likely, from some of the IDI

[in-depth interview] discussions in which participants reported having five or six “rounds” during the course of a single evening, that they did not insert a new gel for each round but did assume when they were being questioned that all rounds were “sex acts with gel”. In this case, conversely (...) lack of used applicators did not necessarily mean that gel was not used during sex. (Pool et al 2010: 6)

The quantification of women’s sexual practices into sex acts directly feeds into the biomedical enactment of the microbicide candidate. The counting of applicators creates the appearance that the microbicide is an object with a singular meaning within a sexual context that is given, in particular one applicator per sex act. This articulation creates the conditions of possibility to present the microbicide’s effect on the HIV virus within the female body during a single sex act as a “matter of fact”. However, through this quantification the biomedical field does not take into account the women who insert the applicators, in terms of the meanings they ascribe to the microbicide candidate within their intravaginal and sexual practices (and their hairstyling routines). Importantly, this study of Pool et al articulates the differences between how women participants and biomedical scientists enact the microbicide within the RCT and the inconsistencies within this study show that the women participants enacted the microbicide in ways that were not in line with biomedical prescriptions. In short, the biomedical enactment of the microbicide as a singular object through the counting of applicators and the enactments of the microbicide through women’s intravaginal and sexual practices do not correspond.

A microbicide candidate is enacted differently by different actors with different conceptions and stakes in its development. Once again following Annemarie Mol, I suggest that the microbicide candidate is enacted as a multiple object. Within this multiplicity, biomedical research practices have a role to play, but so do women’s sexuality and conceptions of cleanliness as the microbicide is enacted within women’s various intravaginal and sexual practices. Counting applicators creates the appearance of a mode of measurement that presents a matter of fact, but it does not correspond to the multiplicity of “microbicides” at play.

Importantly, within this performative process of quantification and the multiplicity that ensues, it is not merely the materiality of the object that is at stake. It is not merely the different material enactments of the microbicide, i.e. efficacy, applicator, hair gel, lubricant, cleanser, etc, that make for this object to multiply. The study discussed here shows that the multiplicity at hand also pertains to the meaning that is ascribed to the microbicide candidate, and the meaning ascribed to the sexual context in which the candidate is used. The microbicide as a technology is material in potentially protecting women’s bodies against the HIV virus and the specific ways in which it is incorporated into women’s sexual practices. However, women’s sexual practices and biomedical research practices are fully

invested in webs of normativity and meaning pertaining to women's bodies, sexuality relationships and so forth. As such, the microbicide is part of a performative process that in a more Butlerian sense is constitutive of the sexualisation of women's bodies.

In the third chapter of this thesis I engaged Nelly Oudshoorn's effort to include a notion of gender performativity within scientific practice. Following this line of thought, in the next section I will focus on two articles based on research conducted by Stadler and Saethre (2010, 2011) in which women participants' enactment of the microbicide into their sexual practices is foregrounded. In this research, the microbicide is shown to be a part of a performative process through which women's bodies are sexualised in a specific manner. Technology and women's sexualised bodies are mutually constitutive. As such, a performative process unfolds in which the materiality of HIV infection and the various normative meanings that constitute notions of sexuality, gender, sexual relation, embodiment and the like become intimately related through the manner within which a microbicide is used. Following Haraway, I suggest this process to signal the material-semiotic character of scientific process through which the microbicide emerges as a material-semiotic actor. (Haraway 1991b: 200, Haraway 1997a: 67)

### *Cyborg Complexities*

Here I will focus on two articles resulting from a study carried out by Eirik Saethre and Jonathan Stadler as part of the MDP 301 social science arm that focus on women participants' experience of PRO 2000's effectiveness through and within their intravaginal and sexual practices. This research was conducted at the Johannesburg site of the trial, in Soweto, in the township of Orange Farm (and some surrounding townships) and was carried out with participants between 18 and 40 years old. Besides conducting interviews and focus groups at the trial site, they also conducted observations in the local market and store.

I already engaged acceptability studies in this thesis in Chapter Four and the discussion here will show a lot of correspondences. The discussion of hypothetical and surrogate studies showed how women incorporated the microbicide into the intravaginal practices they already engaged in. The same will become apparent below. However, one important difference is that the microbicide in question is an actual candidate. This means that women's beliefs on the effectiveness of the compound to protect them against HIV infection are an inherent part of how they incorporate the microbicide candidate into their sexual and intravaginal practices. In this sense, the studies discussed below, also bring up similarities as the acceptability study analysed in relation to the Nonoxynol-9 trial discussed in the previous chapter, in which women believed to have found "their protector".

Saethre and Stadler's work shows that women incorporated the microbicide candidate into their intravaginal practices, and as such this technology became embedded

into women's sexuality, partnerships and bodies and the normative enactments these entailed. As such, the meanings women ascribe to the microbicide are vital to the manner in which the candidate will be used, i.e. norms surrounding women's intravaginal practices enable and constrain eventual microbicide use. Interestingly, this study shows that beliefs surrounding the candidate's effective protection against HIV are closely related with the norms enacted through women's intravaginal practices.

Saethre and Stadler argue that “[b]ecause its clinical efficacy has yet to be determined, PRO 2000 (and other pharmaceuticals under ‘trial’) is evaluated locally based upon understandings of bodily processes and the personal experiences of trial participants.” (Saethre and Stadler: 101) I suggest that the manner within which the efficacy of the microbicide candidate is articulated here as ‘yet to be determined’ can be understood through Karen Barad’s concept ‘indeterminacy’ discussed at the end of Chapter Two. Barad argued that apparatuses construe phenomena out of a certain fundamental indeterminacy. In other words, the components that make up a certain phenomenon such as for instance microbicide/woman, do not pre-exist their intra-action, but are temporal, and radically contingent, determinations. In a similar vein, I suggest that the aim of an RCT is to construe a momentary stabilisation (such as matter of fact) out of a situation of indeterminacy. Although this indeterminacy fuels the biomedical search for efficacy it also invites women participants to come to their own conceptions of how the microbicide works.

In this particular research, women's beliefs about the effectiveness of the gel were closely related to their experience of ‘physical symptoms’ (Saethre and Stadler: 101). When women experienced some side effects, they believed the active ingredient was causing them, as for instance one woman is reported as stating: “*I believe that I was given the one with percentages (0.5% or 2%) because of the way things happen in my body.*” (Saethre and Stadler: 101) Accordingly, the manner in which women articulate their conceptions of the microbicide and its effect of HIV infection, construes a complex relation between the microbicide and women's bodies.

Those stating that they were using an active gel, often added that despite the uncertainty of medical professionals, they believed the microbicides cleansed the vagina and helped to maintain reproductive health. Women often spoke of their vaginas as reservoirs within which ‘dirt’ collected. Through the use of PRO 2000, dirt was portrayed as being ‘drawn out’, ‘dragged’, and ‘flushed’ from the vagina, which was subsequently described as ‘clean’ or ‘cleansed’. As evidence of this process, women usually identified vaginal discharge: ‘*I can see dirty things that have come out so that means it cleans everything that is in my womb.*’ Another participant noted, ‘*I was happy when it came out especially when I saw that it was dirty, it meant that the gel was cleaning me.*’ Some women

commented that when they first began to use the gel, their discharge was opaque and pungent. This was believed to be a sign of disease: *'If you have an infection the gel will clean it out and it will show on the discharge that there is something wrong with your womb.'* Women reported that over time, discharge tended to become clear and odourless – a sign of vaginal cleanliness. (Saethre and Stadler 2010: 102)

The women in this statement articulated a relation between experiences of their body and the microbicide candidate through conceptions of cleanliness. In particular this statement shows how women's understanding of the microbicide, in this case as a cleansing gel, also revealed normative conceptions pertaining to their bodies. Women's bodies here emerge as 'reservoirs within which dirt collected', women articulate their bodies as inherently dirty and the microbicide, in turn, cleanses these bodies by dragging, flushing and drawing out dirt from women's vaginas. In previous chapters I have discussed Nelly Oudshoorn's work and her focus on how, what she calls, the scientific artifacts and gender are co-constitutive. In particular, scientific artifacts, objects like the microbicide, carry "genderscripts" that pertain to the specific cultural contexts in which this technology will be used and importantly the role ascribed to the user herein. Following Oudshoorn, the users of scientific artifacts can be understood as active agents in enacting specific "gender scripts" through these objects. In this light, when we look at the above statement, it becomes clear that women articulate their bodies as clean or dirty and ascribe a specific meaning to the microbicide in this context, namely the candidate becomes a cleansing gel. Women's conception of the gel as a cleanser is directly tied to their belief of the gel's protective effect. Therefore, in contrast to Oudshoorn's focus on gender identity, I suggest that the articulations and enactments under question here show the gender scripts that women articulate do not merely pertain to women's gender identity, but also to the materiality of the HIV virus and infection.

Furthermore, within these enactments, the microbicide is not just an (material) object to which various meanings are ascribed, it also enables women to articulate new meanings through the microbicide as well as enact new sexual scenarios through this technology. In this study, this enabling effect becomes most apparent within women's sexual practices, or intravaginal practices within a sexual context or scenario.

Although gels could be used secretively, women in the trial often told their partners that they were using it. Some women inserted the gel in private and others did so in the presence of their partners. The act of inserting the gel was erotic for some women and their partners. MakiNono said that her husband inserted the gel for her as part of foreplay: *'Sometimes he inserts it for me. I have showed him how to insert it. We start with foreplay and*



*then when we are about to have sex he takes it and inserts it*. Increased sexual pleasure also had a favourable impact on the quality of relationships. Gel use transformed sexual relations as well as the quality of the relationship overall. (Stadler and Saethre 2011: 38)

Since the initial idea of a microbicide, women's specific vulnerability to HIV infection within their sexual practices was understood as women's inability to instigate HIV prevention within their sexual relations. This became apparent in Zena Stein's argument that women were unable to assert dominance in their sexual relations, as well as the GCM's articulation of women's lack of control to negotiate condom use.

What the statements above show, is that the gel becomes part of a sexual practice in which the woman in question is enabled to instigate gel use, either in the presence of her partner or together with her partner. In other words, the microbicide enables a different sexual enactment, a transformation of those sexual enactments which render women vulnerable in advocacy discourse. This opens the door to a transformation of power relation through the specific incorporations of the microbicide into women's sexual practices.

This research does not show the microbicide to be a passive scientific artifact to which meanings are ascribed, either by the designer or its potential user, but rather the microbicide emerges as a material-semiotic actor. In the third chapter of this thesis I discussed Donna Haraway's concept of a material-semiotic actor in order to pay heed to the material-semiotic character of scientific process, in terms of the specific meanings and materialisations its performative processes generate. In terms of the microbicide as a scientific object, it is a way to show how meanings pertaining to sexuality and gender relations become invested into this object. However, importantly, a material-semiotic actor, by virtue of being an actor, has an agency of its own. I suggest that the microbicide as it emerges from Stadler and Saethre's research is such a material semiotic actor, which importantly, has the potential to enable women in this study to engage in unanticipated sexual enactments and power dynamics. As such, this wily actor invites new configurations of sex, gender and sexuality unimagined by the biomedical setting through which this object was designed and in which it is tested. The configurations shown in this study are indeed far removed from biomedical prescriptions.

These configurations are not merely semiotic, they do not merely pertain to cultural notions of sexual relations, but are also deeply material. In particular, this study shows that contrary to biomedical conceptions of the candidate and biomedical protocol, the women participants are shown to understand the microbicide to be active in protecting their bodies against the HIV virus and the compounds are incorporated into women's sexual and intravaginal practices accordingly:

*"I thought that it was searching for diseases inside me whilst protecting me*

*at the same time by removing all the dirt, even if I had come in contact with someone who is infected with HIV.”* Consequentially, the active gel was seen to protect women against contracting many STIs: *“Let’s say my partner had “dirt sickness” [STI] and I did not know about that but since I use the gel I would not need to go to the clinic or have a problem with STIs.”* (...) Through the process of cleansing the womb and removing impurities, the active gel is also believed to eliminate HIV before transmission can occur: *‘The gel is preventing us from many diseases including HIV because it flushes out everything that is dirty’.* However, none of the women interviewed stated that the PRO 2000 could cure HIV if it had been previously contracted. (Saethre and Stadler 2010: 102)

Through its cleansing properties the women in this study ascribed a certain agency to PRO 2000 that went beyond the protection against HIV. Its cleansing properties were understood in a more encompassing sense of which HIV infection is one component and as such women began using the gel in a nonprescribed manner. *“The positive cleansing effects led participants to utilise the gel in non-prescribed contexts: ‘I would sometimes insert the gel without having sex for it to clean my system.’* (Saethre and Stadler 2010: 103) This nonprescribed use was related to how these women understood the effectiveness of the microbicide candidate and therefore in direct relation to the HIV virus.

Women in the trial described how the gel cleansed the vagina and the womb of ‘dirt’. After being inserted, the gel lined the cervix thereby preventing harmful substances from entering the womb. Anelisa (33 years old) described this in the following way: *“When a woman inserts the gel, it covers the walls of the vagina, and then when you penetrate even when you release your sperm. It does not have that power to go in through the layers of the vagina it does not have power and it does nothing.”* (Stadler and Saethre 2011: 36)

The above statement shows that the women in this study ascribed a certain power to the microbicide, which was wielded by them through its use. This expanded the potential of the microbicide in terms of a bodily transformation of power, both in relation to the HIV virus as well as within their sexual practices. In other words, this statement articulates the microbicide as an intravaginal practice, an enactment that *enabled* women within their sexual practices.

The field of microbicide development is marked by a coming together of feminist ideas of women’s empowerment and biomedical scientific investigation, which creates a co-constitutive relation between the microbicide as a scientific artifact and its potential to

transform the power relation understood to place women at risk of HIV infection. Following Nelly Oudshoorn, this co-constitutive relation entails that the meanings ascribed to gendered artifacts and the specific ways in which these technologies materialise configure its potential user. This research showed how women enacted the microbicide as an intravaginal practice, which enabled them to transform their sexual practices in such a way that they were able to instigate the use of an HIV preventative method. The microbicide's potential showed to be contingent on both the microbicides' materiality (as a gel to insert intravaginally) as well as its different meanings (as for instance a cleanser or a sexual product). Moreover, the microbicide as a material-semiotic actor enabled a configuration of its female user as asserting the use of a HIV preventative method within her sexual practices, thereby transforming the power relations advocates propose leave women at high risk of HIV infection.

Therefore, I wish to push Nelly Oudshoorn's suggestion that gender and technology are co-constitutive one step further, and argue that the various components that are brought together within this particular study are intra-active. The women participants emerge from this study as complex phenomena, cyborgs perhaps, in which sexuality, meanings surrounding dirt and cleanliness, bodily experience and the microbicide were all vital components. Furthermore, these components were mutually constitutive. Understanding this intra-action is vital for understanding the ways in which the microbicide is materialised through women's specific uses. Following Barad's line of thought, I suggest that in the field of microbicide development, there are no pre-existing female bodies, virus and microbicide candidates that interact with one another, rather, it is through their intra-action that these "relata" come to be. Virus and microbicide candidates as nonhuman entities are both vital for the production of bodies in the field of microbicides and become-related *through* specific practices.

As an important consequence and in line with cyborg embodiment, the boundaries between women's sexed bodies, the apparatuses of scientific development and the microbicide as a technology evaporate: "...bodies are material-discursive phenomena that materialize in intra-action with (and, by definition, are indissociable from) the particular apparatuses of bodily production through which they come to matter (in both senses of the word)." (Barad 2007: 209) Not only is microbicide use complex, a complexity that cannot be quantified, but because of the meanings women ascribe to it, microbicide use cannot be pre-determined, it slips out from under biomedical control. Indeed, women within the trials might very well enact gendered and sexual scenarios through the microbicide candidate that are not in line with how biomedical scientists understand it. Furthermore, they are vital for the effectiveness of the microbicide candidate and as such the way women enact the microbicide within their intravaginal and sexual practices matters in terms of the microbicide's effectiveness and its material-semiotic potential. This understanding is far removed from the biomedical counting of applicators to measure microbicide use discussed

above.

I suggest that Saethre and Stadler's work can be read as proposing a relational conception and engagement with the promise a microbicide is able to configure:

For researchers in the field of microbicides, and for women living in Johannesburg, microbicides represent the hope of finding a way to prevent the increasing levels of HIV infection. Yet, women who participated in MDP 301 invested the gel with unimagined attributes. Indeed, their accounts of gel use challenge the assumption held by medical science that consumers necessarily share the same meanings that they do. (Stadler and Saethre 2011: 38)

Scientists endeavour to isolate variables and construct specific matters of fact out of a situation of indeterminacy. I read this study as showing that women created their own meanings, determinations, surrounding the microbicide, apart from biomedical prescription. Furthermore, I suggest that this study shows that the microbicide is an enabler within these conceptions, i.e. as a technology it enabled new enactments of women's bodies and sexuality not only not prescribed by biomedicine, but unimagined. As such I argue that the microbicide as a technological artifact has a certain wiliness to it, an agency of its own in terms of how new meanings pertaining to sex and gender are enabled through its specific materialisations within women's bodies and sexual practices.

This conception of a fundamental indeterminacy broadens the microbicide's potential, but it also links into the ethical concerns discussed in Chapter Four surrounding women's vulnerability to HIV infection within the RCT. Saethre and Stadler focus on how women participants experience the effectiveness of the microbicide candidate within an ethical framework. They write:

When a pharmaceutical product is widely distributed but 'unproven', these drugs become imbued with an ambiguity that is not present in other medicines. This paper asserts that *the process of clinical trials encourages participants to interpret their own experiences of using a drug and to formulate conclusions independently to those of medical professionals.* (Saethre and Stadler: 100)

In other words, the indeterminacy inherent in the process of microbicide testing provokes different conceptions in terms of the effectiveness of the microbicide candidate, i.e. a multiple enactment, which already came to the surface in relation to Nonoxynol-9 in which women participants and scientists enact the microbicide's effectiveness in different ways. Both scientists and trial participants will determine these in their own way and what

this study shows, once again, is that these enactments do not correspond. Furthermore, what this study shows, in line with the acceptability study discussed in relation to Nonoxynol-9, is that despite their understanding of the RCT protocol women ascribe meanings of effectiveness to the microbicide candidate. As Saethre and Stadler suggest, and I agree with this suggestion, women's enactment of a candidate as effective is related to the context within which the microbicide candidates are tested, i.e. they are invested with a hope for efficacy within a context where HIV infections are high and women's ability to protect themselves against HIV is minimal.

The efficacy of the microbicide is a matter of fact that emerges out of a fundamental indeterminacy, but biomedical efficacy is not the only 'determination'. Trial participants will create their own determinations (meanings and materialisations) which are often separated from biomedical protocol. Problematically, one of the meanings ascribed to the microbicide candidate was effectiveness, while the microbicide might not materially protect women's bodies against HIV. Because women's vulnerability to HIV infection is a central component of the RCT, women participants are invited into a trial because of the high risk context their sexual lives are situated in. In line with the argument on 'relational ethics' set out in the previous chapter, I suggest that biomedical process of testing candidates within an RCT provokes a multiplicity within an assemblage of relations that the field is ethically accountable for. Women's vulnerability remains central to the RCT and so are the various ways in which women enact the microbicide candidate, of which efficacy might very well be a part, especially within a context of women's socio-sexual vulnerability that the RCT seeks out to further its own success. Stadler and Saethre introduce a space of accountability and responsibility within which the multiplicity and relationality provoked by the RCT can be questioned, a relational ethics that questions the accountability and responsibility for the bodies put on trial. This, however, is in sharp contrast to biomedical quantification, and regulation as I will discuss in the following section.

### **A Configuration of its Potential User practices of regulation and increasing discordance**

Biomedical knowledge cannot (...) be quarantined from general ideas operative in the culture, even when it understands its concepts to be carefully and directly deduced from the factual evidence of the body. Despite, or perhaps because of, biomedicine's assertion of its own innocence of historical and political meaning, it constantly absorbs, translates and recirculates 'non-scientific' ideas – ideas about sexuality,

about social order, about culture – in its technical discourses. (Waldby 1996: 5)

Adherence is the degree to which a participant uses a study drug as directed to ensure that the correct dose of the product is being administered and available when needed. Adherence is a major issue in HIV prevention trials as non-adherence may decrease the potential effectiveness of the study drug and skew the safety profile of the study product. Even a highly effective drug will appear to be ineffective if enough participants fail to follow the prescribed drug regimen. So non-adherence threatens a study's validity and complicates the scientists' ability to derive scientific conclusions. Poor adherence may be responsible for the lack of success in recent microbicide trials, some of which had adherence as low as 44 percent – low enough to mask the true effectiveness of a study drug. (FHI and CAPRISA 2010a: 1)

On the 20<sup>th</sup> of July 2010, at the International AIDS Conference in Vienna the study results of the CAPRISA 004 were made public. This trial was another significant landmark in the field of microbicides, once again, because of the hope and promise it generated. After the promise of PRO 2000 and its failure, the CAPRISA trial was conducted by the Centre for the AIDS Programme of Research in South Africa. CAPRISA was a safety/efficacy trial which enrolled women at two sites in South Africa, one in central Durban and one site in a rural location just outside Durban, from 2007 to 2010. This trial tested the 1% Tenofovir gel which showed for the first time statistically significant proof of concept.

The study found that the gel was safe to use and, importantly, the study found that there were 39 percent less infections in the Tenofovir arm of the trial than in the placebo arm of the trial. Specifically, 60 women in the placebo group were infected with HIV, in comparison to 38 in the microbicide arm. This trial was only conducted on circa 900 women and a larger trial was necessary to give more robust evidence among a larger number of women participating in the study (Abdool Karim et al 2010). Regardless, these data re-invigorated the field once again, after the failure of PRO 2000 (see for instance MTN 2010; IPM 2010a).

Tenofovir gel belongs to the next generation of microbicides, in these compounds antiretroviral (ARV) drugs are used to target the virus specifically. ARVs are used to reduce the viral load of people living with HIV. Tenofovir targets the virus by preventing it from growing/multiplying within human cells and had already been widely used by many people infected with HIV and it has been used to counter mother to child transmission. The CAPRISA 004 trial was the first safety/effectiveness trial to test this new generation (CAPRISA 2010a, 2010b).

The documents surrounding the CAPRISA trial discussed below show that women's own conceptions of their sexual practices and the incorporation of the microbicide were a central part of the study's extensive adherence programme. However, these conceptions were not articulated in terms of the microbicide candidate's incorporation into women's sexual and intravaginal practices, rather, women's use of the candidate in the RCT came to be articulated through adherence, both in terms of its quantifying and regulating effects. The CAPRISA trial explicitly included a dosing regimen and as such makes the regulating mechanisms within the RCT come to the forefront.

In my discussion of the MDP 301 trial and its quantifications, I already mentioned that the manner in which biomedicine endeavours to isolate a matter of fact, such as quantification, is part of a performative process where women's bodies and sexuality come to appear as given, pre-existing biomedical investigation. Although this process occurs within the biomedical context of a RCT, as women's sexuality is central to the practices at hand I suggest that the field's efforts to isolate a matter of fact through specific enactments and purifications (in line with the performative set out by Latour and Mol) provokes a performative process of the regulation of women's sexual behaviour (in line Butler's gender performativity and Oudshoorn's inclusion of this performative into scientific process).

Following this line of thought, in this section I will focus on the RCT's regulating practices pertaining to the regulations of women's sexual and intravaginal practices as well as the monitoring mechanisms put in place surrounding the use of ARVs in microbicide candidates. I argue that these practices constitute a performative process that configures the microbicide's potential user. Furthermore, because these regulations are enacted through facilities not widely accessible outside the RCT, the woman user configured within the trial and the eventual woman who will use the microbicide outside the RCT do not necessarily correspond. This difference is explicitly articulated by the GCM in their problematisation of ARV-based microbicides and their advocacy for non-ARV based microbicides irrespective of the biomedical field.

### *Regulation*

In the last section I discussed women's own articulations and enactments of the microbicide in unimagined ways as a vital part of the microbicide's potential. However, although not conceived in this way, biomedical enterprise also 'inscribes' conceptions into the microbicide design that pertain to the context in which it will be used as well as a specific idea of its potential user. However, these specific notions of sexuality inherent in biomedical process are not understood as such, but rather put forward as *prescriptions* and the problem then becomes the level to which women adhere to this prescription of use.

As already came to the surface in the previous chapter's discussion of the SAVVY and Cellulose Sulfate trials, the biomedical success of a microbicide RCT hinges on

statistical significance provided by women's HIV infections. The quantifying measures discussed above were attuned to this need to show the microbicide's effect on the HIV virus within the female body. However, as I will come to discuss in more detail here, women's HIV infections within the RCT need to be of a specific kind, which is conceptualised through adherence to product use. As adherence to product use has been seen as problematic for the conduction of the RCTs since the advent of microbicide testing, the RCTs have always endeavoured to exclude women's intravaginal practices and those sexual practices (such as anal sex practices) that do not correspond to the microbicide design and the sexual scenario within which scientists imagine the microbicide to be used.

Intravaginal practices are understood to be problematic in relation to the testing of vaginal microbicides in the RCTs, for if women engage in practices like wiping they could remove the microbicide. Furthermore, if women insert other products into their vagina these could cause some chemical interaction which could make the microbicide's use redundant. Furthermore, in the clinical trials intravaginal practices are understood to be problematic for understanding trial data in terms of the extent to which these practices increase women's susceptibility to the HIV virus, either through increased friction, lesions etc although there is no consensus on this part (see for instance Myer et al 2005).

Interestingly, the biomedical conception of women's intravaginal and sexual practices is vastly different from the hypothetical acceptability studies discussed in Chapter Four and Saethre and Stadler's study above, where they were seen to enhance the microbicide's potential as embedded within women's intravaginal practices. In the CAPRISA trial, women participants were counselled in the RCTs not to engage in intravaginal practices, anal sex and to use the microbicide in the prescribed manner.

Women participants in the CAPRISA trial were asked to apply one dose within 12 hours before sex and within 12 hours after sex not exceeding 2 doses in 24 hours; “[a] coitally-related dosing strategy was selected to achieve high adherence” (Abdool Karim et al 2010: 2) called BAT24. In order to make sure women's sexual behaviour remained consistent with this dosing regimen the trial incorporated an extensive adherence program. The factsheet specifically focused on adherence to product use published by Family Health International and CAPRISA states:

For the study, the CAPRISA 004 researchers developed a customized program to improve adherence to the dosing regimen, including innovative counselling aids such as checklists, teaching aids, and personal diaries. Participants were trained on the use of the gel applicator during enrolment and at follow-up visits. They also received personalized support and counselling during the trial. CAPRISA researchers also introduced a participant-centred and interviewer-driven technique, called motivational interviewing. The constructive approach helps participants devise their



own strategies to achieve high adherence. For example, *instead of telling the participant when to use the gel, the interviewer and the participant discuss how to incorporate the use of the gel into the participant's patterns of sexual activity. The rationale being that participants are more likely to act on self-devised and self-motivating solutions to past problems experienced in achieving high adherence.* (FHI and CARPRISA 2010a: 2 emphasis added)

Interestingly, through this motivational interviewing, the scientists made women's sexual practices an inherent part of the process of testing microbicides in the RCT. However, the potential complexity of women's sexual practices and how the microbicide can be incorporated therein was neglected in favour of the trial's emphasis on women's adherence to product use, as they write "*[i]t is therefore critical to use the dosing strategy most likely to achieve high adherence based on information from behavioural studies in the specific population of women where the study is being conducted.*" (FHI and CARPRISA 2010a: 2)

Although the social research arm of the MDP 301 trial highlighted the problems surrounding the quantification of women's sexual behaviour, the report of the CAPRISA trial states that once again gel applicators and information pertaining to sex acts were used to measure adherence to product use, as the factsheet on adherence states:

It should be noted that adherence is intrinsically difficult to measure accurately and there is no gold standard of measuring adherence. *The use of applicator counts to calculate adherence for every participant each month and the use of this information for motivational interviewing was an important step forward in linking real-time measurement to adherence support in the CAPRISA 004 trial.* (FHI and CARPRISA 2010a: 3 emphasis added)

Importantly, women's own articulations were not used to understand the effectiveness of Tenofovir gel, but rather they were used to monitor and regulate women's sexual behaviour, "*linking real-time measurement to adherence support*". The candidate's efficacy is understood in relation to the level of adherence and in this, sexual behaviour that does not correspond to the trial's prescription of use is problematised as nonadherence. As already came to the fore in the discussion of the MDP 301 trial design, efficacy is understood as the effect of the microbicide on the HIV virus when women use it as prescribed. Consequently, the level of success of the trial is not questioned in terms of the extent to which it is in fact possible to separate the candidate's physiological effects from women's sexual and intravaginal practices. Rather, this problematic is located within

women's sexual behaviour as their (in)ability to use the candidate as prescribed. This transferral become evident in the way the clinical trial report articulates its findings:

Tenofovir gel reduced HIV infection by an estimated 39%. The protective effect of coitally-related Tenofovir gel use was evident soon after initiation and peaked at 50% after 12 months of gel use. This *protective effect is evident irrespective of sexual behaviour*, condom use, herpes simplex type 2 virus infection or urban/rural differences. A trend of *higher effectiveness was observed as gel adherence improved*; high adherers had a 54% lower HIV incidence rate in the Tenofovir gel arm.

*The observed level of effectiveness is dependent on both the efficacy of the product and the participants' willingness and ability to use it as prescribed.* Inadequate adherence is the most serious challenge to obtaining an accurate estimate of product efficacy. *To address this, we implemented an intensive adherence support program with motivational strategies which depend on reliable measurement of adherence.* Monitoring of this key behaviour in the trial included an objective count of used and unused applicators returned each month and did not rely solely on self-reported use. *Despite this adherence program and high gel acceptability, about 40% of the women in this study had below 50% gel adherence. Future trials will need to place greater emphasis on enhancing and objectively measuring adherence,* in light of its substantial influence on the trial outcome. (Abdool Karim et al 2010: 5 emphasis added)

This statement once again separates the candidate's efficacy from its effectiveness, as it states that this microbicide candidate had a protective effect *irrespective* of sexual behaviour. Tenofovir's effectiveness is understood to include both the product's efficacy as well as the participants' willingness and ability to use it as prescribed. As already came to the fore in discussing the MDP 301 study design, the trial's failure to isolate the microbicide candidate's physiological effect from the culturally laden practices within which it is used, is transferred unto women's sexual behaviour and the problematisation of this behaviour to not correspond with biomedical prescription. Interestingly, this statement shows that although this microbicide proved to be efficacious, still women's adherence to product use is problematised. A focus on how the microbicide was incorporated into women's sexual practices and the manner within which these enactments benefited the shown 'efficacy' of the candidate is not at stake here. Rather, once again, women's nonadherence is articulated as a problem of measurement.

I suggest that 'prescription' signals a process of monitoring and regulating women's

sexual practices in accordance to the way in which scientists imagined women's sexual practices and the microbicide to be used herein. Here, specifically, following the BAT-24 dosing regimen, i.e. one dose within 12 hours before sex and within 12 hours after sex not exceeding 2 doses in 24 hours. This dosing regime is reminiscent of the quantification of women's sexual behaviour into sex acts as a singular act of vaginal penetration, with or without ejaculation, within which the microbicide is a discrete object with a singular meaning – an applicator that can be counted. I suggest that the BAT-24 dosing regimen and the additional counselling of women participants to use the candidate as prescribed, works in constraining ways as it constrains the women participants to use the candidate in accordance to biomedical prescriptions of use. As such, the biomedical conceptions of the microbicide and the sexual scenario in which it will be used are enforced within the trial, to the detriment of women's own enactments and conceptions.

Within the clinical trials women participants are expected to participate in a specific manner as the regulation and monitoring mechanisms to further women's adherence make very clear. In a similar vein, Nelly Oudshoorn calls clinical trials a “peculiar type of testing” as she writes:

They not only require material resources such as the availability of drugs, instruments to measure the effects of the drugs, and forms and statistical procedures to register and produce data, they also depend on the collaboration of human beings, known formally as the trial participants. Clinical trials thus represent a very specific practice of configuring the user. Whereas most other configuring processes take place in the absence of users, clinical trials, as with other user tests, require the presence and cooperation of potential users. (Oudshoorn 2003b: 171)

Women's intravaginal and sexual practices that are not in tune with the microbicide's design need to be regulated and monitored in order for the candidate's 'real efficacy' to emerge from the trial. I suggest that in a very Butlerian sense, the trial's monitoring mechanisms regulate women's sexualised bodies to constitute “*a stylized repetition of acts*” (Butler 1990: 191), through which a natural female sexed body is fabricated within which the microbicide can be potentially effective. In other words, this stylisation configures women's bodies in such a way that the microbicide can potentially have a protective effect.

In the second chapter of this thesis, I discussed Michel Foucault's History of Sexuality vol. 1 and the scientific mechanisms of power that actively sexualise bodies in the process of investigating them, which he called a 'scientia sexualis'. I want to briefly return to this framework of thought here to make an explicit link between biomedicalisation and the regulation of women's bodies within the RCTs through which women's bodies becomes

specifically sexualised.

Within the field of microbicide development, biomedicalisation and the regulation of women's sexual practices go hand in hand – what Clarke et al have called a Foucauldian technique (2003: 181) inherent in the biomedical process of RCT testing. These regulations construe women's bodies according to the way scientists imagine the gendered sexual scenarios in which women will use the microbicide and how these scenarios should be transformed. I suggest that the RCT is a biomedical mechanisms of quantification and regulation constrain how microbicide candidate can be enacted as an intervention into the socio-sexual power relations that put women at risk of HIV infection *through* women's sexual practices. The exclusion of women intravaginal practices, anal sex practices and particular sexual practices in favour of biomedical prescription and monitoring of use is a lucid example of this.

However, what the above discussion in relation to the MDP 301 trial design showed, is that both biomedical scientists and women participants enact the microbicide candidate according to various conceptions of how this technology will be used within a specific context and that these enactments differ. Indeed, as the continuing 'problematic of nonadherence' makes evident, there are always certain occasions within an RCT that these conceptions do not correspond. Despite the trial's monitoring mechanisms women do not necessarily use the microbicide or use it as prescribed. The problematic of nonadherence makes evident that women's sexual behaviour slips out from under scientific control. I suggest that non-adherence shows the possibility of a different configuration of women's sexualised bodies within the RCT in which the women participants are actors or active components in the configuration of their own bodies. The RCTs quantifying and regulating mechanisms never fully encapsulate the sexed bodies they produce, i.e. the bodies within the development of microbicides are configured through the prescriptive and regulatory mechanisms put in place within the RCT, but not fully determined.

Therefore, while being conscious of its regulating and constraining mechanisms, I suggest that the RCT is also an enabling space in which women are invited to enact their sexuality in a transformative manner, as became evident through my discussion of Stadler and Saethre's research. Once again, following Oudshoorn, the RCT can be understood as a cultural niche in which women participants are expected to perform their sexuality in a transformative manner by using the microbicide candidate which "*required the destabilization of these conventionalized performances of gender identities*" (Oudshoorn 2003b: 172) As such, I propose that contrary to the biomedical discourse, the RCT is a highly sexualised space which includes the sexual and intravaginal practices women already engage in. Therefore, I suggest that the RCT is simultaneously a space in which the transformation of power relations discussed above can be enacted, as well as a biomedical space in which these practices are regulated.

## *The Campaign's Response*

However, it is important to note that the manner within which the RCT configures the microbicide's potential user is not just a matter of sexuality in terms of sexual and intravaginal practices. It also has another material dimension to it in terms of the resources a RCT provides and the extent to which these resources feed into the configuration of the microbicide's potential user. In more particular terms, Tenofovir gel included ARVs and the impact of the field's focus on ARV based microbicides were and are significant on this configuration.

Although the field was filled with excitement after Tenofovir's proof of concept, it also marked the end of the second generation of nonspecific microbicides which was problematised by the GCM. In fact, the advent of this new ARV based generation of vaginal microbicides had led the GCM to move away, explicitly, from the biomedical field. These questions had already been raised when PRO 2000 failed to show efficacious in the MDP 301 trial and it became all the more likely that PRO 2000 would be the last of the nonspecific (nonARV based) microbicide candidates. The ARV based next generation of microbicides is the generation which carries the biggest promise to provide biomedical proof of concept. Accordingly, as ARV based microbicides are more likely to be efficacious, the chance that another microbicide not containing ARVs will make it into efficacy trials is close to nil. The GCM continues to advocate for microbicides that do not contain ARVs, as they stated in relation to PRO 2000:

-PRO 2000 does not contain anti-retroviral drugs (ARVs) so it may be able to be distributed without a prescription. If so, it could be sold in shops and handed out in public health clinics. Women would not have to get HIV testing to use it.

-Most of the other microbicide candidates in clinical trials are ARV-based. This means that, until more is known about how they affect HIV positive women, these products could only be distributed by health care providers and women could only get them if they are also getting regular HIV tests.

-Currently, no other non-ARV based microbicides are in early safety clinical trials. While some candidates are being explored in pre-clinical studies, it is not clear when or whether any of them will be moved forward into clinical trials. This means that – if PRO 2000 is not developed – we are likely to wait for a decade or more for another chance to advance a non-condom, non-ARV based HIV prevention tool that could be made available “over the counter” in shops and from community outreach workers. (GCM 2009f: 3)

As a response to the development of ARV-based candidates, the Global Campaign for Microbicides still pressed for non-ARV based microbicides (see GCM 2010b). Central to this effort is their worry that if these microbicides are proven to be efficacious, their availability may be restricted and they will not be accessible to many women as an over the counter product. The idea of a vaginal microbicide was initially imagined to be easily available to women without prescription as was already articulated in the symposium:

Given the urgency of the HIV epidemic and the difficulty that those women most at risk will have in accessing formal-sector health services and prescription products, participants agreed nearly unanimously that investigators, companies, and agencies working on microbicides should give strong preference to products that will not require a prescription and that can be made available to women through a wide variety of channels. (Heise et al 1998: 40)

This ideal has seemed to have lost momentum with the development of ARV based microbicide candidates.

Furthermore, ARV-based microbicides lead to problems concerning women's HIV infections, both in terms of women's possibility to get tested for HIV as well as the possibility for HIV positive women to use a microbicide, as the GCM states: "*It is critical that the search for non-ARV-based microbicides continues because HIV positive women need workable alternatives if ARV-based microbicides prove to be inappropriate for their use.*" (GCM 2011b) The biomedical field and the GCM have different conceptions of what is at stake in developing the microbicide as an intervention and as such they configure the microbicide's potential user in different ways. Central to this difference is the issue of viral resistance.

Problematically, ARV based microbicides can potentially lead to what is called viral resistance. Viral resistance occurs when the virus becomes resistant to ARV treatment, resulting in the reduced efficacy of the drug. In this case, as Tenofovir hinders the virus from replicating inside human cells, viral resistance would entail that the virus still replicates despite people taking the drug. (Family Health International and CAPRISA 2010b)

Drug resistance refers to the reduced effectiveness of a drug against an infectious organism, in this case a virus. HIV is said to be resistant to an ARV if the virus keeps reproducing even while a person is taking that drug. The resistant virus is known as a *drug-resistant-strain* – it resists the drug and continues to multiply and spread. If a person does develop a type of HIV that is resistant to the drug being tested, it may limit which ARVs the person can take for their future treatment of AIDS. (FHI and

If a person infected with HIV develops viral resistance, this affects the possibilities of ARV treatments in the future (Family Health International and CAPRISA 2010b; Abdool Kareem et al 2010). For HIV negative women viral resistance is not a danger, since there is no virus present, there is no virus to become resistant. As soon as a woman seroconverts, however, this does become a danger. As the GCM articulates, the possibility of viral resistance brings up logistic complexities, if not impossibilities, if ARV based microbicides were to be produced for distribution outside the clinical trial setting. Women can get tested every month through the facilities the RCT puts in place clinical trial settings. Without these mechanisms this is most unlikely to happen.

More wide-spread HIV testing has to be one of the first priorities, since access to ARV-based prevention without testing to make sure that users are HIV-negative is exactly what could trigger the widespread development of drug resistant HIV. Right now, about 80%-90% of all HIV+ people in the countries hit hardest by HIV do not know their status. (GCM 2011b)

The CAPRISA trial did not provide any evidence of viral resistance, however, the women who seroconverted were being monitored to make sure of this (FHI and CAPRISA 2010b; FHI 2010; CAPRISA 2010a, 2010b; GCM 2010a). Furthermore, because of the issue of possible viral resistance the RCT provided various services to protect women against viral resistance. Women in the trial were tested for HIV monthly and as soon as they seroconverted they were taken off the drug. ARV-based microbicides may prove to be successful within the RCT, but this success is closely related to the monitoring mechanism, accessibility and health care available within the trial.

The RCT configures the microbicide's potential user through the mechanisms it employs, such as quantification of sexual behaviour and the regulation of this behaviour as well as the care facilities it puts in place within the RCT. However, this directly raises problems for which women will be able to use an ARV-based microbicide outside the RCT, without all the facilities the trials put in place. In more particular terms, the microbicide's potential user will use the microbicide in a context in which she may very well not know her HIV status and not have access to HIV testing. Furthermore, if women need to go to a clinic in order to gain access to a microbicide, this will seriously constrain its availability for and accessibility to its potential women users. The development of ARV based microbicides raises important questions around which women will eventually be able to use a microbicide. But accessibility and ease of access, as well as the need for HIV testing before using the product, are questions the biomedical field does not engage with as these problems do not pertain to the candidate's efficacy. The possibility of viral resistance, the

need to monitor women's HIV infections, the problems with accessibility once again isolates the RCT from its social surroundings.

The GCM, however, does engage this social problematic in terms of women's needs and the social effects of developing ARV-based compounds. Interestingly, the GCM's problematisation of ARV-based microbicides, leads them to engage the power relations articulated through these objects in a very similar manner as Zena Stein's initial critique of the condom:

Women in high risk communities need to be involved in determining:

1. How to expand women's access to existing proven ARV-based prevention options;
2. How to make HIV testing as easily and as safely accessible to women as possible;
3. Where and how ARV-based prevention should be distributed and packaged for women. How to involve their sexual partners if they want, to get couples counselling, testing and access to products, without putting themselves at risk of sexual violence or stigma-related consequences.

*Most of all, we need to persuade policy makers that these social and educational supports are necessary. Without them, it is very likely that ARV-based prevention – like condoms and medical male circumcision – will primarily become an HIV prevention tool for men if it is effective, and the pattern of inequality will continue. (GCM 2010g emphasis added)*

In this statement, the GCM articulates their concern with the extent to which the power relations the initial idea of a microbicide was meant to transform, will in fact be repeated through ARV based microbicides. In other words, the workings of ARV based microbicides are understood to occur outside the social power relations in which they will be used. As such, the chances are high that the use of these compounds will end up repeating the power structures that advocates understand leave women at high risk of HIV infection.

I propose that this response of the GCM signals a tension between the microbicide's potential user construed through the biomedical process within which efficacy is sought and 'the vulnerable woman' who figures in the promise of microbicides articulated by advocates. The promise of microbicides is *not* just a biomedical promise of efficacy. However, through years of biomedicalisation the social dimensions of the promise of microbicides, both in terms of the complexity of women's vulnerability and ideals of empowerment have been eroded.



The GCM's critique set out above is reminiscent Stein's identification of a separation between the efficacy and the effectiveness of an HIV prevention method as an effort to incorporate the social problematic within biomedical development. This separation never quite held up and through the years has been inhabited in biomedical articulations of what is at stake within the field of vaginal microbicide development. The distinction between efficacy and effectiveness was meant as a way to include the social, but the opposite has happened. The GCM's advocacy in terms of the RCT's exclusion of the social problematic surrounding ARV based microbicides makes this very clear. In other words, the advent of ARV-based microbicides might very well hold the greatest promise of efficacy, but they might also reiterate the power relations the initial idea of a microbicide was imagined to transform. I suggest that the idea of a vaginal microbicide as it stands now, does not fulfil the promise of a microbicide advocates initially imagined.

### **Conclusion**

#### **the end of the GCM, VOICE, FACTS and ASPIRE**

In order for biomedical intervention to work at a population level, individuals must not only be compliant, but also accept potential risks to their physical, psychological and social health. Inadequate attention to the social determinants of their uptake will compromise an otherwise promising intervention. By remedicalizing the epidemic, we are a step away from returning, once again, to blaming the victims. It is time to move forwards, not backwards. (Nguyen 2010: 2)

In the beginning of this chapter I stated that the biomedicalisation of the field of microbicide development accelerated through PRO 2000's promise of efficacy. I understand this process to have continued and to have specific effects on where the field finds itself at present. As such, I want to conclude this chapter with a glance into the future, by looking at a cluster of events. My intention is not to give a thorough analysis of these events, as they are all in the process of unfolding. Rather, I read this cluster of events as a biomedicalisation of the field of vaginal microbicide development. I will mention three clinical trials that are running at present, namely VOICE, FACTS and ASPIRE that all revolve around the problematic of adherence. Furthermore, I also want to touch on the message sent out by the GCM on the 27<sup>th</sup> of July 2012 that they would disband in September 2012.

I opened this chapter with a statement on the field's biomedicalisation and have

continued to argue how the field quantifies and regulates women's sexuality through the concept of adherence that is enacted through a quantification and regulation of women's intravaginal practices and sexual practices. Importantly, this quantification and regulation of sexuality has been intimately related to conceptions of the microbicide's efficacy from the outset. This relation, increasingly, came to stand in for the promise a microbicide holds. I argue that the field's biomedicalisation and the vital entanglement of efficacy and adherence to product use have impacted on both the microbicide's transformative potential as well as its potential user.

Although CAPRISA showed Tenofovir to be efficacious, it was only conducted on a small group of women and the field wanted further proof. Therefore, after the CAPRISA 004 trial the field awaited the results of the VOICE study (Study-Vaginal and Oral Interventions to Control the Epidemic) to further confirm Tenofovir gel's efficacy.

This trial is still ongoing at present and is conducted by the Microbicides Trial Network (MTN). The MTN understands VOICE to be its "flagship study" which once again has a strong focus on adherence to product use. This study tests the daily use of Tenofovir gel, as well as two ARV tablets Tenofovir and Truvada (a systemic intervention called PrEP). The study commenced in September 2009 among research sites in Uganda, South Africa and Zimbabwe including just over 5000 women. Importantly, adherence is articulated as a central aspect of this study, but instead of focusing on women's sexual practices, women were asked to use the gel every day instead of around the time of sexual intercourse. Furthermore, it is the first vaginal microbicide study to include PrEP. In fact, the VOICE study is set up in this way to view the differences between a systemic intervention (PrEP) and a topical vaginal microbicide to see if women adhere more strongly to a compound that is taken irrespective of sex. The MTN press statement on VOICE explains:

While the study's primary aim is to evaluate the safety and effectiveness of the two regimens, an important question VOICE will also address is which of the two – the tablet or the gel – women will actually be more inclined to use. It is the first HIV prevention trial testing these two different approaches in the same study and the first effectiveness trial of a microbicide in which women use the gel every day instead of only at the time of sex. (Microbicide Trials Network 2009e)

Interestingly, instead of focusing on the complexity of women's sexuality to understand how women will come to use a microbicide, women's sexual practices are completely filtered out of the study design.

On the 28<sup>th</sup> of November 2011, the Tenofovir arm of the trial was halted by the Data and Safety Monitoring Board. The rate of HIV infections was similar in the Tenofovir arm as the placebo arm of the trial and therefore the board concluded that Tenofovir would fail to

show any effectiveness. How did Tenofovir gel manage to show effective in a trial where adherence was problematised and not in a trial that endeavoured to side-step the problematic by asking women to use the compound every day, irrespective of sex? Indeed, VOICE is not the end of Tenofovir gel, the CAPRISA efforts is now going to a study called FACTS 001. VOICE tested the daily use of Tenofovir gel, FACTS 001 is testing the same dosing regimen of Tenofovir gel as the CAPRISA trial. In other words, FACTS 001 will once again test Tenofovir's effectiveness within women's sexual practices, regulated into BAT-24.

In this chapter I argued that within the field of vaginal microbicide development there is a strong relation put in place between the (promise of a) candidate's efficacy and the extent to which women participants will adhere to the way in which the candidate's use is prescribed. Accordingly, instead of focusing on the complexity of women's intravaginal and sexual practices and women participants' own enactments and imaginations of the microbicide candidate's incorporation into these practices for its effectiveness, this complexity is problematised. This problematisation has direct consequences for what is understood to be at stake within the clinical trials and which microbicides are designed.

The MTN will also be testing another microbicide candidate, which is quite novel, namely a vaginal ring women can insert once a month which was developed by the International Partnership for Microbicides, a study called ASPIRE.

Experience in the area of female contraception has demonstrated that women's preferences differ, and that a product that best suits a woman's lifestyle and needs is more likely to be used. Only if a product is used and used properly does it have a chance of being effective. This is why it is important to investigate different HIV prevention strategies. Some women may prefer taking a tablet, or prefer using a vaginal microbicide gel; while others may prefer a vaginal ring that they replace monthly. ASPIRE is the culmination of a large body of research looking at the dapivirine ring as an alternative HIV prevention method for women. The study is designed to provide the strength of evidence to support potential licensure of the product. (MTN 2012)

Although this vaginal ring might very well have positive characteristics in terms of its long term use instead of around the time of sexual intercourse, its design also 'conveniently' sidesteps the problematic of adherence as women will only insert it once a month. As I suggested in my discussion of the study conducted by Saethre and Stadler, the microbicide's transformative potential resides within the various ways in which women incorporate it into their sexual practices, to potentially protect themselves against HIV as well as potential enable themselves to transform the sexual scenarios that leave them at risk. However, by sidestepping the complexity of women's use of a microbicide within their

various practices, the design of a vaginal ring constrains this particular potential.

The International Partnership for Microbicides, who developed the vaginal ring, is an organisation (founded in 2002) somewhere between an advocacy agency and a clinical trial network and signals an overriding of advocacy by biomedical enterprise. They represent themselves as a biomedical answer to women's needs and like the GCM they disseminate various forms of information about women's vulnerability to the HIV virus and their need for microbicides. Exemplary of this is their booklet entitled *Giving Women Power Over AIDS*. This is the same title as the traveling exhibition with which I discussed at the end of Chapter Four. However, these two documents are vastly different. Where the traveling exhibition articulated women's stories, the complexity of women's vulnerability and a certain hope for a different future, the IPM's booklet is thoroughly focused on biomedical development. Specifically, they articulate several statements on the criteria under which microbicide candidates should be prioritised and one of these criteria is indeed 'adherence', directly adopted from the biomedical field. They write: "*Compounds that rely on simpler dosing regimens or that are more acceptable or easier to use have priority over candidates that are more complex or expensive.*" (IPM 2010b: 6) However, by prioritising noncomplexity, I suggest that they also limit the microbicide's potential or agency as a material-semiotic actor.

Thus we see how, although the concept of a microbicide first emerged as a tool by which women might assert control within their sexual practices, and give women power over AIDS, after years of biomedicalisation, the same slogan is used, but refers to a vastly different understanding of both the microbicide as a technology of transformation and, by extension, the women who will come to use this object. Perhaps the vaginal ring will indeed prove to be efficacious and perhaps it will be manufactured in such a way that women have access to it. Perhaps it will protect women against HIV. Be that as it may, it will not have the material-semiotic potential of the idea of a female-controlled prophylaxis as it initially emerged.

These events and the biomedicalisation they signal are compounded by the GCM's announcement of their disbandment in September due to a lack of funding as the press release states:

Since GCM was established, the contributions of multiple partners and advancements in the field have meant the context for this critical work has changed. There continues to be a need for a strong voice to ensure that women's issues remain on the agenda when discussing emerging technologies like oral PrEP as well as microbicides. However, changes in funding and in GCM's operations over the past several months mean that GCM's ability to fill this role has shifted. After serious considerations and deliberations about the needs of the HIV prevention field relative to GCM's

current scope and funding situation, we have made the decision to close GCM's operations and activities by the end of September 2012. (GCM 2012b)

I read the GCM's disbandment as a sign of the field's biomedicalisation. I argue that this biomedicalisation curtails the promise of vaginal microbicides in terms of both the microbicide's material-semiotic potential user as well as the configuration of its potential user. Nelly Oudshoorn wrote that

...technologies do not reflect the essentialistic properties of bodies; they are the materialized result of negotiations, selection processes, contingencies, and technological choices, embodying socially and culturally constituted values and practices. (Oudshoorn 2003b: 10)

The promise these new candidate's wield, in line with the field's biomedicalisation, does not reflect scientific progress in any unproblematic way. The exclusion of complexity by focusing on adherence to product use, does not show the essentialist properties of bodies and HIV virus. Rather, this is an effect of negotiations and values of what is understood to be at stake within the field of microbicide development. Throughout the years, the social has become more and more excluded and now with the end of the GCM this exclusion becomes all the more vivid.

The microbicide has the potential to change both women's receptivity to the HIV virus while enabling women to alter the power relations that leave them at risk of HIV infections through their intra-vaginal practices and within their specific sexual practices. Acceptability studies have shown women to incorporate the microbicide into their intravaginal practice, use it as an intravaginal practice, in which this object has an agency of its own. As a transformative technology it was promised to enable women to both alter their receptivity to the HIV virus while transforming the power dynamics inherent to their sexual lives. The microbicide's potential as a transformative technology, is its material semiotic agency, embedded in the complex and multiple ways women enact their sexuality, gender relations and bodies. However, through the field's move away from the complexity the microbicide gathers and the differences that necessarily stem from making women users' imaginations and articulations a central component of the microbicide's potential, this cyborg promise is rapidly losing momentum.

Chapter 7.  
Conclusion

...the issue of ontological politics, about what is or could be made more real, is all the more pointed since every time we make reality claims in social science we are helping to make some social reality or other more or less real. In a world where everything is performative, everything has consequences, there is, as Donna Haraway indicates, no innocence. (Law and Urry 2004: 396)

The promise of vaginal microbicides has been central to this thesis. This, because vaginal microbicides are technologies in the making, an effective microbicide has not materialised yet and as such part of what this technology *is*, is suspended into the future - *promised*. Furthermore, I have focused on the promise of vaginal microbicides, because the microbicide as a technology is embedded within feminist thought and as such, the promise of vaginal microbicides exceeds a purely biomedical promise of efficacy as it links into ideals of women's empowerment. The concept of empowerment has been used by women's health advocates to advocate for a transformation of this vulnerability, a transformation of those power dynamics towards a more empowered future free from AIDS. In this sense, the ideal of empowerment, so closely tied to the development of microbicides, is a transformation of vulnerability that a vaginal microbicide is *promised* to generate. Indebted to Nicole Vitellone's thought on the condom, I suggest that there is a certain 'temporality' to the microbicide and "*the more clearly we come to understand the temporality*" (Vitellone 2008: 139) of this technology within its process of development "*as a prolongation of the present into the future, the more it will become possible to make the future different.*" (Vitellone 2008: 139)

I have argued throughout this thesis that the promise of vaginal microbicides is remarkable because it entangles the physiological real of HIV infection with the transformation of power relations. Women's vulnerability figured in terms of the physiological receptivity of vaginal skin and the cervix to the HIV virus, but also importantly, the specific power dynamics of women's sexual relations that constitute women's socio-cultural risk of HIV infection. The microbicide as a promised intervention entangles dimensions of nature and culture that the field itself conceives as belonging to separate domains and modes of operation, whether that is advocacy or biomedicine.

In order to engage this promise I have foregrounded both performativity and imagination as 'vehicles of entry' into the process of microbicide development. I understand these two concepts to embrace the field's dual investment, namely the biomedical practices through which the vaginal microbicide is sought to be developed (here engaged through performativity) and the ideals of women's empowerment, conceptions of power dynamics, gender relations, sexuality and their

transformation empowerment invites (here engaged through imagination). Most importantly, I have foregrounded performativity and imagination as analytical tools for a comparative reflection between the natural-cultural transformation the field promises to bring about and the material-semiotic effects of its performative practices. I have argued, that there is a fundamental tension between the promise of vaginal microbicides as it initially emerged through women's health advocacy and the effects of biomedical process that have taken the field to where it stands at present. This difference *matters* for the microbicide/woman that emerges from the field as the configuration of its potential user.

I am well aware that in this thesis I have balanced a difficult pose by positioning my research between 'the theoretical' and 'the empirical'. However, I propose that this balancing act has been pertinent to be able to tease out the complexity of what is at stake in the promise of vaginal microbicides and be able to compare its performative effects through an empirical engagement with text and their imaginative investment through a more philosophical engagement with feminist thought. An amalgamation of Barad's agential realism and Haraway's cyborg myth as set out in Chapter Two, reflected this concern.

Through a conceptual point of entry found in text, I aimed to focus on a dimension of power at play within the biomedical development of HIV prevention methods in which systems of meaning are of central importance to understand the manner in which bodies in their relation to the HIV virus and the proposed intervention come to be materialised. Within the field of microbicide development, the material and the imaginative and meaningful are not easily separated. Because what a microbicides *is* encapsulates both ideals of women's empowerment and the physical prevention of HIV infection, they are ridden with normative meanings pertaining to gender, sex and sexuality that invest themselves into the real of bodies, the real of HIV infection and its prevention. I suggest that a distinction between meaning and materiality is not only difficult to delineate, such a distinction interferes with the complexity the microbicide as an intervention generates.

The different meanings ascribed to the microbicide are an inherent part of what this technology *is* and how it comes to matter. Following Donna Haraway and Karen Barad, I have continuously argued that meanings matter, that ontologies are effects of processes both material and semiotic. Through a conceptual point of entry I aimed to show how concepts matter, how meanings matter for they instruct how we can think interventions into the HIV pandemic and think them differently. How women's empowerment, the female body, HIV infection are imagined and made meaningful is inherently entangled with the materiality at hand. More specifically, as I have argued in the final chapter, the manner in which a microbicide materialises is inherently caught up with how its potential user is imagined and the normative meanings that are inherent to this imagination – in terms of women's sexual relations, the gendered power dynamics of their everyday lives, their sexuality and specific sexual practices. In other words, the microbicide as an object emerges from the field of microbicide development as a material-semiotic object and, through this material-semiotic investment the microbicide's potential user is configured. An investigation into the 'temporality' of

the microbicide is an investigation of the material-semiotic effects of how this promise is enacted.

In line with Law and Urry's statement that opened this conclusion, social research into biomedical practice, such as my own, is not radically exterior to the field it investigates. The manner in which we think and the manner in which thought is brought into practice brings certain worlds into being and forecloses the becoming of others. I suggest that bringing a complex world into focus, as I have aimed to do, is not a mere ideological or abstract exercise. I have focused on complexity, in order to bring to light the multiplicity of ideas, voices and enactments that comprise the field of microbicides and are made to matter in the process of its development. As such, I understand my focus on complexity through a performative scope to be both a material and ethical engagement. Furthermore, I suggest such an effort is pertinent to the field of microbicides, not only for the microbicide's transformative potential, but for the ethical investment in whose world is made to matter.

#### *A Cyborg Promise Biomedicalised*

Karen Barad wrote that "*the notion of an apparatus is not premised on inherent divisions between the social and the scientific, the human and the nonhuman, nature and culture. Apparatuses are the practices through which these divisions are constituted.*" (Barad 2007: 169) In the field of microbicides, women's health advocacy and biomedicine do not stand in isolation from one another as a clear cut separation between these two 'collectives' is not easily made. Rather, the development of vaginal microbicides is marked by an alliance between women's health advocates and biomedical scientists. Throughout the development of microbicides, women's health advocacy and biomedicine have stood in relation to each other and this relationality has been of vital importance for the specific ways in which a microbicide and the woman implicated in its intervention could emerge from the field.

In more particular terms, I have argued that although a female controlled prophylaxis, as initially phrased by Zena Stein in 1990, had its roots in the women's health movement, advocates needed biomedicine to be able to materialise this idea. The biomedical development of topical microbicides was given a position of authority to know the real of the female sexed body and as such it enabled a materialisation of this feminist idea. Furthermore, this biomedical prerogative then in turn enabled the field of microbicide's global claim to this sexed body, as the *Global Campaign for Microbicides* indicates. On the other hand, because women's health advocates sought out biomedicine for this materialisation, this scientific field was enriched with the search for an object thoroughly embedded in feminist ideals. Collaborating with women's health advocates introduced the social problematic specific to women into the development of biomedical HIV prevention and as such a new object emerged from this biomedical field. It is exactly because feminists articulated the idea of a microbicide through biomedicine that the boundaries between the field of women's health advocacy and biomedicine blurred and microbicide advocates were able to inhabit biomedicine.



However, this feminist inhabitation of science and the aim to materialise a feminist idea through biomedical process is also where a rift occurred between the promise of vaginal microbicides and the effects of the field's performative practices.

Zena Stein enabled an inclusion of the social problematic of women's vulnerability to HIV into biomedical endeavours. She brought forward the idea of a female-controlled prophylaxis as a promise of empowerment that hinged on the entanglement of social power dynamics and the physiological reality of HIV infection. This created the potential to construe women's bodies at the centre of the transformation of power relations as they are constitutive of women's bodies and sexual practices. I have argued throughout this thesis, that the concept of a female-controlled prophylaxis put forward by Stein was very close to Donna Haraway's cyborg myth. As such, what a microbicide as a HIV prevention method, a biomedical intervention, would bring about would encompass but also exceed its physical effects. The microbicide would not just be a biomedical intervention to keep the HIV virus at bay, but be a tool that women could incorporate into their bodily routines, to transform the power dynamics they live their lives in.

In this thesis, I have suggested that the transformative potential of a vaginal microbicide resides within its agency as a material-semiotic actor. The microbicide's transformative potential resides within its highly sexualised character as an object that women can use as an intravaginal practice and incorporate into their sexual practices to transform these practices in such a way that their risk of HIV infection is decreased. I propose that through the manner within which a microbicide can be used, through sexual practices, the boundaries between the microbicide and women's bodies evaporate. Rather, it is in intra-action that women can potentially emerge as cyborgs, enabled to transform the relations of power that leave them at risk through their sexuality, their sexual practices, through this highly sexualised technology that holds the material-semiotic potential to materialise women's bodies and make women's bodies meaningful in a different way, a way less tainted by AIDS.

However, throughout this thesis I have also problematised the role ascribed to biomedicine within the process of materialising this cyborg promise. Specifically, if I look at where the field is now, in terms of the new ARV based microbicides and the designs (such as the vaginal ring) that sidestep women's sexuality, the promise of a microbicide and the candidates developed seem worlds apart, not only in terms of a certain 'desexualisation' of the object, but also in terms of the likelihood these ARV-based compounds will not be widely accessible to women. In other words, the effects of biomedical process are far removed from the cyborg promise of microbicides, both in terms of the microbicide's material-semiotic transformative potential as well as the configuration of its eventual woman user. In conclusion, I propose that the reason for this divergence is both a biomedicalisation of the field as well as the field's focus on the concept empowerment – an unfortunate concurrence of practice and imagination. More specifically, biomedicine is a process that separates the natural physiology of HIV infection from the cultural power dynamics of sex and sexuality, but this

biomedical process enacts what empowerment and the conception of power that underlies it already invite.

In light of the HIV pandemic and the feminisation of this pandemic, I do see the value of the concept empowerment. It has had a tremendous force within the field of HIV prevention by making a problematic specifically focussed on women visible and including the deeply social dimensions of women's vulnerability to HIV infection into global HIV discourse and biomedical development. This inclusion has been valuable. However, on the other hand, I also see the difficulties of the use of the concept empowerment and the mode of thought that haunts this concept. I see the effects of a certain imagination that ends up interfering with its own aims and goals. As such, I have argued at length in Chapter Two that empowerment as a feminist concept of transformation is incredibly problematic. This concept is haunted by a natural sex/cultural gender dichotomy and a consequential bracketing of sex. This category is then, in turn, left to the natural sciences to discover and determine as a material real. This way of understanding both sex and science limits empowerment as a term for transformation as this transformation can only be engaged with by feminists in the cultural and social sphere. Throughout this thesis I have continuously argued that leaving the determination of natural sex to the authority of the (natural) sciences is problematic for feminist thought and problematic for the feminist investment into the development of vaginal microbicides. Specifically, because science is given full authority to determine a material real understood as ontologically prior to cultural gender and therefore cultural intervention, feminist analyses and investments always remain one step behind.

I have argued that by using the concept of empowerment and the dualist mode of thought that underlies this concept, Stein ironically introduced a conception of a pre-existent physiology, which in turn not only got ascribed to biomedicine but has come to dominate the field. Specifically, a separation between efficacy and effectiveness was central to Stein's critique of the condom and grounded her call for a female-controlled prophylaxis. However, by introducing this distinction she set the stage for a process of bifurcation that biomedical practices surrounding the centrality of efficacy and adherence to product use amplified. This bifurcation of physiological efficacy and socio-sexual effectiveness created the appearance that it is in fact possible to separate the physical effects of a microbicide candidate under trial from the sexual context within which it is used. I call this an appearance, because this separation does not exist outside of biomedical articulations of what is at stake in the development of microbicides. Within the clinical trials, as clinical trial reports and acceptability studies each in their own way have shown, a separation between efficacy and effectiveness does not hold in terms of how women participants use microbicide candidates within their intravaginal and sexual practices.

I propose that empowerment as a transformative concept or mode of imagination has been central to the field's biomedicalisation. The Global Campaign for Microbicides stated that their goal was to change how science is done. However, especially in light of the GCM closing down, the

question remains to what extent they have actually been successful in doing so. Throughout the years, the feminist-biomedical relationship that marked the field of microbicide development has become less and less reciprocal. Biomedicine has increasingly adopted the microbicide, thereby inhabiting the field, to the detriment of its feminist aims - aims that the concept empowerment provided, but was unable to uphold.

I have argued that through the concept empowerment an authoritative space is reserved for biomedicine and the RCT to show the physiology, the natural real of women's vulnerability to HIV infection and the real effect of a microbicide on the HIV virus within the female body. Within this reserved space, biomedicine is understood to merely engage the natural, the real, the objective and therefore dynamics of power inherent in this scientific development are occluded, while simultaneously biomedicine is given full authority. In an effort to form an alliance between feminist women's health advocacy and biomedicine, this concept that ascribes an authoritarian role to the natural sciences is detrimental to a collaborative effort. The way microbicide science is understood has eventually led to a biomedicalisation of the field of microbicide development, which foregrounds the physiology of HIV infection and its prevention, to the detriment of the social.

In the beginning of this thesis, I asked what the effects are of materialising a feminist idea through biomedicine. In conclusion I propose that although this effort enabled the biomedical promise of an efficacious microbicide, biomedical process has also worked as an interference, an interference the second wave concept of empowerment already invites. Both the concept of empowerment and biomedical practice as it stands now have interfered with the complexity of the idea of a microbicide as a natural-cultural intervention. I suggest that the design of clinical trials and microbicide candidates at present, as they are based on sidestepping the complexity of women's sexuality in favour of biomedical efficacy and adherence to product use is symptomatic of this interference. The field's fixation on efficacy and adherence has direct consequences for the way women's sexual practices are conceived of within both the design of microbicides as the manner in which their use is imaged and who their user will be.

This interference is compounded by the authority ascribed to biomedicine and the maintenance of the RCT as the gold standard of microbicide testing. Biomedical process and the RCT specifically aim to construct matters of fact and this constant search of fact allows the field to push forward. And, indeed, the field has managed to persist. But in that persistence, biomedical promise, its constant deferral and hope for efficacy, processes of bifurcation have been central. As such, the field's persistence has eroded the cyborg promise the initial idea of a microbicide composed.

Although in a very real sense political contestation has always debated first principles, once the substantive differences between Nature and Culture, or temporal priority and causal directionality, is disestablished, we enter a very different zone of political possibility. (Kirby 2011: 68)

The possibility of transformation is inherent to the various performatives engaged with in this thesis, i.e. to create the conditions of possibility through which a new, perhaps more liberated future, can emerge. A performative scope embraces a radical contingency, a certain openness into 'a very different zone of political possibility' of which multiple imaginations and enactments for a different future are an inherent part. Indeed, the feminist theories discussed in this thesis all have a deeply transformative tone. The materialist debates that followed in the wake of Butler's notion of performativity, of which Karen Barad's work is a lucid example, allowed for a rich theorisation of materiality. I aimed to keep hold of this rich theoretical work, as a mode of imagination and bring this thought to the field of microbicide development. Women's health conceptions of empowerment and biomedical process both work with a framework of thought that is unfamiliar with the performative notions of materiality I discussed in this thesis. However, I suggest that the theoretical framework I set up throughout this thesis is a valuable way to understand the development of microbicides, both in its material and ethical concerns.

In this thesis I have used various conceptions of performativity. Butler's notion of performativity, Barad's intra-action, Latour's mediation and purification and Mol's enactments differ widely in their focus - to show the performativity of sex/gender, of scientific practice, of the objects of science or both. However, what these performatives have in common is the contention that ontologies (of the sexed body or the scientific object) do not pre-exist, but are the *effects* of practice. The power of performativity and the force of a performative analysis stems from this radical anti-essentialism, this aim to abolish 'first principles'. Through this performative scope, I have aimed to show that although women's vulnerability to HIV infection, the material reality of women's lives within the HIV pandemic and the HIV virus constitute a powerful real, this material real as it becomes-known in the field of microbicides does not pre-exist biomedical investigation. Rather 'the vulnerable woman' emerges from the field in specific, and multiple, ways. It has been my intension to show the power dynamics inherent to biomedical process through which women's bodies are configured as they emerge in relation to the microbicide candidates. By focusing on the performativity of the biomedical investigation of women's vulnerability to HIV infection, and the microbicide as an intervention herein, I aimed to show the complex set of natural-cultural, human and non-human relations this endeavour brings into being, and interrogate how women's vulnerability finds its place within this social/scientific cluster of investment.

Following Barad, I have argued that a certain 'indeterminacy' is central to biomedical process, a certain inessential foundation from which phenomena emerge. Furthermore, I have argued that this indeterminacy provokes a multiplicity in terms of the manner within which HIV virus, women's bodies, socio-sexual relations, socio-economic circumstances, and the microbicide relate and emerge from the trial. I have suggested throughout this thesis that this multiplicity becomes especially pertinent surrounding women's vulnerability to HIV infection.

Microbicides are tested on groups of women at high risk of HIV infection. This vulnerability is exactly what would make them ideal potential users for a microbicide and it is exactly what makes them ideal trial participants as the number of HIV infections furthers the success of the trial. This is an intrinsic irony within the testing of microbicides that cannot be ignored. And, indeed, it is not ignored as for instance the GCM had a thoroughly ethical approach to the trials. However, I have argued that the manner within which they understand the trials to function, and the questions they pose in terms of women's risk inside versus outside the trial positions the trial as a scientific space, isolated from social dynamics of power. As such, ethical deliberation never quite reaches biomedical process.

In contrast, I suggest that this irony that surrounds women's vulnerability is central to the multiplicity the RCT invites. I understand women's vulnerability to HIV infection within their specific socio-sexual relations to comprise a context radically different from the biomedical context of a supposed outer-cultural science. This difference makes that biomedical scientists in their search for efficacy and women participants in their sexual relationships have different stakes in the development of microbicides, and more specifically enact the microbicide as a different object. The ethical problematic lies herein, that biomedical process anticipates women's inability to use condoms as their HIV infections further the success of the trial to show the efficacy of the candidate. This forges a direct relation between the microbicide candidate within the socio-sexual context of women's relationships and the microbicide candidate scientific context of biomedical efficacy. These relations constitute the manner within which women/microbicides emerge from the trial. The manner within which vulnerability is made to matter within this phenomenon and whose imagination and enactments have the power to temporarily 'determine' this materialisation is a deeply ethical matter. I suggest that this multiplicity and the biomedical accountability for its relationality should be the target of ethical concern.

Although indeterminacy invites a multiplicity that is ethically problematic and pertinent, I understand it to also create the conditions of possibility for scientific process to be 'a very different zone of political possibility'. I find it interesting that for Barad indeterminacy is both the condition of possibility for materialisation and simultaneously creates the conditions of possibility for the future to be radically open. I want to conclude this thesis on such an open and transformative note.

I propose that imagination is not a concept of abstraction, but a material and ethical investment, open to different conceptions of different actors at different times and in different places, to enact a different future from a 'fundamental' indeterminacy. As such, I understand it to be a

relational concept that is in tune with the assemblage of relations the development of microbicides brings into being, and the imaginative investments that travel through these relations. There is something intrinsically *indeterminate* about imagination. Through foregrounding imagination I aimed to create the conditions of possibility for a productive and transformative engagement with biomedical conceptions, feminist theory, empowerment ideals and women participants' conceptions of their lived reality in a time of HIV. This imaginative relationality is, I suggest, pertinent for the manner in which HIV prevention is made to matter, made meaningful and the future it brings into being.

## Appendix I: List of Abbreviations and Acronyms

AIDS	Acquired Immunodeficiency Syndrome
ARV	Antiretroviral
ASPIRE	A Study to Prevent Infection with a Ring for Extended use
BAT24	one dose of gel within 12 hours before sex and a second dose of gel as soon as possible within 12 hours after sex and no more than two doses of gel in a 24-hour period
CONRAD	Contraceptive Research and Development
CS	Cellulose Sulfate
DMC	Data Monitoring Commission
FHI	Family Health International
GCM	Global Campaign for Microbicides
HIV	Human Immunodeficiency Virus
IPM	International Partnership for Microbicides
IWHC	International Women's Health Coalition
MTN	Microbicides Trial Network
MDP	Microbicides Development Programme
HPTN	HIV Prevention Trials Network
N-9	Nonoxynol-9
NGO	Non Governmental Organisation
PATH	Program for Appropriate Technology in Health
PrEP	Pre-Exposure Prophylaxis
RCT	Randomised Controlled Trial
VOICE	Vaginal and Oral Interventions to Control the Epidemic
WGHI	Women's Global Health Imperative
WHAM	Women's Health Advocates on Microbicides
WHO	World Health Organization

**Appendix II: Table of Trials**

<b>Study Product</b>	<b>Study</b>	<b>Study Implementer</b>	<b>Trial Sites</b>	<b>Start date</b>	<b>Status</b>
Nonoxynol-9 contraceptive sponge	Joan Kreiss et al	Funded by the American Foundation for AIDS Research, the National Institutes of Health, Family Health International, VLI Inc, and Whitehall Laboratories	Kenja (Nairobi)	January 1987	June 1990 prematurely halted: insufficient rate of sero-conversions, increase in vaginal ulcers
Nonoxynol-9 vaginal film	Ronald E. Roddy et al	Funded by the Agency for International Development, the Mellon Foundation, the National Institutes of Health	Cameroon (Yaoundé and Douala)	March 1994	December 1996 Ineffective against HIV infection, increase in vaginal ulcers
Advantage-S (Nonoxynol-9 vaginal gel)	COL-1492	UNAIDS	South Africa (Durban and Johannesburg) Thailand (Bankok and Hat Yai) Benin (Cotonou) Côte d'Ivoire (Abidjan)	September 1996	June 2000 Ineffective against HIV infection, possible increase in HIV infection due to toxic effects.
Savvy	FHI 9784	Family Health International	Ghana (Kumasi and Accra) Nigeria (Lagos and Ibadan)	September 2004	November 2005 Ghanian study prematurely halted: insufficient rate of sero-conversions  August 2006 Nigerian study prematurely halted: potential increased risk of HIV infection



Cellulose Sulfate (Ushercell)	FHI 9757	Family Health International	Nigeria (Lagos and Port Harcourt)	November 2004	January 2007 <i>prematurely halted following CONRAD study results</i>
Cellulose Sulfate (Ushercell)	CONRAD C03-090	CONRAD	Benin (Cotonou) South Africa (Durban) Uganda (Kampala) India (Bangalore/ Bagalkot and Chennai)	July 2005	January 2007 <i>prematurely halted: potential increased risk of HIV infection</i>
Carraguard	PC-515	Population Council	South Africa (Gugulethu, Soshanguve, Durban)	March 2004	March 2007 <i>Safe but ineffective against HIV infection</i>
Buffergel	HPTN 035	HPTN	Malawi (Blantyre and Lilongwe) Zimbabwe (Harare) South Africa (Hlabisa and Durban) Zambia (Lusaka) USA (Philadelphia)	February 2005	September 2008 <i>Safe but ineffective against HIV infection</i>
PRO 2000	HPTN 035	HPTN	Malawi (Blantyre and Lilongwe) Zimbabwe (Harare) South Africa (Hlabisa and Durban) Zambia (Lusaka) USA (Philadelphia)	February 2005	September 2008 <i>Safe, 30% reduction of HIV infection</i>
PRO 2000	MDP 301	Microbicides Development Programme	South Africa (Durban, Johannesburg and Umkhanyakude) Tanzania (Mwanza) Uganda (Masaka)	October 2005	December 2009 <i>Safe but ineffective against HIV infection</i>

Tenofovir gel	CAPRISA 004	CAPRISA	South Africa (Durban and Vulindlela)	May 2007	July 2009 <i>39 percent less infections in the product arm: "proof of concept"</i>
Tenofovir gel	VOICE	Microbicides Trial Network (MTN)	Uganda, South Africa and Zimbabwe	September 2009	November 2011 <i>prematurely halted: insufficient rate of sero – conversions</i>

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