ICONOGRAPHIES OF EMBODIMENT AT INTERSECTIONS OF MEDICINE AND ART

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Abstract

This work traces certain intersections of medicine and art to argue that an understanding of embodiment is always articulated at the nexuses of different practices. It starts out from a consideration of visuality as central to the modern medical paradigm, enhanced by technological modes of looking from the 19th century onwards. The thesis considers photographic imaging, clinical medicine, and eugenics in conjunction to highlight some characteristic aspects of the late-19th-century understanding of corporeality. It then proceeds to consider medical imaging technologies and links them to certain desires that were also at work in the photographs analyzed in the first chapter. Furthermore, contemporary art pieces are introduced in the last section to underline the ways in which the dividing lines between artistic and scientific epistemology have been subjects to constant change. The thesis ends with a consideration of contemporary artistic practices and biosocial identity formations in creating a new, experimental public around a medical interpretation of embodiment.

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Introduction

Intersections

The impetus for this thesis - much like in most cases of scholarly works investigating embodiment in conjunction with visual culture theory - came from Michel Foucault's emphasis on the central importance of looking within modern medical culture. I do not undertake a close reading of Foucault, but I will rely on *The Birth of the Clinic* to argue for the inseparability of looking and curing, diagnosing, understanding, representing bodies. The visual nature of (medical) science takes me on a journey of examining both scientific and artistic means of visualizing bodies.

Foucault claims that "we must re-examine the distribution of the visible and the invisible insofar as it is linked with what is stated and what remains unsaid: thus the articulation of medical language and its object will appear as a single figure" (*Clinic* xi.). In other words, there is no way of separating the technique(s) of visualization from the very essence of medicine: nor from its practice, nor from any conception of human embodiment. The "distribution of the visible and the invisible" is a central issue in medicine, and therefore every form of anatomical depiction will be at the core of its theory and practice, not a mere illustration of it. A way of looking crystallized in an image, or, in the more elegant words of Daston&Galison: the way an image encodes "a technology of scientific sight implicating author, illustrator, and reader" (18) takes us to the very heart of an era's view on corporeality. I am not suggesting that this view is a unitary formation, on the contrary: the thesis aims to look at intersections of sometimes contradictory discourses contributing with their own understanding of human bodies.

As a first world viewer with a comfortable academic setting and an Internet connection, I have had access to a staggering number of images; a privilege that I am grateful for, but one that also made the selection process difficult. I have also been looking at a number of museums and archives in London, the impressions from which fed into the way this thesis has come to be shaped. I was mostly struggling with solving some of the interesting visual puzzles that the imagery I came across presented me with. I realized that most of the pictures I was interested in seemed to be fighting a similar battle: they were trying to get to grips with embodiment, this "immediately given invariant", our "vehicle of being in the world" (Merleau-Ponty qtd. in Hansen 5). I have been looking at Étienne-Jules Marey's chronophotographs studying the body's motion in space, and the photographic studies by Albert Londe of hysteric patients' awkward movements, performed for and through the photographic medium. I have come across Jo Spence's experiments with photo-therapy, her therapeutic use of the camera within the narrative of chronic disease: a way of imaging illness, of externalizing it and facing it (and making others face it) through the visual. I have been contemplating pathological displays at the Hunterian Museum in London, of diseased body parts forever stopped at their given stage of disorganization by the preserving power of formaldehyde; forever exhibited but for utterly different reasons depending on the cultural epoch they happen to find themselves in: the 18thcentury private collection for the education of medical students has turned into a 21st-century public museum exhibiting its own historicity, the very idea of the medical collection as it came to be established in the 18th-century. I have been trying to understand how the kidney in formaldehyde on a shelf in the Hunterian could be linked to the kidney appearing on a contemporary abdominal ultrasound. I have also been trying to come to terms with the way the meaning of that ultrasound image or any other image of bodily interiors becomes completely

dislodged once it enters the discursive field of contemporary art. Italian artist Renato Meneghetti had a hall-size installation of floating, luminous, X-Rayed Jesus figures based on Mantegna's *The Lamentation of Christ* at the 2011 Venice Biennale. What is the cultural significance of X-Rays or MRIs once they leave their clinical setting and frame of reference? I also spent days exploring the Wellcome Collection's current exhibition on the way the human brain has been figured, understood, depicted, constructed, and deconstructed in various discursive domains of previous and contemporary Western societies. I realized that I had been looking at the exhibition to understand how it looks at modes of looking at brains.

This - somewhat humorous - chain of voyeurism made me realize that from the 19th-century onwards, it has increasingly been through techniques of making visible and/or displayable that embodiment has been conceptualized. It was also obvious that each field offering a technique for visualization depended upon the other, and that it would be impossible to study the visual hermeneutics of the body by following taxonomic division lines between artistic and medical understandings. This is mainly because those very taxonomical lines are constantly shifting, and many images, technologies or displays would loose their capacity to generate any meaning if only a single domain of understanding was taken into account. This thesis is therefore organized around the central claim that visual technology, (artistic) image production and medical epistemology form inseparable nexuses at given points in history. Although these interconnections are shifting, and the interrelations are subject to change, each leaves a certain residue in the way embodiment is figured in the visual register.

In this thesis I will pose the following very broad question: how have certain forms of visualization and certain practices of medicine and art shaped each other into novel formations of embodiment? In his analysis of the clinic, Foucault emphasizes that a mutation took place in the

history of medical science in the late 18th- /early 19th-century (*Clinic* xi). I will look at these "mutations of discourse" (*ibid.*) through an examination of the gaze, and its interconnection with technologies of sight, both in artistic and scientific contexts from the 19th-century onwards. I took this period as my starting point partly because of Foucault's emphasis on a large epistemological shift at the time, and partly because of the development of certain mechanized, industrialized techniques of visualization (photography, microphotography, X-Rays, film, etc.) at the time that I claim to still shape our conceptions of corporeality. I will focus on aspects of convergence, and aspects of divergence as well: I am interested in both the ways in which "conventions of visuality in techniques of knowledge and power emerge across disparate and apparently unrelated cultures and contexts" (Cartwright *Screening* xiv), but I am also interested in historically changing notions of what differentiates the epistemology of art from that of science.

I will pay special attention to the ways in which technologies (of visuality) have been used to link the interior of the individual body to the fabric of the social. The driving force behind visualization has often been to generate a sense of understanding of what is not available to the naked eye, and therefore to make observable and communicable something that modernity, with its delineation of the private from the public, has come to understand as belonging to the plane of primary, personal experience. Visualization is thus intimately connected to the desire to regulate, order and understand phenomena, a project modern science and medicine have both been invested in. Although I am aware of this regulatory potential, I will make an effort not to make it the sole topic of my analysis: I realize the importance of coming to terms with the power relations a practice is embedded in, but I also aim to give a chance for that practice to speak for itself and for its methodology to be examined from a number of perspectives that go beyond dismissive criticism.

Methods I: Nexuses

Because of the vastness of the topic, I aim this thesis to be a very self-consciously limited exploration. However, instead of concentrating on one very specific theme, and analyzing it through a broader theoretical lens, I chose to look at a vast array of data and focus on certain key points within the flow of discourses that constitute it. Of course, in keeping with a doctrine of partiality (Haraway *Simians* 203), what I perceive to be 'key points' might seem utterly irrelevant from another perspective. I am willing to run with this possibility; moreover, I am excited by it.

I aim to construct a method of looking at certain nexuses in the larger network and history of visualization. 'Neurons' are especially productive analogies, since they tend to 'fire' and are in constant interaction with other neurons, transmitting reactions from one to the other. It is in this vein that I treat my material: my focal points will activate other images and structures that are in the background, and will (hopefully) shed light on them. They will, in turn, lead to a following nodal point.

The chapters and sub-chapters are organized around certain, very specific moments within the historically changing network of medical/scientific/artistic modes of generating and depicting knowledge about corporeality; which do not, in any way, aim at a totality. The starting point of a chapter is always a single image (be it medical or artistic). I treat these images as certain 'thickenings' within a larger, amorphous field of various discursive practices that contribute to our understanding of corporeality. They are, therefore, more than simple illustrations of a preexisting reality: these images are articulations or conjunctures, points of convergence that are, for me, particularly telling. They raise a number of problems that are relevant for a critical understanding of the ways in which looking shapes bodies, technology shapes looks, and desires shape technology.

I chose to focus on three nodes of imaging. Firstly, the composite photography method developed by Francis Galton as an integral part of his plan for social regulation and his philosophy of bodies in society, eugenics. The composite portraits of patients with tuberculosis that Galton produced will be used to interrogate late-19th-century visions of disease and the body, wrapped in the imaging potential of photography. Secondly, my focus shifts to contemporary modes of medical imaging, such as CTs, MRIs or ultrasounds, and I consider the similarities and differences between conceptions of embodiment produced through these technologies and those introduced in the first section. The argument is that both composite photographs and medical visualization produce an aspect of corporeality inaccessible to everyday perception, and they both use an interconnection of visualization and technology to provoke bodily changes such as disease into manifestation. This formulation does not deny the existence of those changes prior to their visualization, i.e., it does not deny the reality of disease, but investigates the ways in which that reality becomes entangled with the equally real domain of images. The third section looks at even deeper entanglements between artistic and medical image production and the understanding of embodiment through the examination of contemporary artworks that actively mold scientific image technologies and the very fabric of the body as well. Here, I will focus on modes of understanding disease and corporeality that show an interconnection of art and medicine that is beyond the realm of the visual.

Methods II: The Body and the Image

Theory of the body - indeed, any theory - has become synonymous with anti-essentialist social constructivism (Sedgwick&Frank qtd. in Hansen 7). Most contemporary theoretical work on embodiment arrives at a similar claim, namely that the body is socially, culturally, medically, historically, etc. constructed. From the most radical, Butlerian trends of body criticism that argue for the constructed nature of the very idea of biology (see Butler 94 for example), to the "softer" versions asserting that certain forms or ideas of embodiment are the products of cultural practices such as media discourse, these strands of theory resist any foundational claim regarding the body. Although my thesis sets out to investigate the way visual practices have come to form certain views of embodiment, I would like to distance myself from a purely constructivist understanding. My focus on the visual is not aimed at disregarding the phenomenological primacy of being a body, "the ontological role of the body in giving birth to the world" (Hansen 5).

This does not mean that I argue for a single, bounded, universal, ahistorical version of embodiment valid for every bodily experience of the world. It means, rather, that following on Mark B. N. Hansen's theory, I claim the body to be "a primordial and active source of resistance" (15), repudiating "all externalist accounts, (...), including constructivist theories" (13). I argue for a simultaneity of bodies and social images: while the body is the organic condition of possibility for the image's existence, and the image is part of the body's primordial mode of operation (*ibid.*); it is through the image that we access certain dimensions of our very own embodiment, and it is increasingly through the visual (and technological) that figures of embodiment become communicated, shared, and, sometimes, enforced.

In the second chapter, I will return to Bruno Latour's conception of the body as constantly in a flux of *articulation*, of "being affected by differences" (210). Latour argues that it is through the effect of external influences, including sensory perceptions and images that one comes to a fuller and fuller articulation of being a body. It is through these influences, these interconnections that ones subjectivity-cum-embodiment becomes more profound, more collective and more real (208). This thus means that an interpretation of bodies passively subjected to imaging practices does not hold up. It also means that it is inaccurate to state that embodiment only comes into being once it is performed through social images. Embodiment is *deepened* and *complicated* through imaging practice, but that very practice is implicated in the operational modes of being a body: "imaging is a fundamental, existential power" (Hansen 19) whose condition of possibility is precisely embodiment. It is thus through various social practices and images that bodies become articulated, but this articulation is part of their original potential, and therefore imaging is a way of expanding the scope of bodily agency (*ibid*. 20).

This, of course, does not imply that imaging is in a free domain outside of the network of power relations: that would be impossible. The way images are structured and produced, the kinds of images given primacy, the kinds of technologies developed and their implementation funded is all dependent upon and embedded in a certain ideological framework. It is in this sense that images of bodies are always in the field of the political, and are always articulated at nexuses of power relations. Images are never 'innocent', and cannot be detached from their particular ideological background, contrary to what traditional art history would argue. It is also from this perspective that artistic image production has to be re-examined in conjunction with other fields in terms of the politics it stands for. However, I assume the relationship of ideology to images to be similar to the relationship of the body to images: they are simultaneous. Although ideology is

a condition of possibility for the coherence and meaningfulness of images at a given historical time, it is also only through practices such as that of visualization that ideology can come into being.

This thesis therefore experiments with ways to express simultaneity. It tries not to give primacy to either materiality or representation, to either ideology or image. I am aiming to construct a way of talking about images, bodies and structures of thought without claiming that it is always one regime that constructs the other: this is a shifting relationship. I will try to talk about conditions of possibility instead of origins and results; figures and visualizations instead of representations, trying to evade alluding to an unchanging reality at the bottom of the image. But I will also claim that the materiality of the body is not reduced to what imaging (and other) practices prescribe: it is extended and articulated through these iterations, and its capacity of generating these very images forms a condition of possibility for their existence.



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Galton, Francis & Mahomed, Alexander. *4 heliotypes of photo-composites*. 1882. *Guy's Hospital Reports*, vol. xxv. (also published as *An Inquiry into the Physiognomy of Phthisis by the Method of Composite Portraiture*)

{composite portraits of inmates at the consumption ward of Guy's Hospital, London }

Chapter 1: Composite patients – composite photography and techniques of visibility in the late-19th century

I will use the set of images above as a point of departure to introduce certain aspects of the way photographic visualization and 19th-century medical discourses (and other discourses around the health of the population) started to shape each other. I believe that the (late-) 19th century is the locus of origin for many modern practices of visualizing embodiment. With the development of photographic modes of image production, and the concurrent invention of both cinema and the X-Ray, the introduction of microscopic, cardiographic, myographic and sphygmoscopic views of bodies (Cartwright 12), previously unconceptualized terrains of embodiment became visualizable and locateable. However, we have to tread carefully if we want to avoid a technologically deterministic view on understanding corporeality. Cultural formations, such as the structure of healthcare in the form of clinical practice, and other societal aspects and beliefs have to be taken into account to understand the visualized body along the lines of the methodology I have described above. Similarly, we need to take a critical look at scientific virtues of depiction at the time: where have they come from and how did they become manifest?

The images above were prepared by the technique of composite photography. A composite photograph is created by the superimposition of many images on top of each other, each receiving a fracture of the exposure that would normally be needed. Francis Galton made various composites, each organized around a certain 'type' or recurrence, such as 'the Jewish type', or 'the criminal', or the sufferers of certain diseases (mostly those, such as tuberculosis, that were widespread and grave enough to mean a real problem for biopolitical governance). These images will guide me in my reading of certain late-19th-century formations of embodiment, with a

special focus on the coalescence of eugenic ideology, photographic technology, clinical practice and the virtue of objectivity.

Situating the image

It might seem provocative to start this discussion with Francis Galton's composite photographs of patients in a tuberculosis ward of the 1880s. Galton's photographic output is heavily tainted by the association of his name with the notion of eugenics, and is therefore either shunned away by considerate art historians, or worn like a badge by apocalyptic visionaries of the sad biopolitical future awaiting us in the new millennium. Those who take him less seriously tend to dismiss him as mere pseudo-science, a digression or cul-de-sac of history. Let me, however, take Galton's photographs seriously. Both *as* photographs (works of art, if you like, although my whole thesis struggles to refute such taxonomic gestures), and as examples of a curious research method aimed at social regulation; these images are to be considered as important experiments, *scientific* experiments, however much we, retrospectively, would like to disassociate them from the value-neutral, politically innocent idea of science that we nurture. In the vein of Lorraine Daston & Peter Galison (169), I will treat Galton's images on the same page as other forms of scientific visualization, and ravel in the productive nature of (perhaps unlikely) comparison, rather than propose distinctions between morally 'good' and 'bad' scientific images.

The pictures in front of us were taken in 1882, and are the result of the joint effort of Sir Francis Galton, gentleman scholar and infamous 'founder of eugenics', and Alexander Mahomed, a medical doctor (Galton *Memories* 262). Galton first explains the process, developed and named *composite photography* by himself, in *Inquiries into the Human Faculty and Its Development* (1883). The procedure was roughly the following: Galton and his assistants took several portraits

that Galton assembled in a book, and re-photographed them on top of each other, the resulting image being, in his interpretation, the average of all the faces it took to create it (*Inquiries 6-7*). Galton's claim is that "the effect of composite portraiture is to bring into evidence all the traits in which there is agreement, and to leave but a ghost of a trace of individual peculiarities" (*ibid.*).

Look at these photographs as products of the late-19th century. Considering the relatively infrequent appearance of new imaging technologies at the time, the production of these pictures took place not so long after Niépce, Talbot and Daguerre (with numerous other runners-up around them) produced the first chemically fixed images from the camera obscura. Concurrently, (but, as we shall later see, not *consequently*) a shift in epistemology can be observed through and within the visual regimes of scientific interrogation. As Daston&Galison point out, "[s]tarting in the mid-nineteenth century, men of science began to fret openly about a new kind of obstacle to knowledge: themselves. Their fear was that the subjective self was prone to prettify, idealize, and, in the worst case, regularize observations to fit theoretical expectations: to see what it hoped to see" (34). In other words, the mid-19th century saw the birth of what we now conveniently term *objectivity*, one of the prime epistemological virtues accepted within science. It is vital to realize that "scientific objectivity has a history" (ibid. 17), and that the desire (moreover, moral imperative) to record science's working objects without the intervention of the subjectivity of the observer is a construct of the 19th century. The ideal of seeing objectively informed and guided Galton's photographic investigations, moreover: Galton's composite photographs can be seen as somewhat banal, but (or maybe: therefore) paradigmatic examples of what has been working at the heart of the *objectivity* model.

A situating of Galton's images within the larger shifts in scientific perception at the time also cannot ignore the fact that they are direct outcomes of the research method that eugenics had established. Born out of the experience of the growing multitude in industrialized cities of Western-Europe and North-America, eugenics organized itself as science, social movement, and practice/policy aimed at a specific form of social control: a way of targeting human life and the multiplicity of human bodies understood as a *population*¹. Karl Pearson, English mathematician and inventor of modern statistical methods, was often quoted in eugenicist circles with his famous statement that "half of each succeeding generation was produced by no more than a quarter of its married predecessor, and that the prolific quarter was disproportionately located among the dregs of society" (Kevles 74). Eugenics was essentially the offspring of Mendelian genetics, Social Darwinism (*ibid.* 70) and 19th-century social phenomena such as urbanization, mass immigration, and the increasing availability of statistical information on the apparent worsening of "mental defectiveness", disease, alcoholism and criminality year by year (*ibid.* 72). Eugenics propagated itself as the ultimate science, one that would encompass all previous scientific knowledge in order to secure the future of the population. It was invested in solving problems of the future by making manifest the tendencies of the present.

The idea of the "social dregs" as a category was flexible enough for every thinker to project their own society's *others* into it. Eugenicists in Great Britain worried about the proliferation of the "Irish Roman Catholics and the Polish, Russian, and German Jews, on the one hand, and the thriftless and irresponsible - largely the casual laborers and the other denizens of the one-roomed tenements of our great cities - on the other"; while also dreading the ultimate future of the Islands belonging to the Chinese (*ibid.* 74). At the same time, their American counterparts were

¹ I use the term in the Foucauldian sense. Foucault introduces the term *population* to describe the ways in which biopolitical governance targets human life: "What we are dealing with in this new technology of power is not exactly society (...), nor is it the individual-as-body. It is a new body, a multiple body, a body with so many heads that, while they might not be infinite in number, cannot necessarily be counted. Biopolitics deals with the population, with the population as political problem, as a problem that is at once scientific and political, as a biological problem and as power's problem. (Foucault *Society* 245).

concerned about Mexican and Mediterranean immigrants and African-Americans (*ibid.* 75). Additionally to their concerns about the ethnicity, religion and class of those who would pass down their traits to the succeeding generations, eugenicists also lay emphasis on physical and mental health. According to the eugenic understanding, all of these traits were inherited, and thus every one of them observable within the present would eventually manifest in some way in the future as well. If eugenics was to be the conscious control of human evolution, it had to develop a methodology that would point out the 'dangerous' characteristics so that they could be monitored and controlled. Amongst many other tests (such as the IQ test) and methods (such as statistical exploration), some of the work done by eugenicists was carried out in the visual register.

Lastly, my enumeration of the important discursive fields shaping these photographs also has to include their specificity of setting: taken at the Guy's Hospital in London, they have to be thought of as embedded in a very particular spatial and philosophical system of health and illness; a space and style of thought and a way of seeing that is termed *the clinic* by Michel Foucault. It is important to see not just the ideal of objectivity, but also the structure of the clinic as a historical phenomenon: clinical medicine is a product of the late-18th/early-19th century (Foucault *Clinic* xi). Undoing the seemingly obvious status of clinical methodology, Foucault argues that

[c]linical experience – that opening up of the concrete individual, for the first time in Western history, to the language of rationality, that major event in the relationship of man to himself and of language to things – was soon taken as a simple, unconceptualized confrontation of a gaze and a face, or a glance and a silent body; a sort of contact prior to discourse. (*ibid.* xv) The clinic is also to be understood historically, as a spatial and ideological structure for thinking about disease and embodiment from the early 19th century onwards. It is in this setting that we have to situate Galton's photographic output.

It is important to take all these circumstances into account when interrogating Galton's composite images about their curious formation of human embodiment. This undertaking therefore concentrates on the specific embeddedness of the photographs presented above. As I have already suggested in my Introduction, in order to appreciate the full significance of the image and the process of photography itself for practices of social control, politics or scientific endeavors, we have to move away from an art historical understanding that renders pictures into a separate domain of existence and significance, highlighting only those images that live up to the ever-changing standards of 'high art'. As Allan Sekula has very convincingly argued: "I suspect that this has something to do with a certain bourgeois scholarly discretion concerning the dirty work of modernization, especially when the status of photography as a fine art is at stake" (56). Just as many dismiss eugenics as pseudo-science, "histories of photography have been written thus far with little more than passing reference to their [i.e., Galton's and Bertillon's] work" (ibid.). Drawing taxonomic lines between 'real' and 'pseudo' in the sciences and between 'photography worthy of being considered as art history' and 'photography that can be dismissed' is always a political gesture. Questioning these rigid categories brings the rejected elements back into academic discourse, and posits the uncomfortable possibility of them still structuring our current social practices and modes of thinking. Stating that Galton's composites are not 'pseudophotography', but photography proper (maybe even photography par excellence) also implies that their logic and their understanding of embodiment are at work within the photographic image at its purest.

I therefore focus on photography as a discursive practice, an active and potent, but highly malleable form of (re)presentation. On the other hand, however, not only do we have to refashion our approach to the image; it is also important that we reconsider its relation to its function and the discourse it is embedded in. Instead of conceptualizing photography as a mere instrument in the hands of an abstract ideology or science, I see it as directly constructive of that very ideology. The "optical process" of photography and the "political program" (Sekula 51) of eugenics or late-19th century medical practice cannot be separated from each other, and if we want to arrive at a full understanding of eugenics (or medicine) as a discourse, we cannot subordinate the former to the latter. Photography as a mode of inquiry, a way of looking at the world and constructing its fragments as subject matter, a process of linking subject to image with a peculiar emphasis on the realistic and untainted nature of that link, is at the heart of the eugenic program of biopolitical population control and the clinical program of diagnosing and classifying disease; it is directly structuring these discourses. I think I am not exaggerating if I claim that eugenics or a clinical formulation of embodiment would not have happened in this format if it had not been for photography, and this, being an aspect often neglected, needs further emphasis and explication.

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If we take a close look at all of the circumstances around Galton's image that I have outlined above, we might notice the following point of convergence: they are all structured around, moreover, premised upon an ideal of visibility and surveillance. While photography's visual nature might seem obvious, its association with surveillance, a product of Galton's age and closely related to its application for both criminological and medical work, has to be looked at in more detail, as it plays an important role in the formation of the composite portrait as a methodology. The clinic, as explained by Foucault, is also an institution based on the separating of visible from invisible and creating an ideal space for surveillance. Moreover, eugenics itself can be conceptualized as a movement that is premised upon a certain form of visibility, precisely the kind of visibility that the ideal of 'mechanical objectivity' kept promising. The next section therefore takes a closer look at the nature of the visible within these specific settings, each of which contributes to an understanding of the composite photograph.

Manifestations of sickness: the clinic as a space of visibility

Galton's photographs of patients in the tuberculosis ward were published in the vol. xxv. of *Guy's Hospital Reports* under the title *Inquiry into the Physiognomy of Phthisis by the Method of Composite Portraiture* (Galton, *Memories*, 327). During my research at the Library & Archive of the Royal College of Surgeons, London, I have discovered several similar hospital reports and archives, some of them lavishly illustrated with portraits of patients exhibiting a certain symptom of disease. The Library holds a collection of material from the London Lock Hospital (1747-1952), an institution that specialized in curing sexually transmitted diseases, with a special focus on syphilis (Carpenter 79). The images from this collection, all hand-drawn in color, show a shocking array of skin and genital symptoms associated with syphilis. Although these are not photographic representations, they nevertheless signal the visual tactics of the clinic as they blend into and become influenced by the objective and archival promise of the photographic.

John Tagg argues that with the joint advent of the age of the clinic and that of photography, the urge to record and archive in a systematic manner had become more dominant than ever before: "Whereas, before the invention of photography, clinical records had been confined to

spectacular or freakish cases, with the camera, extensive collections and indexes were compiled" (81). There is something archaic and maybe disconcerting about such archives when one is looking at them from a 21st-century perspective. The almost compulsive urge to keep track of patients (without any consideration of what we now term *privacy*) and to record the signs of disease in a collection form reminds me of the work done by institutions that we do not normally associate with the clinical field: museums. Douglas Crimp suggests that the museum is missing from Foucault's list of institutions that have contributed to the genealogy of modernity as an order of surveillance (45). Although Tony Bennett argues against this claim, stating that the museum is not primarily a space of incarceration but one of exhibition (59), my point is that the clinic *does* share certain features of the museum's exhibitionary nature, and it is therefore not incarceration, but precisely exhibition that can be analyzed as their common characteristic. The clinic is a taxonomical enterprise, one that separates sickness from its "natural location" (i.e., the patient's home) and sets it up in a series of other sicknesses for the sake of comparison (Foucault Clinic 109). The museological nature of the clinic is also underlined by its structure as a spatial taxonomy of disease. As Foucault explains: "[t]here, beneath the eye of the hospital doctor, diseases would be grouped into orders, genera, and species, in a rationalized domain that would restore the original distribution of essences" (ibid. 42). These essences, in the age of clinical medicine (i.e., from the 19th century onwards) however, make no sense in some abstract domain any more, they are not imagined in God's Garden (ibid. 36), but they are empirically related and compared to other diseases in the series, all of which are 'on display' in the clinic. The display can then be demonstrated in front of students of medicine and can be shared with other medical doctors: the clinic therefore generates knowledge that is based on a collective experience and consciousness of disease. The concept of sickness is consequently born from a cross-check of

observations coming from various medical authorities: it is an intersection in the network of shared experiences. The knowledge of sickness, as produced by the clinic, is therefore always a demonstrative knowledge, one that is based on a collective experience "of those who unmask and those before whom one unmasks" (*ibid.* 110).

Let me return to Tony Bennett's claim here, that the museum's exhibitionary nature, its essence of display separates it from institutions of incarceration, such as the prison or the clinic (59). Bennett later on qualifies his argument in the following way:

Two different sets of institutions and their accompanying knowledge/power relations, then, whose histories, in these respects, run in opposing directions. Yet they are also parallel histories. The exhibitionary complex and the carceral archipelago develop over roughly the same period – the late eighteenth to the mid-nineteenth century – and achieve developed articulations of the new principles they embodied within a decade or so of one another. (61)

Bennett's claim is that museums, much like prisons and hospitals, "formed vehicles for inscribing and broadcasting the messages of power" (*ibid.*). Therefore, institutions of display and institutions of incarceration *do* have a common root, and they share certain technologies, especially technologies of visualization. Moreover, I argue that in the clinic of the 19th / early-20th century, certain elements of both display and incarceration can be detected. On the one hand, the clinic, with its interlinked practices of producing archives of medical photography, is inherently linked to practices of control and surveillance. In the nexus of these spaces and practices, we can observe "the very coincidence of an ever more intimate observation and an ever more subtle control; an ever more refined institutional order and an ever more encompassing discourse; an ever more passive subjection and an ever more dominant benevolent

gaze" (Tagg 81). On the other hand, the logic of museological display is also an important element in structuring the visual practices of the clinic. The paradigmatic example of such a constellation is the infamous Salpêtrière hospital in Paris, where Jean-Martin Charcot developed his groundbreaking experiments and analysis of hysteria.

The Salpêtrière and its employment of public demonstration and photographic research as part of its methodology have been explored by many scholarly works², and I find it vital to mention these explorations to understand the workings of the photographic and the museological at the heart of clinical medicine. Hysteria as a cultural phenomenon has often been interrogated by scholars, precisely because of its theatrical nature, and its high exhibitionatry value. Additonally, it is a specifically gendered disease, and is mainly associated with women. Hysteria's gendered aspect also links it to the issues at work within the eugenic discourse: the increasing number of men being diagnosed with hysteria raised an alarm amongst certain social reformers, and was interpreted as a sign of social degeneration (Kevles 85). Cultural histories often refer to hysteria's specific period of 'invention' and link it to the name of Jean-Martin Charcot, neurologist at the Salpêtrière. Hysteria is therefore widely recognized as a disease that is a product of a set of cultural assumptions and anxieties at a specific point in history. André Breton and Louis Aragon's famous surrealist manifesto, the *Invention of Hysteria*, for example, celebrates the phenomenon as "the greatest poetic discovery of the latter part of the century" (qtd. in Rabaté 157). At the heart of the working logic of the Salpêtrière lay its museological structure: Charcot himself referred to it as a living museum of pathology (Didi-Huberman Invention 17):

CEU eTD Collection

² Didi-Huberman: *The Invention of Hysteria*, Ulrich Baer: *Spectral Evidence*, etc.

Charcot thus used the hospital's status as a *collection* ("the living pathological museum") to conjugate a *style* of transmitting knowledge, capable of "already exercising a fortuitous influence on the minds of its audience (...)." Charcot thus paved the way for an *attraction* [*attrait*], *Reize*, of nervous illnesses, for the henceforth aesthetic consciousness of pathology. (*ibid.* 239).

At the Salpêtrière, Charcot held frequent demonstrations ("Tuesday lectures") of hysteric patients performing their symptoms for medical students and members of the (socially prominent) interested public as a way of establishing hysteria as an authentic illness (Baer 33). Hysteria was a specifically performative disease, one in which the patient had to cooperate with the doctor in the production of the symptom in front of an audience. Photography came as the perfect mode of recording and reproducing, moreover, triggering the production of the hysteric symptom, such as catalepsy, lethargy, epileptic attacks, etc. Photography thus became a methodology employed within the Salpêtrière for diagnosis, recording, teaching, and control. It became a means of understanding the hidden phenomenon of disease through the capture of a certain bodily state. Albert Londe was appointed as resident photographer of the hospital by the late 1880s (Didi-Huberman *The Figurative*), and a darkroom was set up on the hospital premises (Didi-Huberman *The Invention* 46).

Photography's way of seeing the world actively structured the production of hysteria as a disease formation. The intertwining of photographic and medical history is especially striking in the flash photography produced of cataleptic patients at the Salpêtrière. The flash and the subsequent image, the pathological structure of hysteria, and the logic of medical diagnosis became inseparable allegories of each other:

Catalepsy attains by way of the body what photography appears to retain with the camera: it freeze-frames and retains the body in an isolated position that can be viewed and theorized about outside a temporal continuum. In Charcot's terms, we might provisionally understand the photograph as symptom and see 'the dark chamber' where the bodies of A..., B..., S... are frozen into immobile statues as an allegory of the photographic process itself. (Baer 39)

Charcot's *museum of pathology* is thus a paradigmatic example of an institution in which the constellations of pathological, museological, photographic and clinical-diagnostic become evident. The logic of the display and the logic of the clinic meet with the scopic regime of photography in the portrait of the hysteric.

Instead of constituting visual evidence of a malady, several of the photographs in Charcot's collection make readable – in the effects of the flash – the link between the camera's mechanism and scientific faith in the possibility of incontestable knowledge. They also reveal a structural similarity between hysteria and photography, for it is the flash that links pathology and technology and teaches us something about the origins of photography. (Baer 26)

As I have briefly demonstrated above, the clinical space that medicine circumscribed itself during the 19th century was heavily structured by visibility, by the specific kind of visibility that photography offered. Not only this spatial structure, but also the views on the pathological and its relation to human bodies depended upon a need to pinpoint, record, and exhibit. These urges were generated and supported by the parallel formations in visual culture, including photography and public exhibitionary complexes, such as world expos and museums. In order to qualify these claims further, I now need to make two remarks about photography: firstly, I will make a short

detour and consider the methodology of writing a history of photography as a medium, and secondly, I will focus on the photograph's mythical association with truth and objectivity.

The Desire to Photograph

Before the latter half of the 20th century, it was not as common as currently for a new representational medium to appear. Therefore, it is inevitable that we recourse to a bit of photographic history and consider photography as a newborn medium, one whose exact ontological status was well under debate when Galton started publishing his work and composite experiments. Consequently, the history of eugenics is simultaneous with the history of photography, the development of each field being in its inception at the end of the 19th century. Moreover, because the respectability and exact position and function of both fields were uncertain due to their novelty, and both rapidly became caught up in the general ideological and epistemological crisis of the late-19th century (Green 14), they inevitably found each other as possible sources of legitimization for their own practices. On the one hand, the ideology of photographic realism lent a sense of irrefutability to eugenics, the demonstrative power of the image (which I will elaborate on later) gave the impression of plain, visible truth to the haunting prophecies of Galton and his colleagues. On the other hand, its involvement in the domain of social thought and societal planning gave photography's affiliation with science a new source of confirmation, affirming the indispensability and central importance of the new visual medium to all forms of human inquiry. Such a historical perspective adds further impetus to the idea that photography as a discursive practice is inseparable from eugenic ideology and "an aesthetic consciousness of pathology" (Didi-Huberman Invention 239) and vice versa. Important as a

historical digression may be, however, it is equally important to stick to an analysis of conditions of possibility instead of taking certain historical truths for granted. One such truism is what Anne Maxwell, following on Geoffrey Batchen's now classical thesis in Desiring Production has termed "the so-called invention of photography" (10). Scholars of the history of photography have tended to rely on the magical date of the production of what we now acknowledge as the first photograph (1839), writing concurrent stories around it with varying historical figures and inventions in focus. However, this has "caused historians to overlook the larger discursive social circumstances of its [i.e., photography's] emergence" (Maxwell 10). Furthermore, it also obfuscates the fact that "photography was not one, but several inventions", a "family of techniques" (Daston&Galison 125) that came to prominence around the mid-19th century and can be linked to many independent experimenters (among whom the famous Daguerre and Talbot are but two). Geoffrey Batchen's history of photography, relying on the Foucauldian notion of archeology, tries to reconstruct its overlapping discursive origins, the conditions of possibility that made photographic modes of representation emerge at the particular historical moment of 1839:

The writing of [photography's] history must henceforth address itself not just to developments in optics, chemistry, and individual creativity, but to the appearance of a peculiarly modern inflection of power, knowledge and subject (...). Thus, a beginning that was once thought to be fixed and dependable is now revealed as a problematic field of mutable historical differences. (Batchen 23)

Batchen conceptualizes this problematic field with the help of the Foucauldian analysis of the panopticon, an overarching apparatus that makes an understanding of the visual nature of modern power relations apparent. The panoptical nature of photography means that the observing subject

behind the camera and the observed subject in front of it both become players in a nexus of optical power/knowledge relations that contribute to the subjectivity of both (*ibid.* 21). Thus photography becomes the ideal technical/optical expression of a desire to map bodies in time and space, which also involves "a production of both those bodies and modernity's particular conception of the time-space continuum" (*ibid.* 23), and the shaping of the subject position of the viewer or photographer him/herself.

Such a conception of photographic history, one that is decisively against specific moments of origin and innocent formulations of technological innovation, is helpful for a critical understanding of the relationship between photographs, eugenics and medical practice. If we work with Batchen's concept of a desire to photograph, that is, a drive consisting of specific pressures, discourses and fantasies at a given historical moment, it becomes clear that photography's history cannot be separated from a large set of societal factors that do not simply produce certain forms of image-making, but make the production of these forms possible and desirable in the first place. In other words, conceptualizing the emergence and history of photography as "an inescapably political issue" (*ibid.*), one that is not driven by mere technological accidents, innovation, or individual creativity, is indispensable for an understanding of its inherent linkage to eugenics, medicine, and other discourses around embodiment.

Indices of corporeality

This conditioning of an understanding of photographic history, developed according to a Foucauldian model of genealogy, makes it possible to critically deconstruct what Allan Sekula has termed the "optical model of empiricism" (53), that is, the cornerstone of photography's

association with the eugenic and medical discourse. What initially made photography such a potent comrade for eugenics and medical diagnostics and surveillance was its association with an untainted reproduction of external reality. As soon as photographic practices entered the domain of scientific knowledge production, engendering new forms of inquiry, they became associated with "a process of disinterested contemplation in which the perceiving subject interposes minimally, and then always passively, between reality and its representation" (Green 3). Batchen remarks that "this desire for a positivist certainty" (22), which we now, retrospectively, automatically associate with the idea of photography, was missing from the initial drive that made its invention possible and desired, but became a dominant concern after the middle of the 19th century.

In their magnificent history of scientific imaging, Daston&Galison refer to this time period as the rise of what they term *mechanical objectivity*: "[t]he automatism of the photographic process promised images free of human interpretation - *objective* images, as they came to be called. The multiple inventors of photography had all emphasized the wondrous spontaneity of the images, 'impressed by nature's hand' in Talbot's phrase" (131). The authors, however, make it clear that the idea of mechanical objectivity is not strictly tied to the emergence of photography as a technology, thus giving further impetus to Batchen's anti-originalist history. It was more of a circulating theme and "epistemic virtue" (120) that found one of its strongest allies in the photographic.

Daston&Galison stress that this formulation of objectivity did not rely on the idea of nonmanipulation (as everyone was aware of the extent to which photographs were crafted depictions), but more on an obsession with keeping the image free from personal preconceptions, bias and impressions (135). On the one hand, this obsession generated the division between scientific and artistic modes of image production, a division that is surprisingly modern, and whose historical construction has been largely disregarded. I will return to the idea of the gap between these two modes of research and image production in the second and third chapters. On the other hand, photography's promise of letting nature record itself with the help of light and photosensitive chemicals gave rise to the idea that natural phenomena and processes could be persuaded to imprint their images (133) and thus leave traces after themselves; traces that are the product of their own bodies, much like animal footprints in the snow. This latter, *indexical* nature of the photographic sign came to be of central importance for every attempt at visualizing the body. It can also be linked to the vast array of medical imaging technologies that have emerged during the latter half of the 20th century, but more on these technologies in the second chapter.

Indexicality thus became a key element in late-19th century representations of the body as a source of truth. Imagined as a trace, the index is directly, physically connected to what it represents, therefore it does not work by mere substitution, but by actual re-presentation (Krauss 203, Bazin 14). Therefore the photograph of each individual body is a trace of that very body as it etched itself into the silver of the negative, but that body's surface, when recorded by the right methods (as determined by the ideological frame employed) is also the trace of hidden personal qualities and further, a trace of all bodies biologically or morphologically related to the pictured person. It was precisely its promise to provide an index of corporeal morphology that turned photography into a primary means of social surveillance during the course of the 19th century.

It was its association with recording something trace-like and thus untainted by subjective impressions that allowed photography to be the medium that served to "introduce the panoptical principle into daily life" (Sekula 10). Galton's composite imagery thus has to be looked at in the much wider context of not only medical photography, but also the visual culture of criminology

that begun to form at the same period of time. Sekula mentions another institution, similar to the museum, as both metaphor and actual organizing principle for the photographic efforts of keeping track of the *others* of any given society: "[w]e can speak then of a general, inclusive *archive*, a *shadow archive* that encompasses an entire social terrain while positioning individuals within that terrain" (10). The archive is the means by which criminological, medical and anthropological photography begun to be organized from the late-19th century onwards (56), and it is also the paradigm that made it possible to fit each and every body within a larger system of comparisons, from moral superiors to the unfit, rejected and abject.

The clearest indication of the essential unity of this archive of images of the body lies in the fact that by the mid-nineteenth century a single hermeneutic paradigm had gained widespread prestige. This paradigm had two tightly entwined branches, physiognomy and phrenology. Both shared the belief that the surface of the body, and especially the face and the head, bore the outward signs of inner character. (10-11)

This convergence is of central importance not only for composite photography, criminology and the clinic, but also for every form of bodily visualization whose characteristics I am tracing here. The surface, recorded with a belief in indexicality by the photographic apparatus, is placed in a larger archive of bodily morphologies, all of which tempt the scientist/policeman/doctor with unveiling something about the truth of their interior. It is this configuration that lends itself to eugenic ideology and the development of composite photography as its visual methodology.

Eugenics and Photography: Composites and Anthropometry

As a consequence, photography had become to mean the promise of recording the reality or truth of the body for the emerging eugenic ideology. I want to argue that without this promise of photography, without its association with a "mapping of bodies in time and space" (Batchen 23), eugenics as ideology and scientific pursuit would have turned out completely differently, had it appeared at all. It is precisely because the photograph had come to be understood as a trace of reality that Galton and his contemporaries could start to work with the surface of the individual body as a symptom of interior, hidden qualities, promising the possibility of unearthing and capturing what lay underneath:

It is as if photography makes us susceptible to evil's secret origins, nearly implicating a microbial theory of visibility. (...) After all, a germ can be seen, even if this requires the complicated mediation of a microscope, stains and cultures, while we would never be able to see a miasma or an influence. The see an entity is already to foresee its action. (Didi-Huberman *Invention* 33)

The hidden qualities to be arrested were not only lodged within the interior space of the body, but were also dispersed temporally, linking the symptoms of the bodily surface to previous and upcoming generations. That is, past causes and future possibilities can be traced on the surface of the individual body. Some of Galton's composites imply a direct investment in future genealogies, by drawing timelines across families through superimposing the portraits of multiple generations. This experiment is the visual counterpart of the eugenic ideology of taking human evolution in our hands. I will return to this investment in a future temporality in chapters 2 and 3 as a main theme emerging from imaging the body within 20th century medical practice.

In this sense, the carefully composed photograph of the individual was in a synechdochial relationship (Sekula 34) with two displaced plains of truth: it alluded to invisible qualities of the individual body, speaking of secrets that combined into the eugenic essence of the person; and it also hinted at a larger group of bodies, those related to the individual in the picture, and those with similar features, qualities and measurements. Thus, as the faces and shapes of the multitude of human beings wedged into the proliferating urban areas of the Western world became recordable, these records also immediately turned into metonymic, indexical signs of individual and collective eugenic identity.

The two most important photographic systems developed within a eugenic ideology, namely composite portraiture and anthropometric photography, were both premised on the photograph as an anchor to bodily reality. Allan Sekula analyzes these two methodologies as two opposing and yet structurally and ideologically similar poles of eugenic image-making. On the one hand, anthropometric photography tried to "systematize the body's signs in terms of a quantifying geometrical schema (...) focusing both on the skeletal proportions of the body and upon the volume and configuration of the head" (22-23). Anthropometric photography thus basically established a 'currency' of bodily features, each based on strict measurements which allowed for a comparison of parts and traits across bodily boundaries and time restraints between succeeding generations. In order for this "comparative anatomy" (*ibid.* 30) to work, anthropometric photographs had to be taken with a strict attention to detail and setting, using identical poses and neutral lighting. In line with photography's truth claim, this also called for "the suppression of all evidence of the photograph's own materiality and a denial of the image's status as representation" (Green 4). The assumed transparency of the photographic image allowed for
anthropometric photography to function as "a discursive terrain upon which art and the emerging bio-social sciences met during the middle of the nineteenth century" (Sekula 23).

Without the photographic image, the paradigm of the population as a "multiple body" (Foucault *Society* 245) would not have worked the same way within eugenic ideology. Once the individual with his/her specific features could be identified, those features could then be compared to other images, thus slowly building up a concept of the population that needed to be brought under the control of selective breeding that eugenics envisioned as a way of taking human evolution into its hands. It was only possible through the faith invested into the evidence of photographic visualization that certain observable bodily features could suddenly gain special significance, that certain tenets of bodily change could be identified as degradation or development, that certain recurring traits could be registered and seen as clustering around a visual type. Photography's constant flirtation with the 'real' has turned the medium into a potent source of evidence, producing images that could possibly be interpreted as traces of something more abstract.

Although this paradigm relies on assuming this abstract entity to be existing prior to its capture on the negative, Batchen's remarks on the birth of photography should be considered here once more. If photography was born out of certain politically and aesthetically infused desires, which made photographic image production possible, then it would be naïve to believe that once it was about to reach maturity, photography detached itself from its ideological underpinnings and became a disinterested optical innovation happening to unveil the reality of the body purely by means of its nature as a medium and technology. If we read the history of photography with a focus on certain societal conditions of possibility, it becomes evident that

what the photograph claims to 'unveil' is in fact premised upon the ideological system it is embedded in.

It is the ideology of 'unveiling' that is employed by Galton's composite photography, only in an upside down manner. In an inverse of the act of unveiling, the *overlaying* of images is meant to reveal the ideal that is hidden behind the multiple empiric manifestations of a given social or medical factor. As the body is turned into a symptomatic surface, its significance always points beyond itself, towards its interior secrets of disease or malformation; it is also always gravitating towards a type, or "some ideal typical form from which the individuals may deviate in all directions, but about which they chiefly cluster and towards which their descendants will continue to cluster" (Galton *Inquiries* 10). This *type* is thought to be brought to the domain of the visible from that of the ideal by Galton's ingenious photographic invention and its existence is therefore assumed to be prior to the process of creating a composite photograph.

However, as Sekula points out, it is only by the conditioning ideology and the consequent desire to see the type forming at the center of the composite image that would eventually generate that very type itself. By first setting the premises of what should constitute a type, Galton collected individuals only on the basis of his very own taxonomies that highlighted certain social groups as essentially similar, ignoring their organic connectedness to other parts of society. Similarly, whatever would have come up as the result of the composite process, he would have accepted it as the image of the ideal at the central parts of the hazy picture, simply because he set out to discover that ideal in that very location in the first place. In this sense, the structure of the composite image has to be rethought, once again, in the vein of Batchen's criticism that puts that structuring desire as a condition of possibility before the actual resulting technology or image.

Photography is thus both comfortably embedded within eugenic ideology and structures that very ideology at the same time. Without a belief in the synechdochical truth of the photographic surface, the capability of the visual record to capture the type, or the possibility to picture individual bodies in space and time as fragments of a larger whole, i.e., the population, the agenda of eugenics would have been completely different, or might not have been thinkable at all.

The images that I started this chapter with, composite portraits taken in the tuberculosis ward of the Guy's Hospital, are therefore to be interpreted in the nexus of ideas about scientific objectivity in image production, the circumstances around the birth of photography, the desires structuring the representation of the body in terms of indexicality as a method of social ideology, and the spatial and philosophical structure of the clinic that gives a framework for the interpretation of disease. They present their viewer with an intricate vision of corporeality that works as a prism for the nuanced understanding of the era's conceptions of health and disease, and the links made between individual bodies and the body of the population. They also highlight the ways in which disease came to interpreted as a social problem with regard to the future of the population, resulting in the eugenic pursuits to hunt down, point out, and eliminate traces of disease on individual bodies.



Full-body and pelvis MRI-scans. Source: Schmidt, Gerwin P., Maximilian F. Reiser and Andrea Baur-Melnyk: "Whole-body imaging of the musculoskeletal system: the value of MR imaging." *Skeletal Radiology* 36.12 (2007)

Chapter 2: (Con)fusing Inside and Outside: An Analysis of Medical Visualization Technologies

What are we looking at?

1895 was a curios year: it marked the symbolic birthdate of both cinematic representations of bodies in movement, and the X-Ray vision of the interior of bodies. The second half of the 20th century saw a boom in visualizing technologies for opening up inner bodily space, often in conjunction with the real-time visualization of movement within that space: ultrasound, computer tomography (CT), magnetic resonance imaging (MRI), functional magnetic resonance imaging (fMRI), endoscopy, positron emission tomography (PET), electron microscopy (EM) and angiography define the cutting-edge of current diagnostic practice. Renée van de Vall claims that the emergence of these new techniques of visualization is of profound importance in terms of thinking about bodies:

Precisely because most of the practices currently constituting medical visualisation are still rather exceptional and not yet completely taken for granted, the new techniques provide a challenging opportunity for scholarly reflection. As such, the investigation of their dynamics shows 'embodiment in the making', demonstrating to what extent the presencing of bodily interiority results from an interaction of many external agents, including other bodies, images, technological artefacts and organs. Furthermore, this investigation compels us to rethink the history of the body - or rather, the histories of bodies - and of bodily mediations from a new angle. Transitional moments in the constitution of embodiment such as we are currently witnessing prompt the question of how our conceptions of

bodily interiority came into being in the first place. (*The Body Within 4*)

The investigation carried out in the previous chapter could be seen as becoming increasingly relevant from the perspective of this contemporary transitional moment in the constitution of embodiment. In their visual modes of linking inner body to social body, certain continuities and divergences can be traced that help us better understand current cutting-edge practices.

The images above, according to their caption in the scientific journal they were published in, show "a 60-year-old male". They were produced by magnetic resonance imaging (MRI), one of the most up-to-date imaging technologies available in contemporary medicine. They make me wonder: in what way do they represent "a 60-year-old male" or "the 60-year-old male"? How do these images relate to, construct, explain his embodiment in a visual form? What understanding of disease do they subscribe to, communicate, or create? And how are they similar to, or different from, the photographic images surveyed in the previous chapter in terms of generating and visualizing knowledge about the body?

In this chapter, I will focus on medical imaging technologies at large to give some tentative answers to these questions. I will consider medical imaging technology as an example of *technoscience*, a phrase I borrow from the field of Science and Technology Studies (STS), implicating the technological and social context of science. As I set out to explore composite portraits in the first chapter, my take on medical imaging is also one that sees visualization as an active and potent practice that shapes both the public understanding, and the most personal ways of experiencing disease and embodiment. The chapter will focus on the ways in which medical imaging progressively creates a fusion of the two, creating new forms of ethical concerns that need a reformulation of moral thinking.

There is an important (ontological and methodological) remark that has to be added to the

above questions. In order to avoid the trap of technological determinism, and keep with a logic of simultaneity, I have to posit these questions in a dynamic way, and look at the interconnections and mutual shapings between technological and societal/cultural/personal change (Livingston 98). On the other hand, I also have to be vary not to assume that "ourselves and our understandings come first and then [are] merely expressed" (*ibid.*) through practices and machines. Ira Livingston warns us that taking any of these two extreme positions would eventually lead us back to one of the two schematic "straw men" of cultural analysis, essentialism and constructionism, whose complication and deconstruction usually merely reinforces the strength of this binary in structuring our thought. Instead, it might be productive to "rethink bodies and technology not as agents and patients, not as constructed or constructing, not as hard or soft but rubbery and slippery (...), not as the payoff of a long argument but as a starting point" (*ibid.*).

The feminist challenge of technoscience: methods and alliances

What happens when we leave behind the domain of 19th-century photographic practices depicting disease and embodiment? What changes in the way we look at images when they are no longer embedded in a long-gone past that offers itself to dismantling by the contemporary viewer? How can we keep with the practice of looking sharply, of keeping with a self-reflexive analytical rigor when we turn our gaze on imagery produced by contemporary scientific technologies? In other words, how do we practice a mode of *looking inside*, a way of examining our very own, very contemporary practices of visualizing bodies?

Ludmilla Jordanova notes in *Sexual Visions* that "it has to be admitted, it is harder to bring our own underlying assumptions to the surface, when the foreignness of the past is absent. However, when the decoding of contemporary items has been done, the way is opened for an examination of the workings of long-standing traditions, from which important continuities emerge" (142). My aim is to trace such unlikely continuities: what remnants of long-gone traditions can we unearth from the bottom of our most contemporary practices?

This might indeed be a painful process, one of facing ourselves, our beliefs and structures of logic in ways that we would rather evade; thus, the analytical process once again becomes an allegorical equivalent of the very phenomenon it is aimed at analyzing: medical technologies of visualizing the interior of bodies. The taboo surrounding the viewing of the body's inner cavities is an ancient one (Sawday 3), and the taboo around peering into the recesses of *one's own* body is even more deeply embedded in historical views of embodiment (*ibid.* 8). Therefore the recent boom in medical visualization technologies also involves the generation of fears and ambivalences around the viewing of the interior of bodies. At the same time, however, these imaging technologies are also invested with an increasing sense of faith, and represent curative medicine at its best and most promising. Undoing these beliefs and subjecting medical image technologies to cultural analysis might also provoke a sense of unease as it tends to question the solid basis of effective and progressive benevolence that such technologies mean for many. Such a confrontation, however, can yield new insights that allow for a more empowered stance in the nexus of power relations that figures our everyday encounters with medicine.

Donna Haraway, pioneer in feminist work that has been done on the issue of technoscience and biomedicine, has explicitly argued from the 1980s onwards for the political importance of facing medical technologies with cautious curiosity³. Feminist scholarship has produced a number of enlightening accounts of women's embodiment within a culture of medical

³ See, for example: Simians, Cyborgs and Women; Modest Witness@Second Millennium.FemaleMan Meets OncoMouse, SF: Speculative Fabulation and String Figures etc.

visualization, and therefore this chapter will engage with a more feminist-oriented body of literature than the previous one. It might actually be argued that the field of critical engagement with modern scientific technology is a prime arena for feminist research, indeed, feminism cannot do without a research into the way embodiment and gender relations are reconfigured in the wake of emerging new machines, new practices and new actors. Feminist cultural studies of technoscience has been a fairly established field since the 1990s (Lykke 10). It brings together insights from cultural studies, and thus situates technology within a larger framework of power relations and views its products as cultural texts that can be analyzed alongside other cultural formations (*ibid.* 11). The added impetus of feminism further destabilizes scientific development as independent from social, emotional, and political factors. Feminist cultural studies of technoscience

connects the displacement of positivist notions of technoscience, the discarding of beliefs in technological determinism, and the explosion of elitist notions of culture. (...) At the same time, this perspective is linked with a feminist approach, which is not limited to the study of sex/gender issues but instead fits the description of a special kind of hermeneutical tradition that can 'open up' an unlimited number of topics. (*ibid.* 12)

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However, allow me to take my feminism with a pinch of salt, for reasons relating to ethics and the mainstream feminist constructions of embodiment; both of which I will elaborate on in this chapter. I am intrigued, however, by Haraway's work regarding both its ethical implications and its understanding of corporeality, and I am committed to her understanding of the political importance of interrogating the tools and practices of technoscience, including medical imaging technologies: Feminist technoscience inquiry is a speculum, a surgical instrument, a tool for widening all kinds of orifices to improve observation and intervention in the interest of projects that are simultaneously about freedom, justice, and knowledge. In these terms, feminist inquiry is no more innocent, no more free of the inevitable wounding that all questioning brings, than any other knowledge project. (*Modest_Witness* 191)

Haraway's passage also establishes a parallel between the medical projects mapping the interior of human bodies and her own feminist inquiries into that very process. With this move, she acknowledges the inherent entrapment of every form of human research within a certain style of thought; and therefore claims no innocence or moral superiority to her own feminist project in comparison with the project of technoscience that she sets out to analyze. Haraway fights a battle of equals, one in which curiosity and not condemnation is the driving force. This is in stark contrast with most feminist scholarship on the body within medical practice, as it has tended to be wholly critical of medical practice as a means of objectifying bodies. Thus, within this literature, the body is set up against a regime that wants to reduce it to mere parts, to mere flesh (Berg&Akrich 7). In a similar line of argument, feminist studies of the body have tended to focus on the body's organic and inherent wholeness and integrity, something that is lost through the procedure of medicalization, imagined as violent intrusion or shattering reduction. However, such a strategy is a politically dangerous one, also from the point of view of a feminist politics, as it "reinvents the body as a universal, a-historical category – and such categories have never been very generous towards women or people of color, to name just two examples" (*ibid.* 7). Positing bodily integrity as a starting point is a paradoxical move as it "may inadvertently reinforce the brutally carved boundaries of the epistemic practice that feminist scholars have

typically sought to challenge" (Deller 22). In other words, campaigning merely for the violence of the scopic regimes of medical visualization that produces an "impoverished 'medical' body vis-a- vis the 'lived' body that would somehow be more pure" (Berg&Akrich 8) means a recourse to "myths of origin" (Haraway *Simians* 151), a political strategy of masking hegemonic claims into innocent, natural formations: the very ideological structure that feminism set out to fight against.

I will, therefore, tread cautiously when it comes to taking an ethical stance on what is happening to bodies within current medical visualizing practices. Relying on Bruno Latour's concept of performative articulation, Renée van de Vall (Brain Scans 98) recommends the use of a combination of ethnographic and phenomenological research methods to come to a fuller understanding of the ways in which, in the interaction with new technologies, "new (aspects of) worlds emerge, internally differentiate and structure themselves through the embodied doings of those enacting and experiencing these worlds" (*ibid.* 93). Van de Vall's argument is that it is only in the context of real life-worlds and the way everyday practices shape each other that we can grasp the ethical and political implications of medical technology. Additionally, because diagnostic imaging plays a crucial role in our most quotidian understandings of (our own) embodiment and disease, their phenomenological and psychological aspect is also worthy of study. Although my chapter is not based on ethnographic work, I will try to reflect on the way medical imaging circuits outside of the clinical domain through the consideration of contemporary visual arts as a mode of representing cultural attitudes towards new technology. In the last section of this chapter, I will take a look at some reconfigurations of ethics that have taken some of the lessons learnt from a feminist cultural studies of technoscience into account. In

the following chapter, I will comment on contemporary art as alternative practice that can guide us in outlining values in the slippery field of visualization technology.

Proliferation and interpretation: medical imagery in the public domain

Images of bodily interiors proliferate in contemporary cultures imbricated in the beliefs and technologies of Western medical practice. Making sense of them is a task performed continuously by a large group of actors, including medical technicians, radiologists, doctors and nurses, patients, patients' families, educators, artists, cultural theorists, etc. It could be argued that there are more actors involved in this process than ever before in history: with the dissemination of imagery through media, multitudes have gained access to visions of interiority. In addition, visualizing diseases has become the core practice of medical diagnosis (and, in some cases, such as endoscopic surgery, medical treatment); therefore most of us admitted to hospitals with an ailment will return with the experience of having seen something of our own insides on screens or in pictures. Making sense of this imagery is indeed a task of such gravity and importance that it needs to be carried out by an ever-growing group of people with different backgrounds, to avoid anyone claiming monopoly on their interpretation. Our cultural imagination increasingly equates such forms of visualization with the meaning of human embodiment, health and disease, and their communal understanding and constant questioning is thus of primary importance from an ethical and political point of view.

I will return in chapter 3 to the issue of the possible dissemination of authority over the definition of disease in contemporary cultures. However, the phenomenon is important to mention here, as the question of readership, audience and interpretation is central to medical imaging technologies. Unlike the composite photographic experiments I have dealt with in

chapter 1, images of brains, guts, hearts, stomachs, kidneys and wombs are highly contested terrains inside and outside their primary space of generation: the hospital. On the one hand, these images are the ultimate phase of the incorporation of photography- and film-based imaging technologies into the clinical agenda. We have come a long way from Galton's and Dr Alexander's cautious introduction of the camera into the hospital. Also long gone are the archives generated by Charcot and his photographer Albert Londe. Medical visualization is an increasingly popular practice, and it allows for newer and more uninhabited modes of looking at bodies than ever before. On the other hand, however, these forms of imaging generate debate and interest in circles far beyond the domain of their direct application.

There is a discrepancy between the widespread visibility and visual allure, and the highly specialized structure of meaning encoded within MRI and CT scans or ultrasounds, for example. Because these images are the results of medical expertise, and take a lifetime of learning to interpret 'correctly', their apparent transparency can be misleading (Cartwright *The Visible* 4). In addition to elaborate medical codes, the images' ideological and cultural background also complicates this seeming transparency. Their realism is indeed an effect of a cultural setting in which such images are common signifiers in medical practice (van Dijck 126). In other words, MRI scans of the brain, for instance, might "seem transparent (...), but they are, instead, fraught with complexity and produce by their very transparency an unacknowledged and overdetermined way of viewing and acting in the world" (Crawford 42).

While the spreading of medical imagery within everyday (popular) culture lures us with the promise of what José van Dijck has termed the myth of the *transparent body*, it also promises an unlimited possibility of curing through the equation of seeing and healing (7). Indeed, the ubiquity of such imagery feeds into an idea of modifiability, perfectibility, and curability without

limit: technologies localize and eradicate diseases in a seemingly unproblematic equation of the gaze and the therapy. Van Dijck suggests that "Foucault would term this the 'normalization' of the medical gaze" (38), that is, the spreading of a medicalized way of looking at the body throughout society, and the standardization of such a view. This creates an atmosphere of possibilities and hopes, but at the same time an absolute dependence upon medicine in making sense of bodily procedures. I will bring up some arguments that complicate the totality of this dependence upon medicine in Chapter 3, but let me stay with this working logic for now.

The widespread presence of medical imagery in our culture shapes our ideas of our "objective-selves", i.e., "our taken-for-granted notions, theories and tendencies regarding human bodies" (Dumit 7). This shaping and standardizing takes part in a linking of individual bodies to *the* body or the collective body of the population and the field of the social. In the wake of The National Library of Medicine's *Visual Human Project* (www.nlm.nih.gov/reserach/visible), two virtual human bodies available online for medical training and research, it requires little argumentation to prove that technologically generated images of bodies serve as collective archetypes for understanding our corporeality.

What are the main tenets of the possible body images that are configured in the nexus of contemporary medicine, visualizing technologies, and cultural conditions? In the next section, I will provide some examples of the ways in which embodiment and disease are configured in these intersections. I will pay special attention to the ways these configurations show continuities with, or differ from archival and composite modes of registering bodies at the end of the 19th century. As Jordanova (142) remarks, these continuities and differences show possible points of productive self-critique and introspection, and might grant us with insight about the nature of practices and images that seem too new to grasp adequately.

It is important to note that the body formations I sketch out here are not meant exclusively: I am not intending to draw a picture of embodiment in contemporary medicine at large, that would be impossible. There are numerous medical practices (and even other forms of medical visualization) that are all melting into an understanding of bodies. Blood tests, genetic screening, new reproductive technologies, immunological considerations, etc. all chart different visions and understandings of embodiment. In chapter 3, I will elaborate on some of these alternative conceptualizations, but my focus here is on advanced technologies of visual diagnostics, some amongst many that play into the complex network of actors shaping embodiment.

Indices of corporeality II: the concave space

Medical imaging technologies have to be understood in the context of what Lisa Cartwright termed "the study of a dark and concave space; the inner side of the visible" (*Screening* 9). They are caught up in a web of problems that seems at first to be similar to what Francis Galton was trying to solve with his composites, and what Charcot was trying to capture in his photographic archives, i.e., how to make the internal externalized, how to make the invisible manifest. In this paradigm, the disease, imagined as something hidden, has to be brought to the surface of visibility in order to be tackled by medical authority. This is the essence of the logic of the medical gaze as conceptualized by Foucault: visualizing lies at the bottom of healing, without it, therapy is impossible. Tricking the disease into manifestation also underlies the authority of medicine as scientific practice and social rite: in its logical regime, the visualized is equated with the controlled, and in its intertwining of power/knowledge, the unearthed and captured disease formation becomes the basis for medicine to claim power over the interpretation of bodies.

The bedrock of this power and medical logic is the procedure that channels a phenomenologically and physically interior situation (that of being diseased) into an exterior and describable, shareable entity through a technique of visualization. In other words, medical imaging translates an experience of the living and self-sensing Leib into an artifact of the Körper that can be demonstrated and shared by a communal experience between patient and doctor⁴. The logic behind this move is similar to that of the exhibitionary nature of the clinic, exemplified by the Salpêtrière that I discussed in the previous chapter: in an event of simultaneous translation and production, the disease-phenomenon is formed as a visual entity that can be compared with other similar entities, and can thus be placed within the taxonomical table of illness. It is for this reason that Sturken&Cartwright can argue that techniques such as CT or endoscopy make a similar move to that of photography in the late-19th century: by making the hitherto invisible manifest, they provide the basis of categorizing and typifying human beings, much like the composite portraits did for the eugenic movement (Practices 306-7). However, I will argue that while medical visualization does produce comparable structures of embodiment, as we shall see later, it is much less invested in producing the image of the type than early medical photographic endeavors were.

The workings of vision are inherent within this process of producing an externalized artifact out of something internal, and medical imaging enhances these possibilities. This is facilitated by the (partly) indexical nature of the signaling system of such technologies, an issue I have introduced in relation to photography. Renée van de Vall explicates the indexicality of MRI with the concept of *witnessing*, and mentions that patients she interviewed after MRI scans "consider[ed] the printout [of their examination] as they would any photograph, as a visual testimony of what happens inside" (*Brain Scans* 101-2). Similarly, José van Dijck analyzes

⁴ For a more detailed discussion of the *Körper-Leib* distinction in phenomenology, see Slatman 114.

endoscopic photographs taken of bodily interiors as "souvenirs of (...) exploratory missions" (68). The testimony and the souvenir, similarly to the photograph, are both understood as indexical signs, implying a sense of having-been-there, an authenticity that cannot be produced by any other form of signification. They suggest that a piece or trace of the original is somehow enveloped in them. Medical imaging employs visualization techniques that are dependent upon the body's own tracing of itself: for instance, in ultrasound, the image is produced by an interpretation of the strength and temporality of high-frequency sound waves bouncing back from bodily tissue; while in computer tomography, X-Rays penetrating tissues of different density let organs and bodily structures paint their own shadows on the image plane (the most advanced CT-technology is in fact based on the same idea of imaging that the mid-19th century developed for photography).

Once the image is produced, it can be appreciated and analyzed as an artifact, as the objectform of disease that helps both doctor and patient conceptualize pathology. In the indexical definition of the proof of disease, medical imaging has remained fundamentally photographic, relying on principles of objectivity that are very similar to the ways in which Galton intended to unearth the truth of the body. The investment of belief in the index also implies an almost obsessive interest in the future. The composite portraits of tuberculotic patients were clearly motivated by an attempt to take control of the future morphology of human embodiment: to track down the tell-tale signs of disease across a segment of population, and enable something that we would today call *screening*. The concept of screening can be thought of as a biopolitical measure⁵ and it implies the production of a population at risk⁶, of groups or subgroups that have to be monitored with a future temporality in mind.

⁵ "What does this new technology of power, this biopolitics, that is beginning to establish itself, involve? I told you very briefly a moment ago; a set of processes such as the ratio of births and deaths, the rate of reproduction, the

However, there are also some strikingly new aspects to the logic of the image in contrast with the photographs encountered in the previous chapter. Let me now turn to the ways in which CT scans, MRIs, endoscopic images and the like take part in a reconfiguration of embodiment, and consider their workings in the general larger network of actors involved in their production and use.

Redefined boundaries and the concept of life

First and foremost, medical visualization creates a confusion of the inside and the outside. Imaging thus comes as the contemporary mode of answering the "pictorial paradox" (van de Vall *The Body Within* 9) of the three-dimensional space of interiority, a paradox that has haunted medicine because "the closed anatomical space can only be depicted as an outside, as a surface" (*ibid.* 10).

Medical visualization technology promises the actual externalization of the inside, a true picture of the hidden. This move makes the boundary between inside and outside more flexible than ever before; technological imagination makes possible the projection of the interior into external space, bringing it to the light of clinical scrutiny. It is an important communicational gesture that undoes certain basic assumptions about bounded corporeality by making its most intimate aspects communicable in the visible, external world that we have learnt to navigate in

fertility of a population, and so on. It is these processes – the birth rate, the mortality rate, longevity, and so on – together with a whole series of related economic and political problems (...) which, in the second half of the eighteenth century became biopolitics' first object of knowledge and the targets it seeks to control" (Foucault *Society* 243). I use the term *biopolitics and biopower* in the Foucaldian sense of a power that targets man-as-species, as a population, a power that is making live and letting die, see Foucault *Society* 241-2.

⁶ Nikolas Rose in *The Politics of Life Itself* analyzes genetic susceptibility tests when he remarks that these technologies create new forms of life and new collectivities of those "at risk" (19). I will return to Rose's analysis in the last chapter, but here I would like to refer to his logic in connection with imaging technologies as being constructive of identities through the routine work of screening.

our everyday practices. Renée van de Vall quotes visual culture scholar Nicholas Mirzoeff in order to formulate an understanding of body boundaries traced by visualizing technologies:

[T]he body is no longer the obvious and natural boundary between the objective world outside and the subjective inner experience. The body has become a fluid and hybrid zone in between inside and outside, just as changeable as other cultural artifacts, just as thoroughly determined by representational conventions, just as liable to manipulation. (van de Vall *Between Battlefield*)

Visualizing techniques thus destabilize the bounded body and its association of "notions of individuality and identity being somehow located inside our bodies, the skin forming the boundary between 'self' and 'other'" (van de Vall The Body Within 11). They enter corporeal space, and fuse it with its surroundings, thereby questioning the marked boundaries of embodiment. The bounded body, with its strictly drawn contours carving it out from the external world, is a particularly modern achievement (linked to the post-Vesalian redefinition of Galenic medicine⁷), and is one of the central pillars of modern subjectivity: the bounded, self-managing and functioning body is the epitome of the modern individual with his/her fixed identity located in an interior, invisible space (*ibid.* 11). This formation of subjectivity rests on the idea of individual, rational autonomy, the source of which is located in an interior, private space whose workings are essentially invisible to anyone on the outside, including the conscious experience of the subject him/herself. Medical visualization upsets this axiom of individual identity by making inner working processes visible and thereby disturbing boundaries and questioning the origins of autonomy and subjectivity. Images of the brain can prove especially controversial from this point of view, as they involve the chiasmatic and uncanny experience of looking at the structure and

⁷ Jonathan Sawday in *The Body Emblazoned* gives a detailed description of the differences between a pre-modern and modern conception of the body, linking this shift to the late-Renaissance. Going into the details of these changes is, unfortunately, beyond the scope of this thesis.

functioning of an internal organ, a viewing situation and experience facilitated by that very organ itself. Artist Susan Aldworth's remarks about her experience with a cerebral angiogram are enlightening in this regard: "I still cannot escape the thought that I am seeing all this and thinking all this because of the very thing that I am looking at" (qtd. in van de Vall *Brain Scans* 103). I will return to the issue of the visualized brain in art in the next chapter.

Imaging technologies are thus aligned with a concept of an increasingly malleable form of embodiment (and subjectivity). Not only do they confuse ideas of boundedness, they also present bodies as "fluid zones between inside and outside, liable to manipulation". This is already a step away from the representational conventions of indexicality that I have discussed above and in relation to photographic means of image-making. Although medical visualization does rely extensively on indexical modes of reference, it also blurs some aspects of this representational convention by hybridizing indexical signs into new, simulated images of corporeal space. For instance, in computer tomography, once the bodily data is assembled through the use of X-Rays, it can be reconstituted on the computer screen into a three-dimensional representation of the inner cavities. This latter move is beyond the workings of the index, it is already a step into simulation. As José van Dijck explains in relation to the Visible Human Project (VHP):

the digital data sets offer three-dimensional images that can be rotated so that the projected body parts may be seen from any plain or perspective. (...) A digital cadaver, the VHP claims, is no longer a representation, tainted by the subjective interpretation of the artist, but a simulation – a digital reconstruction of a real body. The VHP data sets (...) have allegedly brought anatomical illustrators away from art and closer to science. (125)

Medical visualization posits its claims about the truth of the body in terms of the accountability and precision of computerized modes of image creation. It therefore introduces a new way of underpinning its claims of authority over the interpretation of disease. This also involves another way of defining the gap between artistic and scientific image creation shaped by the 19th-century notion of objectivity. While previously the representation of anatomical structures was the result of intense co-working between draughtsman and scientist (Daston&Galison 77), MRI and CT claim their authority by separating their visions of embodiment from the sphere of artistic reproduction. Medical imaging bases the truth claim of the image not only on the elimination of human bias in its production, but also on the computerization and digitization of the process. This separation of spheres of image production is the reformulation of the 19th century's legacy that I have dealt with in the previous chapter, and is currently under scrutiny in the field of contemporary visual arts. I will return to this in the next chapter.

There is another important aspect in which medical visualization looks at and shapes a different body to the modes of image production I introduced in the first chapter. Lisa Cartwright remarks that when we view the images produced by these technologies, we are in fact looking at a body understood in very different terms than in the more static surface-representations of early photography: while photography was particularly apt for recording morphology and anatomy; cinematic representations and certain visual diagnostics are more compatible with a picturing of life in its procedural enfolding (*Screening* xii). The temporality involved in screening procedures is often the temporality of the very image itself, as ultrasounds or fMRIs, for example, are capable of reproducing the real-time motions of bodily interior. The movement *into* the interior,

the movements within this interior, and the movements of the interior are interconnected into a vision of life, the idea of a complex, living organism, as opposed to the inert state of death. In The Order of Things, Foucault remarks that for the natural science of the classical era (i.e., before the turn of the 18th/19th centuries), "life itself did not exist. All that existed was living beings, which were viewed through a grid of knowledge constituted by natural history" (128). When opposed to the flat taxonomies produced by this episteme, Foucault refers to the 19thcentury reformulation of nature and history as deeper and more temporal. With the advent of a biological knowledge of living beings, the 19th century proposed to substitute "anatomy for classification, organism for structure, internal subordination for visible character, [and] the series for tabulation" (*ibid.* 138). It is in this era that "life assumes its autonomy in relation to the concepts of classification. It escapes from the critical relation which, in the eighteenth-century, was constitutive of the knowledge of nature" (ibid. 162). Lisa Cartwright adds that "the shift from natural history to biology entailed a shift in modes of visuality, and that with the emergence of a mode of representation specific to biology, we find the emergence of 'life' as a cultural concept" (Screening 9-10). In order to imagine life, a new mode of representation is needed: "Whereas the grid of natural history brought living beings to full knowledge, biological representation seeks to get at what cannot be seen in a process that makes all the more evident the disjuncture between representation and 'object' (or body)" (ibid. 10).

The Birth of the Clinic returns to this concept of life, and posits it within the clinical paradigm of anatomical pathology. Once the clinic came to be the dominant mode of organizing the social structure and understanding of health and disease, it came to be the terrain within which shifting conceptualizations of embodiment and therapy came to be contested. Foucault describes the concept of life within a changing clinical paradigm: "Life, with its finite, defined

margins of variation, was to play the same role in pathological anatomy as the broad notion of nature played in nosology: it was the inexhaustible, but closed basis in which disease finds the ordered resources of its disorders" (*Clinic* 153). In this formation, Foucault continues, "disease will merely be the pathological form of life" (*ibid.* 154). In this Foucauldian terminology, disease is imagined as inherently encompassed in the concept of life, as the other side of life that connects it to death. Disease is thus marked with inevitability and temporality, and has its specific and necessary stages which lead slowly to the disorganization of the ordered forms of life (*ibid.* 157). In other words, the phenomenon of disease comes to be imagined as "a form of degeneration that constantly accompanies life and, throughout its entire duration, defines its confrontation with death" (*ibid.* 158). Disease as degeneration, as disorganization, as the organic underside of life, its necessary counterpart; a procedural, temporal entity that structures our lifetimes here on earth. Within this scheme, the medical gaze also goes through a mutation, and it becomes the virtual reconstruction of an interior, three-dimensional space, an imagined postmortem autopsy:

> The problem, then, is to bring to the surface that which is layered in depth; semiology will no longer be a reading, but the set of techniques that make it possible to constitute a projective pathological anatomy. (...) The anatomoclinician's gaze has to map a volume; it deals with the complexity of spatial data which for the first time in medicine are three-dimensional. (*ibid.* 162-3)

It is important that we understand these changes in medical perception less in linear, historical terms than as shifts of consciousness that are very often overlapping. Foucault's genealogies are working precisely against a deterministic, progress-oriented view of historical events, and therefore have to be interpreted accordingly. Consequently, when analyzing visualizing technologies within this framework, alluding to certain differences does not necessarily mean that one technique overwrote the other, or that ways of seeing follow each other in a linear and exclusive fashion on a temporal scale. Although Foucault claims that the concept of life, linked to biology, is a 19th-century formation, this does not mean that it came to organize every area of the medical episteme. The composite portraits analyzed in the previous chapter point much less to the concept of life in its organic enfolding, its network of living entities and its inherent corruption by disease procedures than to a static tableaux of typologies characteristic of the workings of the pathological museum and nosology or taxonomy.

On the other hand, however, the idea of life has come to spread amongst cultural representations of bodies from the 19th century onwards, and is still an important tenet in our contemporary understanding. Medical imaging technologies are primarily invested in detecting the procedures and changes within the body as an entity of organic life, a malleable formation inherently prone to disorganization as part of its own processes. Medical imaging is the visual counterpart of a particularly modern type of ailment, a mode of illness that comes into prominence with the eradication of major viruses that resulted in the death of entire subpopulations: medical imaging is the technology of chronic disease. It is aligned with a form of sickness that enfolds in time, and proceeds through predictable stages that last long enough to be well-observable. Visualizing is mainly used in a form of diagnostics that deals with changes in bodily flows and processes, internal malformations such as tumors, blocks in circulation and digestion, abnormal growth or degeneration of tissue. Apart from the use of conventional X-Rays in the diagnosis of tuberculosis, it is not primarily bacterial or viral diseases that are peered at through these technologies, but abnormalities of organic function and inner equilibrium. They accompany illnesses that the 21st century has come to understand as severe and long-term: heart

dysfunction, digestive blocks, malignus growths and auto-immune forms of sickness. As a result of the interconnection between changes in hygienic and clinical practices, lifestyles and economic conditions, in conjunction with the visualizing possibilities offered by CT-scans, ultrasound and the like, bodies are increasingly seen as sums of interior processes that are prone to flow in the wrong way and direction at any possible minute. The goal of medicine is to reduce the time between the onset of such a procedure and its capture on screen, thereby performing more effective therapy, a formulation that adds further strength to the idea that seeing is somehow already curing. This is a medicine that is invested in prophylaxis and the maximization of efficiency, and this implies a body that is inherently corruptible, but also limitlessly modifiable if timing is right.

This conception of disease locates it less on a plain of visible social typologies (à la Galton) than in the disturbingly private and at the same time obscurely universal plain of the interior body and its inner functional logic. While composite photographs literally tried to give a human face to the general vision of a disease, thereby attempting to point out its social location and control its resurgence, visualized diagnostic tools conjure up the illusion of tackling disease right in the space of its occurrence. Illness has no face within this logic, it is not inscribed on a symptomatic surface; illness has become a location within a temporal and procedural flow of inner life. This conceptualization lends itself less easily to social typologies, it is imaged and imagined as something deeply personal and also widely universal: it is strongly localized and scrutinized in a fixed space, but its image is also abstract enough to engender a general picture of the given illness.

The way the societal, visual and economic configurations outlined above coalesce in the image of the kidney on an ultrasound screen or the distribution of blood in the brain in an fMRI

scan, builds a very concrete, very localized image of disease as a functional aberrance of inner life circuits. Sickness is thus interpreted much less symptomatically, there is less trust in the haptic and observational interaction between doctor and patient, there is less reading of the surface of the body for tell-tale signs: *life*'s unruly movements are pointed out directly in their source location. What cannot be visualized can hardly be conceptualized as illness. José van Dijck makes this emphatically clear when she interprets her journey leading up to a laparoscopic surgery: "Apparently, I had put such trust in the diagnostic visual evidence (gastroscopy and ultrasound) that I was ready to deny my own experience of pain" (x). This is the ultimate phase of the medical gaze, if not a phase after its reign, a phase in which every other information and experience making up the diseased state is subsumed under the decisive evidence of the visual. The physician's knowledge of the body is also second-order compared to the image gained from the diagnostic screen. His/her task of reading the body with careful scrutiny has come to be only complementary to what screening technologies confirm about the interior. Medicine's primary site of investigation has become the internal; medical hermeneutics is no longer dominantly a reading of the body, it is a reading of an image of the insides of the body.

Implications: an ethics of the open body

In the remainders of this chapter, I would like to take a look at what happens when medical images are considered outside of their immediate context of reference. Since the "foundational events" of bioethics, the "Nuremberg trials of Nazi physicians for atrocities committed against Jews and others, and the Tuskegee Syphilis Study performed by the U.S. Public Health Service on African Americans" (Wolf 6), our century's thinking about new or controversial medical technologies and practices are primarily embedded in an ethical framework. This ethical attitude

towards medicine has to be viewed as a new phenomenon, something that was practically nonexistent in relation to the photography of hysteria or tuberculosis that I described in the previous chapter. While viewing the interiors of the body has always been fraught with anxiety and cultural/religious limitations, it has rarely been considered in the framework of privacy, rights, or consent, for instance.

Although an inclusive consideration of the bioethical implications of medical imaging is way beyond the scope of this thesis, I would like to make a short remark in relation to the configurations of embodiment I have sketched out above, and return to some of the considerations I introduced at the beginning of this chapter. Most medical ethics (including feminist bioethics) start out from the following considerations regarding imaging. First, that it somehow objectifies the body and reduces it into a passive, suffering, inert entity (see Campbell 9). Second, medical imaging is often read in terms of the keywords of (post)modern critical theory of the scopic regimes of modernity: voyeurism, spectacle, exploitation of vulnerability, violation of privacy, etc. (see van Dijck 36 as an example). I believe that most of these critiques rely on a figuration of embodiment that is conceptualized in terms of the binaries of outside/inside, public/private, subject/object, active/passive, etc. Berg&Akrich explain that bioethics and feminist bioethics has often produced such criticism with the implied hope of returning to a wholesome body:

Often, the politics at stake in topicalizing 'bodies' is a struggle for the wholeness of bodies, or for the integrity of body boundaries. (...) This recourse to the integrity and wholeness of bodies has been a powerful and successful strategy for feminists and ethicists, amongst others (...). At the same time, however, this position is more and more contested. (7)

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Many such explorations merely re-articulate the conclusions that other authors have come to using this binary framework. I believe that in order to come to a formulation of ethics that is actually suited to addressing the issues brought up by medical imaging, we need to move beyond this unproductive point, and structure ethics, critique and appreciation around a less dualistic understanding of embodiment.

Bruno Latour, in his article *How to Talk about the Body?* raises the concept of *interface* to propose an alternative mode of conceptualizing the state of being a body. Latour writes: [the body is] "an interface that becomes more and more describable as it learns to be affected by more and more elements. (...) [T]here is no sense in defining the body directly, but only in rendering the body sensitive to what these other elements are" (206). In this formulation, bodies come into being through articulation, a process that never has a definite endpoint, and involves the creation of new modes of being and perceiving through the interaction with various phenomena. Latour includes medical imaging in this definition, and analyzes it as one amongst many forms of interaction that form embodiment, that take part in the process of articulation, instead of a reductive practice with predetermined outcomes (227). I believe that if we base our ethical considerations on such a notion of the body, we will come to more productive debates that will foster more productive conclusions.

Margit Schildrick's *Leaky Bodies and Boundaries* proposes such a reformulation of the starting point of moral thinking for the contemporary setting of the medicalized body: "if my critique of medical ethics is to attempt any different formulation, then it must take account of the re-visioning of bodies, indeed the production of new bodies, that informs the cutting edge of medical research and knowledge" (115). Schildrick's ethics destabilizes fixed notions of identity and autonomy (the most basic requirements of moral agency), and points out that these concepts

all rest on "the mapping of untenable boundaries" (117) that are no longer of any validity within contemporary medical settings. She proposes, instead, an ethics that is premised upon uncertain boundaries and non-fixed identities: an ethics that takes openness and interaction as a starting point.

This is, of course, a simplification of both Schildrick's and Latour's theories, but it nevertheless points in the direction that I see most apt for an ethical understanding of medical imaging, a technology that permeates boundaries and confuses notions of inside and outside. I will now turn to the consideration of another field in which visualization technology is reflected upon, a field that could possibly serve as an alternative to bioethics.



Anker, Suzanne. *Butterfly in the Brain*. 2002.From left to right: 1. installation view; 2. *Total Recall*; 3. *Taxonomy* Universal Concepts Unlimited, NYC

Chapter 3: An Experimental Public

In this last chapter, I take a look at contemporary conceptual art as a practice that allows certain meanings within medicine to emerge in new ways. I claim that conceptual art and biological art are two historically unique spaces within which the understanding of embodiment and disease comes to be shaped actively and reflexively; sometimes on the very level of the materiality of the body, sometimes through the articulation and re-presentation of medical images and technologies. I will link these developments to Paul Rabinow's notion of *biosociality* and argue that the molecularization and geneticization of the medical gaze, conjoined with certain social and cultural shifts, results in the formation of an *experimental public* of artists, scientists and laypeople, all invested in actively shaping the conceptualization of bodies and diseases. This will take me to a consideration of the intertwining of art and medicine beyond the domain of the visual.

The 'other' of a practice: contemporary conceptual art and medical imaging

In her installation *Butterfly in the Brain*, contemporary visual artist and theorist Suzanne Anker presents us with framed arrangements of modified brain scans produced by MRI; museologoical display boxes with three-dimensional Rorschach-test sculptures inside them, and a similar Rorschach-pattern on the opposite wall. The piece works as an environment, the space and its very gesture of installation forming part of the artwork. In *Butterfly in the Brain*, the artist presents the viewer with an environment in which various scientific/medical modes of organizing and representing knowledge about the body (specifically: the brain) confront each other, and also come into contact with modes of contemporary artistic practice, and the exhibiting space of the art gallery.

Suzanne Anker's art has been dealing with the public understanding of scientific knowledge production since 1989 (Goldsworthy), in the form of both visual art and theory⁸. Her work is exemplary in the sense that she combines cultural theory, scientific understanding and artistic practice. She is one of a generation of artists who move comfortably within all three worlds, using their intersections as the focus of their output. I would first like to focus, through the example of *The Butterfly in the Brain*, on the ways in which contemporary art can harbor medical image production, and then move onto the consideration of contemporary art as a field producing its own very organic visions of embodiment.

A number of contemporary visual art projects have turned to the images produced by medical diagnostic tools that I discussed in the previous chapter. For example, Italian artist Renato Meneghetti has been working with the combination of X-Ray and masterpieces from the history of painting⁹; Mona Hatoum has been incorporating endoscopic vision into her pieces examining body boundaries¹⁰. Instead of seeing them as relevant only within the fairly closed elite of the artworld, I view these artworks as players in a larger circuit of generating understanding around the interior views of the body: as imaging technologies make previously unseen spaces accessible to the gaze, the vistas generated by them become slippery terrains where contemporary medical practitioners, patients, artists and other actors engage in a definition of embodiment and disease.

I focus on Anker's installation to explore certain aspects of the interrelations of contemporary conceptual art and medical imaging technologies. I claim that the domain of contemporary

⁸ Anker has published extensively on the interrelationship of contemporary art and (biomedical) science. Her publications include *Fundamentally Human: Contemporary Art and Neuroscience* and *Cultural Imaginaries and Laboratories of the Real: Representing the Genetic Sciences.* She was also one of the organizers of the online symposia *Visual Culture and Bioscience* and *Visual Culture and Evolution.*

⁹ www.meneghettirenato.com

¹⁰ See, for example, Hatoum's *Corps étranger*.

conceptual art is one of the very few spaces in which medical/scientific practices can appear in their visual complexity, but dislodged from their normal referential terrain. From the 1960s onwards, a number of conceptual artists have started interrogating the *archive*¹¹ as a means of preserving and ordering historical data (Merewether 10). This conceptual framework has then been applied to other fields of generating and displaying information within scientific practices. The laboratory, the library, the museum, etc. have all found their place within the flexible and expanding field of conceptual art¹². This field is a historically unique phenomenon, a space in which established practices of detached scientific observation and ordering can be observed and ordered themselves. It is a space for interrogating the very rituals and belief systems to which we subscribe in our everyday understanding. This reflexive relationship between artistic and scientific domains is often taken for granted from a contemporary point of view, but it is in fact a radically new phenomenon. In the previous chapters, I have traced some characteristic moments in the history of interrelations and divergences of artistic and scientific image production regarding the representation of the human body. With the advent of the epistemic virtue of *mechanical objectivity*, and the simultaneous changes within artistic production that lead towards Romanticism, the artistic and scientific depictions of the body have come to diverge, explicitly defining themselves against each other. If we return to Daston&Galison's account of the history of modern scientific imaging practices, it will become clear that the approaches we now comfortably and confidently delineate as 'artistic' and 'scientific' are in fact historically shifting categories. As artistic and scientific vision had an entirely differently structured relationship in

¹¹ See Jacques Derrida: Archive Fever (1995) and works by artists such as Christian Boltanski, Gerhard Richter or Susan Hiller.

¹² See, for example, the work of German photographer Candida Hofer that focuses on libraries, or Thomas Struth who looks at the ways in which visitors engage with museum exhibits. Hungarian conceptual artist Orshi Drozdik interrogated the production and display of anatomical wax figures. The list is endless.

the era Daston&Galison term "truth-to-nature"¹³, the now familiar divergence between the fields of artistic and scientific image production should be understood as an entirely modern phenomenon, rooted in the 19th century. Contemporary art's mode of reflecting upon scientific data production and research modes is thus an entirely new phenomenon, one that could not be imaginable without the divide between the two fields defined by the advocates of *mechanical objectivity* in the 19th century. In order for this reflexive relationship to come into being, artistic image production first needed to be defined in opposition to its scientific counterpart. If we view the relation from this perspective, we can avoid taking certain taxonomical categories for granted.

Suzanne Anker's work is thus embedded within this historical formulation: contemporary artistic practice as a space of reflection on scientific imaging. In *The Butterfly in the Brain,* Anker allows the representational conventions of medical science to appear *as* representational conventions. The installation confronts the viewer with three types of gathering and representing data about the brain: the MRI scans on the wall, the Rorschach test patterns, and the museological display cabinets that could be interpreted as a reference to the pathological museum. Anker's installation gives space for the logic of these systems to appear, because the dislocation of each presentation from a medical frame of reference leaves them without the setting in which they usually generate meaning about the body.

Firstly, the glass cabinets allude to the structures of museological presentation itself. The installation involves a very specific mode of presenting artifacts that has been employed in museums of pathology from the 19th century onwards. But inside the cabinets, the visitor meets elaborate sculptures instead of diseased organs in formaldehyde: sculptures that are three-

¹³ Daston and Galison discuss the complex relationship between the artist's and the scientist's vision during the period they call "truth-to-nature" (55-113).

dimensional versions of the Rorschach-test, often used by psychologists and psychiatrists to come to a better understanding of the patient's psyche. The implication is that in the display box, it is the test itself that is exhibited as an artwork. The Rorschach-test does not visually represent the brain, but it is a pattern that allows certain (assumed) features of mental function to emerge through a personal investment of the visual with meaning. These tests are thus technologies of making certain inner features appear; they are techniques of manifestation, much like the visualization techniques that I investigated in the first two chapters.

The Butterfly in the Brain couples its museological displays with taxonomic grids of MRI scans presented on the walls. With this gesture, it makes a tentative visual link between the tradition of the medical museum, the Rorschach-based technique of making sense of mental phenomena, and the regime of medical visualization, and dislocates all of these from their corresponding environments. The MRI scans loose their immediate referent of the dysfunctional brain, *my* dysfunctional brain that they would come to stand for in a hospital setting, and appear as mere visual patterns, aesthetically pleasing ones at that. This allows Anker to make visual comparisons between the symmetrical nature of the brain's image and that of the butterfly, the Rorschach inkblot, or the enlarged image of the chromosome. MRI, the definitive visualization technology that claims an understanding of the brain's function; the archetypal image that represents subjectivity in our contemporary visual culture, thus becomes one amongst many similarly structured visual patterns and similarly oriented representational conventions.

The Butterfly in the Brain is an intricate arrangement of different modes of visualization or techniques of manifestation, all of them without their conventional referential field; a piece that can therefore be interpreted as "the other of a practice" (Annamarie Mol qtd. in van de Vall *Brain-Scans* 103). Renée van de Vall refers to contemporary art as a form of "performative

articulation" (*Brain Scans* 103), along the lines of the Latourian terminology I introduced in the previous chapter. Van de Vall brings up contemporary art within an empirical approach that resists expressing criticism on practices unless they can be mirrored by another practice. Art, in its current relationship to scientific imaging (as I described above), has come to provide a space for the empirical exploration of medical visualization; it can be seen as a testing ground of sorts:

I would like to point to art as a particularly informative type of alternative and potentially critical practice. Both as productive and as receptive practices artworks embody forms of performative articulation. As such, they possess the same kind of reflective potential as the ethnographic and phenomenological studies (...), but in contrast to those studies, this reflective potential is exemplified in the same kind of visual/material form as the artifacts on which it reflects. (*ibid.*)

In this formulation, contemporary art reflecting on medical imaging becomes a form of "learning to be affected" (*ibid.* 104), a mode of making sense of the intersections of self, body, and technology. For van de Vall, this is an invaluable resource for providing a framework within which medical visualization can be discussed critically without a reference to transcendental values (*ibid.*). By juxtaposing images with others or presenting them in unusual ways, outside of their context, the art installation becomes the sphere in which authoritative practices become open for interrogation. The installation can thus be seen as an alternative to the ethical take on medical imaging that I dealt with in chapter 2. It makes certain tenets in the logic of technology apparent, leaving an open space for the viewer to engage with the work and come to his/her own conclusions.

It might be symptomatic, therefore, of a reluctance to express an explicitly ethical stance that there is an increasing number of academic articles on medical imaging, more specifically brain
imaging, that end their investigation with a reflection on a piece of contemporary art. For example, Fernando Vidal's *Brainhood* and Renée van de Vall's *Brain Scans and the Mediation of Subjective Embodiment* both conclude with a brief look at contemporary artistic ways of incorporating and coming to terms with imaging technologies. I interpret this as a sign that a more open kind of ethics is needed in order to formulate a critical and morally engaged understanding of the technologically facilitated way of viewing bodily interiors.

The Bio-Artistic and the Bio-Social

Let me close my investigation with a brief look at the curios hybrid of present and future, science and art, individuation and collectivity, creativity and heredity, agency and biopower that contemporary formulations of biosociality and bio art present us with. I claimed in the introduction to this chapter that contemporary conceptual art has not only become a sphere of receiving and re-presenting scientific images; it has embarked upon its own venture of experimentation that we would still commonly understand as scientific in nature. I would like to connect this orientation of biological art with the social phenomenon that Paul Rabinow (and then Nicholas Rose after him) have termed *biosociality*. I see both of these tenets as contributing to, testing, using and questioning the medically grounded understanding of embodiment in contemporary Western societies.

Reviewing Western biomedical science in the 1980s, Donna Haraway stated that

[i]t has become commonplace to emphasize the multiple and specific cultural dialects interlaced in any social negotiation of disease and sickness in the contemporary worlds marked by biological research, biotechnology, and scientific medicine. The language of biomedicine is never alone in the field of empowering

meanings, and its power does not flow from a consensus about symbols and actions in the face of suffering. (*Simians* 203)

From the 1990s onwards, contemporary art has become one of the many dialects that explicitly form not only the interpretation, but the very material and direction of medical research. It is important to situate contemporary art within the field of a medicine that is also contemporary: this is a medicine of the molecular level. Nicholas Rose (*The Politics* 12) makes it clear that this entails a complete shift in the medical paradigm compared to the clinical scheme that I have so far been dealing with, and it also involves a mutation of the medical gaze. Rose remarks that while the clinical gaze touched upon and formed bodies at their "molar" level, it looked at bodily wholes and units (as I explained in chapter 1); the molecular gaze sees life

in terms of the functional properties of coding sequences of nucleotide bases and their variations, the molecular mechanisms that regulate expression and transcription, the link between the functional properties of proteins and their molecular topography, the formation of particular intracellular elements (...) with their particular mechanical and biological properties. (*ibid*.)

It is, partly, in this sense that Haraway, in a particularly insightful footnote to *A Cyborg Manifesto*, can declare that "[i]t is time to write *The Death of the Clinic*", because "the clinic's methods required bodies and works; we have texts and surfaces. Our dominations don't work by medicalization any more; they work by networking, communication redesign, stress management" (*Simians* 245). Here I return to what I mentioned in chapter 2: the ways in which embodiment is understood and envisioned in contemporary culture and medicine is very heterogeneous. Therefore, although medical imaging practices disseminate the idea of a strongly medicalized body, Haraway's claim also stands in relation to the slow reconfiguration of

medicalization processes, as I will demonstrate in the upcoming paragraphs.

Within the era of the molecular gaze, the body, as a set of codes, sequences and communication processes, is imagined as more modifiable and flexible than ever before: "human vitality has been opened up, at the molecular level, for technical innovation, economic exploitation, and for highly competitive forms of bioeconomics" (Rose *The Politics* 11). It is this conception of malleable bodies that bio-art taps into and starts to work with. From the 1990s onwards, contemporary artistic practice has been actively involved with the forefront of biomedical research, and not only in the commentator's role, as I have traced in the previous section, but also engaged in the very flesh (or, rather, cell culture) of cutting edge knowledge production¹⁴. For those producing what has come to be called *biological art*, "biotechnology is not just a topic but their very medium" (Kac 12). Siân Ede (55-6) gives an institutional history of the various projects and funding bodies that have created the tradition of placing artists as residents in hospitals or science laboratories.¹⁵ This institutional basis for art-science collaborations gives not only financial, but conceptual backup to artistic projects that engage with biomedicine and technology, creating a wider public understanding of such engagements.

In *Good and Evil on the Long Voyage* (1997), conceptual artist Paul Perry created a hybridoma by fusing one of his own white blood cells with a cancer cell from a mouse. "The success rate for such cross-species transgene fusions is very low – in our case there were only a couple of successful fusions out of approximately ten million attempts", writes the artist (Perry 211). *Good and Evil on the Long Voyage* is one of the most famous and most thought-provoking pieces of biological art. It is both an installation (when exhibited, the cell culture is presented in a

¹⁴ See, for example, the work of Joe Davis, Eduardo Kac, Marta de Menezes, or George Gessert.

¹⁵ Some of the most famous of such collaborations are Helen Chadwick's work done at the In Vitro Fertilisation Unit at King's College Hospital, Kitsy Dubois' involvement with the French Space Agency or Neal White's placement at the Human Genome Mapping Project's Resource Centre, but the list is very long, see Ede 55-64 for further examples.

bio-reactor within a canoe, raised a few meters above the ground), a biological sculpture, and an immortal cell line, a type of cell culture that is used in the forefront of biomedical research (including research into cancer, HIV/AIDS, the effects of radiation and toxins, etc.). While immortalized cell lines from a patient can result in a number of benefits for research, they raise ethical and legal issues regarding the immortalization and use of tissue from a human being¹⁶. On the other hand, Perry's experiment is considered to belong to the sphere of art, where the artist willingly submitted himself to the procedure. The cell culture goes on to live forever, entangled in a battle of 'good' and 'evil', generating antibodies that can be used in treatment (Andrews 131).

Good and Evil on the Long Voyage is a conceptual, artistic and scientific project that takes the molecular vision of the body as its starting point. Perry's work, as that of biological artists in general, engages the body itself, in its malleability on the cell level. Such artworks therefore once again bring us back to the question of drawing boundaries between scientific and artistic practice and trouble their clear delineation. At the same time, they exemplify the ways in which new groups of actors become involved in the medical definition of embodiment, health and disease. Donna Haraway's statement on the "multiple cultural dialects" that are intertwined in any contemporary definition of biomedicine is especially insightful in this respect: the terrain of a medical understanding of what it means to be a body has become extremely heterogeneous, and it increasingly involves input from the field of a variety of other sciences, technologies, and practices that go well beyond the realm of the scientific. My claim at the beginning of this thesis was that visualization is at the heart of all formulations of bodies within the domain of the medical; and this is how I arrived at a consideration of art, photography and imaging

¹⁶ See, for example, the most famous debate around the HeLa cell line in Skloot, Rebecca. *The Immortal Life of Henrietta Lacks*. New York: Crown/Random House, 2010.

technologies. By closing this piece of writing with Perry's work and a consideration of biological art, I also acknowledge that the intertwining of scientific and artistic practices has arrived at a new level. In this arrangement, the conceptual space that we have come to regard as *contemporary art* becomes entangled within the very materiality of bodies that previously only medicine had direct access to. It is important to see this change not only as a historical development in the relation of two fixed spheres of human endeavor, but also as a sign of the mutations taking place in the very definition of each domain. It is not only the relation of art and medicine/science that has changed dramatically, but also the social, personal, and ideological definition of what counts as artistic and what counts as medical or scientific practice.

This is, of course, partly due to the fundamental changes that have recently been going in within medicine: with the molecularization of the medical gaze and the advent of genetics and biotechnology as dominant discourses, medicine has become a fluid terrain between a variety of approaches and frameworks that speak of a body whose secrets are to be read not only on the visually accessible level, but also in terms of abstract flows, networks and codes that are rarely visual in nature. This shift is co-existent with the increasing use of medical visualization that I dealt with in the previous chapter, and thus signals the ways in which multiple figurations of embodiment can be present within the same episteme.

The understanding of corporeality formulated by this version of medicine is inherently open to modification. Even within a genetic framework, the body as genetic code is imagined as something whose 'faults' can eventually be corrected or eliminated with the advance of science. It is at this point of the convergence of genetics, an ideal of modifiability and creativity that both bio art and biosociality can tie into medical understanding. The creative element is implied within the field of biotechnology that molds and shapes organisms. It is in this way that 'grotesque' or non-typical life forms can become part of the very tenet of life as opposed to being its extremes or undersides (Kac 9). It is also this way that artistic and scientific creativity have both come to work with the very materiality of life. And it is also a sense of creativity on the very level of life and an understanding of embodiment that I perceive to be an important tenet within biosocial identity formation.

Paul Rabinow observes the "formation of new group and individual identities" (188) arising out of the new truths offered by testing for genetically transferred diseases once their corresponding genes or gene combinations have been mapped. "There already are", he remarks, "for example, neurofibromatosis groups who meet to share their experiences, lobby for their disease, educate their children, redo their home environment, and so on. That is what I mean by biosociality", he concludes (*ibid*). According to Rabinow, the purpose of these groups is to take control over their fate through their actions and practices and to demand a set of rights specific to their disease. Similarly to Rabinow's concept of biosocialty in relation to genetic testing, what Nicholas Rose and Carlos Novas trace back to AIDS activism is a form of "active biological citizenship" (448), formed as group and individual identities "around the proliferating categories of corporeal vulnerability, somatic suffering, genetic risk and susceptibility" (ibid. 442). Rose&Novas explain that although such biosocial groupings are not necessarily new, the way they engage with medical knowledge and shape identities around it is something indicative of new forms of relationships between knowledge and practice, between knowledge producers and patients. While previous groupings primarily opposed medical power and expertise, new biosocial identity politics engage with, moreover, shape medical knowledge production. Their engagement with medical knowledge produces informed subjectivity, one that creates new practices, termed 'techniques of the self' by Foucault (ibid. 450). These practices are also

important for Rabinow's understanding of biosociality, as they point towards the ways in which individuals become active biosocial citizens, acting upon their fate through the incorporation of technoscience into their own knowledges (189). These personal bodies of knowledge and experience are at the center of the politics of biosocial groups: they try to act as the intermediary between medical and individual knowledge production and understanding, and they provide platforms for interpreting, accepting, or challenging medical discourse on the given disease.

It is important to understand that support groups and other manifestations of biosocial identity politics are still within the field of power in Foucauldian terms, moreover, "biopower produces and creates conditions of possibility for the emergence of communities around *bios*, or life" (Friedner 337). However, these practices and collectivities also exemplify a creative and affirmative way of engaging with biomedicine. They are made possible by an understanding of human corporeality as inherently malleable. Additionally, biosociality as a social phenomenon is also the result of an understanding of "nature (...) modeled on culture understood as practice" (Rabinow 186). In Rabinow's terms, biosociality marks the end of a conceptual division between the natural and the cultural, whereby the naturally 'given' is seen in fusion with the culturally and technologically possible.

Bio art and biosociality are therefore both manifestations of a new, experimental public within which the definitions of embodiment and disease become opened up on the very material level of the body to doctors, scientists, artists and those constructing their identities on the basis of susceptibilities. All of these projects are invested in the future: biosocial lobbying for research funding into a given disease or the recognition of certain rights associated with disabilities; artistic practices conducting experiments that question and rewrite scientific belief systems; biotechnological modifications of organisms, and genetic screening for risk and susceptibility are

all partakers in a project of enhancing, molding, influencing the future of human embodiment; the management of disease and the incorporation of disease and disability into the fabric of the social.

The entanglement of art and science within this new, experimental public is one of reflection, questioning, the opening up of new spheres and spaces for thinking, and an active involvement with each other's practices regarding organic material. The understanding of corporeality in this framework is co-created by art and science not so much in terms of their sharing of similar methods and concerns regarding visualization, but in terms of their experimental engagement with each other. Similarly to the composite portraits and the medical imaging technologies that I have previously analyzed, these techniques of the body are still invested in the future through processes of screening, and are still concerned with linking individual bodies to the fabric of the social, the biopolitically conceptualized *population*, but they aim to achieve their goals less by techniques of making visible than by molding the organism, the body itself, and by being open to new actors and types of agency around its definitions.

Conclusion

This thesis has traced some nodal points in the interconnections of medical, technological, and artistic understandings of embodiment. The analysis made it clear that separately considering the various discourses feeding into images of the body would result in loss of meaning and intelligibility. My exploration started out from the claim that technologically aided visualization has been working at the heart of formulating embodiment from the 19th century onwards. The examples of composite photography (and their relationship to the clinic and the program of eugenics) and medical imaging supply evidence for this claim. It is the need to point out, diagnose, interpret, and regulate that has been structuring a medical interpretation of embodiment, and it is this need that feeds into practices of visualization. These practices make perceivable something that is not available to ordinary vision, and translate between bodily interiority (hidden features contributing to taxonomical and eugenic identity, or unseen processes in the flow of biological life) and the external world. This process is far from seamless or transparent: it is made possible by certain ideological and technological formations of the given era, styles of thought that carve out the direction of looking and distinguish relevant from dismissible. Bodies become articulated at the nexus of these practices of looking, but they are not mere passive objects inscribed upon by technology and ideology: their materiality forms the condition of possibility for technologies and images themselves, and thus they contribute to a fuller expression of the body's potentialities. It is, however, evident that all of these events take place within the field of (bio)power, and are therefore taking part in the construction and surveillance of populations through the linking of each individual body to the collective, multiple body.

Contemporary artistic practices have come to provide a conceptual space in which these visual processes and representational practices can be reflected upon without a necessary recourse to a traditional ethical framework. They also tie into scientific and medical understandings of the body through their own experiments; projects that question delineations between art and science, and make their historicity visible. At this point, art provides less of a visual framework for medical/scientific research than becomes involved with the very fabric of organic matter that medicine/science have previously had monopoly upon.

Although my investigation was not aimed to provide a clear historical account, it did benefit from a comparative look at different eras' beliefs, desires, practices and technologies. However, I would like to avoid a linear interpretation of the changes that I have traced. They are not to be seen as succeeding each other, but more as feeding into each other, leaving certain traces in newer and newer practices. What we understand as the human body, how we perceive our very own embodiment, and how we conceptualize health and sickness at a given moment in history is always dependent upon a large network of actors; a network in which images and imaging technologies play a crucial role.

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