

P·U·L·S·E

A GRADUATE JOURNAL OF HISTORY,
SOCIOLOGY, & PHILOSOPHY OF SCIENCE

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Introduction

Matthew Baxendale, Alexandra Claudia Manta & Maria Temmes

The current and third issue of *Pulse* brings together an eclectic range of approaches and topics to the history, philosophy, and sociology of science. The papers collected within are organised around four broad themes. We begin with metaphysical issues in the philosophy of science, before proceeding to consider how individual philosophers have developed these themes in their own work. This is followed by a section dedicated to the history of science with a dual focus on past and contemporary cases. The issue is brought to a close with a look at the interaction between science and society. In what follows we offer a more detailed description of each section, the questions that define these sections, and the connections between the individual pieces that comprise them.

Philosophy of Science

The search for an account of how best to characterise the phenomena in the world has long been a goal of philosophers of science. Can an account capture the relationships between phenomena in the world, both causal and constitutive? Can this account serve as a guide to ruling out proposed phenomena that fail to meet certain criteria? The issue begins with two papers exploring these and related questions. Freitas begins by exploring physicalism – the view that everything in the world is physical. Stated as such, physicalism does not offer much to go on. Through the lens of recent work on the concept of physicalism, Freitas discusses whether ‘physicalism’ is actually apt to capture anything significant about the world around us. Freitas explores not only a variety of accounts of physicalism but also the strategies used to construct them. Specifically, he analyzes *via negativa* – constructing an account of what physicalism is by ruling out what it cannot consist in. He concludes that this strategy is doomed to fail and possibly so too is the traditional conception of physicalism. In our next piece, Morales discusses an alternative to classical physicalism – namely, non-reductive physicalism. Here we are introduced to the concepts of emergentism and downward causation – do new properties emerge through increasing complexity and can these new properties have a causal effect on properties at a lower level of complexity? Morales argues, conceptually at least, that they can – leaving the door open for empirical work to confirm such hypotheses.

Philosophers on Science

Often individual philosophers are associated with clear, neat, easily discernible views on science. In this section of the issue we present two papers that seek to engage with such historical figures and see what lessons can be learnt for contemporary science studies. Are the classic portraits of these figures accurate? Are their disagreements and similarities faithfully represented, or does more careful analysis reveal fruitful divergence from the received view of these philosophers and their engagement with science? In the first paper, Zsolt Kapelner takes up this very question and argues that there are interesting similarities between the work of Heidegger and the logical positivists – particularly Rudolf Carnap and Otto Neurath. Kapelner points to their respective views on the use and abuse of science, as well as the possibility of radical revision for any given scientific statement, in order to demonstrate how these philosophers share much, despite rarely being considered as complementary. In a similar vein, Massimiliano Simons turns our attention to two prominent French philosophers – Foucault and Althusser. Simons argues that, despite being the received view, the major point of difference between Foucault and Althusser on science was not their differences on the concept of ideology. Rather, Simons argues, their difference lies in the way that they understand the connection between ideology and science.

History of Science

The “History of Science” section is methodologically dominated by an internalist perspective, which focuses on the conceptual operations and epistemic and social effects of the discourse of knowledge itself. How is discourse of knowledge shaped by the historical context in which it takes place? From where does scientific authority emerge and how is it sustained?

Athanasios Rintotas provides a rich and ambitious account that counters orthodox historiographies of science that either completely disregard or discredit both the Middle Ages and the Arab influence on the constitution of “European Science.” Rintotas is interested in the dynamics of the process of scientificization of knowledge in the modern West as a paradigmatic process of reconceptualisation of the forms, the methods, and the goals of epistemic inquiry. Rintotas takes for granted the authoritative epistemic position of natural philosophy – which he also sees not as a pure product of the Greco-Roman Antiquity. Rintotas' paper thus makes two parallel arguments: (1) that the Arabic translations of the 11th - 12th centuries A. D. were crucial to the implantation of Greek natural philosophy

into the intellectual soil of continental Europe; and (2) that transformed Greek natural philosophy was itself crucial to the naturalisation of magic and alchemy, and to the reclassification of the sciences so that magic and alchemy would become more epistemically authoritative ways of dealing with nature.

Whilst Rinotas chooses to focus on the Arab contribution to “European” medieval and early modern scholastic knowledge, for both Ana Popović and Kylie Boazman modern 19th-century science seems decidedly European and a product of empire. Popović’s paper situates the meaning of late 19th-century soap advertisements in Britain at the intersection of classist medical and hygienist discourses of health-preservation and disease-prevention, and of racial-imperialist discourses of whitening and civilizing. Popović draws upon the work of Anne McClintock in order to point out the contours and the modes of operation of “commodity racism” as a form of popularization of “scientific racism.” Here she includes discussion of 19th-century anthropological theories on the origin of racial differentiation, the Darwinian theory of natural selection, and its subsequent ramifications in social theory and population government.

“Scientific racism” remains at the heart of Kylie Boazman’s article, which focuses on physiological sensitivity to pain and emotional sensibility as vectors of differentiation among human bodies in function of gender, race, and able-bodiedness. Boazman argues for the rhetorical and material co-constitution of science/scientist and scientific object through the very mobilization of that differentiation process. This striking juxtaposition of arguments and analytical angles testifies to the pluralism of science – in terms of the meanings attached to it, and of the cognitive and practical operations constitutive of it – and thus, ultimately, to its historicity.

Science and Society

The final section aims to bring forth questions arising from the multiple ways in which science and scientific discourse affect society and vice versa. Donatas Paulauskas’ article offers insights into the ways in which activist group ACT UP’s posters criticised scientific-popular discourses on AIDS in the late 1980s USA, by utilising and altering the meanings given to the image of monstrosity when picturing AIDS patients. Andrea Prajerová’s article questions how current medical interventions, such as foetal screening, have modified the issues connected to abortion in neoliberal society. By pointing out versatile feminist scholarship on abortion and “free choice” and combining it with the biopolitical theories of Michel Foucault, Ruth Miller, and Penelope Deutscher, Prajerová offers a nuanced and critical view on the

possibility to consider abortion as “free choice” in contemporary neoliberal society. She does this by highlighting how questions related to abortion are connected to normalised conceptions of race, gender and able-bodiedness. Finally, Tamara Szűcs article leads us deeper into questions related to the changing relations between humans and technology. By examining recent discourses related to Rosetta and Philae space projects, Szűcs develops Donna Haraway’s concept of a cyborg in order to argue for a need for a more nuanced understanding of the human-machine interaction that would not be centered on humans.

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ΜΕΤΑΦΥΣΙΚΣ

Metaphysics

Stoljar, Baltimore, and Strawson on Physicalism

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1. Introduction

In his book *Physicalism*, Daniel Stoljar argues that “physicalism has no formulation on which it is both true and deserving of the name” (2010, 9).¹ However, Joseph Baltimore (2013) argues that “Stoljar fails to show, concerning versions of physicalism for which he grants the possibility of being true, that none of them is deserving of the name” (Ibid., 127). More specifically, Baltimore thinks that Stoljar has failed to eliminate theory-based physicalism of the kind that defines physical properties in terms of the statements of *actual physical theories* (e.g., modern physics.) He directs his criticism at Stoljar’s discussion of a hypothetical ‘twin-physics’ world in which everything is like it is in the actual world except for the fact that the fundamental properties of physics (e.g., mass, spin, and charge) turn out to be quite different. Stoljar argues that while physicalism as we normally understand it would be true in the twin-physics world, it would be false according to actual physical theories since, *ex hypothesi*, the fundamental physical properties in that world are not the ones found in the actual world. Therefore, he argues that theory-based physicalism is untenable since it is false in a scenario in which it should be true according to our intuitions about physicalism.² Baltimore, however, argues that this need not be the case: if panpsychism³ were true in the twin-physics world, physicalism as we normally understand it would be false in that world. Furthermore, he argues that Stoljar faces a dilemma in setting up his twin-physics world, given his later criticism of the *via negativa*⁴ strategy for formulating physicalism. Stoljar ultimately rejects the *via negativa* strategy, but seems to have already employed it implicitly in his twin-physics world. Baltimore argues that Stoljar cannot have it both ways.

I argue that Baltimore’s criticism of Stoljar’s twin-physics world is both wrong, insofar as I think panpsychism can be intuitively construed as a form of physicalism; and right, insofar as it’s true that Stoljar can’t have it both ways in regards to his treatment of *via negativa*. In the case of the former, I consider Strawson’s (2008) argument to the effect that “real physicalism” actually entails panpsychism. In the case of the latter, I argue, as does Stoljar, that *via negativa* is a bad strategy for formulating the thesis of physicalism. More controversially, however, I briefly argue that *via negativa* is at the heart of all widely held formulations of physicalism albeit implicitly. In that sense,

I think Stoljar is actually correct in thinking that there is no version of physicalism that is both true and substantive (i.e., non-trivially true.)

Preliminary to my argument, I will explicate Stoljar's general characterization for the thesis of physicalism, and then consider what he calls "starting point physicalism" which he draws from our intuitions about ordinary physical objects. After which, I explain his "method of cases" and how it is used in his rejection of starting point physicalism. I then consider Stoljar's rejection of actual theory-based physicalism based on his twin-physics world thought experiment. Next, I consider Baltimore's two primary objections to Stoljar's argument which include the case of panpsychism and an inconsistency in Stoljar's treatment of *via negativa*. At this point, I argue for my aforementioned thesis by first considering Strawson's argument that panpsychism actually entails "real physicalism," and then adopting Stoljar's argument that *via negativa* is a bad strategy for formulating the thesis of physicalism. Finally, I offer a somewhat speculative argument to the effect that the *via negativa* strategy is at the heart of all widely held versions of physicalism (albeit implicitly).

2. General thesis of physicalism

Stoljar begins by looking for a general characterization of physicalism to serve as a template for the different formulations of the thesis he wishes to consider. He begins his discussion with a broad definition of physicalism as the thesis that "everything is physical" (2010, 28). From this starting point, Stoljar carefully expounds upon and refines the general thesis of physicalism guided by our general intuitions for that thesis.

First, Stoljar argues that "everything is physical" is obviously too broad since philosophers intuitively exclude certain classes of things from the thesis of physicalism. For instance, "the U.S. Supreme Court" and "the number two" are certainly real things in the world, however, one wouldn't ordinarily think of them as physical objects. Therefore, we must restrict the thesis of physicalism to some things but not others.

Second, Stoljar consequently restricts the thesis to *properties* of objects. He argues that the contemporary opponents of physicalism are generally property dualists as opposed to substance dualists. Traditional substance dualists, like Descartes, thought that the mind and the body are two distinct substances. However, talk of substances has generally been rejected in favor of speaking of the properties (i.e., qualities or characteristics) of objects.

Third, Stoljar restricts the characterization of physicalism to *instantiated* properties since some philosophers speak of the existence of uninstantiated properties (e.g., being a unicorn.) Although there may be uninstantiated non-physical properties in the world (like the property of being a ghost), physicalism is strictly a thesis about actually instantiated properties (like the property of being a human). Nonetheless, Stoljar argues that another

qualification is necessary. For instance, the “U.S. Supreme Court” is a particular thing that instantiates the property of having “the power to prescribe rules of procedure to be followed by lower courts” (2010, 33-34). However, most philosophers would not count “a power to prescribe rules” as a physical property.

Fourth, Stoljar argues that the needed qualification can be found in saying that every instantiated property is ultimately *necessitated* by physical properties (2010, 36-28). Although, *everything* is not physical, all the properties of things are either physical themselves or necessitated by physical properties. Thus, although “a power to prescribe rules” is not a physical property itself, such a property must ultimately be necessitated by physical properties.

Therefore, Stoljar arrives at the following general characterization for the thesis of physicalism: “Physicalism is true if and only if every instantiated property is either physical or else is necessitated by some instantiated physical property” (2010, 37). Which, given the above considerations, he abbreviates to “every property is necessitated by a physical property” (Ibid., 43). As Stoljar frames it, the question then becomes one of defining “physical property” within that thesis. As such, he considers various definitions for “physical property” which each logically entail a specific version of physicalism given the above characterization.

3. Starting point physicalism

Stoljar thinks that the concept of a “physical property” is best understood as a cluster concept given the variety of ways philosophers have conceived of physical properties. He then “rather baldly” offers up some “of the elements that might legitimately be included in the cluster concept for physical properties,” which he then incorporates into what he calls the “Starting Point View” (2010, 56):

- F* is a physical property if and only if
- (a) *F* is one of the distinctive properties of [intuitively] physical objects [the Object criterion]; and
 - (b) *F* is expressed by a predicate of a physical theory [Theory]; and
 - (c) *F* is objective [Objective]; and
 - (d) *F* is a property we could come to know about through the methods of science [Method]; and
 - (e) *F* is not one of the distinctive properties of souls, ectoplasm, ESP, etc. [Contrast.] (p. 57)

Stoljar explains these criteria as follows. The (a) criterion ties physical properties to ordinary physical objects like “washing machines and rocks” (Ibid., 64). Thus, we intuitively think that the ordinary physical objects we encounter on a daily basis have physical properties. The (b) criterion ties

physical properties to the widely held intuition that, given physicalism, physical properties are best described by physical theories (paradigmatically physics.) That is, physical properties are, or should be, described by the true statements of physical theories. The (c) criterion defines physical properties as being objective in the sense of being knowable inter-subjectively “from more than one point of view” (Ibid., 56). The (d) criterion then ties that objective knowledge to the methods of the natural sciences which is consistent with the (b) criterion. Finally, the (e) criterion intuitively excludes the distinctive properties of those things which are most obviously non-physical (e.g., ghosts and poltergeists.)

As such, given the Starting Point View for physical properties, Stoljar formulates the thesis for “starting point physicalism” as: “Physicalism is true if and only if every instantiated property is necessitated by some instantiated starting point physical property” (Ibid., 57).

Stoljar then proceeds to evaluate starting point physicalism by a “method of cases” which is essential to his argument.

4. Method of cases and possible worlds

Stoljar’s “method of cases” evaluates each specific formulation of physicalism against a variety of case scenarios or possible worlds⁵ (2010, 57). For each possible world, he asks two questions: (1) *Is the formulation of physicalism under consideration true in that world?* and (2) *Is physicalism, as we normally understand it, true in that world?* According to Stoljar, so long as the answers to these questions are always the same (whether both true or both false) we have confirmation for that formulation of physicalism. However, insofar as the answers to these questions come apart, the candidate version of physicalism is disconfirmed. In other words, Stoljar is looking for a formulation of physicalism that is neither “true at possible worlds where no version of physicalism should be true,” nor “false at possible worlds where no version of physicalism should be false” (2010, 90). If these criteria are not met, then the formulation given is not “deserving of the name” *physicalism* (2010, 90). Given this methodology, Stoljar constructs three possible worlds as test cases for starting point physicalism. It is upon the last of these, the modern physics world, that he rejects starting point physicalism.

The *modern physics world* is one in which “every property is necessitated by properties distinctive of things postulated by modern physics” (2010, 62). That is, in the modern physics world, every property is a property described by modern physics or entailed by such properties. Most philosophers would consider this the intuitive paradigm, or starting point, for physicalism as we normally understand it. That is, many think that our world just is the modern physics world. However, Stoljar argues that the modern physics world is actually the paradigm case against “starting point physicalism.” This is

because modern physics posits that fundamental entities (e.g., fields, quantum wave-functions, and super-strings) have properties that are clearly *not* distinctive of intuitively physical objects (e.g., washing machines and rocks). Therefore, by his method of cases, Stoljar argues: (1) physicalism, as we normally understand it, is intuitively *true* in the modern physics world given philosophers' general intuitions about physicalism, however, (2) starting point physicalism is *false* in the modern physics world given that contemporary physics postulates properties which are anything but intuitive. Therefore, Stoljar concludes, starting point physicalism fails the method of cases, but this is just the beginning.

5. Actual theory-based physicalism

Given the failure of starting point physicalism, Stoljar considers the project of "liberalizing" the Starting Point View such that "it does not have the result that, because of developments in science itself, the thesis is false" (2010, 70). He argues that the problem with starting point physicalism is its reliance on our intuitive notion of ordinary physical objects which ultimately conflicts with modern-day physics. Therefore, Stoljar suggests getting rid of the previously considered (a) *object* criterion: viz., the requirement that physical properties be distinctive of intuitively physical objects. Furthermore, he rather quickly discards the (c) *objectivity* and (d) *method* criteria simply saying that they "have [only] a procedural or epistemic quality to them" (Ibid., 72). Moreover, Stoljar (quite prophetically) discards the (e) *contrast* criterion – namely, the exclusion of "the distinctive properties of souls, ectoplasm, ESP, etc." – saying this criterion "is obviously privative, that is, it tells you something about what the physical is *not* rather than about what it is" (Ibid., 72). Consequently, we are left with only the (b) *theory* criterion: that is, the requirement that physical properties be expressed by the predicates of a physical theory.

This essentially moves the previous emphasis on our intuitive notion of *physical object*, in starting point physicalism, to the notion of *physical theory*, in the liberalized version. Accordingly, Stoljar calls the liberalized version the "Theory View" on physical properties, which entails to the following theory-based formulation of physicalism: "Physicalism is true if and only if every instantiated property is necessitated by some instantiated theory-based physical property" (Ibid., 71). By way of clarification, Stoljar offers an "admittedly simple-minded" characterization of physical theory as any "theory that a scientist advances in the course of trying to explain or describe ordinary physical objects, their distinctive properties, their constitution and behavior, and so on" (Ibid., 73). Physical theories *just are* the theories that actual physical scientists come up with. However, Stoljar also distinguishes between two different formulations of theory-based physicalism. The "actualist" formulation of theory-based physicalism (which I am calling *actual theory-*

based physicalism) ties physical theories to the actual world by claiming, “Every instantiated property is entailed by some instantiated physical property, where a physical property is a property expressed by a physical theory true in the actual world” (Ibid., 76). While the “possibilist” formulation of theory-based physicalism ties physical theories to “some world or other” (Ibid., 75). The distinction between the actualist and possibilist versions of physicalism is an important one, however, we are only concerned with actual theory-based physicalism. Stoljar’s twin-physics world thought experiment and Baltimore’s critique specifically target actual theory-based physicalism.

6. Stoljar’s twin-physics world

Stoljar argues that actual theory-based physicalism fails the method of cases when evaluated in a *twin-physics world*. The twin-physics world is an adaptation of Putnam’s (1975) well-known twin-earth thought experiment in which he argues for semantic externalism. This is how Stoljar sets out his version: “This is a possible world or twin-earth at which every property is necessitated by twin-mass, twin-charge, and twin-spin. The properties instantiated at this world duplicate whatever properties are instantiated at the actual world, insofar as this is possible” (2010, 77). The twin-physics world is just like our own, however, the fundamental physical properties described by *twin-physics* turn out to be quite different than they are in the actual world. That is, while mass, charge, and spin are (we are assuming) fundamental physical properties in the actual world; twin-mass, twin-charge, and twin-spin are fundamental physical properties in the twin-physics world. Therefore, by hypothesis, the fundamental properties in the twin-physics world are not the fundamental properties postulated by actual physical theories. Moreover, by hypothesis, it is also true that all the properties in the twin-physics world are physical properties, or necessitated by such properties, in that world. This perfectly meets Stoljar’s general characterization of physicalism. However, actual-theory based physicalism must be false in the twin-physics world since the fundamental physical properties are different there. Therefore, Stoljar claims “while physicalism [as we normally understand it] is true at the twin-physics world... actual theory physicalism is not true at the twin-physics world” (Ibid., 78). That is, actual theory-based physicalism turns out to be true in a scenario (the twin physics world) where it should be false; therefore, actual theory-based physicalism fails the method of cases and is undeserving of the name. However, Baltimore challenges this conclusion.

7. Baltimore’s objections

Baltimore argues that Stoljar has failed to show that actual theory-based physicalism could *never* be both true and deserving of the name. More specifically, he claims that Stoljar has failed to restrict the fundamental properties in the twin-physics world in such a way that physicalism *must be*

intuitively true in that world. Baltimore argues, “For instance, if twin-charge is a conscious property, then the twin-physics world is not a possible world at which physicalism, as we normally understand it, is true” (2013, 131). That is to say, Stoljar has only specified that twin-properties are “of a quite different character” than they are in the actual world (2010, 77). However, some panpsychists argue that the fundamental entities postulated by physics can have conscious properties. Furthermore, philosophers seem to universally agree that panpsychism is *not* a formulation of physicalism as we normally understand it. Therefore, if we assume panpsychism is true in the twin-physics world, then both physicalism, as we normally understand it, and actual theory-based physicalism would be *false* in the twin-physics world. In which case, Baltimore argues, actual theory-based physicalism would survive Stoljar’s method of cases.⁶

Nevertheless, Baltimore suggests that Stoljar seems to have one further restriction in mind that could in fact rule-out the possibility of panpsychism in the twin-physics world. Stoljar says of fundamental twin-properties that he is “not imagining here that the properties in question are spiritual or mental or conform to any paradigm we have of a non-physical property” (2010, 77). Baltimore suggests that insofar as conscious properties are paradigmatically non-physical properties, according to this passage, twin-properties could not be conscious properties in the twin-physics world (thus ruling out panpsychism). However, Baltimore argues that Stoljar cannot simply “help himself” to this sort of negative restriction on fundamental properties in the twin-physics world, given his later rejection of the *via negativa* strategy for formulating physicalism (2013, 132). Stoljar subsequently argues that while it is true that one can attempt to define something in terms of *what it is not* (*via negativa*), “this is not a good way of explaining what a thing is” for, amongst other things, this can lead to an “indefinite” regress of exclusions (2010, 87-88).⁷ However, it appears that Stoljar is using this very strategy when he suggests that fundamental twin-properties cannot be “spiritual or mental or conform to any paradigm we have of a non-physical property” (*Ibid.*, 77). According to Baltimore, this is obviously inconsistent and Stoljar can’t have it both ways.

8. Strawsonian real physicalism

This is what is both wrong and right with Baltimore’s argument against Stoljar’s twin-physics world. First, I *do not* think the conceivability of panpsychism clearly shows that physicalism as we normally understand it, would be false in the twin-physics world. This is because I don’t think panpsychism is necessarily inconsistent with physicalism as we intuitively understand it. Second, I *do* think that Baltimore is right to point out the conceptual inconsistency between the twin-physics world and Stoljar’s later criticism of *via negativa*. That is to say, I think Stoljar makes an implicit use

of *via negativa* in his thought experiment, but later argues *via negativa* should never be used in this way. Moreover, I think there is a much broader point to be made in terms of critiquing *via negativa* as a strategy for formulating physicalism. I contend that the *via negativa* strategy is inevitably used, either explicitly or implicitly, in all the widely held formulations of physicalism. Moreover, I agree with Stoljar when he says that *via negativa* is a bad strategy for formulating physicalism; thus, I ultimately agree with his thesis that there is no formulation of physicalism that is both true and substantive.

Baltimore assumes, as many do, that panpsychism is inconsistent with physicalism as we normally understand it. What is more, he thinks that the burden of proof is on Stoljar to offer a *clear* intuition that physicalism, as we normally understand it, must be true in the twin-physics world (2013, 132). However, I disagree insofar as I think one can just as reasonably have a *clear* intuition that panpsychism is consistent with physicalism. For example, Galen Strawson (2008) makes a case for what he calls “real physicalism” which he not only thinks is consistent with panpsychism, but actually entails panpsychism. Strawson does, however, have a peculiar notion of physicalism in mind when he speaks of “real physicalism.” He says, for instance, “You’re certainly not a realistic physicalist, you’re not a real physicalist, if you deny the existence of the phenomenon whose existence is more certain than the existence of anything else: experience, “consciousness”, conscious experience...” (2008, 53). This signifies Strawson’s “consciousness first” approach to the philosophy of mind which is typically associated with those who are generally antithetical to physicalism.⁸ That being said, Strawson distinguishes “real physicalism” from the more popular (ersatz) version, which he calls *physics*-alism: “the view – the faith – that the nature or essence of all concrete reality can in principle be fully captured in the terms of *physics*” (Ibid., 54).

Now, you might think that Strawson’s “real physicalism” is not physicalism proper, and so it has no bearing on formulating the thesis of physicalism in Stoljar’s sense. However, I think Strawson is arguing that our pre-theoretical intuitions about physicalism are better understood in terms of “real physicalism” than *physics*-alism. In that sense, “real physicalism” is the *real* thing after all, and that’s what we should be talking about in formulating the thesis of physicalism. More specifically, Strawson takes physicalism to be the “view that every real, concrete phenomenon in the universe is...physical” (2008, 53). And, he characterizes panpsychism as “the view that the existence of every real concrete thing involves experiential being, even if it also involves non-experiential being” (Ibid., 57). Consequently, Strawson thinks that every concrete particular in the universe has conscious (i.e., experiential) properties. Now, he also thinks that concrete things are non-abstract spatiotemporally located particulars, which, in my mind, makes them physical objects (Ibid., 53).⁹ Therefore, according to Strawson and my

way of understanding him: if physicalism is true, then panpsychism is true and is a substantive formulation of physicalism as we normally *should* understand it. Nonetheless, you might still think Strawson's interpretation of physicalism is implausible. However, for one thing, in order to question Baltimore, we need only establish that panpsychism *might* be intuitively construed as consistent with physicalism. For another thing, if you still disagree, the stronger objection comes in the analysis of the *via negativa* strategy.

9. Physicalism via negativa

I've argued that Baltimore fails to make his case against Stoljar regarding the counter-example of panpsychism being true in the twin-physics world, nonetheless, I think he's right about Stoljar's being inconsistent in his use of the *via negativa* strategy. Moreover, I think the *via negativa* strategy is at the heart of the matter when it comes to formulating the thesis of physicalism. Specifically, I think some version of *via negativa* is exploited (either explicitly or implicitly) in all the widely held formulations of physicalism, and I agree with Stoljar when he argues that *via negativa* is a really bad strategy for formulating the thesis of physicalism. By way of examples of both explicit and implicit uses of *via negativa*, we need look no further than Stoljar's original construal of starting point physicalism, and his subsequent liberalization project of the same.

In the case of starting point physicalism, Stoljar's (e) *contrast* criterion for the Starting Point View, viz., the exclusion of "the distinctive properties of souls, ectoplasm, ESP, etc." is clearly an *explicit* use of *via negativa* (2010, 57). In fact, Stoljar all but acknowledges this fact when he later says that the (e) criterion "is obviously privative, that is, it tells you something about what the physical is *not* rather than about what it is" (Ibid., 72). Of course, starting point physicalism is also characterized by the (a)-(d) criteria, so you might think that Stoljar can simply remove the (e) criterion. However, with a little reflection, I think it's obvious that it's the (e) criterion that's doing the heavy lifting for starting point physicalism. To see that this is so, simply try removing it. That is, without the (e) criterion, "souls, ectoplasm, ESP" and numerous other "spooky" things are going to be consistent with starting point physicalism since, in principle, we haven't been given a reason to think that such things (if they exist) couldn't meet the (a)-(d) criteria. Yet, no self-respecting proponent of physicalism (at least, in the *physics*-alist sense) would accept this conclusion. Which is just to say that starting point physicalism, without *via negativa*, cannot be physicalism as we normally understand it. Therefore, the (a)-(d) criteria are simply insufficient for the thesis of physicalism.

In the case of the liberalization project, Stoljar's twin-physics world involves (or at least needs) an *implicit* use of *via negativa*. This is inconsistent

with Stoljar's later rejection of *via negativa* on the grounds that defining something solely in terms of *what it's not* is a bad strategy. Moreover, I think that this kind of *implicit* introduction of *via negativa* can be found in all of the other widely held formulations of physicalism that might be substantive (i.e., non-trivially true.) I won't make a full argument for this point here, since it would require a much more lengthy analysis of each of the widely held formulations of physicalism. Nonetheless, I think I can offer strong support for this thesis by briefly examining the two general categories of approaches to formulating the thesis of physicalism: the *a posteriori* approach, and the *a priori* approach. I believe these two categories essentially encapsulate all of the current and widely held formulations of physicalism.

The *a posteriori* approach to the formulation of physicalism ties the thesis of physicalism to the empirical facts of either current or future/idealized physics. Stoljar's actual theory-based physicalism is just such an approach, and one which Strawson would derisively call *physics-alism*. The most well known argument against the currentist approach (which ties physicalism to current/actual physics) is that it makes the thesis of physicalism come out false. This is because modern physics rests on both general relativity and quantum field theory which are known to be inconsistent. Given this, and other problems, I think that the proponents of the *a posteriori* approach are inevitably led to positing some *a priori* restriction in their formulation of physicalism. That is, I think that an *a posteriori* approach cannot by-itself be sufficient for the thesis of physicalism.¹⁰ Ultimately, for any sort of success, an element of the *a priori* approach must be brought in to bolster the argument. In which case, this would lead the *a posteriori* approach into the problems I will now identify for the *a priori* approach.

The *a priori* approach to the formulation of physicalism ties the thesis of physicalism to our pre-scientific intuitions about the differences between mentality and physicality. The *via negativa* is one such strategy in that it ties physicalism to our pre-theoretical intuitions about *what is not* physical. But, that's a bad strategy. Other examples of the *a priori* approach include what I call the *attitudinal* and *pragmatic* approaches. The attitudinal approach takes physicalism to be a kind of all-embracing naturalistic or scientific attitude towards the world. Alyssa Ney adopts an attitudinal approach, arguing that, "One is a physicalist in so far as one is disposed to believe in all and only those entities which (current) physics says exists. This understanding of physicalism... is not the type of thing to be true, false, or trivial" (2008, 1038). On the other hand, the pragmatic approach takes a kind of utilitarian view to formulating physicalism, taking the thesis to be no more than a tool in framing otherwise important philosophical debates. Philip Goff offers an example of the pragmatic approach when he says that in defining physicalism "we are either trying to track how philosophers happen to have used the term...or we are trying to shape a definition which is useful for practitioners of philosophy"

(Forthcoming, Chapter 3). Nevertheless, I think that all of these *a priori* approaches ultimately appeal to *via negativa* insofar as they might possibly offer a substantive formulation of physicalism.

When it comes to the attitudinal approach, I can't see how an attitude in-and-of-itself can result in a substantive metaphysical thesis. The success of the natural sciences may be *the* most remarkable occurrence in the history of mankind. Nonetheless, a naturalistic attitude is merely a way of looking at the world as opposed to a positive metaphysical account of the world. There may be some general reason to take on a particular attitude toward the world, but the thesis of physicalism requires a sound argument. That is, insofar as the attitudinal approach simply applies the name "physicalism" to a particular naturalistic attitude, it is trivial in the sense that most philosophers use that term. And, insofar as the attitudinal approach might be substantive, I think the proponents must appeal, albeit implicitly, to the *via negativa* strategy.

When it comes to the pragmatic approach, insofar as physicalism is a mere rhetorical starting point for other debates, the thesis in-and-of-itself is not supported. Again, I can't see how practical considerations in-and-of-themselves can result in a substantive metaphysical thesis. There may be some general reason to employ the thesis of physicalism to get a philosophical debate going, but the thesis itself requires a sound argument. That is, insofar as the pragmatic approach simply uses the thesis of physicalism as a rhetorical device, it is trivial in the sense that most philosophers understand that thesis. And, insofar as the pragmatic approach might be substantive, I think the proponents must appeal, albeit implicitly, to the *via negativa* strategy.

Consequently, I think that both the *a priori* and *a posteriori* approaches to the formulation of physicalism ultimately come down to our pre-theoretical intuitions about what is *not* physical (or what *is* non-physical.) Those in the attitudinal camp eventually bring in a pre-theoretical notion of what "spooky" things (like ghosts and poltergeists) the natural sciences should *not* contemplate. However, I think there's no independent reason to think that the natural sciences must necessarily exclude ghosts and poltergeists in future discoveries. Those in the pragmatic camp eventually bring in a pre-theoretical notion of what "spooky" things their future hypotheses should *not* contemplate. However, I think there's no independent reason to think that philosophy should necessarily exclude ghosts and poltergeists in any future theory.

This is only the sketch of an argument to the effect that all the widely held versions of the thesis of physicalism ultimately, albeit implicitly, rely on the *via negativa* strategy. Nonetheless, this result is consistent with Stoljar's thesis, at least, for the widely held versions of physicalism. If all versions of physicalism ultimately rely on the *via negativa* strategy, then, at best, they are all trivially true. That is, if one first excludes all the non-physical properties

from the thesis of physicalism, *via negativa*, then the world is made up of only physical properties. In which case, physicalism would be true, but uninteresting.

10. Conclusion

In this paper, I have argued that Stoljar's argument for the thesis that there is no version of physicalism that is "both true and deserving of the name" is invalid. I began by explicating Stoljar's general characterization of the thesis of physicalism, and then considered his Starting Point View for the conception of physical properties. After which, I looked at Stoljar's methodology of cases and briefly considered the possible world upon which he argues against starting point physicalism. I then considered his liberalization of the Start Point View which culminates in the Theory View for the conception of physical properties. At which point, I introduced Stoljar's twin-physics world thought experiment which he uses to discredit actual theory-based physicalism. By contrast, I then considered Baltimore's criticism of the twin-physics world thought experiment based on the conceivability of panpsychism being true in that world. Baltimore argues from the intuition that panpsychism is inconsistent with physicalism, however, I have argued that this need not be the case. Nonetheless, I have agreed with Baltimore that Stoljar is inconsistent in his implicitly using the *via negativa* strategy in the twin-physics world, but then later rejecting that same strategy.

More significantly, I've offered the beginnings of an argument to the effect that all widely held versions of physicalism rely on the *via negativa* strategy albeit implicitly. I have briefly argued that *a posteriori* strategies for defining physicalism are generally invalid unless supplemented by some *a priori* considerations. However, I have also argued that *a priori* strategies for defining physicalism ultimately rely on the invalidated *via negativa* strategy. Therefore, I think that all the widely held versions of physicalism rely on an unsound strategy. For this reason, I actually agree with Stoljar's conclusion that, at present, there are no substantively true versions of the thesis of physicalism.¹¹

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¹ Physicalism is very roughly the thesis that “everything is physical” (Stoljar 2010, 2). This will be expounded upon shortly.

² This is according to Stoljar’s ‘method of cases’ which will be explained later in this paper.

³ Panpsychism is roughly the view that mental properties are fundamental properties. For instance, some panpsychists argue that subatomic particles can have *conscious properties*.

⁴ The *via negativa* strategy is an attempt to define physicalism in terms of *what it is not* as opposed to what it is. This will be discussed later in this paper.

⁵ A *possible world* can be understood as a hypothetical scenario for the entire world or universe. More specifically, a possible world may be understood as what our world (i.e., the *actual world*) *might have been like* in a very broad sense.

⁶ Stoljar’s defenders might at this point argue that either panpsychism is obviously false, or that we needn’t deal with *every* possible formulation of physicalism in the twin-physics world. First, though it is counterintuitive, I don’t think that panpsychism is obviously false. Second, notice that Stoljar’s skeptical thesis is quite strong in saying that there is *no* formulation of physicalism (whatsoever) that is both true and substantive.

⁷ For example, Stoljar argues, if one says a dog is not a cat, since a hamster is not a cat, one must say that a dog is neither a cat nor a hamster. However, a donkey is neither a cat nor a hamster, so one must say that a dog is neither a cat, nor a hamster, nor a donkey, etc. (2010, 87-88).

⁸ I borrow the moniker “consciousness first” from Philip Goff (manuscript, Chapter 1). He contrasts the “consciousness first” approach with the “brain first” approach which begins the dialectic on consciousness from the point of view of the natural sciences.

⁹ I am, of course, thinking of physical objects as more than just “washing machines and rocks.”

¹⁰ These are broad strokes towards a fuller argument. At this point, the typical move for the proponent of an *a posteriori* approach is to suggest that we tie the thesis of physicalism to future/idealized physics. But then, it’s unclear what future physics will actually postulate. If we agree with Strawson, a future physicist might well discover subatomic particles which have conscious-experiential properties.

¹¹ I offer my thanks to Philip Goff, Howard Robinson, and an anonymous

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Nonreductive Physicalism: Understanding Our Metaphysical Paradigm¹

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1. Introduction

Nonreductive physicalism (NRP) is the metaphysical thesis that claims that all the entities of our world constitute an ontological and causal network that is fundamentally physical but, however, cannot be reduced to nor fully explained by the laws, properties, and concepts that the basic physical science can discover and articulate. My purpose in this paper is to analyze the proposal of NRP and to argue that this philosophical approach should be understood in terms of macrophysicalism, that is, emergentism. My claim is that this version of physicalism is a philosophical theory that allows us to understand the coherence and irreducibility of the different scientific approaches, from microphysics and chemistry to psychology and sociology, trying to explain the various levels of organization of our empirical world. In the first part I analyze the standard (that is, the functionalist) formulation of NRP, which claims that although the higher level facts metaphysically supervene on the facts of the lower levels, ultimately on the microphysical facts, they cannot be reduced to the latter because of their multiple realizability. I explain the kind of criticisms that in recent years this perspective has received about its capability to account for the *causal irreducibility* of the higher level properties, a problem which arises from the assumption of the metaphysical supervenience of the macro-properties on their microphysical realizers or conditions; an assumption that is plausibly an empirically false claim. Then, I introduce emergentism or macrophysicalism as a nonreductive physicalist proposal which claims that the higher-level properties cannot be reduced to their lower level bases because although they are *metaphysically dependent* on the latter, *are not determined* by these. Finally, I explain the downward causal influence that on this view the higher level properties should have on the lower causal processes.

2. Glossary:

Emergentism (or macrophysicalism): the physicalist theory that claims that some of the fundamental phenomena our world are essentially macrophysical, that is, physical phenomena which cannot be reduced to,

nor understood purely in terms of the properties and relations of their microphysical components.

First/second order property: a second order property is an object's property of having one or other (called first order) property which plays a specific role.

Lower/higher level property: a higher level property is a property that is instantiated in virtue of (because it depends on) a lower level property.

Macrophysical/microphysical property: a macrophysical property is a property that is instantiated by a physical system composed of other physical systems. A microphysical property is a physical property that characterizes the most basic and simple physical entities that may exist.

Microphysicalism: the physicalist theory that claims that every entity of our world (e.g. chemical, biological, neurophysiological, mental, social, and so on) metaphysically supervene on – are metaphysically determined by – their basic physical constituents, that is, their ultimate microphysical elements.

Reduction: the relation between two (set of) properties whereby one of them is nothing over and above the other.

Supervenience: a set of properties (A) supervenes on another set of properties (B), just in case there cannot be a difference in A without a difference in B.

3. The physicalist approach

One of the most important philosophical problems in the history of our thought is the question about human special particularity. In the beginning of *Modernity*, Descartes introduced his mind-body dualist proposal in order to account for this peculiarity. But we know that this proposal entails seemingly intractable problems. From this very same time, philosophers like Spinoza and Leibniz have noted that Descartes' perspective could not be correct because it could not explain the necessary causal interaction between the body and the mind. Inheriting the anti-Cartesian spirit and incorporating a scientific perspective, physicalism develops criticisms against any theory which attempts to understand mind and matter as two distinct realities, arguing that our world, and therefore the human mind as one of its constituents, should be understood as fundamentally physical.

Physicalism claims that *the entities that constitute our world are physical entities*, phenomena which the physical sciences must discover and articulate in their theories.² Contemporary philosophers have considered

physicalism as *both an a posteriori and contingent thesis*. It is a posteriori because it tries to overcome the problems of its direct predecessor, materialism. The latter was established as a metaphysical doctrine that attempted to specify the entities of our world in an a priori way, in terms of a specific set of features that supposedly defined the material; features such as conservation, deterministic and on contact interaction, impenetrability, inertia, and solidity (see, for example, d'Holbach 1770). But this a priori specification proved to be wrong. It is now clear that if any of these conditions is necessary for something to count as material, then physics speaks of immaterial entities (see Crane & Mellor 1990, 186). Nonetheless, a posteriori physicalism faces not a minor problem: the so-called Hempel's dilemma, which is based on an intuitive distinction between current physical science and complete or ideal future physical science. Hellman puts it in these terms:

[C]urrent physics is surely incomplete (even in its ontology) as well as inaccurate (in its laws). This poses a dilemma: either physicalist principles are based on current physics, in which case there is every reason to think they are false; or else they are not, in which case it is, at best, difficult to interpret them, since they are based on a 'physics' that does not exist—yet we lack any general criterion of 'physical object, property, or law' framed independently of physical theory. (1985, 609)

Physicalists respond to this problem in a very interesting and, I think, successful way; by affirming that their doctrine can be understood in terms of *the complete physical science* we can find and clearly recognize *as a descendant of the current physical science*. This is Papineau's formulation:

The idea here is to appeal to the categories represented by current Physics Departments, but to allow some wiggle room for future developments. So we might think of 'physical' as referring to all those categories that bear some *resemblance* to the categories recognized in contemporary Physics Departments. For example, 'physical' might be understood as equivalent to something like 'displaying mathematically simple and precise behaviour'. (2008, 130)

Then, physicalism argues that the entities that constitute our world are those that *that* physical science needs for its understanding and explanation. Therefore, this theory will be *contingently* true only if the claims of the physical science upon which it rests come to account for our empirical world *in a proper and all-sufficient form*. On this perspective, all macroscop-

ic and microscopic systems will be physical, that is, completely explainable by the physical science. Nonetheless, this leaves open the status of the necessary connection of the different levels of organization of our world, from microphysics, chemistry, and biology to psychology, sociology, and economics. Reductive physicalism claims that all the properties of our world are identical and reducible to the properties of its most basic level, that is, its microphysical level; meanwhile, nonreductive physicalism (NRP) argues that although higher level properties maintain a necessary connection with the properties of the basic physical level, they are neither identical nor reducible to these.

4. The functionalist formulation of nonreductive physicalism

Nonreductive physicalism, considered by philosophers like Jaegwon Kim as “a position that can deservedly be called ‘the received view’ of today” (1993, 339), is the ontological perspective that claims that all the entities of our world constitute an ontological and causal network that is fundamentally physical and, however, cannot be reduced to the laws, properties, and concepts that the level of the basic physical science can discover and articulate. It argues that although all the systems of our world are both wholly composed of and metaphysically depend on the properties and entities of its most basic level, that is, its microphysical level, the properties of the so called special sciences – from chemistry and biology to psychology, sociology, and economics – are neither identical nor reducible to the properties of this basic level.

Most contemporary philosophers have understood the physicalist perspective following a supervenience theory, according to which the properties of our world supervene on and therefore are metaphysically determined by its microphysical facts (see, for example, Chalmers 1996, Kim 2005, and Shoemaker 2007). The notion of supervenience has been introduced and developed with the primary aim of accounting for a naturalist and physicalist non-reductive proposal, which intends to support both the priority of the natural and physical phenomena of our world, and the irreducibility and difference of properties and phenomena that in principle cannot be understood as physical, such as the mental, moral, political, and economic. It is precisely this idea that philosophers of morality as G.E. Moore and R.M. Hare, and philosophers of mind like Davidson, Fodor, and Putnam have in mind when affirm their naturalistic commitments. For example, based on the idea that there cannot be “strict” psychophysical laws, Davidson articulates his non-reductive physicalist proposal, which he

calls anomalous monism, claiming that the mental properties supervene on the physical properties even though they cannot be reduced to these (1980, 214).

But Davidson's proposal is not the only theory accepting the conjunction of the priority of the physical that is articulated in terms of supervenience, and the irreducibility of the mental or the special³ properties in general. Another very important theory is the non-reductive physicalism that Putnam and Fodor developed in the 1960s and 1970s of the 20th century, which is based on the powerful argument of the multiple realizability (MR) of the special or higher level properties/kinds. Based on the inter-theoretic model of reduction proposed by Nagel, and his idea of "bridge-laws" that can correlate predicates of the special sciences with predicates of the basic physics in a bi-conditional form, Putnam and Fodor's argument is that special properties can be instantiated by, or realized on, multiple dissimilar physical structures and that, for this reason, only an open, extensive, and artificial disjunction of all the actual and possible realizers of a special property could constitute its physical reducer. But the problem is not only that such disjunction could be empirically implausible; it is that even if such disjunction could turn out to exist, it could not be logically sufficient to achieve the reduction just because, to put it in Kim's terms, "[a] disjunction of heterogeneous kinds is not itself a kind." (Kim 1992, 9)

Most authors believe that even if the higher level properties cannot be reduced because of their MR, they are metaphysically determined by their physical realizers. In fact, this idea seems to follow from the very formulation of the physical realizability of the special properties. It was Putnam (1970) who introduced this theory to account for the relation between the logical and functional states of a Turing Machine and their particular physical implementations in terms of what he called a relation between first order and second order properties. A second order property is the property of having one or other property that plays a specific role (of causal and non-causal dependencies). According to this perspective, higher level properties are both second order and MR properties because there are different basic physical properties which can play the functional role specified by the former. Moreover, because second order properties are fully defined in terms of their functional role, and because this role is played by each of their physical realizers, the kind of non-reductive physicalism that appeals to this notion of realization can be understood as assuming a clear *metaphysical determination* between the physical realizers and the higher realized properties. Now, given that this non-reductive physicalism affirms

that the physical bases of the metaphysical supervenience of the higher level properties are not only physical but microphysical (see, for example, Chalmers 1996, Kim 2005, and Shoemaker 2007), this kind of perspective is counted as a kind of microphysicalism; that is, as the *non-reductive microphysicalism* states, because of their MR, special properties cannot be identical to or reducible to their microphysical bases.

Although this form of non-reductive physicalism which affirms the irreducibility of the higher level properties on the basis of their MR is one of the most accepted approaches, plausibly the most accepted theory of the second half of the 20th century, in recent years it has received very strong philosophical criticisms especially about its capability to account for *the causal irreducibility of the higher properties*. For authors such as Kim, their idea is relatively simple. First, they accept the anti-reductive principle whereby a disjunction of heterogeneous kinds is not itself a kind. Then, they ask whether a reductive position is constrained to take the derivational model of Nagel, in which each higher level kind (property) must have a nomologically coextensive kind in the reduction base, and they respond: “No; for it isn’t obvious why it isn’t perfectly proper to reduce kinds by identifying them with properties expressed by non-kind (disjunctive) predicates in the reduction base” (Kim 1992, 10). In the third step, they claim with the anti-reductionist that special properties are realized by events that belong to completely heterogeneous microphysical kinds (the MR thesis). Fourth, they argue that special causal powers of special events are inherited from (in fact, are identical to) their microphysical causal powers. In conclusion, as special classes are MR, and since in each case the causal powers of a special instance are identical with its microphysical powers, special kinds are really disjunctions of microphysical kinds, not natural kinds in themselves.

We can see that the argument crucially depends on the acceptance of the fourth step that Kim has called the *causal inheritance principle*: “If [a special property] *M* is instantiated on a given occasion by being realized by [a microphysical property] *P*, then the causal powers of this instance of *M* are identical with (perhaps, a subset of) the causal powers of *P*” (1993, 355). NRP is committed to this principle since, as we have seen, a second-order property (the realized property) is metaphysically determined by its first order realizers.⁴ Kim’s argument (see also Lewis 1980 and Bickle 1998), which can be understood as a movement of local reduction, leads to the conclusion that what at first seems like a higher level property finally cannot be treated as an unitary property providing genuine causal power to its

instances, but as a combination of dissimilar microphysical properties that provide different causal powers to each of its instances.

But the conclusion that these philosophers derive is unacceptable to nonreductive physicalists who argue that there are real higher level states that have basic and irreducible properties and causal powers, and that an explanation of the world cannot be completed until we have a satisfactory account of them. NRP claims that the movement of local reduction cannot explain the common features that the special states have (e.g. what all the pain states have for being mental states; see, for example, Block 1980 and Shapiro 2008) and, therefore, does not account for the very existence of the higher level entities. Finally, the problem for NRP is, in the very terms of Kim, “to state an alternative principle [to the causal inheritance] on just how the causal powers of a realized property are connected with those of its realization base; or explain, if no such connections are envisioned, the significance of the talk of realization” (1993, 355).

5. The nonreductive physicalism of emergentism

The fundamental idea of emergentism is that there exist physical *systems* having properties that their constituent parts don't have, and that can neither be reduced to nor explained by the properties of these parts. In this sense, the emergentist perspective understands the physical world as an orderly process of events located at different levels of hierarchy and instantiating the mereological relation of *being part of*; e.g., the microphysical events constitutes *in a complex way* the biological events; these constitute *in a complex form* the mental events; and the last constitute *in a complex manner* the social events.

Emergentism assumes a physicalist ontology with respect to the concrete realm, that is, the realm of objects, events, states, processes, and every entity as spatiotemporally conceived. In this sense, for example, Alexander comments:

We thus become aware, partly by experience, partly by reflection, that a process with the distinctive quality of mind or consciousness is in the same place and time with a neural process, that is, with a highly differentiated and complex process of our living body. We are forced, therefore, to go beyond the mere correlation of the mental with these neural processes and to identify them. There is but one process which, being of a specific complexity,

has the quality of consciousness. [...] It has then to be accepted as an empirical fact that neural process of a certain level of development possesses the quality of consciousness and is thereby a mental process; and, alternately, a mental process is also a vital one of a certain order. (1920, 5-6)

This is precisely the ontological thesis which Fodor defends and calls *token physicalism*, “the claim that all the events that the sciences talk about are physical events” (1974, 397). Although at first glance this seems to be a completely viable way to state a physicalist commitment, many authors (see, for example, Chalmers 1996, Kim 2005, and K. Bennett 2008) have developed arguments that show that token physicalism is too weak to be established as an acceptable and sufficient form of physicalism, since it is compatible with property dualism, the theory that claims that the properties of the higher levels of our world are connected with the physical level properties *in a merely contingent form*.

Most contemporary philosophers have articulated the property dualist proposal as opposed to a theory of supervenience, stating that the fundamental tenet of this kind of dualism is that higher level properties do not metaphysically supervene on, and therefore are not completely determined by the microphysical conditions. But property dualism denies not only the metaphysical supervenience of the higher properties on the microphysical conditions; *it denies that there is a metaphysical dependence between them*. This is precisely the meaning of its statement that the higher properties are connected with the microphysical properties in a *completely contingent* form. This means that *there is neither a determination nor a dependency metaphysical connection* between the two sets of properties and, therefore, according to this view, that it is entirely possible both the instantiation of the physical properties without the instantiation of the higher level properties, and vice versa, the instantiation of the special properties without their physical realization (for example in Cartesian substances).

Both property dualism and emergentism states that higher level properties *do not* supervene on, and therefore are not metaphysically determined by, the microphysical properties and relations from which they emerge; it is in this sense that we say that an emergent is something different from, additional to, and non-derivative from its emergent basis. However, there exists a crucial difference between these perspectives:

emergentism claims while property dualism denies a *metaphysical dependency connection* between the higher levels and the level of the microphysics. This metaphysical dependence between the emergent special properties and their microphysical bases follows from two crucial facts: firstly, from the fact that the emergence connection is a type of mereological relation which, as such, connects the properties of the whole with the properties of the parts in an essential form. And secondly, it follows from the fact that the emergent property is not simply different from and additional to the properties of the constituents, *but a special organization of these elements* which, as such, fully and ontologically depends on them.

On this understanding, emergentism is *a kind of non-reductive physicalism*. A physicalism as it argues that special properties are no more than higher level organizations of purely microphysical entities and, as such, fully depend on them. And a non-reductive proposal, because it affirms that such higher organizations are emergent, that is, *not metaphysically supervenient on* and so neither identical with nor reducible to the microphysical bases from which they emerge.

And here we can find the crucial difference between the functionalist and the emergentist (macrophysicalist) formulation of NRP: the former claims, while the second denies the thesis of the metaphysical supervenience of the macro-properties on their microphysical conditions. We have seen that this is the reason why functionalism should accept Kim's causal inheritance principle and, in consequence, cannot account for the irreducibility of the causal relevance of the special properties. But the assumption of this metaphysical supervenience is plausibly an empirically false claim: it seems to be against results coming both from the physical science itself, as when we talk about holistic or systemic physical properties not explainable from nor reducible to their constituent conditions,⁵ and from the special sciences' greatly successful theories and experiments that provide explanations and predictions which, as far as we know, are not reducible to the microphysical laws and explanations from which they must arise.

We have seen that authors such as Kim think that NRP faces insurmountable problems about the alleged *irreducibility of the causal powers* of the special properties. But this problem becomes the trouble that NRP has of accounting for the real and irreducible causal influence that the higher level properties should have on the world, especially on the basic level of reality, that is, the level of microphysics. In sum, we can say with Kim that the problem of NRP, and emergentism as one of its exponents, becomes the problem of the *downward causal influence* that the special properties

should have on the basic physical level of reality. Let us examine the emergentist response to this question.

6. Downward causation

It was Donald Campbell who in his 1974 article “‘Downward Causation’ in hierarchically Organised Biological Systems” introduced the expression ‘downward causation,’ and even its notion. The psychologist and philosopher, concerned primarily with problems of philosophy of biology and evolutionary epistemology, starts from the idea of a hierarchical organization of biological systems and advances the thesis that the higher level entities have *some kind* of causal influence on lower level entities through the *selection* the former exert on the latter. For him, we necessarily have to assume, as physicalist theorists, the following two principles:

(1) All processes at the higher levels are restrained by and act in conformity to the laws of lower levels, including the levels of subatomic physics. (2) The teleonomic achievements at higher levels require for their implementation specific lower-level mechanisms and processes. Explanation is not complete until these micromechanisms have been specified. (1974, 180)

These two principles synthesize the physicalist implications of NRP. However, they are not sufficient. Campbell argues that in order to understand the hierarchical organization of nature, we need to add two emergentist principles:

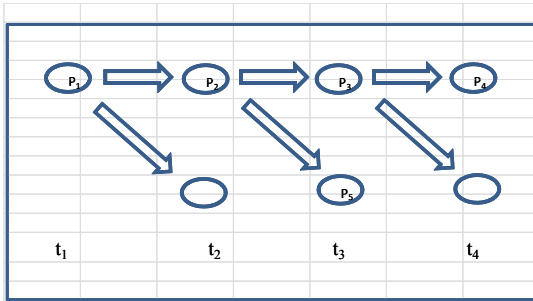
(3) (The emergentist principle) Biological evolution in its meandering exploration of segments of the universe encounters laws, operating as selective systems, which are not described by the laws of physics and inorganic chemistry, and which will not be described by the future substitutes for the present approximations of physics and inorganic chemistry. (4) (Downward causation) Where natural selection operates through life and death at a higher level of organisation, the laws of the higher-level selective system determine in part the distribution of lower-level events and substances. Description of an intermediate-level phenomenon is not completed by describing its possibility and implementation in lower-level terms. Its presence, prevalence or distribution (all needed for a complete explanation of biological phenomena) will often require reference to laws at a higher level of organisation as well. Paraphrasing Point 1, all processes at the lower levels of a hierarchy are restrained by and act in conformity to the laws of the higher levels. (1974, 180)

According to this author, the laws of the higher levels have some causal influence on the *distribution* of lower level events. That is, the instantiation of higher level laws and properties selects the instantiation of some lower properties by *constraining the range of their possibilities* (see Juarrero 1998). Following this interpretation, we can say that the idea of downward causation is necessarily articulated from the concepts of *selection* and *constraint*, which in turn presuppose the existence of *a variety of possibilities at the lower level to be constrained*. In other words, downward causation works as the decrease in the degrees of freedom given at the lower physical levels of the natural systems.

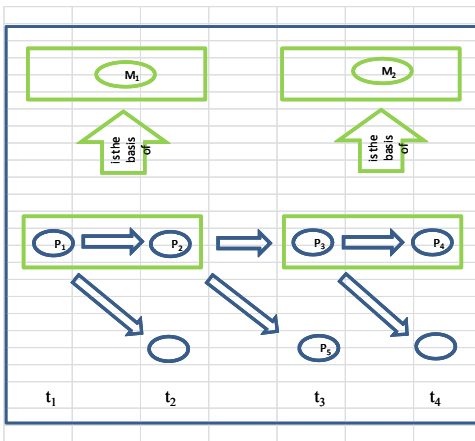
An example that is used in recent years to suggest plausible emergent processes and the action of downward causation is that of protein folding. This is the process by which a protein reaches a three-dimensional structure enabling it to fulfill its biological function. On this example, Murphy and Brown comments:

[I]f a protein could be composed of (only) 85 amino acids (actually some have 200), the number of proteins allowed by the laws of chemistry would be 10^{110} , which is equal to the mass of the universe measured in units of the mass of a hydrogen atom times the age of the universe measured in picoseconds. Biochemistry itself can never explain why the world contains the proteins it does, since it explains equally well why we could have had a vast number of sets of entirely different ones. We need top-down accounts that involve information about what existing proteins do in organisms' bodies in order to explain why these ones exist and others do not—we need to know their *functions* in larger systems. (2007, 64)

To get a clearer idea of the philosophical articulation of this kind of causation or causal influence, let us suppose in a simplified and formal way the following microphysical laws: (i) the probability of an instantiation of P_1 causing an instantiation of P_2 is 0.5, that is: $\Pr(P_1 \rightarrow P_2) = 0.5$; (ii) $\Pr(P_2 \rightarrow P_3) = 0.5$; (iii) $\Pr(P_2 \rightarrow P_5) = 0.5$; and (iv) $\Pr(P_3 \rightarrow P_4) = 0.5$. Let us diagram the different causal possibilities admitted by these microphysical laws as follows:

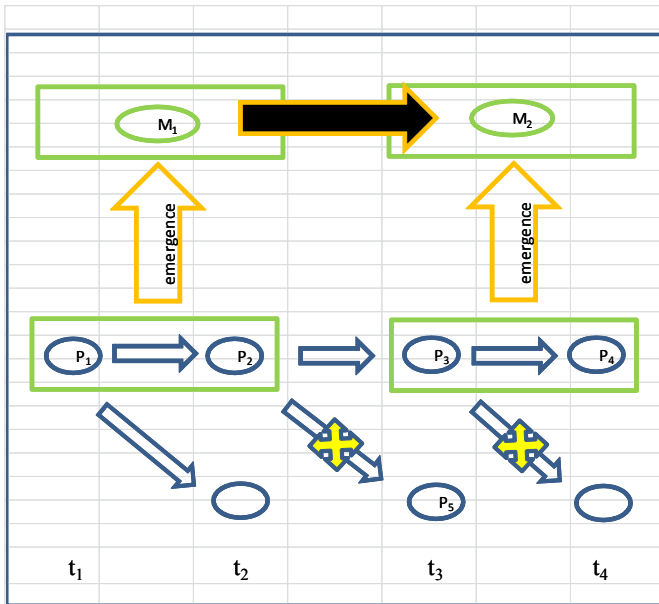


Now, let us suppose that $P_1 \rightarrow P_2$ realizes the higher level, mental state M_1 , and that $P_3 \rightarrow P_4$ realizes the mental state M_2 . We would have something like what is shown in the following diagram:



If this is so, from a purely lower physical point of view (that is, from the instantiation of its microphysical realizer $P_1 \rightarrow P_2$) the instantiation of M_1 could still cause different courses of events which are not necessarily mental; for example $P_5 \rightarrow P_6$. Precisely, this is a consequence of the existence of some indeterminacy at the lower levels: from a single microphysical state (say, P_2) it can follow many different courses of events (say, either P_3 or P_5).

However, the probability of the arrangement and occurrence of the various events changes when we introduce a higher level law that constrains the possibilities given at the lower basal level. Let us then suppose the higher level, psychological law: (iv) $\Pr(M_1 \rightarrow M_2) = 1.0$. In this case, if we have an instantiation of M_1 that is realized by $P_1 \rightarrow P_2$, and we have the fulfillment of the psychological law, then we will necessarily have the lower causal chain $P_1 \rightarrow P_2 \rightarrow P_3 \rightarrow P_4$. In this case we would have the following diagram:



In this kind of circumstances we can ask to the microphysicalist why the causal process $P_1 \rightarrow P_2 \rightarrow P_3 \rightarrow P_4$ (and thus $M_1 \rightarrow M_2$) is instantiated, and no other different lower processes which are compatible with the lower level laws which are present, as for example $P_1 \rightarrow P_2 \rightarrow P_5 \rightarrow P_6$, or $P_1 \rightarrow P_2 \rightarrow P_5 \rightarrow P_7$, or other different ones. The nonreductive, emergentist answer is that the lower physical possibilities governed by the lower physical laws are constrained by the higher level law $M_1 \rightarrow M_2$, which increases the probability of the instantiation of $P_1 \rightarrow P_2 \rightarrow P_3 \rightarrow P_4$ over the others.

Whether this kind of macro-causation ends up being a fact of our world or not is essentially an empirical question which consists in the existence of two conditions: the necessary *under-determination* given at the lower levels, and the existence of the higher level laws that constrain the lower level courses of events. Then, if this kind of phenomenon constitutes a fact of our world it is possible the existence of multiple levels of organization with their own laws and causal influences that would end up complementing each other. As stated by Campbell, Van Gulick (1993, 252), and Sperry (1986, 268), the higher level laws do not contradict, not change nor violate the lower ones. For this reason it is emphasized that not only the special laws must conform to the lower, but the laws of the lower levels must act in accordance with those of the higher levels. But the mere assertion of the existence of multiple causal laws and levels is not enough. To understand the relationship and *dependency* of the higher level laws vis-à-vis the lower ones, we must remember that the former only function as higher level constraints of the latter and, therefore, can only exist while the latter take place; without the existence of lower level laws involving different degrees of freedom and under-determinacy it is impossible the occurrence of higher level laws acting as their constraints.

If NRP in its emergentist account is empirically correct, our world is a largely complex, rich, and hierarchical world; a world constituted by higher level laws as determinant factors of the courses of events at the lower levels that to *some extent* are nomologically and causally under-determined. Moreover, it seems that our current basic physics, quantum physics, assures us one of its conditions: microphysical indeterminacy.⁶ NRP, as a philosophical position, shows us its conceptual and metaphysical possibility. The rest will have to be confirmed or refuted by empirical work.

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¹ Thanks to Brian McLaughlin, Alejandro Rosas, and an anonymous referee for this journal for valuable comments on this work.

² Here I will use the general sense of 'entity' and 'phenomenon' for including both particulars (as objects, events, and processes) and what many theorists take as universals (as properties, relations, and laws).

³ Henceforth, I will use "special property" to refer to the properties of the special sciences.

⁴ Here I do not have space for a detailed analysis of the *subset account of realization* which claims that the causal powers of a higher level, realized property are a *subset* of the causal powers of each of its realizers (see, for

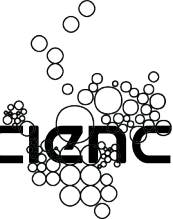
instance, Shoemaker 2007). Nonetheless, I think that there is a direct argument for the idea that, on this proposal, higher level properties should be finally reduced. Following the principle of causal individuation of kinds (that is, the idea that a property is a singular and unitary natural property if and only if its instances have similar causal powers; see, for example, Kim 1992 17 and Gillett 2007 196) we have to say that the physical causal powers in virtue of which a realizer occupies the functional role of a special property (the causal powers that this theory considers that are a subset of the entire set of this realizer's causal powers) should individuate both the higher level property (because these causal powers are necessary for the instantiation of this property) and the lower level realizer property (because these causal powers are sufficient for the instantiation of this lower level property). It follows that, against the subset account of realization, the causal powers of a higher level property are *identical with* the causal powers of each of its realizers (for a detailed articulation of this argument see Morales Manuscript).

⁵ Two of the most recurrent *physical* examples that seem to show the falsity of the microphysical supervenience is the phenomenon of the quantum states of entanglement (see, for instance, Papineau 2008) and the fact that in General Relativity, according to Einstein's field equations, the relativistic gravitational field of two or more objects is neither the sum nor the product of a linear function of the gravitational fields of its constituent objects (see, for instance, McLaughlin 1992).

⁶ Given the most widely accepted interpretation of the quantum theory of matter, most contemporary theorists maintain at least the possibility of a causally and nomologically non-deterministic world; a world in which the events are not fully determined by antecedent events and the laws governing their appearance and, therefore, where causation is basically probabilistic; where causes act by increasing the probabilities of their effects (see Hitchcock 2012 for example).

Philosophers on Science

PHILOSOPHERS ON SCIENCE



The Scientific World-Conception, Worldview, World Picture: Towards a Heideggerian Positivism

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1. Introduction

In my paper I set out to find a middle ground between Heidegger's early, i.e. pre-1930, conception of science, and the scientific world conception of the logical empiricist or logical positivists in the late 1920s and early 1930s. It is a commonplace in the history of philosophy that Heidegger's and the logical positivists' views on science were diametrically opposed. I argue, nonetheless, that, despite appearances, a synthesis of these views is both possible and desirable. I draw on the shared conviction of Heidegger and the positivists that, on the one hand, science proper, or authentic science, is characterized by a certain openness, or readiness to fundamental change, and, on the other hand, that it is always at risk of becoming a rigid, closed system of principles, that is, a worldview, as the logical positivists said, or, in Heidegger's words, a world picture. That risk can only be averted by leading science back to its foundation in the experiential and practical sphere of ordinary life, for science, and the scientific conception of the world, as the Vienna Circle's manifesto makes it clear, ought to serve life.

The year 1929 witnessed the publication of two very important philosophical texts: the manifesto of the Austrian logical empiricists or logical positivists,¹ "The Scientific Conception of the World: The Vienna Circle", and Martin Heidegger's seminal lecture "What is Metaphysics?" In the late 1920s, logical positivists, especially members of the Vienna Circle, were on their way to becoming the most influential figures in 20th century philosophy of science, while Heidegger was gaining a reputation as both a leading German philosopher and a notoriously anti-scientistic thinker. Their purportedly opposing viewpoints clashed in 1931, when the prominent positivist Rudolf Carnap deemed Heidegger's metaphysical claims put forward in "What is Metaphysics?" pseudostatements devoid of meaning (Carnap 1959, 69). Not surprisingly, the idea that Heidegger and the positivists were radically opposed on the matter of science became a commonplace in the history of philosophy.

In recent decades, however, many scholars have defended the view that a common ground between these thinkers can be found. Michael Friedman (2000) pointed out that Heidegger and the Austrian logical positivists were deeply embedded in the contemporary German neo-Kantian philosophical culture. They shared interests, theoretical convictions, and even teachers. For these reasons, many authors have admitted that some Heideggerian and logical positivist ideas are congruent in certain respects (Bowie 2000, 471, 474). In this paper I take this idea one step further, and argue that a *synthesis* of Heidegger's and some logical positivists' views on science is possible as well as desirable. Presenting that synthetic view, however, is beyond the scope of the present investigation. My aim is merely to indicate those aspects of the two conceptions that can serve as the basis for a future synthesis.

Before I begin, some preliminary remarks are in order. To begin with, it would be impossible to discuss every aspect of Heidegger's views on science, for the relevant texts and thoughts are incredibly numerous and rich. Similarly, the logical positivist movement was so multifaceted and produced so much material on this topic that I cannot hope to take into account all of it in this short paper. I therefore confine my investigation to Heidegger's early works² (with the exception of the 1938 essay "The Age of the World Picture"), and to two main figures of logical positivism: namely, Rudolf Carnap and Otto Neurath.

I choose Heidegger's early, i.e. pre-1930, works because during this period he had a much more positive view on science than after his famous *turn*. He believed that a philosophical grounding of science was possible (Rouse 2005, 180), and that philosophy itself should be conceived of as a science or at least as scientific (Glazebrook 2000, 63). These beliefs suit my present purposes much better than his later views. From the 1930s on, he advocated a much grimmer picture of modern science stating that it does not complement philosophy, but rather it is *opposed* to it. These ideas lend themselves much less easily, if at all, to a comparison with logical positivism which undeniably has a pro-science attitude.

As for the logical positivists, choosing representatives of such a large movement with so many different members is never an easy task, and virtually any choice can be called into question. My decision to focus on Carnap and Neurath is no exception. One can argue that these members of the so-called "left Vienna Circle" represent a dominant, though not predominant, version of logical positivism, a version that was explicitly

opposed by such members of the movement as the leader of the Vienna Circle Moritz Schlick (Oberdan 1998, 298 ff.).

I believe that this challenge can be answered. Carnap and Neurath were arguably the most influential logical positivists both within and outside the movement. Even if their views weren't held by all positivists, they did exert a great influence on every one of them, and they also effectively shaped the public and professional perception of the movement during the course of the 20th century. Therefore I take them to be appropriate representatives of logical positivism.

Of course, I am aware that the way in which I limit my discussion is already influenced by my agenda. Comparing the early Heidegger with other logical positivists, such as Schlick or Friedrich Waismann, would most certainly not yield the results I present here. Similarly, as I noted above, Heidegger's later conceptions of science could hardly be synthesized with Carnap's and Neurath's views. Nonetheless, I hold onto my choice, for my main goal in this paper is not to establish a historical point but rather to prepare the ground for a positive, first-order philosophical theory of science.

2. Heidegger's philosophy of science

Heidegger is rarely thought of as a philosopher of science. If anything, he is famous for being an anti-scientific thinker who formulated the famous motto, "science does not think." This conception, however, is evidently mistaken.³ He was concerned with problems of science throughout his career, and even though he was far from being preoccupied with this topic, he engaged in a thorough discussion of it at pivotal points in his writings (Schwendtner 2005, 16). His remarks, at least in the early works, are seldom condemnatory. What explains this special attention that science receives from Heidegger and how should his statements be interpreted?

Let me begin with the general philosophical outlook of the early Heidegger.⁴ His main project is to answer the question "what is Being?" He approaches the problem through the analysis of human existence (Heidegger 1962, §2, 3). This analysis is phenomenological insofar as it appeals not to abstract concepts or linguistic analysis, but rather to the *experiential-practical basis of everyday life*. He points out that human beings are essentially embedded in a world with which they are always practically engaged. In Heidegger's terms, the human being or *Dasein* is a being-in-the-world (Heidegger 1962, § 12), and its existence is constituted by *care* (*Sorge*), that is, a deep practical as well as existential involvement and interest in the

various entities that inhabit that world in which it finds itself (Heidegger 1962, § 41).

Science, for Heidegger, is one of the ways in which we engage with the world and the entities in it. It is characterised by a certain focus on the things themselves. In the case of most everyday activities, Heidegger argues, the entities we interact with *withdraw* or dissolve in their function; when we use a hammer, for example, the hammer itself does not stand forth, but rather it is present only in its function (Heidegger 1962, 98). But when we investigate the hammer scientifically, we allow it to show itself, independent of our interests and goals.⁵ As Heidegger puts it:

Yet when we follow their most proper intention, in all the sciences we relate ourselves to beings themselves. [...] To be sure, man's prescientific and extrascientific activities also are related to beings. But science is exceptional in that, in a way peculiar to it, it gives the matter itself explicitly and solely the first and last word. In such impartiality of inquiring, determining, and grounding, a peculiarly delineated submission to beings themselves obtains, in order that they may reveal themselves. (Heidegger 1998, 83)

In Heidegger's jargon, scientific reason renders its objects present-at-hand (*vorhanden*) instead of ready to hand (*zuhanden*). Things that are present-at-hand exist as inert objects in the external world. The main mode of accessing them is *contemplation* from a distance, not *use*. This contemplative attitude gives rise to what Heidegger calls the theoretical stance.⁶ Sciences are theoretical insofar as they are contemplative and disinterested. This mode of being related to the world is fruitful insofar as it reveals certain aspects of it that would otherwise be inaccessible, precisely because of the withdrawal of the things in the average everydayness or ordinary life (Rouse 2005, 175 ff., esp. 178).

Heidegger holds that the theoretical stance is not fundamental; it originates from the experiential-practical basis of everyday life. By default, we do not relate to the world in a contemplative way, but rather in an engaged, involved, and practical way. The very existence of a theoretical stance is made possible by this more fundamental kind of relation. Theorizing is but one way of engaging with the world, and all forms of engagement presuppose a network of background practices, customs, and beliefs that jointly constitute the existence of Dasein as care.

Science becomes problematic when it detaches itself from its sphere of origin. This sphere belongs to the experiential-practical basis of life which can only be investigated by phenomenological philosophy. It is philosophy that discloses this area of Being that science attempts to investigate "and,

after thus arriving at the structures within it, makes these available to the positive sciences as transparent assignments for their inquiry” (Heidegger 1962, 31). As Heidegger emphasizes, “such research must run ahead of the positive sciences, and it *can*” (1962, 30).

Scientific research, then, is fruitful insofar as it allows us to access certain aspects of the world. In the absence of a philosophical groundwork, however, it becomes futile, for it is not a fundamental kind of investigation. Science is only one among the many possible ways in which we might relate to the world. If it becomes predominant, it can disable other kinds of relations, thus impoverishing our experience as well as our practical life. And since the very existence of the human being is constituted by the experiential and practical involvement with the world, i.e. care, the predominance of science can impoverish our very existence. It is important to see, however, that this is not a problem with science per se, but rather with a certain *abuse* of scientific reason.

3. The scientific world-conception

The logical positivist view of science is much harder to summarize, even if we limit ourselves to Carnap and Neurath. Their writings on science are far more extensive and richer than those of Heidegger. They covered themes ranging from the philosophical analysis of Einstein’s theory of relativity, the structure of scientific theories and explanations, and the issue of the logical analysis of the language of physics and the problems of physicalism. I cannot take into account all of these topics in this paper. Instead, I only discuss the role of science in acquiring knowledge and in human life in general.

A common perception of the logical positivists is that they were worshipers of science. While Heidegger, as we saw, conceived of science as an activity embedded in and reliant on other kinds of everyday practices and experiences, the positivists assigned a *fundamental* role to science. According to this common interpretation, the positivists believed that every aspect of human life should be subordinated to science and those that cannot, e.g. traditional metaphysics and ethics, should be abandoned altogether.

This somewhat simplistic view of logical positivism has been questioned in recent decades by many historians of philosophy such as Thomas Uebel (1991), Alan Richardson (1996), and John O’Neill (2003). Logical positivists, in their view, did not celebrate scientific reason for its own sake disregarding other aspects of life. They did indeed aspire to reconfigure the entirety of life in accordance with reason (probably scientific); that

aspiration, however, did not stem from a blind worship of science, but rather from a deep commitment to an Enlightenment project that was meant to be the continuation of the grand tradition of the French *philosophes*, e.g. Diderot and d’Alembert, and their contemporary successors, most importantly, Ernst Mach (cf.: Uebel 2004; Carus 2007a).

Such aims are clearly stated in the 1929 manifesto of the logical positivist movement “The Scientific Conception of the World: The Vienna Circle.” In it, Carnap, Neurath (both of whom were the main authors, cf.: Uebel 2008), and Hans Hahn proclaim, “endeavours toward a new organization of economic and social relations, toward the unification of mankind, toward a reform of school and education, all show an inner link with the scientific world-conception” (Neurath, Carnap, and Hahn 1973, 304–305). Their aim, they say, is not merely to theorize, but “to fashion intellectual tools for everyday life, for the daily life of the scholar but also for the daily life of all those who in some way join in working at the conscious reshaping of life” (Neurath, Carnap, and Hahn 1973, 305). They close the manifesto with a bold claim: “the scientific world-conception serves life, and life receives it” (Neurath, Carnap, and Hahn 1973, 318).

Science and scientific philosophy, in this view, do not exist and should not be pursued for their own sake, but rather as part of a larger project aimed at the conscious reshaping of life. This tenet, while generally accepted at least in the so-called “left Vienna Circle”, was interpreted in different ways by different authors. Neurath, for example, believed that political agendas can be taken into consideration in the evaluation and elaboration of scientific theories, especially in the social sciences (Uebel 2005, 758). Carnap, by contrast, insisted that while science and philosophy of science are subservient to the larger Enlightenment-project, political and ethical premises ought not to figure in scientific reasoning. But as Uebel puts it:

[W]hile there did obtain in the left Vienna Circle disagreements about the extent to which pragmatic-political considerations may influence philosophy of science, none obtained concerning the view that in the larger scale of things even philosophy of science possesses a certain political valency and that, for the reasons indicated, pragmatic-political considerations might play a role in science itself. (Uebel 2005, 760)

It is important not to exaggerate the importance of social and political activism in the logical positivist movement. Some members, such as Schlick or Waismann, were much less interested in the reshaping of life than, for example, Neurath, who was, after all, a political activist (Cartwright et al.

1996, 1 ff.). It is also true that after the Second World War, the social and political impetus of the movement subsided, and was never re-established.⁷ Nevertheless, the claim that logical positivism adhered to doctrinaire scientism and that it was not at all concerned with science's wider social role is thoroughly misguided.

The scientific world-conception of the Vienna Circle posited science as an instrument within a wider project aimed at the reconfiguration of the society and life in accordance with reason. Science and philosophy of science has value, in their view, only insofar as they contribute to this agenda. In this respect, logical positivists conceived of themselves as heirs to the philosophers of the Enlightenment (Uebel 2004, 56). Even though this commitment to the idea that science and philosophy is, or at least should be, intertwined with life did not surface in each and every writing of the positivists, it was clearly lurking in the background all the time.

4. Worldview and world picture

These brief overviews of the Heideggerian and logical positivist conceptions of science already indicate some similarities. For example, both reject the idea that science is an isolated, purely intellectual enterprise that has no bearing at all on other domains of life. There remains, however, a major contradiction between them that needs to be resolved in order to make a synthetic view possible. While the positivists believe that science and scientific thinking play a crucial role in reconfiguring life, Heidegger seems to distrust science and think that it should be contained and regulated by philosophy, and that otherwise science becomes dangerous. In this section I discuss this apparent contradiction.

What kind of science is held to be problematic and dangerous by Heidegger? His main contention concerning science was that it allowed us access only to some aspects of reality. Science posits the object of investigation as present-at-hand, i.e. present in an objective, inert manner, investigable only through disinterested contemplation. But things are usually *not* encountered as present-at-hand, and some entities, such as the human being (Dasein), is never present-at-hand (Heidegger 1962, 67). Therefore, if we attempt to relate to reality only in a scientific way, we distort and impoverish our understanding of the world. Since our understanding and engagement with the world constitutes our very being, assigning a fundamental role to science impoverishes our very existence.

In his early writings Heidegger clearly deemed this kind of science to be *inauthentic*, belonging to a "fallen" mode of existence of human beings

(cf. Schwendtner 2005, 121). In one of his later pieces he describes inauthentic science as a “shop floor”⁸ (Heidegger 2002, 63) that produces in an almost industrial manner a *world picture* (Heidegger 2002, 71), i.e. a total representation of everything that exists as present-at-hand. This terminology can be rather instructive for the present investigation.⁹

Logical positivists have a notion similar to Heidegger’s world picture that they evaluate in a similar way. This is the concept of the world view. Phillip Frank remarked that the very term “scientific world-conception” was employed in order to avoid the term “worldview” (Frank 1949, 38) which, as Neurath explains in his 1930 essay “Ways of the Scientific World Conception,” is, unlike a world-conception, a closed system of basic principles that recognizes the world as a whole and is established in order to grasp the totality of reality. It aims “at comprehending a mighty *world-picture*” (Neurath 1983, 32, emphasis added).

Neurath calls the aspiration for such overarching worldviews *pseudorationalism*. Genuine scientific rationality, as we shall see, is characterized by ambiguity and undeterminedness (Cartwright et al. 1996, 129). When these are denied to science, when indefiniteness is replaced by definiteness, pseudorationalism arises (Neurath 1982, 136). Pseudorationalism also appears when one denies the importance of individual decision and deliberation that is germane to scientific practice, i.e. when we “regard scholars as a sort of *automata* that detect contradictions and deduce consequences.” (Neurath 1982, 136, emphasis added)

It would be hard to deny the similarities between pseudorational science and inauthentic science as Heidegger describes it. Both are aimed at producing an all-embracing, total account of the world and what it contains through a rigid, almost automatic process of deducing universally valid statements from observed data. Furthermore, both are condemned: on the one hand, because they produce false statements about the world and on the other hand, more importantly, because they have detrimental consequences for life in general. Just as inauthentic science impoverishes human existence, pseudorationalism forestalls the conscious reshaping of life in accordance with reason.

These considerations indicate the first point that can serve as the basis for a synthetic view of Heidegger’s and the logical positivists’ accounts of science. Such a view would be based on the commitment, shared by Heidegger and the positivists, to the idea that science can be (and it indeed is) abused in contemporary society, and this abuse is driven by a desire for an all-encompassing worldview or world picture that is produced in an

automatic, almost industrial process that replaces genuine scientific practice and yields undesirable consequences for ordinary life.

A Heideggerian positivist critique, for example, would point out how problematic it is to publish vast amounts of papers, to make enormous investments, such as the Large Hadron Collider, and to found academic institutions for the sole purpose of resolving the remaining puzzles given rise to not by problems with which people struggle in reality but by the inherent dynamics of the fields of contemporary science. She would condemn attempts to explain phenomena such as religion and morality by subsuming them to already established paradigms, e.g. neurophysiology and cognitive psychology, instead of approaching them from their original experiential and practical bases and attempting to do justice to them in their own terms. At the same time she would praise climate change research for setting out from an actual and quite pressing problem of our times while acknowledging that it is not entirely free from the dangers of the world picture. Her ultimate aim would be to point out both the ways in which a scientific world picture (or worldview) limits our understanding and how such a limitation diminishes the prospects of a wider project aimed at the conscious reshaping of life.

One might object that there is still a major difference between pseudorationalistic science and inauthentic science. While pseudorationalism is a remnant of metaphysical and theological thinking, and thus is essentially alien to science, the tendency to become a shop floor pertains to its very nature, according to Heidegger. Though this might be true of the later Heidegger, in his early period he took this version of science to be inauthentic, and, as Tibor Schwendtner emphasizes, Heidegger acknowledged the possibility of an authentic kind of science (Schwendtner 2005, 124). Interestingly, his proposals as to how science should be redeemed are very similar to that of the logical positivists. Let us now turn to this issue.

5. An authentic conception of science

If inauthentic science, according to Heidegger and the logical positivists, is characterized by a closed set of basic principles and a rigid methodology, then it stands to reason to assume that authentic science, in their view, is essentially open to the radical revision of both the basic principles to which it is committed and the methods it employs. This is indeed a view to which both camps adhere in different, though compatible, and more importantly, combinable ways. In this section I discuss the nature of these views, and the possibility of their synthesis.

By the early 1930s, following their famous protocol sentence debate, both Carnap and Neurath came to the conclusion that science proper is characterized by radical openness (cf.: Uebel 1996). Neurath always advocated scientific anti-foundationalism. Not only did he believe that there was no one true method to science, but he also denied that it can have any firm foundation. As his famous metaphor indicates, scientists are like sailors who have to rebuild their ship on the open sea – they are never “able to start afresh from the bottom. Where a beam is taken away a new one must at once be put there, and for this the rest of the ship is used as support.” (Neurath 1973, 199)

An important element of this metaphor is that “the ship can be shaped entirely anew” (Neurath 1973, 199). Science is an everlasting discourse among scientists governed solely by pragmatic considerations (Cartwright et al. 1996, 142 ff.). If the demand of the day, to which science always has to respond, requires it, science has to revise even those of its elements that seemed to be the firmest beforehand. The a priori exclusion of certain possible changes would already amount to pseudorationalism.

Carnap developed similar views during this period. The idea that science fulfils a pragmatic role and that it functions as an instrument by means of which we organize our chaotic experiences already appeared in his early writings (Carus 2007b, 27 ff.). Such views were operative even in his first major work, titled *Der Logische Aufbau der Welt*, which is often misinterpreted as an exemplar of doctrinaire positivist foundationalism (cf.: Friedman 1999, 144 ff.).¹⁰ From the 1930s on, however, he clearly advocated an anti-foundationalist, thoroughly pragmatist view that is not only very akin to but also influenced by Neurath’s thinking.

In his 1934 book *Logical Syntax of Language*, Carnap developed a liberal epistemology that is committed to the dictum made famous by W.V. Quine: no scientific statement is immune to revision (Carnap 2001, 318). At the same time he started to subscribe to a certain kind of overarching pragmatism similar to that of the renowned American pragmatist philosopher C.I. Lewis, and others, e.g. Charles Morris and Ernst Nagel (A. Richardson 2007, 298). These philosophers were highly esteemed by Carnap, who regarded the American pragmatist movement as “an ally in [the logical positivists’] fight against traditional metaphysics.” (Carnap 1963, 868)

The idea that science proper or authentic science is essentially open to the radical revision of its basic concepts is not at all foreign to Heidegger’s views. At a crucial point at the beginning of *Being and Time*, he makes the following remark: The real ‘movement’ of the sciences takes place when their

basic concepts undergo a more or less radical revision which is transparent to itself. The level which a science has reached is determined by how far it is capable of a crisis in its basic concepts” (Heidegger 1962, 29). The real or authentic¹¹ movement of science, then, consists precisely in the radical revision of its basic concepts. A science is real or authentic, it seems, whenever it is capable of a crisis – that is, of such a radical revision.

Authentic science, according to Heidegger, is characterized by openness in another sense too. It also needs to be open to its sphere of origin in the experiential-practical basis of human existence (Schwendtner 2005, 112). Science is open to that sphere insofar as it is able to reflect upon the fact that it is not a self-enclosed project that exists for its own sake, but stems from more fundamental problematics. When authentic science, open to its sphere of origin, faces a crisis, it is able to resolve it by appealing to that sphere.

That act of appealing to the sphere of origin is in Heidegger’s view a *replication* or repetition of its original foundation, i.e. the original moment when a problem gave rise to the scientific inquiry (Schwendtner 2005, 119; cf.: Heidegger 1962, 347). An analogy from Heidegger’s teacher Husserl might be instructive at this point. In the *Crisis of European Sciences* (1970), Husserl claims that scientific fields stem from more fundamental problematics arising in the so-called “life-world”, i.e. “the world constantly given to us as actual in our concrete world-life” (Husserl 1970, 51). For example, geometry stems from the original problem of how to measure land and estate – a problem present in our actual day-to-day activities. During the course of the history of science, however, certain fields became detached from their sphere of origin, and retreated to the abstract realm of measurements and mathematical formulae.

Heidegger’s proposal that science should be open to its sphere of origin, i.e. respond to crises by replicating its original foundation, might be interpreted in the following way: in times of crisis, science should appeal to the original “real-life problem”, e.g. the problem of how to measure land, which gave rise to the theoretical enterprise, and investigate what kind of revision that original problem demands. Heidegger emphasizes, however, that this replication should not be thought of as a simple *copy*, but rather as a *reply*, as in a debate, i.e. a critical and reflective and, if necessary, modified re-enactment of that original founding moment (Schwendtner 2005, 119).

These considerations can provide the logical positivists with significant aid. An important problem for Carnapian-Neurathian pragmatism is that it is not always clear which pragmatic considerations ought to govern

scientific research. As A.W. Carus remarks when discussing Carnap's and Neurath's boat, "the decision what port to head for next we have to make on board" (Carus 2007a, 22); there are no initially given principles determining the direction of the research. But if that is so, how is decision possible at all? Should we aim at making our theories simpler, or should we enhance their predictive force? The pragmatist will point out that this depends on our aims and what the current situation requires from us. But how should we find out what is required from us and what our aims should be?

Heidegger seems to have an answer. According to him, we should derive our pragmatic principles from the sphere of origin of the field in which we work. We should examine the original problem from which it stems, and attempt to reflectively re-enact the original foundation of the theoretical enterprise. It is important to see that this strategy does not reintroduce foundationalism into our model. The principle that science in times of crisis should replicate its original foundation is not a fundamental epistemic principle that would justify or in any other way grant legitimacy to the decisions we make. Instead, it is a proposal as to how to preserve authenticity and avoid pseudorationalism.

In turn, the Heideggerian account can also be ameliorated by the positivist account. Recall that the idea that science is a kind of activity deeply embedded into a larger social context is not at all foreign to Neurath and Carnap. The crucial difference between their views and those of Heidegger is that the larger enterprise science is part of is essentially and primarily social and political, while Heidegger's is, in a broad sense, existential. A combination of these two conceptions of the deeper basis of science on the level of everyday life might result in an enriched understanding of the role that science plays in life.

6. Conclusion

This paper has shown that the views on science of the early Heidegger and some key logical positivists are compatible and can be synthesized. Such a synthesis would have two bases. First, their shared commitment to a radical anti-foundationalism and a thorough pragmatism according to which science is, by its very nature, deeply embedded in the wider domain of social, political, and personal life. Second, their critique of the kind of scientific reason that is blind to science's embeddedness in life, and its lack of solid foundations; such science is problematic not only because

it leads to a false view of what science is, but also because its prevalence bears detrimental consequences to society and human life in general.

By claiming that a synthesis of the Heideggerian and logical positivist philosophies of science is possible, I do not claim that every aspect of these different philosophies is reconcilable. Essential disagreements remain between Heidegger and the positivists, e.g. on the relationship between philosophy and science, on the legitimacy of the phenomenological method, etc. I also do not claim that the synthetic view would be ipso facto justified. It might well be the case that this synthesis would not be correct, or that its justification would require further elaboration that cannot be based on Heidegger's or the logical positivists' thoughts alone.

Nonetheless, I do believe that creating this synthetic view would be a worthwhile enterprise. In today's society, the significance of science is increasingly growing. Whether or not we conceive of it as a self-enclosed activity or as something deeply embedded into social, political, and existential structures of human life is of crucial importance. The synthetic view I discussed would be able to provide firm philosophical foundations for the claim that science needs to be reconnected with the wider territory of ordinary life that gives rise to it in the first place.

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¹ Calling the movement "logical positivism" is somewhat problematic. Many of its members did not adhere to this name, and preferred others, e.g. "logical empiricism", "scientific humanism", etc. In today's scholarship, the term "logical empiricism" is most widely used. I use "logical positivism" because in fields outside the history of analytic philosophy it is still widespread.

² For more information on the distinction between Heidegger's early and later period and the unity of his thought, see Olafson (1993).

³ Glazebrook (2000, 214), Kockelmans (1985, 133 ff.), and Batovanja (2009) each address the "science does not think" comment.

⁴ Of course, this is but a fraction of Heidegger's early theory of human existence. For a more detailed discussion of his thoughts relevant to this discussion, see Richardson (2012, chap. 3–4).

⁵ However, this does not mean that science reveals the thing in itself, its true, underlying nature, for no such nature exists, according to Heidegger.

⁶ Heidegger put special emphasis on the origins of the world "theory" and "theoretical", which is the Greek word "theorein" meaning "to contemplate".

⁷ For further discussion on the history of the de-politicisation of logical positivism, see Reisch (2005).

⁸ Heidegger uses the term "Betrieb" which means both "constant activity" (the standard translation) and "shop floor," as in industrial production (but not "workshop" which is another important Heideggerian term).

⁹ The essay in question is Heidegger's 1938 "The Age of the World Picture." Although it belongs to his later period, the tendencies he describes in it are extensively discussed in his early writings as well (Schwendtner 2005, 122).

¹⁰ On the wider context of the *Aufbau* see Galison (1996), Richardson

(1998), and Tuboly (2014).

¹¹ Heidegger uses here the term “eigentlich”, usually used to refer to authenticity (Eigentlichkeit).

Beyond Ideology: Althusser, Foucault and French Epistemology

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I am trying to elucidate the mechanism which explains to us how a *de facto* result, produced by the history of knowledge, i.e., a given determinate knowledge, functions as *a knowledge*, and not as some other result (a hammer, a symphony, a sermon, a political slogan, etc.). (Althusser & Balibar 1970, 69)

1. Introduction

Although Michel Foucault and Louis Althusser were personal friends, as intellectuals they were known as “theoretical enemies” (e.g. Resch 1992, 233-241; Ryder 2013). During the 1970s it was still reasonable to speak of a fundamental dichotomy in the intellectual landscape – one was either an Althusserian or a Foucauldian –, nowadays Foucault seems to be the only one still standing. Althusser’s name, on the other hand, seems to have disappeared from the scene. How is it possible that Althusser is forgotten while Foucault seems to be more popular than ever? Is Althusser simply outdated due to his Marxist terminology and concepts? Does Foucault still remain relevant because he, in contrast with Althusser, never was a Marxist and started from a radically different conceptual background? To find answers to these questions, it is necessary to clear out the difference between these two authors.

To begin, I will briefly describe Foucault’s position and the apparent critique one can give, based on his philosophy, of the philosophy of Althusser. However, if one looks at what Althusser himself has to say, this critique seems not to be the most profound critique of Foucault, because Althusser seems to be more in line with Foucault than at first sight. To understand what really is at stake, it is necessary to go back to the tradition in which both authors intellectually grew up: the French epistemology or *épistémologie*. Only by keeping that tradition in mind can the most pertinent divergence between Althusser and Foucault be seen.

2. The novelty of Foucault

The work of Foucault is particularly praised for its innovative approach to the phenomenon of power. He offers us a radically new analysis of power: power is not something merely negative or repressive, but something positive and productive. Power structures are not all about prohibitions, but they do also actively create new things: knowledge, behaviour, structures. In *Surveiller et punir* (1975) Foucault illustrates this by focusing on the history of Western penal systems and related disciplinary institutions. These power structures do not only serve to repress and to confine certain elements in society, but do also produce multiple forms of knowledge by imposing a precise structure of rules and norms which shape the behaviour of individuals. In this sense, the subject and his desires, needs, et cetera, are the product of power structures rather than a form of “human nature” that is allegedly suppressed. Foucault writes:

The individual is no doubt the fictitious atom of an ‘ideological’ representation of society; but he is also a reality fabricated by this specific technology of power that I have called ‘discipline’. We must cease once and for all to describe the effects of power in negative terms: it ‘excludes’, it ‘represses’, it ‘censors’, it ‘abstracts’, it ‘masks’, it ‘conceals’. In fact, power produces; it produces reality it produces domains of objects and rituals of truth. The individual and the knowledge that may be gained of him belong to this production. (1977, 194)

This does, however, not imply that all knowledge is a result of power structures. What it does imply is that power and knowledge are related, influence and presuppose each other (*savoir-pouvoir*). An example can illustrate this, namely that of the police (power) and statistics (knowledge).¹ The police can only function efficiently if there is enough knowledge available about the population. This knowledge is delivered by statistics. However, in turn, statistics require social order to make collecting information possible, which is delivered by the police. “Police makes statistics necessary, but police also makes statistics possible.” (Foucault 2003b, p. 315)

Related to this, Foucault argues that the state should not be seen as a mere instrument which can be used to suppress pre-existing entities. This is also why the concept of ideology seems to be so problematic: speaking of ideology suggests that one is faced with a form of false consciousness, hiding some unrecognised reality. This suggests that there is some kind of *given* reality somewhere hiding beneath the layer of ideology. According to Foucault, there is no such pre-existing element, but needs, self-images and

conducts are “produced” as well. Secondly, the notion of ideology seem to suggest a strong idealistic conception of power: ideology appears to be merely representations, ideas, thoughts, et cetera. Meanwhile, power is, according to Foucault, far more materialistic because it actively governs the conducts of the individuals, not merely by acting on their ideas, but also by acting on their bodies. He uses the neologism of “governmentality” (*gouvernementalité*) to describe this: the art to govern (for example) a population in a certain direction by a range of measures and tactics. This seems to go beyond ideology that appears just to be the application of a layer of false consciousness on an untouched reality. For example, in *La société punitive* (1972-1973), Foucault writes:

[I want to distinguish my own thinking from] the scheme of ideology, according to which power cannot produce in the order of knowledge anything but ideological effects, which implies that power either operates in a silent way by violence or in a discursive, talkative way by ideology. (2013, 236; my own translation)²

3. Althusser as a friend of Foucault

While elaborating his own views, Foucault seems to contrast his ideas against some unnamed adversary. But who can this be? Louis Althusser seems to be the likely candidate because Foucault often criticizes Marxism, and Althusser was one of the most prominent Marxists in the 1960s and 1970s. Furthermore, Althusser is famous for his theory of ideology (1971, 2014). Thus, should we understand the critique by Foucault of Althusser as an accusation that Althusser does not escape from a too rigid idea of the state, from the concept of ideology, and therefore from a negative conception of power?

This idea seems unsustainable, as Althusser does not endorse these “naïve” positions. First of all, Althusser’s conception of the state is more complex than the idea of a suppressing state. He makes the distinction between a repressive state apparatus (the police, the army, et cetera) and a plurality of ideological state apparatuses (the church, the family, the schools, the unions, et cetera). These apparatuses do not always form one solid front, centred in a sort of central state. Nor are they *either* repressive *or* ideological, but always a mix of both. At most, some apparatuses are dominantly repressive and other are dominantly ideological (Althusser 2014, 169).

Furthermore, according to Althusser, the notion of ideology is certainly not equal to false consciousness nor located on the plane of “ideas”. Ideology is always characterised by a certain material existence, embedded in certain practices and institutions, by which they affect individuals. As Althusser writes:

Ideology does not exist in the ‘world of ideas’ conceived as a ‘spiritual world’. Ideology exists in institutions and the practices specific to them. We are even tempted to say, more precisely: ideology exists in apparatuses and the practices specific to them. This is the sense in which we said that Ideological State Apparatuses realize, in the material dispositives of each of these apparatuses and the practices specific to them, an ideology external to them, which we called the primary ideology and now designate by its name: the State Ideology, the unity of the ideological themes essential to the dominant class or classes. (Ibid., 208; see also 236-238)

This is also clearly stressed by Warren Montag, who points at the Spinozistic background of Althusser. Althusserian philosophy is deeply materialistic, as is Spinoza's. The only reason why Althusser still uses the concept of “ideology” is to undermine it from within, a similar tactic that can also be found in the work of Spinoza. “Althusser has preserved the language of interiority, the words “belief,” “consciousness,” in the very same sense that Spinoza preserved the concept of God, in order more effectively to subvert it.” (Montag 1995, 66)

Ideology isn't concerned with mere *false* ideas, but with conducting the thoughts and actions of individuals so that the reproduction of the existing relations of production is ensured. The crucial element is not the falsehood of the idea, but the fact that ideology encourages certain forms of behaviour to ensure the reproduction of existing relations. This is why Althusser also speaks about “practical ideologies”, which he defines as “complex formations which shape notions - representations - images into behaviour - conduct - attitude - gestures.” (Althusser 1990, p. 83)

Finally, it is possible to raise serious doubt whether Althusser's concept of power is really repressive. Althusser seems to be aware that power can be productive too:

[We need to realize that] exploitation is not reducible to repression; that the state apparatuses are not reducible to the repressive apparatus alone; [...] we have to show how the ideology realized in the Ideological State Apparatuses works. It

produces the following class result, which is astonishing but quite 'natural': namely, that the individuals in question 'go' [*les individus concrets 'marchent'*], and that it is ideology which makes them 'go' [*fait 'marcher'*]. (2014, 232-233)

The last sentence is particularly crucial: ideology is not merely repression, but encourages individuals to behave in certain ways. In this sense, Althusser seems to be a theoretical "friend" of Foucault rather than a theoretical adversary.

4. Althusser as adversary of Foucault

There exists, however, a more profound critique by Foucault of the work of Althusser - a critique which can cast a clear light on the pertinent differences between both authors. The most profound disagreement between Foucault and Althusser is not concerned with the notion of ideology per se, but with the connection between this concept and its counterpart: *science*. What is wrong with Marxism, according to Foucault, is not its critique of ideology, but its claim to be scientific. This is particularly clear in his lecture series *Il faut défendre la société* (1975-1976) in which he opposes Marxism to his own "genealogical" approach:

Genealogies' or genealogists' answer to the question "Is it a science or not?" is: "Turning Marxism [...] into a science is precisely what we are criticizing you for. And if there is one objection to be made against Marxism, it's that it might well be a science. [...] When I see you trying to prove that Marxism is a science, to tell the truth, I do not really see you trying to demonstrate once and for all that Marxism has a rational structure and that its propositions are therefore the products of verification procedures. I see you, first and foremost, doing something different. I see you connecting to Marxist discourse, and I see you assigning to those who speak that discourse the power-effects that the West has, ever since the Middle Ages, ascribed to a science and reserved for those who speak a scientific discourse. (2003a, 10)

The main problem seems to be that, by connecting ideology with its counterpart science, one necessarily finds oneself in a certain power relation between different forms of knowledge. Even if ideological ideas are not "false", by opposing them to science, they are still ascribed to an inferior position when described as "non-scientific". Claiming to be scientific is, first and foremost, constituting certain power relations.

Althusser, indeed, might be the most clear example of someone claiming that Marxism is a science. There is hardly a text by Althusser in which this claim cannot be found (e.g. 1969 13; 2014, 41). One could even describe Althusser as *the* epistemologist of Marxism. The central claim of Althusser is that in the oeuvre of Marx there is an epistemological break (*coupure épistémologique*) between the early, ideological Marx and the older, scientific Marx (Althusser 1969, p. 33). Only by this break did Marx's work become scientific. In an interview, Foucault clearly states that he cannot accept this claim, and that it is this claim that distinguishes him from Althusser:

There remains, however, between Althusser and me, an obvious difference: he uses the term of epistemological break in connection with Marx, and I, on the contrary, affirm that Marx does not represent an epistemological break. (1994, 587 (own translation))³

So, the main difference seems to concern this concept of science and whether or not one can characterise Marxism as scientific and what this implies. It is important to notice that, in the case of Althusser, the claim of the scientificity of Marxism is not based on a naïve Positivism or Scientism. Althusser bases this claim on a specific French tradition that he interestingly shares with Foucault, namely French epistemology (*épistémologie*). To understand the claim Althusser is making and that Foucault is criticising, it is necessary to get a grip on this tradition first.

5. The forgotten tradition of French epistemology

French epistemology is a tradition that is often overlooked in overviews of 20th century philosophy (but see Gutting 2001). However, this tradition was crucial in the education of many French philosophers and its influence can be found in authors as diverse as Louis Althusser, Pierre Bourdieu, Michel Foucault, Jacques Lacan and Michel Serres. Also, it is important to notice that the term “epistemology” differs from how the term is used in analytic philosophy: rather than the study of knowledge in general, *épistémologie*, in France, refers mainly to the study of scientific knowledge, and thus philosophy of science.

The French tradition of philosophy of science is especially notable for its focus on the history of science when outlining its philosophy of science. In fact, the tradition can be traced back to the work of Auguste Comte, who stressed that one should not study the mind by reflecting on it, but by looking at its history, i.e. the history of the sciences (1998, 33-34). In order to learn

how the mind works, you should look at how it develops itself through the ages. Comte's law of three stages is an example of an hypothesis of how the (scientific) mind works. Of course, many criticisms are formulated against the original Comtean project, but there is a whole tradition who kept loyal to the general program (i.e. studying the mind through its history) but not to the Comtean answer.

This tradition succeeds in getting institutionalised in the French academic circles at the beginning of the 20th century. In this sense one can speak of a "first wave" of authors, still relatively loyal to the Comtean project. Examples are Gaston Milhaud, Pierre Duhem, Abey Rey, Émile Meyerson, and Léon Brunschvicg (see Chimisso 2008). However, more important here, is the next generation or the "second wave" of philosophers which followed this first generation. These authors are somewhat more known, although still often neglected: Gaston Bachelard, Alexandre Koyré, Jean Cavailles and Georges Canguilhem. What distinguishes these authors from the first group is that they formulate a more profound critique of the positivist and continuist program of the earlier authors. Instead, they reinterpret the history of the sciences as a discontinuist history, i.e. a history of ruptures, breaks and revolutions. These leaps in the history of the sciences can reveal the structure of our minds.⁴ According to these epistemologists, science is not completely independent from ideology and culture, but is nonetheless somehow different from other social and cultural spheres as well. Science typifies itself, as Bachelard puts it, by an epistemological break (*rupture épistémologique*) with ordinary thinking and the subject:

We believe, in fact, that scientific progress always manifests a break, perpetual breaks, between common knowledge and scientific knowledge, as soon as one touches on an advanced science, a science which, by virtue of these breaks, bears the mark of modernity. (1958, 207 (own translation))⁵

There are two (connected) arguments to give for the necessity of these breaks. The first can be found in the work of Bachelard, who tries to argue for the fact that ordinary, common knowledge only results in epistemological obstacles (*obstacles épistémologiques*): the imagination of the mind is spontaneously tempted by certain images that block all further scientific progress. The mind is inclined to see the sun as moving or heat as some hidden substance in the object. It is overtaken by these images and does not pursue any further inquiry. The objective of science can thus never be the immediate objects of ordinary thinking, but it has to detach itself from

them. Based on this, Bachelard states in *La formation de l'esprit scientifique* that "it must therefore be accepted that there is a very real break between sensory knowledge and scientific knowledge." (2002, 237)

A second argument can be found in the work of Jean Cavailles. In his posthumously published *Sur la logique et la théorie de la science* (1947), he states that if scientific rationality is completely attributed to the subject, for example by stating that there are certain timeless transcendental categories that explain all scientific knowledge, then there is no room for any radical novelty or dynamism in science. All "new" things, then, should in fact already be hidden somewhere in the mind and are not really "new". However, according to these French authors, the history of the sciences demonstrates such novelty and radical breaks. Or as Cavailles writes it himself:

If there is consciousness of progress, there is no progress of the consciousness. However one of the essential problems of the doctrine of science is that, in fact, progress itself may not be augmentation of volume by juxtaposition, in which the prior subsists with the new, but a continual revision of contents by deepening and eradication. What comes after is more than what existed before, not because it contains it or even because it prolongs it, but because it necessarily departs from it and carries in its content, every time in a unique way, the mark of its superiority. There is more consciousness in it - and it is not the same consciousness. (1960, 78 (own translation))⁶

Scientific development would otherwise consist in a mere accumulation of facts, by a timeless subject. This seem to presuppose the idea that scientific concepts, instruments and theories are mere instruments for the mind. On the contrary, according to these French epistemologist, these elements play an active role themselves. Following a famous distinction made by Foucault, one could contrast "a philosophy of experience, of sense, and subject" – related to authors such as Jean-Paul Sartre or Maurice Merleau-Ponty – to "a philosophy of knowledge, of rationality and of concept," linked with these French epistemologists (Foucault 1989, x). To understand the history and the development of the sciences, one should question the assumption that there is a timeless and unchanging subject. Instead, science itself plays an active role and possesses its own rationality and dynamics. The idea that the subject is completely in control is questioned and problematized: rather than the leading figure in the development of the sciences, the subject and the mind can be seen as an obstacle or a producer of obstacles for science.

This does not mean that the subject no longer plays any role in scientific progress, nor does it mean that science is completely autonomous from the scientists involved (therefore becoming some mythical entity working on its own). Rather, it means that in the network of all elements involved in science, the pith of the matter is not centred on the subject. The specificity of the sciences does not lie in pure rational thinking of the subject, nor is science a purely ideological or political weapon: instead, the specificity lies in a certain rationality in the structure of science itself. This is a typical element of these French epistemologists and can also be found, for example, in the work of more contemporary epistemologists, such as Gilles-Gaston Granger, who focuses in his work mainly on the social sciences:

“Whatever may be the importance of these [scientific] ideologies, we believe that it is nevertheless permissible to take science in itself, and epistemological reflection can be justified only if the systems of scientific thought reveal an order of reasons, which, without conferring on them any absolute autonomy, nevertheless manifest the authenticity of the movement from which they proceed.” (1983, 3-4).

6. French epistemology beyond epistemology

There are some clear resemblances between these French epistemologists and the work of both Althusser and Foucault. Althusser borrowed the concept of epistemological break from Bachelard and tries to apply it to the work of Karl Marx. Foucault’s notion of *épistémès* resembles the discontinuist writings of the history of the sciences.⁷ Nonetheless, the subject-matters of the studies of Althusser and Foucault seem to be quite different. Rather than a pure history of science, they focus on more political themes such as ideology, power, interpellation and subjectivation. So how are they still French “epistemologists”?

Inspired by the introduction Foucault wrote for the English translation of *Le normal et le pathologique* (1943/1966) by Georges Canguilhem, it is possible to speak of a “third wave” in this French epistemology. While previous epistemologists focused on more “exact” sciences, Canguilhem opens the door to more “vulgar” forms of science, such as biology and medicine. By “vulgar” I mean that within the life sciences, exact laws and strict principles seem to be inapplicable: within living beings, there are always unpredictable actions and forms of contingency involved. This opening-up is, however, according to Foucault, more than a mere addition of new fields of study. Canguilhem’s own interest, for example, goes

also to the phenomenon of vitalism in biology and in the relation between the normal and the pathological. By addressing these issues as well, Canguilhem's reflections go beyond the role of the subject in the sciences (as was the case with Bachelard), and also look at the role of the subject in its biological and social existence. According to Canguilhem, man is not structured by strict laws, but instead his (biological) existence must be understood as an "order" of which the equilibrium is always threatened by mutations, illnesses or environmental changes (2008, 125). Foucault typifies Canguilhem as the "philosopher of error" (1989, 23) for that reason: he tries to map how the biological subject constitutes itself as a response to these "errors" that always threaten his existence. In this sense, similarly as with the second wave, one should not understand the subject as primary even in the biological realm, but as a result of underlying processes in the biological and social sphere.

From this perspective, the work of Althusser and of Foucault can be seen as a continuation of this French tradition: they transfer the same methodology to the study of man beyond science. This means two things. Firstly, the style and methodology of these French epistemologists is applied to other domains to investigate how knowledge comes into being in these spheres. Foucault's work on the rise of the disciplinary society can be seen as an example, but also Althusser's reflection on the possibility of Marxism as a science of history. Secondly, the constitutive role of the subject is also questioned beyond the sphere of the sciences: must the subject be seen as the source of biological and social norms (Canguilhem)? Is history a process with or without a subject (Althusser)? And must power be understood as a product of the (intention of the) subject (Foucault)?

Thus, when Althusser claims that Marxism is a science, it is not Positivism or Scientism, but instead because of the claim that Marxism is able to function through the relative autonomous scientific rationality that breaks with ordinary and ideological knowledge. Because the sciences seem to possess some kind of "autonomous" rationality, they hold the promise of a non-ideological theory of philosophy, ideology and society. This is why it is so important that Marx makes the epistemological break, which is the only guarantee of his independence of ideology.

As we have seen before, Foucault radically disagrees on this: there is no such thing as an epistemological break in the work of Marx. As Foucault famously put it in *Les mots et les choses*: "Marxism exists in nineteenth century thought in the same way a fish exists in water; that is, it stops breathing anywhere else." (1972, 262) Marxism cannot be the science that

Althusser wants it to be, because such an autonomous scientific practice is impossible. Marxism is deeply imbedded in the social and cultural aspects of the 19th century. Claiming to be scientific, it is already inscribing itself in certain extra-scientific power and social relations.

In this sense Foucault creates in his work more distance between him and the *épistémologie* than Althusser does. While Althusser dreams of some kind of power-free analysis of society, Foucault states that this is fundamentally impossible: "Relations of power are not in a position of exteriority with respect to other types of relationships (economic processes, knowledge relationships, sexual relations), but are immanent in the latter" (1978, 94).

However, by not reducing "real" knowledge to scientific knowledge, and by stressing the relation between truth, power and subjectivity, Foucault opens up the possibility to study these aspects in a new light. In a 1972 interview he states:

I believe that the problem does not consist in drawing a line between that in a discourse which falls under the category of scientificity or truth, and that which comes under some other category, but in seeing historically how effects of truth are produced within discourses which in themselves are neither true nor false (1984, 60).

Governmentality, for example, is not necessarily linked with "scientific" knowledge, but can be connected by various forms of knowledge. It is the art of governing that is immanently related to power and knowledge structures, which imply each other. A good example that Foucault uses in his lectures at the Collège de France is Utilitarianism (Foucault, 2008, 40-41). Instead of looking at it as if it were either an ideology or a science, Foucault focuses on the effects it had on governmental practices. Utilitarianism gave rise to a practice of calculation: to what extent are certain governmental practices efficient and useful? These effects are the real significant aspects to analyse. The fact that Utilitarianism is either scientific or an ideology is not really relevant.

Another example is the notion of "truth". In the lectures Foucault gave at the Collège de France in the 1980s, Foucault focuses mainly on the techniques of the self in Ancient Greek and early Christian philosophy. Based on this, he maps a different "history of truth": truth as spirituality. Truth is thus not necessarily the same as "cognitive truth", as we are likely to think since Descartes (unshakable certainty). In the case of spiritual truth it is all about a truth that one brings into practice, that one lives, and that has a

profound impact on the individual itself. Arriving at the truth in this case implies a far-reaching self-labour and a transformation of the self:

We will call "spirituality" then the set of these researches, practices, and experiences, which may be purifications, ascetic exercises, renunciations, conversions of looking, modifications of existence, etc., which are, not for knowledge but for the subject, for the subject's very being, the price to be paid for access to the truth. (2005, 15)

The same "open" approach can be found in his analysis of the notion of the confession and *parrhesia*. Again these notions are somehow related to truth, but not to "cognitive" truth: a confession is in a way always true, otherwise it would not be a confession. And *parrhesia*, or speaking boldly, was a right in the Greek polis which was based, not on an undisputable epistemological foundation, but on a certain mode of life. These phenomena would disappear between all the other "ideologies" in the case of Althusser, and they can only be properly studied if one does not start from the opposition between science and ideology.

7. Conclusion

So, there is a clear disagreement between Althusser and Foucault, but not the one to which one is inclined to point at first sight. The disagreement is not one about whether power is productive or whether ideology is purely false knowledge or not, but instead is concerned with the status of science in society: Can there be a real scientific analysis of society, somehow free from all present ideologies?

The background of this discussion is very important, but often forgotten. That is why I have tried to elaborate, somewhat extensively, this tradition in order to shed a new light on the disagreements between Althusser and Foucault: is there something special about science, or should we get rid of the idea of its privilege and superiority? It is important to avoid both extremes: claiming that science cannot be separated from certain social and cultural influences is, nowadays, a rather trivial statement. Claiming that it is nothing but a cultural phenomenon is plainly false. There is something specific to the sciences, which distinguishes them from religion, art, politics or sport. Or as Althusser writes:

If this analysis leads anywhere, it leads us to the threshold of the following new question: what is the specific difference of scientific discourse as a discourse? What distinguishes scientific

discourse from other forms of discourse? How do other discourses produce different effects (aesthetic effect, ideological effect, unconscious effect) from the knowledge effect which is produced by scientific discourse? (Althusser & Balibar 1970, 68)

This, of course, does not mean that the sciences are something completely rational and independent. French epistemologists clearly recognise the role of ideology and culture in the shaping of the sciences. Althusser is very clear in this when he speaks about the “spontaneous philosophy of the scientists” (1990 109). However, this is not the whole story about science: although the sciences are linked with ideology, they still, somehow, succeed in surpassing the mere level of a cultural phenomenon like a painting or a political speech. This specific rationality, which seems to break with ideology on some levels, is however not just a given fact or a premise, but the real problem: how is this possible? Althusser believes that this scientific mechanism is also at work in social sciences such as Marxism or psychoanalysis, while Foucault does not: “what I have been trying to show [...] is certainly not how, as the front of the exact sciences advances, the uncertain, difficult, and confused domain of human behaviour is gradually annexed by science: the gradual constitution of the human sciences is not the result of an increased rationality on the part of the exact sciences.” (2003a, 38). However, the question still remains to what extent Foucault would make this claim about *all* sciences. For example, in *Surveiller et punir* he seems to state that there is a significant difference between the empirical and the social sciences:

For, although it is true that, in becoming a technique for the empirical sciences, the investigation has detached itself from the inquisitorial procedure, in which it was historically rooted, the examination has remained extremely close to the disciplinary power that shaped it. (1977, 226).

So perhaps even Foucault would accept such an (relative) autonomy of the exact sciences from ideology. He did indeed state that there is no epistemological break in Marx, but that does not imply that there might not be other epistemological breaks in different scientific fields. What is certain, however, is that he did not accept it in the case of Marx and the social sciences. Is science still possible, if it is always, somehow, in the grasp of ideology? And if so, how? Both Althusser and Foucault are concerned with that crucial question, just as this French epistemological tradition was, but they give radically different answers.

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¹ The concept of 'police' refers to the police in the 17th century and not what we see as police nowadays. The police in the 17th century had different (more) tasks: it was the responsibility of the police to guard the quality of life of the population: hygiene, food safety, order, et cetera. (Foucault 2003b, 312-314).

² « [Je voudrais me démarquer du] schéma de l'idéologie selon lequel le pouvoir ne peut produire dans l'ordre de la connaissance que des effets idéologiques, c'est-à-dire que le pouvoir ou bien fonctionne de façon muette à la violence, ou bien de façon discursive et bavarde à l'idéologie. » (According to a footnote added by the editors, Foucault had Althusser in mind as his opponent. (*Ibid.*: 245f9).

³ « Il reste cependant, entre Althusser et moi, une différence évidente: il emploie le mot de coupure épistémologique à propos de Marx, et j'affirme inversement que Marx ne représente pas une coupure épistémologique. » However, in *L'Archéologie du savoir* (1969), Foucault is more nuanced while still critical (see Ryder, 2013).

⁴ This is of course a simplification. Earlier authors, such as Lucien Lévy-Bruhl and Hélène Metzger seem to fit more to the project of the second generation. Metzger, for example, speaks of 'mental a priori's' who can differ from period to period. By these ideas she influenced Thomas Kuhn in his thought, a fact he recognises in the introduction of his most famous book (1970 VI f1). However, these mental a prioris seem to resemble Foucault's notion of *épistémè* as well, but studies concerning the relation between Metzger and Foucault seem to be non-existent.

⁵ « Nous croyons, en effet, que le progrès scientifique manifeste toujours une rupture, de perpétuelles ruptures, entre connaissance commune et connaissance scientifique, dès qu'on aborde une science évoluée, une science qui, du fait même de ces ruptures, porte la marque de la modernité. »

⁶ « S'il y a conscience des progrès, il n'y a pas progrès de la conscience. Or l'un des problèmes essentiels de la doctrine de la science est que justement le progrès ne soit pas augmentation de volume par juxtaposition, l'antérieur subsistant avec le nouveau, mais révision perpétuelle des contenus par approfondissement et rature. Ce qui est après est plus que ce qui était avant, non parce qu'il en le contient ou même qu'il le prolonge mais parce qu'il en sort nécessairement et porte dans son contenu la marque



History of Science
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The Philosophical Background of Medieval Magic and Alchemy

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1. Introduction

Magic and alchemy were provocative themes during the Middle Ages. Magic views the world as an integral whole, which consists of spiritual and material forces. As these forces interact with each other, magic claims that it can provide the means in order to manipulate these forces and use them for the benefit or harm of humanity. Thus, magic is divided into many categories such as divination, astral magic, image magic, ritual magic, magic recipes, etc., all of which describe ways of recognizing and manipulating the aforementioned forces. Originally, in the Early Middle Ages, the works of St. Augustine and Isidore of Seville were responsible for equating magic with *maleficium*, a kind of magic that involved the intervention of demons. Hence, magic was associated with the pejorative term *demonic magic*, which aimed at distinguishing Christianity from pagan tenets and practices. However, as it will be shown in this paper, during the 12th century *natural magic* emerged, a kind of magic that manipulated the forces of nature so as to achieve its goals instead of using demonic aid. Despite the emergence of *magia naturalis*, as it was called, magic was most of the times subsumed under demonology and therefore was denounced as an act of apostasy from faith (Fanger and Klaasen 2006, 724-731; Coudert 2011, 25-43). On the other hand, alchemy appeared in Europe and specifically in Hellenistic Alexandria in the 3rd century CE. Afterwards, it passed in the Arabic world between the 7th and 8th centuries and hence to Medieval Europe in the 12th century. Alchemy had two goals: a) to transmute base metals into gold and b) to attain longevity through the *elixir vitae*. This elixir should be regarded as a catalyst that would accelerate the process of transmutation. In order to manufacture this elixir the alchemists performed the *Great Work/Magnum Opus*, according to which a metal was subjected to a three-stage procedure (*nigredo*, *albedo* and *rubedo*) with the aim of reducing the metal to its first matter and afterwards transmuting it into the desirable metal. Modern scholars do not have a unanimous opinion about the relation between alchemy and magic. In particular, Kieckhefer and Bailey consider alchemy as part of magic, whereas Newman and Principe support the contrary, posing

in this way a distinction between the disciplines. The first group of scholars associates alchemy with magic in terms of astrology and ritual procedures and the second, in turn, distinguishes alchemy as a bellwether of chemistry (Kieckhefer 1989, 133-139; Bailey 2007, 95-96; Principe and Newman 2001, 385-431). Nonetheless, alchemy raised suspicion and distrust mostly because of its erroneous claims in manufacturing genuine gold. However, the influx of Arabic translations after the 11th century changed the intellectual environment of Western Europe, resulting in a different attitude towards the occult sciences as well. In this paper, I intend to shed light upon two case studies in order to synthesize the philosophical background of the aforementioned occult disciplines. First, I will present a short selection of the most important occult books that were imported from the Arabs and concurrently I will depict how these books influenced the medieval attitude towards magic and alchemy. Second, I will show how these books led to an important epistemological shift and a “scientific” rehabilitation of both magic and alchemy, and I will specify the nature of this rehabilitation relating it to ancient Greek philosophical traditions. Finally, I will provide two historiographical examples, those of William of Auvergne and of Albertus Magnus, arguing that these scholars attempted to entrench an innovative perspective towards occult sciences¹, since their work combines and associates magic and alchemy with natural philosophy.

2. The influx of occult Arabic works into Medieval Europe

In this section, I will present a short selection of translated Arabic books that are considered to have had a strong impact on magic and alchemy in the High Middle Ages. In the 12th century the Arabic translations were overflowed into Western Europe and a massive amount of knowledge came under the scope of Latin scholars. As a result, the Arabic literature provided a strong impetus for the renewal and reconstruction of medieval “science”, in which magic as well as alchemy were involved. The aforementioned statement can be easily proved, since Dominic Gundissalinus’ *De divisione philosophiae* (circa 1150) included a subdivision of physics², included image magic³ and alchemy among the sciences, which were probably drawn from the *De ortu scientiarum* (10th century) of Al Farabi (Thorndike 1923, 78-80). Consequently, a great variety of books referring to magic were translated, an action which led to a positive redefinition of the notion of magic. In particular, before the Arabic translations, magic was harshly sentenced by the severe authoritative works of St. Augustine and Isidore of Seville. According to their dicta, the works of magic were a result of demonic

deception and therefore should be condemned as an act of apostasy from faith. This caused magic to be vulgarized and equated with *maleficium* in the minds of common people (Bailey 2007, 53-58).

With regard to magic books, those translated from Arabic altered the negative attitude towards magic and associated the art instead with philosophy and science. It should be noted that during the Middle Ages there was a debate involving the disciplines of science and art. In general, the medieval *Trivium* (Grammar, Logic and Rhetoric) and *Quadrivium* (Arithmetic, Geometry, Music and Astronomy) compiled the knowledge of that period, which was considered as superior to mechanical sciences (that is, the arts). The main argument was that the contemplative sciences were more essential and liberating for the soul in comparison with mechanical arts. The latter takes their name after the Greek word “μοιχεία”, which means adultery and suggests a corruption of the soul. Both alchemy and magic tried to promote themselves as legitimate sciences, but their practical and mechanical character led them to be considered more as arts than sciences (Whitney 1985, 124-128 and 153-154).

Proceeding now with our subject, one of the most influential books on magic was the *De radiis stellarum* (9th century), attributed to Al Kindi. The book cultivated the ground that separated magical astrology from Aristotelianism, thus making their reconciliation possible. It posited that words, characters and images could likely influence other material entities and objects via the powers of the stars. On the one hand this opinion contradicted the basic tenets of the Augustinian magical tradition and on the other it attained persuasive force, because it grounded speculation within the philosophical tradition (Fanger and Klaassen 2006, 716-717). Another book that combined magic with philosophy was the *De theoricis artibus magicarum* (9th century), which was again attributed to Al Kindi. This book is intriguing as it seems to be the source from which Giles of Rome drew material in order to compile his *Errores philosophorum* (13th century) (Burnett, 2005, 383), which in turn indicates that magic was seriously involved in philosophy by that time. An additional work of analogous impact was *Introductorium in astronomiam* (9th century) by Abumashar, whose work is perhaps the most significant in the field of astrology, because it provided the main arguments that effectively mitigated the medieval resistance to the doctrine that the stars may impact beings of the sublunar world (Wedel 1919). Abumashar argued that the influence which came from the stars was contingent and not necessary, leaving in this way free space for the human will to act. Apart from this contribution, however, the *Introductorium* played

a decisive role in the acceptance and establishment of the Aristotelian cosmological model, both in the science and the theology of the period. Before finishing this short account, we are compelled to dwell on the case of Hermes Trismegistus. Whether considered as a god or as a mythological figure, Hermes was seen as the source of a huge amount of texts which associated him with magic, alchemy and the occult sciences in general. Now, considering magic, passages like *Kyranides*, *De lapidus veneris*, *De duodecim annulis*, *Liber mercurii hermetis* and many more were attributed to Hermes and were in great circulation among the scholars (Lucentini and Compagni 2006, 513-519). Despite the fact that the Hermetic texts were usually of a mystical nature and could be characterized as “dark” and dubious in their meaning, it cannot be overlooked that Hermes was held to be some kind of a sage and a bearer of a unique ancient knowledge. Given these facts, the theoretical Hermetic texts seemed to be valuable scripts of an old philosophy which had to be rediscovered and reevaluated, an effort which lasted up to the Renaissance.

Then with respect to alchemy books, the case was no different, for we encounter a great abundance of texts related to alchemy. No one has located any alchemical writings beyond the 12th century, the key period of alchemy. Before that time, all that could be traced were some texts which depicted a germinal stage of alchemy, mostly dealing with metallurgy, glass making, bell casting and colour making activities that are described in texts ranging from the 9th to 11th centuries. Such texts are *Compositiones ad tingenda musiva*, *Mappae clavicula*, *Schedula diversarum artium* and *De coloribus et artibus romanorum* (De Haage 2006, 22-23).

Officially, alchemy was introduced to the medieval Latin world in 1144, when Robertus Castrensis translated the notorious work *De compositione alchimiae*, in which Morienus, a Byzantine monk, introduced Khalid Ibn Yazid to the secrets of Alchemy (Moureau 2011, 56). Thereafter, a great variety of alchemical texts were transmitted to the medieval world via the Spanish peninsula, where knowledge of the Arabic language was at the disposal of many scholars. Perhaps the most famous work of Latin alchemy in that period was *Summa perfectionis magisterii* (13th century), which is attributed to Geber, under whose authority many alchemical texts were written. This work generated extra acknowledgement and credibility for alchemical ideas in the mind of any scholars that would read them. It should be noted that most of these writings were pseudonymous and probably compiled by Paulus de Taranto, a Franciscan monk (Principe 2013, 55). These pseudonymous works contained, among other things, alchemical recipes concerning the

transformation of matter and the fundamental sulphur-quicksilver theory, which was entrenched in a strong philosophical Democritean background. According to Democritean tradition, matter was composed of very small, yet distinct particles, which in turn formed the four known Pre-Socratic elements, which consequently formed superior species of life. This tradition⁴, discerned in the depths of alchemy, is not surprising since as far back as the Hellenistic period, there existed a thriving bibliography which related Democritus or more accurately Pseudo-Democritus within the discipline of alchemy. Another passage that was widely circulated was the *Turba philosophorum* (9th century), attributed to Jabir Ibn Hayyan. Therein, a philosophical assembly of nine Pre-Socratics and other distinguished philosophers like Aristotle and Plato discussed the theory of matter and other cosmological issues in terms of alchemy. However, in this assembly the ideas of the philosophers were presented in a distorted fashion, something which was done deliberately by the author, in order to provide a highly sophisticated status for alchemy, whilst each philosopher appears as a devotee of the art (Plessner 1954, 335). Moreover, philosophically important were also the books that combined astrology with alchemy. In general, during the Middle Ages it was conceded that the influence of the stars and of the planets was responsible for the generation of the metals in the bowels of the earth. Under this natural-philosophical framework, alchemy was associated with cosmological concepts, something which was perfectly depicted in the *De perfecto magisterio* (13th century) of Pseudo-Aristotle. In this book it was emphasized that each planet should be considered as a *Deckname*⁵ for each metal, consequently developing constant relations between the two parts. Thus, a cosmological alchemy was constructed, established on strong astrological foundations, where the qualities and the properties of a metal were susceptible to the position of the analogous planet to which the metal was linked (Newman 2013, 389). Lastly, in the field of alchemy, Hermes Trismegistus emerged as the legendary founder of the art. This title was initially given him by the Arabs and then later on transmitted to medieval philosophical traditions. It should be mentioned though, that it would be rather reckless to consider the alchemical *Hermetica* as purely philosophical texts, the authoritative shadow of Hermes conferred a status of wisdom to alchemy, which contained various philosophical connotations. Consequently, the most circulated hermetic text was *Tabula smaragdina* (published between the 6th and 8th centuries) is supposed to be written by the very Hermes himself and was found in his tomb engraved on an emerald tablet. The primary ideas were that all things come from one, the structure of the

microcosm depends on the macrocosm and that the notions of sun and moon must be held counterparts of those of the father and the mother (Brabner 2005,20).

These books delineated the early stage of the integration of philosophy with magic and alchemy. On the one hand, the result of such an integration was the advent of a new kind of magic, *magia naturalis*, which was based on Stoic, Neoplatonic and Aristotelian principles⁶. Natural objects were thought to have occult virtues in them, which were likely to be “activated” by the celestial influence deriving from the stars. On the other hand, alchemy was synthesized in terms of an Aristotelian philosophical paradigm, which in turn provided the appropriate arguments in order to justify the possibility of elemental transformation. The rise of magic and alchemy is thus necessarily entwined with the natural-philosophical doctrines inherited from Ancient Greek philosophy. An analysis of these will lay bare decisive elements for an in-depth understanding of the change in attitudes toward alchemy and magic.

3. The rehabilitation of magic and alchemy via natural philosophy

In this section I will show the nature of the rehabilitation that was brought by the influx of the translated books. Both magic and alchemy were associated with ancient Greek philosophical traditions, which led to a different perspective regarding their status and approval.

The most influential philosophical doctrine that can be distinguished in magic is that of cosmic sympathy, a notion which derived from Stoic philosophy. According to Stoics such as Chrysippus and Marcus Aurelius, nature can be identified with God, Logos, Reason and Fire, which all depict alternative narratives of the active principle in Stoic’s physics (White 2003, 125). This active principle acts upon matter with the aim of creating forms of life that are contained within the cosmos. However, this cosmos works in harmony and in a deterministic way mainly due to the fact that these diverse forms of life must be considered in fact to be a variation of the active principle which was mentioned before. As a result, all the entities that dwell in the cosmos are somehow “connected” through a common element, the tenor, whose manifestation depends on the complexity of the life form. Consequently, all beings operate together in universal cohesion in order to preserve the deterministic order. Ultimately, this would lead to a conflagration and destruction of the cosmos followed afterwards by a rebirth (Sellars 2006, 97-98). This procedure may repeat itself forever, whereas the spermatic principles that exist in the active principle are not destroyed and become the essential elements required to achieve recurrence. From the

analysis provided it is easy to understand that the Stoic cosmos is an interrelated one, in which everything communicates with and pertains to everything, for in every form of life a variation of the active principle exists, though in a different proportion. This is cosmic sympathy: a kind of a coherence that allows for interaction among the parts of the cosmos to maintain the universal harmony and deterministic order of the universe.

With regard to natural magic, the aforementioned notion of cosmic sympathy seems to be a fundamental theory. Cosmic sympathy tries to explain how magical operations could be successful through the manipulation of the occult virtues of beings. In turn, these occult virtues seem to be identical with the spermatic principles mentioned before, which proffer themselves as a means of connecting the living things of the cosmos. The medieval magus has to identify these virtues and activate them in order to accomplish his magical purposes. However, it should be mentioned that this kind of magus differs from a *maleficus*, who usually invokes demons to ensure the success of his deeds (Peters 1978, 68). Rather the former magus is supposed to unlock the secrets of nature in order to perform this kind of art. In this way, the medieval magus could easily explain why the eyes of an eagle are of benefit to the eyes of a human, since the occult virtues of the bird's eyes are a part of the cosmic sympathy that permeates the world. In addition, cosmic sympathy could be depicted on other occasions as well. The resemblance of form could be a criterion for a plant to be used for remedy purposes. For example, liver-shaped leaves were thought to be of benefit to the human liver (Kieckhefer, 1989, 13).

As we have already seen, natural magic presents itself as a licit and benevolent practice, something which initially must be attributed to Neoplatonism. That is to say, among the Neoplatonic doctrines someone may discern that of *theurgy*: a spiritual procedure that helps the subject to reach the One through illumination. According to Neoplatonists, illumination could be achieved either through philosophy or through theurgy, whereas the latter includes rituals aiming at the purification and at the preparation of the soul in order to reach the One. In fact, Iamblichus believed that theurgy was the proper answer for the soul, for in this way it does not remain attached to matter and achieves its illumination by ascending towards the One. In the philosophical tradition, this belief gives priority to theurgy over philosophy as a means of reaching the One (Shaw 1995, 47). Of course, theurgy introduces a practice full of magical connotations, nevertheless it is held to be a good kind of magic that does not include the interference of demons. As a matter of fact, this practice seems to puzzle St. Augustine, who,

whilst condemning theurgy as a malevolent magical practice, would also convey a more moderate attitude towards it in some other passages (Thorndike 1908, 50). Nevertheless, it must be admitted that theurgy is responsible for legitimizing the idea to medieval minds that not all kinds of magic are blameworthy and therefore need not be condemned as demonic practice.

In addition, Neoplatonism seems to have an influence on the exercise of image magic. Particularly, Iamblichus accepts the idea that material objects such as stones and herbs are likely to have a divine sign engraved upon them, the *synthema* as he calls it, which is thought to be a sign of the divine presence on the object (Shaw, 1995,48). This *synthema* allows for an easier and more direct contact with the divine, whilst also operating as a medium to develop an affinity to the sympathy of the Whole. The way in which these signs work must be further explicated. The One must be considered as a source from which light emanates and is cast upon all creation. As a result, all inferior entities found below it, bear a proportion of its emanation. The low ranking entities that are close to earth are more susceptible to corruption and decay because they are too far from the source, but still the emanation should not be considered as absent but rather as dim. Under this theory, we can understand the role of the *synthema*, which is more a medium through which we can achieve a better connection with the source and vanquish the threat of corruption and decay provided by the matter (Shaw 1995, 49). This Neoplatonic practice is extremely significant for astrological magic because it partially provides the appropriate arguments for the astrologers to justify the influence of the stars on the sublunar world.

Lastly, we come across the Philosopher, Aristotle, whose impact on medieval philosophy is tremendous. This impact extends to magic also, for Aristotle provides arguments which could make magic compatible with the knowledge of the times. Specifically, the magical interaction among beings could be explained via Aristotelian ontology, in which the intrinsic structure of an entity is a decisive role. For example, a herb of a cold quality could be of help in overcoming an illness of a hot quality, like a fever. The reason for such an interaction could be found in Aristotle's ontology, where all beings of the sublunar region are made by the four known Pre-Socratic elements, that is water, fire, air and earth. These elements, in turn, are characterized by a pair of qualities, which, when mixed, form an entity with strongly manifest elements and qualities (Ross 1995, 106-107). Given this kind of mechanism it is easy to imagine how the intrinsic structures of the beings cooperate in order to overcome a disease or to strengthen an occult virtue.

That being said, the most important contribution of Aristotle to magic is a philosophical background that it makes it possible to justify the stellar influence. In Aristotelian cosmology, everything begins from the Prime unmoved Mover, which sets the first heaven in motion and the celestial spheres that are contained within. This motion is transmitted to the sublunar world as well and is mainly responsible for the growth of life. Aristotle does not specify in detail how this kind of influence might form the cosmos of the earth. Still, the fact that the celestial bodies consist of a nobler element, *ether*, which is incorruptible and unchangeable compared to the four terrestrial ones, provides a legitimate argument for explaining the aforementioned influence (Grant 2007, 172). Perhaps it could be depicted as a “logical” influence deriving from the superior to the inferior forms of life.

Stoicism is one of the main philosophical movements that influenced the aforementioned occult art. In order to achieve alchemical transmutation, there is a need of a substratum which would be stable during the transmutation process, would allow the diverse elements to convert in the desired forms and would thereby justify the sulphur- quicksilver theory. This substratum, which is called *prima materia*, reminds us of the Stoic passive principle (plain and indefinite matter) which gets shaped by the active one, usually acknowledged as God or *technikon pyr* (Long 2003, 239). Furthermore, there is a vivid analogy between the Stoic conflagration and the stages of the alchemical *Magnum Opus*, where the effort of the alchemists to reduce base metals to *prima materia* by the aid of fire has much in common with the Stoic conflagration which is the cause for all beings to be relegated to the stage of mere matter. Stoic allusions might be brought into relief if we attempt to interpret the famous symbol of the snake, which is eating its own tail. Below this symbol stands an inscription saying “*hen to pan*”, that is, the whole or the one is everything. The meaning of this inscription is that matter must be seen as a unity, where the creative active principle submerges material beings into the state of *prima materia* through eternal circular recurrences (Principe 2013, 25-26). Another Stoic notion in alchemy is *pneuma*, which according to Chrysippus is the vector of reason, it has intelligence and it acts as the medium for universal coherence (Long 2003, 250-251). The alchemists believed that the *pneuma* of a metal contained the secret of the transmutation of one metal into another, and as a result, the alchemists struggled to capture the spirit of a metal during a distillation with the aim that in doing so they would have found the missing key for accomplishing alchemical transmutation. .

Another thinker that provides a philosophical background to alchemy is that of Plato, whose *Timaeus* contributes a variety of arguments which justify the transmutation process. It must be said that *Timaeus* is partially known during the Middle Ages through a translation made by Chalcidius in the 4th century AD, whereas in addition only the *Meno*, the *Phaedo* and the *Parmenides* are circulated among the scholars (Aertsen 2010, 77-78). This resulted in a depreciation of the Platonic doctrines during the Middle Ages in relation to those of Aristotle. Nevertheless, there is a strong case to be made for the possibility of an implicit Platonic influence on alchemy.

In the *Timaeus* we find a material theory which best suits the alchemical need for a substratum. Particularly, *Chora* is a place where no corruption occurs and it provides a reception *terra* for all things that have been generated (52a-b). *Chora* should not project itself through the things it receives, because then they would get distorted (50e), whereas in addition, the four known elements existing therein are not in perfect shape and they demand the *Demiurge's* contribution in order to become perfect entities. The Platonic *Chora* may be considered as the *prima materia* of the alchemists and the *Demiurge* as an alchemist who tries to extract or transmute forms by manipulating the prime matter. Congruently, an analogous reference presents the *Demiurge* as the constructor of the cosmic soul, whose successful attempt depends on consecutive mixtures, a procedure that alludes to alchemical recipes being performed in laboratories (Joly 1998, 282).

It is to Plato's successor, Aristotle, however, that one may ascribe the most profound impact on alchemy. As previously stated, alchemy was not a recognized art before the Arabic translation movement and therefore had not undergone an assimilation process which would have given given it the opportunity to absorb all the philosophical influences equally. In contrast, the Aristotelian impact was unmitigated, mostly because of the thriving scholasticism of that epoch. Scholasticism was developed in the Middle Ages after the 11th century. It was a form of dialectic reasoning, which mostly aimed at clarifying ancient texts in detail and at bridging any dogma or philosophical contradictions. A typical scholastic text contained questions and answers, in which at first was stated a question and then the answer of the opponents. Afterwards, a counterproposal was given and lastly the arguments of the opponents were disproved. After the foundation of the universities, scholasticism became the main method of teaching and of exercising critical thought in medieval Europe. Inevitably, it was quite natural for alchemy to draw upon Aristotle in order to display itself as a legitimate

art (Newman 2011, 314-315). Consequently, Aristotelianism provides a material theory for alchemy, much as Stoicism and Platonism does. Similarly, the Aristotelian matter plays the role of the alchemical *prima materia* and the form is the active principle that acts upon passive matter (Haage 2006,17-18). Yet, entelechy acting as an intrinsic mechanism impells beings to tend towards superior forms, something that suits alchemy by means of justifying the transformation of base metals into gold.

Moreover, Aristotle's *Meteorology* is the most famous text among the alchemists as it offers a generation theory of metals, which is established on a dual action of a hot and a moist principle reflecting the Arabic one of sulphur-mercury. Aristotle cites that two vapours are produced by the sun, a moist and a hot one that derives from earth. As soon as these vapours become enclosed in the depths of the earth, they become responsible for the generation of the minerals (Eichholz 1949, 141-146). In fact, the vaporous exhalation forms the fossils and the dry exhalation forms the metals, whereas each formation mentioned does not imply the absence of the other, but on the contrary, it should be regarded as an analogy, in which per exemplum the vaporous exhalation is quantifiably greater than the dry one and that is the reason a metal formed. But still, the fact that the dry element is in an latent state gives the opportunity to the alchemists to argue for the potentiality of a transformation in Aristotelian terms. Lastly, the Aristotelian element of *ether*, which is supposed to be incorruptible and unchangeable, inspires the finding of the *quinta essentia* by the alchemists (Schuett 1998, 61). Similarly, the alchemists assume that the beings of the sublunar world contain an analogous element with *ether* which could be extracted by distillation and thence used to produce the philosopher's stone. The Philosopher's stone or Stone of the Sages was considered as the *summum bonum* of alchemy. Of course, the "Philosopher's stone" was a cover name (Deckname) and it was a substance, the use of which would help the transmutation to be done faster and easier. Its preparation was a secret, often associated with the stages of the Great Work, that is, the laboratory process of transmutation (Principe 1998, 215-220). However, the Philosopher's stone was of greater use for a human, since it contributed to obtain longevity.

After considering the main strains of natural-philosophical thought constituting the background for magic and alchemy during the 13th Century, it becomes obvious that philosophy was used during that epoch as a means of legitimizing the occult arts, which were either newly imported, as in the case of alchemy, or reinvigorated, as in the case of magic. Magic, as well as

alchemy, promoted itself via a rhetorical language that portrayed nature as the main source responsible for the outcomes of the aforementioned occult arts. Still, this change may become more apparent if we examine the historiographical cases of William of Auvergne and Albertus Magnus.

4. The cases of William of Auvergne and Albertus Magnus

In the last section I will describe two historiographical exempla, which will show how this natural-philosophical rehabilitation is depicted in the works of William of Auvergne and Albertus Magnus, who both were scholars of the High Middle Ages. William of Auvergne (1180-1249), the bishop of Paris, is a scholar who shows a big interest in magic in terms of philosophy. William is the founder of the term *magia naturalis*, which concerns an innovative kind of magic linked to natural philosophy. He clearly distinguishes between demonic and natural magic, where the latter could be performed if a magus knows how to unveil and avail himself of these occult virtues. No doubt, William attempts to promote natural magic as a new branch of science, but yet he is wary not to exceed the limits of natural magic and come across accusations of being a *maleficus*.

From the beginning William does not hesitate to acknowledge *magia naturalis* as the eleventh part of philosophy and therefore accepts that not all kinds of magic are to be condemned. In fact, according to William, the overall rejection of magic could be ascribed to people's ignorance which derives from not having read and scrutinized the books referring to natural magic (Lang 2008, 25). In the *De universo* as well as in the *De legibus* he cites an abundance of magical operations linked to natural magic. In particular, something regarded as a marvellous phenomenon is the sudden generation of some animals such as frogs and worms, which seem to reproduce under ambiguous conditions. For William, in this case, it is quite obvious that there is no close contact between the cause and the effect induced, yet it is apparently undeniable that this magical operation is due to nature itself only and not to demons. Besides, the aforementioned action does not bear or imply any bad outcome so as to justify a demonic interference, something which provokes William's positive attitude towards natural magic. In the same line of thinking belongs the example with the masculine and feminine palms, where the two trees incline towards each other in order to reproduce. William proceeds with the enumeration of the occult virtues of other beings like herbs, gems and animals, where he affirms that the flesh of snakes has many renovating virtues, that the sapphire is of benefit to the eyes and that jasper has a repulsive virtue against snakes (Thorndike 1923, 362-363). Of

course, many more examples are cited by William, but still what is to be considered is that the occult virtues of these beings are in accordance with nature and when exposed they aim to interact on a natural basis excluding any demonic interference.

However, another notion which is of philosophical interest is that of sense of nature, a *sensus naturae* as he calls it. This sense of nature should be considered as a superior state of apprehension akin to prophecy, which works like the human instinct. In this way he explains how the sheep apprehends the presence of a wolf and dogs distinguish a burglar among other people, William speaks also of women that could sense their husband coming from two miles away (Thorndike 1923, 348). In light of the analysis presented so far, it is quite obvious that William asserts, even if indirectly, that the examples above involve the Stoic notion of sympathy. It seems that nature works as a whole, where a “common part” exists in each being and it is mainly responsible for the so called “sense of nature”. On the other hand it must be mentioned that William is probably not aware that this doctrine is attributed to the Stoics, given the fact that Stoic physics was not known in the Middle Ages. It is highly likely that William’s influence upon this subject might be an Arab source or a translated book of an unknown writer, a hypothesis that emerges from the fact that William enumerates many magical books that had been read by him, even if a part of them are unknown to us (Thorndike 1923, 353-354).

Before closing the case of William of Auvergne, there is an intriguing aspect in the way William explicates the interaction among beings. According to him, there are two modes of explaining how an object acts upon another, either by contrariety or by assimilation (Marrone, 2009,170). In the first case, one object attempts to eliminate the opposite virtue of the other object, whereas in the second, an active form is induced and impressed upon another and so the assimilation is accomplished. As an example of the first case, we could take an apple which falls on grassy ground and thence the stillness of the ground attempts to eliminate the opposite, that is, virtue of motion, whereas in the second case we could imagine how the virtue of heat is assimilated by an object touched. It is worth noticing that in both cases material contact is demanded in advance in order to justify the interaction between the objects. Now, here lies the problem with natural magic, since there is no material contact. To William this is not a paradox but an exception, and it is worth mentioning how he describes the interaction which occurs with natural magic. Describing how the sapphire could cure a disease he says that it accomplished its purpose *secundum totam naturam*, that is, *by the*

aid of its whole nature (Marrone, 2009, 173). Again, William uses Stoic rhetorical tools, even unknowingly, to adequately describe the operations of natural magic.

The second historiographical example is that of Albertus Magnus (1193-1280) whose works refer both to magic and to alchemy. In order to legitimize magic through philosophy, Albertus presents the Biblical Magi as philosophical personages. In *Enarrationes in Evangelium Matthei* (ca 1262) we have the first connection of magic with nature. He argues that the Magi know and conjecture things from the inevitable process of cause and effect in nature and in this way they have the ability to predict and produce marvelous things (caput II.1.61). Moreover, in *Commentarii in librum Danielis prophetae* (ca 1262) he clearly states that the Magi are masters who philosophize about the universe and they must be held to be astronomers who search the future in the stars (caput I.20). In the same way as William of Auvergne, Albertus argues for *magia naturalis*, a new kind of magic which draws its validity from nature. Likewise he gives an abundance of examples where herbs, animals and minerals are suitable for magical operations notably because of their occult virtues. As a result, he admits in *Vegetabilibus et plantis* (ca 1250) that there are several herbs which have divine properties and effects, like *betonica* which strengthens the ability of divination and *verbena* which was used for erotic purposes. Similarly, in the same work, Albertus explains the procedure through which plants gain their properties as a combination of five virtues, where the influence of the stars is included among them (V.ii.1). In the matter of occult virtues in animals, Albertus gives many examples in his work *De animalibus* (ca 1250), where several parts of them appear to be of wondrous properties. For example, the eyes of an eagle are of benefit to the human eyes and the skin of a lion might be used as a mean of protection.

In contrast with William of Auvergne, Albertus relates natural magic to astrology in order to explain and justify the “activation” of the occult virtues. Under this consideration, Albertus accepts Aristotelian cosmology and the mechanism through which the Prime Mover expands its influence upon the celestial bodies, which in their turn impact the sublunar world. In this fashion, Albertus provides a cosmos where the stars light up the virtues of the material beings of the sublunar world and therefore these become ideal for the operations of natural magic. Moreover, Albertus accepts natural magic which comes from seals or signs engraved on the surface of a stone or metal. This is the art of magical images, commonly known as talismans, where an image or a seal is engraved on the surface of a stone or a metal at a favorable

moment, when the celestial influence would be at its zenith. After this procedure, the engraved stone or metal could be suitably used so as to produce marvels and extraordinary spectacles (Rutkin 2013, 492-497).

Further philosophical implications may be detected in Albertus' views on alchemy. The work which represents his views upon the matter is called *De mineralibus* (circa 1260) and Albertus thinks of it more as a supplement to the Aristotelian corpus rather than a purely alchemical work. In it, Albertus associates alchemy with astrology as the alchemists declare that the precious stones gain their powers from the stars, whereas it is due to the influence of stars again that the seven known stones⁷ acquire their form (III.6.1). In another work, the *De causis et proprietatibus elementorum* (circa 1250), it is cited that the good alchemists work by a waxing moon, because it is then that purer metals are produced and the whole procedure is aided by stellar influences (I.7.2). Lastly, Albertus' philosophical alchemy culminates with an argument for the possibility of transmutation. According to Albertus the transmutation of metals is possible and could be explicated in terms of Aristotelianism. In particular, alchemy operates in such a way that it destroys a substance by removing its specific form and by using what is left it induces a new specific form in order to accomplish the transmutation (*De mineralibus*, III.9.1). Obviously, Albertus seems to perceive the Latin word *species* as specific form, which could be corrupted and replaced by a new specific form, a view taken from Avicenna and his *Epistola ad hasen regem* (10th to 11th centuries)

5. Conclusion and final thoughts

In conclusion, after the influx of the Arabic translations into Medieval Europe, both magic and alchemy were reformed and reconsidered as disciplines. The Arabic texts contained, in advance, a variety of Greek philosophical ideas and thus this literature became the vehicle by which traditional stereotypes about magic were challenged. As a result, magic began to become associated with nature and presented an aspect which could be regarded as scientific and philosophic. Thus, we can discern philosophical topics drawn from Stoicism, Neoplatonism and Aristotelianism, which all influenced the medieval notions of natural magic and that of occult virtues. On the other hand, alchemy was a newcomer in the medieval cosmos and thus claimed to become a *persona grata* among the sciences and the arts. In order to succeed, alchemy had to be established on a strong Aristotelian basis, whilst a hint of Stoic doctrines may also be recognized. Lastly, bearers of this new and innovative trend were William of Auvergne and Albertus Magnus, who both lived in the 13th century

and produced radical ideas in their works concerning the occult sciences. However, despite the fact that the occult sciences did not win any further validation, it is important to bear in mind that this course of actions worked as a bellwether for the reevaluation of the arts that took place in the next centuries.

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¹ The "occult sciences" include astrology, alchemy and natural magic and the term is initially introduced in the 16th century. The etymology of the word "occult" (Lat. Occultus = hidden) indicates that the aforementioned sciences aim at manipulating the occult virtues of natural objects and nature itself, as well, in order to attain a high understanding of the cosmos.

² Here the term "physics" is meant in an Aristotelian conception. Actually, Aristotle's *Physics* contains an inquiry into nature and a treatise on motion, both of which argue on motion, place, causation and time subjects. As a result, the Aristotelian *Physics* differs from the modern

notion, since the latter involves the study of matter, energy and the interaction between them.

³ Image magic involves signs or seals that are naturally or artificially (by the magicians) engraved on objects. Due to these signs or seals the objects are thought to receive a stronger influence by the stars, which means, in turn, that these objects could bring a greater result during a magical operation. The connection between the object and the stars is achieved in terms of sympathy, whereas an important precondition for the success of the magical operation is that the stars should be at their zenith so as to gain the best influence possible.

⁴ Democritus introduced the “atomic” theory, according to which, reality consists of atoms and void, where atoms should be regarded as the main particles that constitute the material world. Atoms are indivisible, infinite in number and vary in size and shape. As they move in the void, they collide or combine with each other, forming in this way material bodies.

⁵ “Decknamen” (German word) are cover names for alchemical terms which intend to keep the art secret from those who are not initiated in it. For example the two main ingredients of metals, that is sulphur and quicksilver, are often given by the “Decknamen” father-mother or sun-moon.

⁶ The Stoics see the world as a whole, where God, reason and nature are considered as aspects of the same thing. The world is subjected to causality, something which means that everything that happens has a purpose and fate seems to be of significant importance. The Stoics believe that cosmos would end with a conflagration and a new, identical one would be created, a procedure that repeats itself in eternity. The Neoplatonists, in turn, see the world as an emanation of the One. The One should be considered as the first principle of the cosmos, which is simple, ineffable and unknowable. From the One derives the Nous, then the world soul and lastly the corporeal world. In the latter there is corruption, which is due to the distance from the supreme One. Given the fact that humans live in the corporeal world, they are subjected to corruption, but still they can achieve salvation through contemplation, which is the mean to reach the One. Lastly, for Aristotle the world is divided into hyperlunar and sublunar, where in the first division the Unmoved Mover sets the celestial spheres in motion and this motion is transmitted to the sublunar world. The celestial spheres are created by ether, an incorruptible and eternal substance, whereas the material world is consisted of the four known Pre-Socratic elements. According to Aristotle, the world and its relations could be explained by the four causes: the material, the formal, the efficient and the final. The final cause shows that there is teleology in the world, which means that everything done has a purpose, even if it is not quite clear to us.

⁷ In alchemy, the seven Stones were supposed to be associated with the planets of our solar system. In particular, the Sun was associated with gold, the Moon with silver, Mercury with quicksilver, Venus with copper, Mars with iron, Jupiter with tin and Saturn with lead.

Late Victorian Scientific Racism and British Civilizing Mission in Pears' Soap Ads

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1. Introduction

The last two decades of the 19th century in Britain were years marked by imperialism and capitalist competitions. Britain was one of the key players in the “scramble for Africa”, an imperialistic rivalry between European countries over vast territories of the African continent. The exploitation of African resources made possible the flourishing of British companies, which consequently lead to the economic rivalry between them and the creation of monopolies over market. The creation of the prestige of a company was aided by a mighty tool which came into existence at roughly the same period: advertising.

One of the products which became immensely popular in the second half of the 19th century was soap. Anne McClintock states that owing to the British exploitation of African land and the forced colonial labor which provided the British with palm oil and palm kernel oil (2000, 131-132), soap was no longer a luxury for upper-classes (Ibid., 25). Now both middle and working classes could afford to buy soap. In the beginning, soap was sold by weight, but with the rising economic competition, it became a branded good in the 1880s widely advertised through popular British press (McClintock 2000, 132; Ramamurthy 2003, 24).

One of the most lucrative advertising campaigns for a soap company in that period was Pears' Soap advertising (Ramamurthy 2003, 26). Pears' Soap was advertised in a threefold fashion: as a beauty product for “a perfect complexion” aimed at middle classes; as a cleaning product for “cleansing the great unwashed” (McClintock 2000, 129), i.e. for educating the poor of Britain about the virtues of cleanliness; and as an imperial British product which has the power to civilize (that is to say – whiten) the “savage” black Africans (Te Hennepe 2014, 15). To emphasize how racially-tuned Pears' advertisements actually were, one must bear in mind that in comparison with any other product advertised in the popular British newspaper *The Graphic*, Pears' Soap released the most images of black people since the 1880s until the First World War (Ramamurthy 2003, 37).

In this paper, I focus on the racist and imperialist messages in Pears' advertisements in the late-Victorian period. Namely, I search for the echoes of the then-flourishing British scientific racism in Pears' advertisements, aiming to show how both the scientific and commodity racism were constructed to justify the British imperialist invasion of Africa by representing it as a "civilizing mission".

I begin by discussing the attention paid to the healthy (white) skin in British public health in the second half of the 19th century and the race and class implications of that. I analyze the racial connotations of healthy white skin on the example of a Pears' Soap commercial featuring a white boy who gives soap to a black boy, which magically turns the black boy white. I then discuss the basic features of late-19th century British scientific racism and the way it was applied to this Pears' Soap ad. In the last chapter, I discuss the so-called British "civilizing mission" defended both by scientific and commodity racism. In this chapter, I analyze two more Pears' Soap advertisements to show how Pears' brand appropriated the scientific discourse of the "civilizing mission" as a justification for imperialism.

2. Skin and health in the mid-19th century Britain

According to Mienneke te Hennepe, after Gilbert Breschet and Augustin Roussel de Vauzème wrote on the anatomy and the role of the sweat glands in 1835, skin began to be seen as an inseparable element of the overall health of the body (2014, 400). Skin was not anymore just a "receptive layer" (Ibid., 399). Rather, it acquired an important physiological function of serving as a tool through which body cleanses itself (Ibid., 399).

The first person in Britain who talked about skin in this new light was dermatologist Erasmus Wilson. In 1845 he published his most famous work, *Healthy Skin*, in which he discussed the importance of keeping skin clean in order to preserve the health of the body (Te Hennepe 2014, 402). Wilson argued both for the importance of individual private hygiene and for sanitary reform for the working classes (Ibid., 403). In later years, following in Wilson's footsteps, British hygienists made analogies between the skin and sewer systems by referring to skin as a "grand drainage pipe of the body", the purpose of which was to cleanse the body of the unwanted waste and dirt (Ibid., 410).

However, in 19th century Britain the idea of healthy skin had additional cultural value attached: healthy skin had to be white skin. Namely, in Victorian Britain, the working classes which lived and worked in unhealthy conditions were at the epicenter of dirt and disease. At the same time,

working classes spent many hours working outside, which made their skin darker (McClintock 2000, 133). Not having dark skin meant not being part of a working class and therefore, not being dirty.

Moreover, dark skin was not only “the visible stigma” of belonging to a working class, it was also a feature of the “uncivilized” and “savage” black race under British imperial rule (McClintock 2000, 133). Therefore, for the middle classes, making one’s skin clean meant keeping one’s skin white, which in turn differentiated them both from the working class laborers and the “inferior” races. As far as the laboring masses were concerned, cleaning their skin not only improved their health, it also brought them closer to the middle-class ideals of cleanliness and it emphasized their own superiority over the “inferior” dark races (Ramamurthy 2003, 31-32). In Victorian Britain, therefore, healthy white skin functioned as a symbolic surface (Te Hennepe 2014, 398) on which both class and racial values were inscribed.

3. Soap as a cleansing tool: Pears’ Soap advertisements

The crucial product used for cleaning one’s skin was, and still is, soap. Therefore, in accordance with the symbolic value of the skin, as McClintock argues, “soap took shape as a technology of social purification, inextricably entwined with the semiotics of imperial racism and class denigration” (2000, 133).

Many of the Pears’ Soap ads explored the symbolic values attached to the skin by emphasizing the connections between washing and being *clean*, and between washing and being *white*. In a linear logic, Pears’ Soap ads aimed to show that to wash was to be clean, to be clean was to be white and to be white was to be civilized. This kind of advertisement worked hand-in-hand with the racist discourse: the soap boxes bore the pictures of black kids being washed white or they portrayed soap as a product that had the potential to civilize the African other. Consequently, Pears’ Soap, as a branded good, became an epitome of “commodity racism” (McClintock 2000, 131). Therefore, the notion of “commodity racism” refers to the phenomenon of spreading of racist messages through commodity advertisement.

One of the most famous racist Pears’ Soap advertisements (fig. 1) represents a black boy becoming white thanks to Pears’ Soap’s “magic”. The advertisement, which appeared in *The Graphic* in 1884, consists of two images: in the first one, the white boy gives a bar of Pears’ Soap to a black boy who is sitting in a bathtub. The second image reveals that, after washing, the black boy has a black face, but a white body. He joyfully looks at himself

in the mirror presented by the white boy and apparently admires the change in the color of his body which Pears' Soap produced.



Figure 1: Pears' Soap ad in *The Graphic*, Christmas Number, 1884

At the top of the advertisement a caption says: "For improving and preserving the complexion". This advertisement has been analyzed thoroughly both by Anne McClintock (2000) and Anandi Ramamurthy (2003). Since making your skin white was synonymous with being civilized, both McClintock and

Ramamurthy argue that making the black boy white functions as the representation of the British “civilizing mission” (Ramamurthy 2003, 26, McClintock 2000, 134), in which soap is featured as a product which whitens, i.e. civilizes, the racial Other (McClintock 2000, 134). As Ramamurthy says, through the representation of the black child as “desiring to be white and in effect accepting its inferiority”, Pears’ Soap ad justifies British imperialism (2003, 31).

Nevertheless, despite their thorough analyses of the inscriptions of British imperialism in Pears’ Soap ads, neither Ramamurthy nor McClintock touched upon the connections between scientific racism and British imperialism. As a consequence, they did not explore the way Pears Soap’s ads resonate with scientific racism in the late 19th century which, as I will show, served both as an impetus and a justification for the British imperialist mission.

Therefore, my goal is to contribute to the research of racist advertisement in the late 19th century Britain by focusing on the role scientific racism played in British imperialist mission and consequently, on the way it is echoed Pears’ Soap ads. In further sections I will explore late-19th century British racial science in its relation to British imperialist politics and soap advertising in order to demonstrate that commodity and scientific racism joined forces in justifying British imperialism.

4. History and origins of British scientific racism

The debate between the advocates of monogenesis and polygenesis, which took place in the mid-19th century Britain, was fully resolved by the last quarter of the century in favor of monogenesis. In the 1850s and the 1860s, advocates of the school of polygenesis, such as Robert Knox and James Hunt, then president of the Anthropological Society, claimed that races were “species with separate origins” (Lorimer 1988, 405) with a “distinct, biologically fixed, unequal characteristics” (Lorimer 1988, 405). However, after the initial debates, the school of polygenesis was definitively abandoned in the 1870s in favor of a monogenesis approach consistent with Christianity and the Bible.

The monogenesis approach to race was the belief that “blacks” and “whites” were the same species and the advocates of monogenesis in the last quarter of the 19th century were in fact Darwinists who believed that “mankind had the same origin” (Bratlinger 1985, 182). However, embracing the monogenesis approach did not necessarily entail the abandoning of the “superior vs inferior” race dichotomy, which was a prominent feature of the

polygenesis school. Although the advocates of monogenesis approach believed in the common origin of mankind, they did not see the black and the white races as necessarily equal. The main arguments that supported the inequality of races stemmed directly from evolutionary theory. Therefore, in order to understand the late 19th century scientific racism, one must look into its origins: the theory of evolution, i.e. Darwinism and social Darwinism.

In order to understand the roots of Darwinism and social Darwinism, it is necessary to revisit the theory of Thomas Malthus which was influential for Darwin's theory of natural selection. According to Malthus, poverty in society is "inevitable" and "impossible to alleviate" (Rodgers 1972, 269) because the "power of population is... greater than the power in the earth to produce substance for man" (Rodgers 1972, 270). Therefore, Malthus thought of war and misery as "positive checks" which control the growth of the population (Claeys 2000, 230). The disadvantaged, according to Malthus, should not be helped because that would only help keep alive the "parasites" of the society. Only if the poor and the disadvantaged are productive, i.e. only if they benefit the society, should they be given help according to Malthus (Claeys 2000, 232).

Malthus' theory was highly influential for Darwin's discovery of the process of natural selection. Owing to Malthus, Darwin discovered that since "all organic beings tend to increase", there will be a struggle for resources and existence between them (Rodgers 1972, 270). In this struggle, organisms will try to adapt to the changing circumstances, but not all of them would be equally successful. Those organisms which fail to adapt will be "weeded out" by natural selection (Rodgers 1972, 271). Natural selection, therefore, favors the existence of the more adapted organisms and, in parallel, eliminates those organisms which prove to be less successful in adaptation.

Darwin's idea of natural selection resonates with what was soon to be called social Darwinism: Spencer's theory of the survival of the fittest. Namely, it was Herbert Spencer, a British sociologist, who used the term "survival of the fittest" to describe the competition between people over resources in which "the valuable members of society", the "most useful ones", would survive (Claeys 2000, 235). Since social Darwinism dealt with the society, being fit was not conceptualized as being physically strong, but as being "the most intelligent and adaptable" (Rodgers 1972, 280). The implications of social Darwinism, therefore, were that the poor were poor because they were unfit (Rodgers 1972, 275) and that any kind of war is legitimate (Claeys 2000, 226) because it was seen as a competition in which the more intelligent population wins.

5. Darwinism and race

What were, then, the implications of Darwinism and social Darwinism for race? Although seen as having the same origin and being the part of the same species, the black and white races were not seen as equally intelligent or “fit”. Belonging to a certain race meant having a certain set of characteristics which were inherited biologically, together with their physical forms (Claeys 2000, 246). The black race, according to Darwinists, did not evolve as successfully as the white race did – they were less fit and less intelligent. Therefore, any kind of clash between the white and the black races was understood as competition over resources, in which the more intelligent ones (i.e. the whites) should win. As a result, Darwinism and social Darwinism were used to justify British colonialism and imperialism (Claeys 2000, 237, Lorimer 1988, 430).

Moreover, the perspective on the *causes* of the black race’s “inferiority” significantly changed in British science after the wide acceptance of evolutionary theory in the 1870s. Before Darwinism, differences between races were often explained through environmentalism, the idea that the development of the individual depends on environmental influences (Claeys 2000, 238). However, Darwinism shaped the idea that races and differences between them are determined and inherited *biologically* (Claeys 2000, 238). As Lorimer shows, the biological accounts of racial difference, rather than the environmental explanations, became much more popular in the last two decades of the 19th century in Britain. By 1880s, Lorimer states, “environmentalism was on the losing side of the nature/ nurture argument” (1988, 430). Although there were individuals, such as cultural evolutionist Edward Burnett Tylor, who gave more importance to the “learned behavior or culture” than to “physical differences” (Lorimer 1988, 418), a majority of scientists in the late 19th century Britain thought of racial differences as *biological* differences. For example, the anatomist W. H. Flower, who thought that races underwent a different evolutionary development which influenced different development both of their physical features and their “intellectual and moral qualities” (Lorimer 1988, 419) and Francis Galton, an anthropologist who also claimed that heredity is more influential than environment in the development of individual’s characteristics (Lorimer 1988, 422).

This kind of Darwinist theory of race, i.e. the deterministic approach arguing for biological differences between the races, took its visual shape in the Pears’ Soap ad (fig. 1) featuring a black boy, which I already discussed.

Although the ad demonstrates the civilizing potential of British goods, it is also imbued with skepticism about the limits of the civilization. Since the white boy does not wash away the blackness of the black boy in its entirety, educating the black race (i.e. “civilizing them”) is seen as something that could be achieved only until a certain point. The white race can educate and train black bodies, but they cannot civilize their minds. The inferiority (i.e. the “blackness”) of the black race is represented, therefore, as biologically determined. As Bratlinger (1985) argues, evolutionary anthropology “suggested that Africans... were such an inferior ‘breed’ that they might be impervious to ‘higher influences’” (182). Put differently, this Pears’ ad echoes the prevalent theory of late-19th century British scientific racism: that the black race can be educated to act like the white race, but that educating them by no means makes them equal to the white race because they are biologically inferior. As a result, both in scientific accounts of race and in Pears’ Soap ads, the white race is represented as inherently superior.

6. The British “civilizing mission” in scientific and commodity racism

The fact that British scientists, in light of social Darwinism, thought that the black race was *as a race* less intelligent did not prevent them from claiming “civilization” as their mission. Science, therefore, was not only *used* for purposes of imperialistic justifications, but as Petitjean (1988, 109) argues, science had a *mission* to “provide a rational basis for hierarchizing civilizations” in order to justify the colonization. Bratlinger supports this position, stating, “evolutionary thought seems almost calculated to legitimize imperialism” (1985, 184).

By producing “proof” of racial differences scientists could easily explain the occupation of African territories and then justify the exploitation of their land. First, they were able to use the evolutionary theory to explain the “backwardness” of African peoples and the “superiority” of the white race. Then, they could advocate for the “civilization mission”, in which the “superior” race was supposed to educate the “inferior race”. Science, after all, was defended as inherently altruistic (Petitjean 2005, 117). According to the logic of the late-19th century scientific discourse, although the black race could never become completely “white”, they could be “civilized” to a certain degree, their “savage” customs could be changed and brought closer to the Western ideals.

The “assimilation of blacks to the civilized ideal” project of the British imperialism was based on the monogenesis idea that the black and the white races originated from the same stock (Deacon 1999, 107). The

British, therefore, tried to assimilate the African peoples to the Western civilization through the “rule of law and education” (Deacon 1999, 107). Unlike polygenism theory, according to which the differences between the white and the black races were seen as unchangeable, the widely accepted monogenism theory supposed that, since the black and the white races belong to the same species, the “backward” races could be guided towards civilization (Petitjean 2005, 115).

A number of Pears’ Soap ads echo the “assimilatory ideal” by showing the civilizing mission of the British achieved through the education of the African peoples. One of them, published in *Harper’s Weekly* in 1886 bears the title “The Birth of Civilization: A Message from the Sea” (fig. 2). It shows a black man, dressed in what seemingly perpetuates the idea of the “savage”/ “uncivilized” black person holding a Pears’ Soap bar. He is shown wearing feathers in his hair and a large piercing in his ear. His whole body is completely naked, except for his genitals, which are covered in simple white sheets. The finishing touch of this portrait of a “noble savage” is a spear which the man holds in his left hand.

This “noble savage” is represented standing on a shore and holding in his right hand a Pears’ Soap bar. Next to his feet there is a box labeled “Pears’ Soap” and the back of the picture reveals a sinking ship. The story which the viewer deduces from this image is that, as a consequence of the shipwreck of a boat transferring goods to Africa, a box of Pears’ Soap arrives at the African shore. A black man picks up this mysterious Western product and then the new civilization is born. Just so that the viewer is positively clear that it is indeed Pears’ Soap, i.e. a Western commodity which brings the civilization into “uncivilized” territories, the caption below the image says: “The consumption of soap is a measure of wealth, civilization, health, and purity of the people”. Again, the message that Pears’ wants to send is that washing yourself by using soap, i.e. preserving the health of your skin, is a feature of the civilized Western world. Therefore, the black race is born into civilization as it adopts Western values of cleanliness. As a consequence, once they adopt Western values, the black people become less black/less savage and more white/ more civilized, as the advertisement with the black child demonstrates.

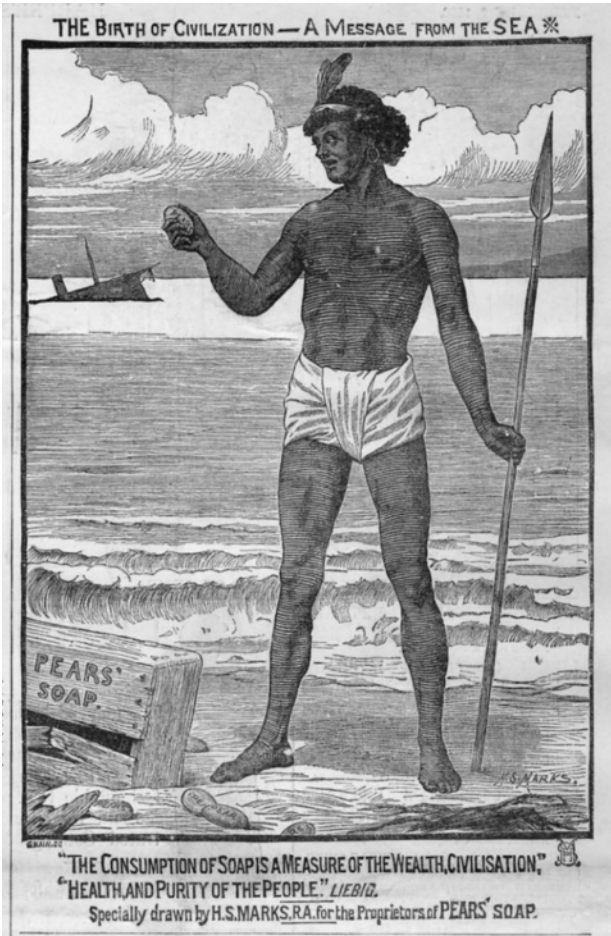
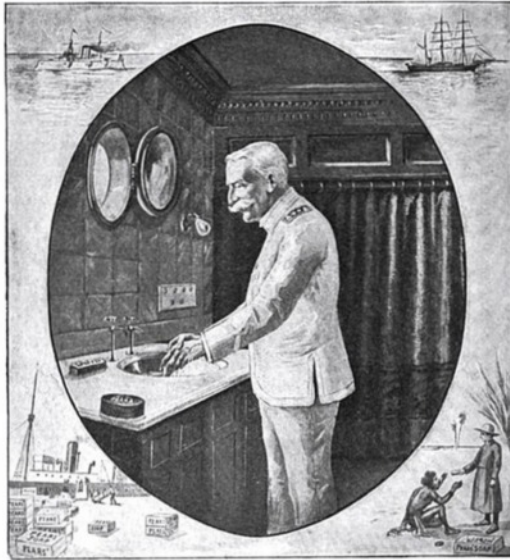


Figure 2: Pears' Soap ad in *Harper's weekly*, February 1886

Therefore, contrary to Darwin's prediction that, as a result of the process of natural selection and the survival of the fittest, the "lower races" would be eliminated by the "higher civilized races" in the near future (quoted in Claeys 2000, 239), the "higher races" decided not to wipe them out but

to “educate and help their lesser brother”. In reality, what happened was that the Western forces realized that they would benefit more from exploitation of black labor than from wiping them out. The “lower race” should not be left to die because, according to Malthusian theory, they served a purpose: they were seen as a “pool of productive labors” (Lorimer 1988, 424). However, the colonial and imperial exploitation of the black working force and their resources had to be represented in a more favorable light that would justify Western occupation of African territories. As Petitjean argues, “altruism” justified economic exploitation and imperialism was defended as a “civilizing mission” (2005, 117).

Another Pears’ Soap ad which perpetuated the scientific theory of the black race being inferior and in need of the British “civilizing mission” appeared in *McClure’s Magazine* in 1899 (fig. 3). The central part of the image shows an elderly white man in a naval uniform washing his hands in a boat cabin. In the upper corners of the ad there are two boats in the ocean and in the lower left corner of the ad we see the unloading of Pears’ Soap cargo from a ship. The lower right corner of the ad shows a white man handing over soap to a kneeling black man completely naked except for the strap covering his genitals. The caption below the picture says: “The first step towards lightening The White Man’s Burden is through teaching the virtues of cleanliness”. It is followed by text: “Pears’ Soap is a potent factor in brightening the dark corners of the earth as civilization advances, while amongst the cultured of all nations it holds the highest place – it is the ideal toilet soap”. The “imperialism as civilizing” message is clearly expressed: the images reveal that the British ships sail towards the new land and that a trade takes place there (the ships are loaded with cargoes). However, the message that the ad sends is not one of British exploitation of African territories: this is not even implied. Rather, what the viewer sees is the representation of British humanitarian actions: yes, the British do sail to new lands, but they do so in order to *bring* the Africans their goods, to civilize and educate the uneducated savage, to “brighten the dark corners of the earth” and to teach them how to be clean and healthy. And the crucial ingredient of their “civilizing” mission is, of course, Pears’ Soap.



The first step towards lightening
The White Man's Burden
is through teaching the virtues of cleanliness.
Pears' Soap

is a potent factor in brightening the dark corners of the earth as civilization advances, while amongst the cultured of all nations it holds the highest place—it is the ideal toilet soap.

Figure 3: Pears' Soap ad in *McClure's Magazine*, October 1899

Following in the footsteps of late 19th century racial science, Pears' Soap ads offered a justification for British imperialist conquest and exploitation of African territories. Therefore, together with science and in accordance with scientific ideas of the era, advertising could serve as a mighty tool in the hands of British politics. Furthermore, advertisements broke the boundaries that science had in its spreading of racist ideas. Being published in newspapers and appearing on boxes of a widely used commodity such as soap, Pears' Soap ads had the potential to reach mass audience. As a result,

owing to mass media and the rise of consumerism, the scientific theories of race arguing for the biological inferiority of the African Other and justifying imperialism as a “civilization mission” were not limited to scientific intellectual circles. They could now reach laypeople through a simple picture on a box of soap.

7. Conclusion

In the last two decades of the 19th century, racial science based on biological differences between races finally found solid proof in Darwin’s theory of natural selection. As a consequence, scientists produced studies arguing for *biological* differences; studies that posited the racial Other as inherently “inferior”, yet capable of limited improvement under the rule of their “more civilized” European brother. In a way, the racial Other was seen as sufficiently biologically similar so as to be molded according to European “civilizing” standards. However, at the same time, the racial Other was described as different enough not to have the same capacities as their European brother, and therefore would remain inherently inferior. As a consequence, the scientific texts justified British imperialist and colonizing mission. During the last quarter of the 19th century science was professionalized and scientists were given authority on the question of racism over laymen, such as travellers and clergy (Lorimer 1988, 429). Therefore the opinion of the scientists and the scientific theories were precious because they could be used as proof of “objectivity” which justified the white race’s rule over the black race.

However, scientific texts were not written for a larger public and therefore only the intellectual elite could have access to them. As McClintock states, scientific journals that published articles on racism were “inaccessible to most Victorians” who lacked means and education to read such material (2000, 131). Therefore, in order to get wider acceptance for its imperialist cause, the British Empire needed to popularize racist theories proposed by science. In brief, British imperialist mission needed the support of the people of Britain as well. As it is the case today, the support of people was gained by using the mass-media, in this particular case – press. Commodity advertising in press, as a result, gave birth to commodity racism. As McClintock argues, unlike scientific racism, commodity racism has a “capacity to expand beyond the literate propertied elite” (2000, 131). Advertisements of such a cheap product as soap, marketed as a necessary element of every household, were aimed both at the middle class and the lower class of Britain.

They were printed in daily newspaper and therefore could reach a large audience.

Science therefore gave an authoritarian and scientifically “objective” justification for British imperialism. Advertising commodities, on the other hand, helped spread these ideas to the popular masses. Echoing scientific racist ideas, Pears’ Soap ads joined hands with science in justifying British imperialist politics by representing the black race as “savages” in need of British civilization. By using racist images which represented the black race as “savage” and “inferior” and by justifying the British imperialism as a “civilizing mission”, Pears’ Soap ads united the divided British classes against a common enemy – the racial Other.

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Scientific Discourses of Differentiation by Race, Gender, and Disability from the 19th Century Until Present Day

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1. Introduction

In 2014, researchers from Northwestern University and the University of Virginia published a study that suggested white Americans believe that black Americans experience pain and physical challenges differently than their white counterparts. When presented with photos of a black man and a white man, and asked questions about who would require more pain medicine for injuries, white participants believed that black people experienced significantly more pain than white people (Hutson 2014). Other studies have contradicted this research and suggested that as early as age 7, white American children believe their black peers feel less pain. In addition, research claims that injured black athletes will receive less treatment than their white counterparts with similar injuries, and that black patients in hospitals will receive less pain medication than white patients (Samarrai 2014, Noonan 2012). These conflicting understandings about different levels of pain in white and black bodies potentially lead to discriminatory practices in medical institutions, which have repercussions for individuals' health and racially frames social relations. In addition to race, stereotypes about the experience of pain and emotion exist in relation to gender and disability, which I will argue throughout this article. These scientific and popular discourses underlined discriminatory practices while influencing how people thought about race, gender, and disability.

The aforementioned contemporary and contradictory beliefs about black people and pain can be said to have a long history rooted in scientific debates in Europe and North America. In the 19th century, as science was rapidly professionalized, traits such as objectivity became increasingly prioritized. This process demanded divisions between who could practice science and who was a scientific object, while perpetuating these distinctions to rationalize larger cultural anxieties. The positions of women and people of color, most commonly black people, was of particular concern, as was the management of an ever-growing disabled population. One of the popular comparative projects of the era was evaluating the levels of pain and emotion in women, black people, and the disabled, as the Other, which were then contrasted with those of the male, white, and able scientist (Schuller 2012).

Scientists were expected to remain distant from their research, often erasing their own emotion in order to analyze and categorize bodies. This connected objectivity to a lack of pain and emotion, and this attitude persists today, both scientifically and popularly with regard to how pain and emotion are studied. These ideals of objectivity enforce social and scientific boundaries, so it is essential to examine the process of isolating science, promoting specific traits, and labeling groups of people as abnormal, as well as the relationship between science and society at large (Foucault 2004). I argue that perceived scientific differences in the experience and expression of pain and emotion built discriminatory discourses that underlined segregation, and these discourses continue to exert cultural influence in contemporary differentiation along the lines of race, gender, and disability. A recent example of scientific and popular discourses surrounding pain and emotion in disabled people focuses on autism, which I will address later in this article.

2. The rise of objectivity

In their book *Objectivity*, Lorraine Daston and Peter Galison describe the development of the scientific self as a public figure, combined with an increased interest in objectivity for scientists in the 19th century (2010). In a post-Enlightenment context, subjectivity refers to experiences tied to the individual and their consciousness and thoughts. Subjectivity was innate within all scientists but it was seen as a negative quality, something to be hidden or stamped out. It was tied to personal emotions, judgments, and interest in a subject, which would alter the science performed and the role of the scientist. Objectivity was therefore positioned as a means for scientists to access and understand the world around them. This emphasis on rationality and disinterest was designed in opposition to subjectivity and promoted as a value. A complete break between subjectivity and objectivity suggested that scientists were impartial, without emotions, and capable of doing the work necessary for the greater good.

The development of the “scientific self” allowed scientists to erase their subjectivity and become prestigious, valued, and objective doers of science. As the subjective self was untrustworthy and not conducive to doing science, scientists were expected to have “self-restraint, self-discipline, [and] self-control” (Ibid., 198). Scientific developments were happening in conjunction with historical shifts, particularly when it came to reflexivity across the disciplines. Reflexivity in science suggested an awareness of one’s inner emotions and their influence on external actions, which required self-control. Prior to the 19th century, the Immanuel Kant-inspired moral self was held in high esteem: a Kantian self was free, autonomous, and actively in control (Ibid., 210). As evolving understandings of the self reworked Kantian ideals

to merge with scientific thought, the new 19th-century “scientific self” held value and prestige. It asserted itself as objective: “to know objectively was to suppress subjectivity, described as a post-Kantian combat of the will with itself” (Ibid., 210). Scientists had enough resolve to exercise their agency, overcome their subjectivity, and subdue the self. Good, successful science was “the triumph of the will,” which allowed scientists to become better laborers for their nation, establishing “standards for the entire community” and serving their country’s “pulsing industrial economy and educational institutions” (Ibid., 228). To do science was to exercise the will (Ibid., 228), transforming a man into the ultimate post-Kantian self who controlled and examined the world (Ibid., 242).

During this debate, similar questions rose about active and passive roles in science (Ibid., 243). Scientists debated the use of microscopes, hand-illustrated details versus photographs, and the ability of humans to view and describe without bias. As microscopes and, later, photographs, relied on technology rather than human ability, these advances were seen as more reliable and objective methods. These tools were controversial since people were still necessary to operate the machines and room for error persisted. Although scientists had actively used their will to defeat their own subjectivity, this needed to be demonstrated outwardly, often as a challenge to other scientists. Daston and Galison reference several competitors, often bridging art and science, who questioned each other’s accuracy by referring to emotions or personal bias as negative influences on the results. For example, scientists and artists Wilhelm His and Ernst Haeckel engaged in a long professional rivalry over their methods: His used technology to trace images and take photographs while Haeckel hand-illustrated his work. His argued that Haeckel was “smuggling his theoretical prejudices” into his art and Haeckel called His an “exact[ing] pedant” who thought himself virtuous because of his methods (Daston and Galison 2012, 191). These types of arguments were detailed in scientists’ personal journals, kept as an emotional outlet and a balancing tool for the active and passive elements at play. As the authors write, “the divided scientific self, actively willing its own passivity, was only one possible self” (Ibid., 246). However, this regular assertion was necessary in order to demarcate scientists from the general public. Since scientific objects could be human, the scientist needed to separate emotions from their work. Scientific objects were full of pain and emotion and subjectivity, and always examined in contrast to the scientist, who was valued but normal, objective and active. Scientists Othered scientific objects by testing humans for pain and emotion, removing any personal connection, and comparing themselves to their subjects. These comparative studies resulted in an emphasis on differences, or categorizing people, and, as a

result, were entangled with social segregation, based on “measurable” traits, as I argue below.

3. Race, gender, and sentiment: marking the other

Anxieties about boundaries and differences between humans had been present in Europe long before the 19th century, and were often related to the desire to cleanly categorize everyone by race. In 1719, the author Abbé Dubos wrote *Refléxions critiques sur la poésie et la peinture*, and repeatedly referred to his interest in studying how humans could be so different in “inclinations and mind, although [all humans] came from the same father?” (Curran 2009, 152) Many scholars in the 18th century, particularly Europeans whose countries were engaged in colonialism, addressed race and gender in some form, no matter their field of study. Kant, the Comte de Buffon, Georges Cuvier, Christoph Girtanner, Carl Linnaeus, and others from several academic fields all discussed sexual and racial typologies. Understanding human difference was essential for classifying, ranking, and subjugating. Dubos and others were interested in external influences on “national bodies and minds” to differentiate between the French and their colonies, according to Curran (Ibid., 153). Additionally, there were anxieties of miscegenation in the colonies. How were the French to distinguish between themselves and those in their colonies? A scientifically grounded project of distinguishing between racial groups was necessary to maintain demarcations and rationalize actions. Racial science continued into the 19th century, spreading across Europe and North America, often with subprojects related to gender and disability included to further develop hierarchies.

In the late 19th century, as described by Kyla Schuller, evolutionary scientists employed sentimentalism to support gender and racial discrimination. Sentiment is defined as the mental or emotional response to physical stimuli (Schuller 2012, 278), and humans were expected to have a particular amount of sentiment if they belonged to an “evolved, civilized race” (Ibid., 278). White men were expected to have a higher level of self-control over their senses, which, as Schuller argues, led to a particular epistemology espoused by the American School of Evolution (Ibid., 278). The American School of Evolution was a self-defined group inspired by Darwin, active from the late 1860s to the early 20th century, who helped their members find academic appointments and publishing opportunities. The School argued that the formation of species (as well as that of race and gender) was determined by experiencing the senses and gaining their associated knowledge (Ibid., 278). The empiricism necessary for science was dependent on “embodied, sensory knowledge” (Ibid., 280), which also meant that objective scientists had the appropriate gender, race, and level of

sentiment in addition to their formal education. Schuller writes, “the language of ‘sentiment,’ ‘feeling,’ ‘impression,’ and ‘contact’ was a constitutive element of 19th-century science, structuring methodological approach, analytic object, and professional strategy” (Ibid., 280). Science became increasingly professionalized, a process that required setting standards for what science was and was not, and who could and could not practice it. A high but mediated level of sentiment was expected, as only a high level of impressibility could lead a man to curiosity and progress. Sentimentalism was to be regulated and refined, directing the evolution of those in control of their civility. As behavior was linked to physiognomy, this paved the way for subdisciplines like phrenology, and arguments about the mental and physical evolution of races.

In contrast to the level of sentiment expected of white men, heightened and useless sensitivity was associated with women and black people (Schuller 2012). In principle, this eliminated any possibility of women and black people practicing science, while also relegating them to the realm of scientific object. Black women in particular have long been used in medical experiments, such as new surgeries or gynecological exams. As described by Schuller, these tests were typically performed without anesthesia, as black women were seen to have a “failure to receive impressions upon the nervous system” (Ibid., 287). This made experimentation on black women a fairly inexpensive and consequence-free activity for scientists, while also promoting the perception of the “savage insensibility” to the scientific community and the public. The concept of a “savage” was typically a raced and gendered term that associated “lower” forms of humans with animals, particularly with regard to emotions, behavior, and sexuality (Ibid., 293). Black women experienced the resulting discrimination the strongest, as reflected by individuals like Saartje Baartman, who was pathologized in the 19th century as a primitive, sexual, and emotional being who reflected the fears and suppressions of Europeans. She was taken on tour across Europe and after death her body was displayed before being dissected by Cuvier in the name of science. Cuvier and others had asked for years to see Baartman nude to study her genitals and she had refused. Her body was used by scholars like Cuvier to test the idea that more “primitive” or “savage” women were more sexual and therefore closer to animals. Because Europeans were using Baartman’s body for science, they refused to return her remains to her homeland for decades (Crais and Scully 2008). Stories like Baartman’s demonstrate the intensity of the interest in studying black women and their sexualities and emotions, as well as the belief that Europeans were the ideal scientists and had a right to black women’s bodies for science.

Across the ocean, scientists used cases like Baartman's to study the experiences of pain in black people, while seeking moral reasons to further support their experiments. There were not specific studies about pain in women, unless they were black, and this type of research tended to prioritize emotions or physical traits, as in the example of Baartman. In addition to pain or other physical experiences, researchers such as Joseph Le Conte and Edward Drinker Cope, who were also founding members of the American School of Evolution, suggested that "moral sense" or "sympathy, pity, [and] love" were absent from black communities and holding them back from racial advancement (Ibid., 287). Sympathy was the most widely discussed aspect of these necessary mental traits; as studied by Susan Lanzoni, "sympathy was tethered to a variety of moral and epistemological ends" (2009, 270). Controlling sentiments was therefore described as an evolutionary progression amongst humans. Multiple studies involved assessing sympathy in the general American population in comparison to black medical subjects, to bolster racial scientific arguments about mental and moral evolution. Scientifically, sympathy ensured "civilized responses to stimuli benefit racial progress" (Schuller 2012, 287), and the discrepancy in sympathy across races justified colonial projects. Cope and Le Conte linked pain, as a physiological response, with sympathy, as a psychological feeling, which combined to shape an individual's "degree of impressibility [which] indexed its racial status" (Ibid., 295). These emotional or mental differences were used to justify social segregation, much as the differences in bodily abilities and levels of pain could rationalize slavery or colonialism. The American School of Evolution and their European counterparts argued that colonization was necessary to protect the highly evolved sentiments of Anglo-Saxons, or "only way to ensure the continued sensitivity of the civilized" (Ibid., 286). An excess of sentiment would be the downfall of society. Similar arguments existed about pain: Cope believed that sympathy enabled individuals to understand pain and contribute to the greater good, and those who couldn't understand pain needed to be guided and have their societies controlled by more evolved beings (Ibid., 288-289). As scientists argued that black people felt minimal levels of pain and emotion, and this was a clear marker of poor evolution, this concretely demonstrated a need to separate black people from white society.

4: Mental disability, pain, and emotion: a hierarchy of others

Although Schuller focuses primarily on scientific objectivity at the intersection of race and gender, there are brief mentions of disabled individuals and their levels of pain and emotion. I will focus on examples that primarily concern mental illness and developmental disabilities, as there is

more historical discourse surrounding the Othering of these disabled people. Expanding on the categories of male sentiment and female sentimentality, Schuller references the assassination of President Garfield in 1881. The subsequent newspaper editorials, written in part by Cope of the American School of Evolution, described the assassin as insane: “the emotional or sentimental elements of character have so far overcome the rational as to cause the commission of self-destructive acts” (Ibid., 292). Mental illness was therefore equivalent to being too sentimental, or lacking the ability to act rationally or for the greater good, much like the traits associated with women and black people. A lack of sympathy, or differing levels of pain and emotion, were justification for segregation and discrimination. All three categories of race, gender, and disability emphasized human difference and were extremely popular when scientists sought test subjects. Cope himself advocated for scientific professionalization, which he believed included protecting the availability of “insane, idiotic, or deformed” people as scientific objects (Ibid., 294). One of the many studies he supported was published in *Science* journal in 1889, which was published anonymously, and discussed the 1880 US census of “the defective classes.” The author also proposed work on their enumeration: evaluating heredity of disabilities, marital relations, and new forms of classification “for educational purposes” (“Census of the Defective Classes” 1889, 38).

In classifying disability, scientists have categorized those with physical disabilities as separate from those with mental disabilities (including intellectual, sensory, and developmental disorders). This is evident in the *Science* article, where the anonymous author advocated for separating the deaf and blind into a new group who could be educated, unlike those who need “eleemosynary care or restraint” (“Census” 1889, 40). The 1880 census grouped disabilities by the following categories: blind, deaf-and-dumb, idiotic, and insane. The *Science* writer disagreed with these divisions and argued that those with congenital disorders were not the same as adults who became disabled, and all conditions should be grouped by whether they affected the senses, the mind, or the body, before being evaluated separately. Census-takers were expected to contribute to scientific research and remain objective: the author of the article advised census-takers on how to contribute to scientific research in an objective way: they suggested particular language to use, standardized questions to ask, calculations to make, and genealogies to draw, so that everyone was categorized and counted correctly (Ibid., 41).

In the discourses on mentally disabled people, numerous studies were written in the 19th century regarding abnormal levels of pain in mentally disabled subjects. “Insensibility to Pain from Mental Causes,” written by Dr.

T.W. Fisher in 1869, is one of these studies. Dr. Fisher references a case of a patient who was hit several times on the head after running away and being arrested, and his resulting medical treatment. He references a testimony of Dr. Walker from the Boston Lunatic Hospital, who stated, “immunity from pain, by reason of mental disease in most of its forms, was a well-known fact and matter of record” (Fisher 1869, 416). Other studies from the mid to late-19th century are similar in content (Kendell 2001). Doctors were prone to believe that anyone with a mental disorder was unable to feel and express pain normally. The combination of criminalizing disability, segregating populations, and medicalizing crime suggests that, in principle, there were no disabled scientists, because of the criteria necessary to become a doctor. Unlike in the discourses surrounding racial and gendered Othering, disabled people were not explicitly made into scientific objects because of their lack of objectivity, but similar ideas regarding pain and emotion prevented them from practicing science nonetheless.

5. Pain and emotion in the disabled Other: contemporary discourses of autism

For disabilities, in particular mental and developmental disorders, ideas about pain and emotion are often contradictory, although significant differences are always drawn between a disabled and a non-disabled individual. Contemporary narratives about autism are a common example: the majority of articles published today about autism suggest that autistic children do not experience normal levels of empathy or pain, and are unable to express either in a regulated way (Volkmar 2005). The Diagnostic and Statistic Manual of Mental Disorders, published by the American Psychiatric Association, lists “hyper- or hyporeactivity to sensory input or unusual interests in sensory aspects of the environment (e.g. apparent indifference to pain/temperature...)” (2013). Supporting studies claim that since autistic children often express pain differently than their neurotypical peers, their pain cannot be quantifiably compared. This argument is based on research that links facial expressions or other emotional reactions to pain as representative of the level of pain felt. If an autistic child doesn’t have a standard expression of pain on his or her face when having blood drawn, even though they still feel the needle and the pain, parents and doctors argue that they are not in pain. Another study, from 2009, focused on the biological or chemical reasons that autistic children “displayed absent or reduced behavioral pain reactivity” instead of questioning the premise that facial expressions can reflect a lack of feeling pain (Tordjman et al 2009). This misconception is common enough that major autism organizations like the United Kingdom’s National Autistic Society emphasize that “people with

autism may not feel pain” on their webpage dedicated to autism and health. When organizations like the NAS and APA promote the idea that autistic people either don’t feel pain normally or express it in the same way as their peers, this idea enters mainstream society and becomes an accepted part of disability discourse.

While some opposing research exists that suggests autistic children experience pain more acutely than other children, and that they have too much empathy and emotion (but are unable to express this in a normative way, resulting in a “lack of facial response”), these often rely on the connection between autism and sensory disorders (Bumiller 2008). When combined with sensory input such as painful stimuli, a sensory disorder (autism has many comorbid disorders that address sensory processing or modulation) could result in feeling a pinch or a burn either very minimally or at an extremely painful level, or incorrectly expressing this reaction. Similar arguments exist for emotion that parallel the 19th-century discourse about sympathy in black people. One of the most common stereotypes about autistics is their lack of empathy, based largely on the assumption that they experience both pain and emotion at diminished levels, leaving them unable to recognize either in peers. Studies argue that autistic people have “impaired emotion recognition performance” and an inability to personally connect, supporting an assumed lack of empathy (Lerner et al 2013). In a broader social context, this debate is framed in questions that go deeper than empathy, like blog posts that ask “Do people with autism experience emotions?” (Big Think 2012). A study published in 2011 compared distorted social perceptions amongst subjects who were autistic, schizophrenic, or psychopaths. One of their arguments was that psychopaths cannot perceive experiences like pain in humans or animals, similar to the claims that have been made about autistic individuals (Gray et al 2011). Although the linking of autism and psychopathy is not new, it does represent the negative consequences of trying to assess pain or emotion in disabled people. Discourses linking autism and psychopathy potentially stigmatize autistics by relying on arguments about emotional processing, empathy, and levels of pain to justify social discrimination and segregation.

6. Conclusion

Although studies of the differences between scientists and bodies marked as “the Other”, whether as raced, gendered, or disabled, existed prior to the 19th century, the 19th century marked a clearly increased interest in marking categories and labeling people as abnormal. Science rationalized the process of Othering and researchers could potentially use these discourses to justify anything from discrimination to colonialism.

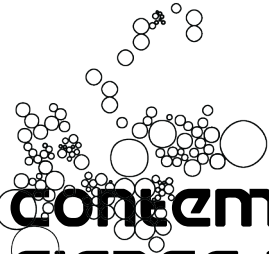
Whether the levels of pain and emotion were too high or too low, or if there were changes in regulation or expression, there were significant stereotypes about the differences between humans, and these stereotypes had consequences. Although objectivity is not explicitly articulated in most of these cases, the link between pain, emotion, and objectivity is historically strong enough that questions of objectivity are still relevant. As scientists distanced themselves from the Other, positioning themselves as emotionally neutral and objective, and therefore with the authority to categorize bodies in different ways, these actions served as the foundation for discourses on pain and emotion as differentiated by race, gender, and disability. This outlook remains prevalent today.

The assumed lack of objectivity associated systematically with black people, women, and the disabled led to discursive and professional discrimination. As discussed by Schuller, science and medicine were predominantly dominated by white and able men, who set the standard to their own bodies and minds, which perpetuated the damaging cycle of scientific knowledge. All scientific fields historically had low numbers of researchers who were female, black, and/or disabled, because workplace discrimination was encouraged by the discursive discrimination in the 19th century. As in the 19th century, when studies were conducted to prove concrete differences between scientists and their (black, female, and/or disabled) subjects, the resulting categories and stereotypes are carried from the laboratories to the broader world. The effects of this can still be felt today as similar research continues to be conducted, and popular opinion suggests that people haven't unlearned stereotypes about those who are different from them. In contemporary times, women, black people, and disabled people participate in science but not at the same rates as white, able men. The stereotypes that initially prevented these groups from producing science have been heavily critiqued by feminist and science studies in academia, and are slowly changing, but the effects and stereotypes from the 19th-century discourses can still be detected in today's scientific and popular texts.

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**CONTEMPORARY ISSUES:
SCIENCE MEETS SOCIETY**

Contemporary Issues: Science Meets Society

Inverting Monstrosity: ACT UP's Fight against Scientific-Popular Discourses of AIDS

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1. Introduction

The ACT UP movement emerged in the late 1980s in the U.S. to fight the AIDS epidemic and draw public and state's attention to it. One of the many things that distinguish this queer movement from others is the variety of visual strategies that were employed. In this paper, I focus on one of those strategies: i.e. how ACT UP criticized the movement's political enemies in particular and biomedical politics in general in its own posters. By analyzing this visual discourse, I argue that ACT UP used the genre of monstrosity to counter homophobic scientific-popular discourses of AIDS that were demonizing gay men and constructing their image as monsters. I claim that such discursive confrontation of ACT UP were realized by deliberately employing visual strategy to appropriate the genre of monstrosity from those scientific-popular discourses. First, I will delineate these latter discourses before turning to the aspects of monstrosity and monstrous homosexuality. I will finish with a short analysis of ACT UP's visual strategy of using posters to respond to popular-scientific discourses of AIDS.

2. The image of the gay man in the AIDS crisis

The AIDS crisis in the American society in the 1980s was accompanied by state ignorance, scientific homophobia, and media hostility directed against homosexuals. Media played a significant role here: together with early medical discourses of AIDS that labelled it a "gay cancer", "gay disease" or "gay plague" interchangeably (Epstein 1996, 45-48; Lupton 1994, 8), the media was thoroughly constructing AIDS as a mysterious retribution to promiscuous homosexual life. The discourse around AIDS was grounded in hierarchical binaries: illness/health, Homosexual/heterosexual, guilty/innocent, perpetrator/victim, contamination/cleanliness, abnormal/normal etc. (Treichler 1987, 63-64). The discursive constructions of binary oppositions served to stigmatize

those living on the “other side” of AIDS. As Deborah Lupton (1994, 49-50) shows in her analysis of the Australian press that reflected the tendencies of the U.S., in the early 80s media reports coupled AIDS with gayness, deviance, plague, mystery, and death, and constructed those binary oppositions to defend the general heterosexual public from any connotations to AIDS.

Treichler (1987) states that biomedical discourse in the U.S. also operated in the same way: “ambiguity, homophobia, stereotyping, confusion, doublethink, them-versus-us, blame-the-victim, wishful thinking: none of these popular forms of semantic legerdemain about AIDS is absent from biomedical communication” (37). Moreover, those popular discourses that tied AIDS with homosexuals were directly buttressed by scientific ones. During the early 1980s, scientific explanations of AIDS were formulated within the interpretative frame of immunology, since the first cases of AIDS were understood to be unknown immunological breakdown in gay men (Patton 1990, 61). Immunological interpretations emphasized the nuanced relationship between environment and body, the disturbance of which caused weakness and illness of the body (Ibid.). This immunological viewpoint introduced the popular “immune overload” hypothesis that was based on the presumption that AIDS is most probably caused by the excess of gay life style: too much sex, too much semen, too many sexually transmitted diseases and too many recreational drugs to fight those diseases (Epstein 1996, 49; Patton 1990, 61). Despite the already known cases of AIDS in IV drug users, biomedical discourse insisted on the causal relation between gays and AIDS. This means that both popular and scientific discourses were ruled by the same biased ideological narratives and explanations that were consolidated by the media. During the early period of the AIDS epidemic, media representations were used to completely separate AIDS from the general public, the “white non-drug-using heterosexual population” (Bersani 1987, 201), not without the help of biomedical discourses.

However, when the increasing number of AIDS cases in IV drug users and hemophiliacs was reported in 1982 and especially when HIV was identified in 1984, immunology ceased to be an adequate explanatory framework. It was replaced by a virologic conceptualization built on the discovery of the virus-like agent that causes AIDS and on the principle of “one disease, one cause, one cure” (Epstein 1996, 59). As a result, later treatments and drug trials were also based on the virologic model: unlike the early treatments where immune boosters were used, later treatments

and drug trials were designed to attack the virus itself and prohibited using any other medication, not even those drugs that could stop deadly opportunistic infections (Patton 1990, 63; Collins and Pinch 2005, 165). Virologic thinking inspired public discourse and popular modes of thinking as well: it was feared that now AIDS might potentially affect everyone (Epstein 1996, 59) while still being an attribute of the homosexual who is “morally culpable (both self-destructive and homicidal) for engaging in activities which might result in HIV infections in the absence of a “cure” or “vaccine”” (Patton 1990, 64). Biomedical discourse was again to support and inspire popular discourses of AIDS.

Alongside the emerging cases of AIDS within the general population¹, public discourse gradually changed and AIDS began to be perceived not as an isolated gay problem, but as a threat to the general public. Homosexuals started to be seen as serial killers, putting everyone around them at the risk of deadly virus and deliberately spreading HIV within the general public (Bersani 1987, 220-211). It was understood not just as a health crisis but a moral crisis as well: homosexual men threatened the sacred unity of “the family”, “the nation” and even “the species” (Watney 1987, 75). The “evil” was not just promiscuity, but the dangerous and heartless monstrosity causing panic, fear and anxiety everywhere around.

Moreover, according to Lupton (1994), both popular and scientific texts started addressing AIDS and its ‘carriers’ by employing the discourse of “invasion”: “AIDS discourse has roused pollution, contagion and contamination anxieties to do with the maintenance of bodily and societal boundaries against invaders” (132). Historian of medicine Mirko G. Grmek (1990, 3) stresses the same aspect – AIDS was not only a “strange” disease, but also “foreign”, coming from “strangers” from “beyond” attacking the healthy society. Nevertheless, paradoxically, these invaders were not outside the safe bodily and societal order: “Like HIV lurking silently within a nucleus of a cell, the ‘other’, the gay man, prostitute or injecting drug user, lurks within the body politic, breaking boundaries by spreading disease into the heterosexual population using bisexual or promiscuous men as the carriers of infection” (Lupton 1994, 133). This general notion illustrates how scientific and popular discourses and perceptions were conflated and reveals how hysteric and paranoid was the public response in the face of its own created monster – the promiscuous gay man (so alien that it must have come from the “outside”) deliberately spreading a deadly virus from inside of society, so that the general public could never feel safe again.

Imagining a deadly threat, the general public burst out with hysteria and homophobia aiming to destroy the monster. The solutions of the AIDS crisis that the general public, together with the media, came up with was, for instance, the sterilization of 'AIDS carriers' or the recriminalization of homosexuals (Bersani 1987, 199). Another solution, this time from the American government, was to consider mandatory AIDS testing without guaranteed anonymity, which was understood as an effort to define a new class of people and in this way make them disposable and dependant on the state which at that time was fascinated by the idea of massive quarantine (Bordowitz 1987, 183-184). The state here also played a significant role. During the AIDS epidemic, Reagan's administration illustrated how biopolitical state actually works and how "the right to make live and to let die" (Foucault 1997, 241) was exerted in the epidemic: Reagan's ignorance of the AIDS crisis on the state level, the insufficient state funding for AIDS research, AIDS testing and safe-sex campaigns lead to neglected lives of thousands who died from AIDS. The state policy was accompanied by institutional system that carried out its biopolitical tasks: for instance, employers could fire employees with AIDS, doctors refused to operate on people with HIV, schools refused forbidden children with AIDS, etc. (Bersani 1987, 199). All this illustrates how biopolitical state fragments society into classes, creates the separate new class of gay men and other groups of people tied to the risk of AIDS, and leaves them to die.

The picture of AIDS-affected homosexual man was constructed from two fabrics – the narratives of sexually perverse promiscuous homosexual man and of deadly power of HIV/AIDS that both were produced by scientific-popular discourses. It is not surprising then that the "master narrative" of the AIDS epidemic constructed gay men as promiscuous killers, deadly invaders, and polluting deviants that destroy society, population, nation, family, morality, and sexual norms. In the next section I will look how this image was constructed through the genre of monstrosity. It will help to look more in-depth into the social regimes that constructed and maintained this image.

3. The gay man as monster

A monster is the product of the cultural, social and political imagination that has a specific place in a society. Nevertheless, monsters are not merely metaphors: for society, monsters are real – embodying the worst nightmare, causing the ultimate danger for social /cultural/ political/ /bodily orders and their normative standards. Monsters – the object of

public hysteria, fear and anxiety – are constructed by the media, state, politics, public rhetoric, science, public emotions and other ways through the genre of demonization, dehumanization, criminalization and *monstering*.

How monsters are made? Edward J. Ingebretsen (1998, 30) claims that monster-making is, on one hand, about the repudiation, denial, and dis-nomination of the one who violates the order(s) of society and, on the other hand, the naming, identification, and cursing of that deviance as monstrous. The analysis of scientific-public discourses of AIDS quite accurately illustrates this monster-making process: the marginalization and separation of homosexual men from the healthy general public was accompanied by naming/cursing them as various kinds of monsters: promiscuous killers, deadly invaders, etc. What was understood as especially monstrous in homosexuals is the breaking of bodily boundaries, disrupting corporeal integrity and thus all bodily order by invading, polluting, and contaminating the population of healthy bodies. This was perceived as monstrous because “the notion of the diseased, the unclean or the contaminated is never just an empirical ... descriptor, but carries the weight of all that stands against – and of course paradoxically secures – the normative categories of ontology and epistemology” (Shildrick, 2002, 70). In other words, “the homosexual monster” is seen as threatening not only to society but to the whole of Western culture and its normative values: it threatens the closed, pure, and rational body image as well as the bodily integrity of the unitary subject and the stability of the relationship between the Self and the Other.

Nevertheless, monsters play a very crucial role in a society: they are paradoxically used as a mark that helps to reassert the normative values. As Shildrick (2002) perfectly describes, “the monster... rather than being simply an instance of otherness, reminds us always of what must be abjected from the self’s clean and proper body” (54). Thus a monster is a reminder, calling people to come back to the roots of the normative life. That is why monster-making works as a social ritual of periodic cleansing from the diseased elements in a society: those elements are pushed into the margins of the social body and serve there as an “outside” according to which “the normal” is reasserted and secured (Ingebretsen 1998, 26). In other words, monsters tell us how to be good and normal and what happens when you are not (Ibid.). The AIDS discourse that I depicted above is similar: it shows how homosexual men, together with other AIDS-affected groups, served to reinforce the binaries between

homosexual/heterosexual, illness/health and so on, to consolidate the categories of what is normal, to remap the borders of the general public, and to solidify conservative morality and traditional values.

Another role that monsters have to play is to die. Ingebretsen (1998, 29-30) claims that from the very beginning a monster is created for the purpose to be killed, for it cannot be left to live, since it reveals that the society in which monster has emerged is not perfect, that the regimes of normality in that society are not ideal, that monsters are our failed selves, and that monstrosity is a potential in all of us, because our ways of living to some extent are hardly compatible with social norms. Monster-making is not about something foreign or outside of us or our society. Popular imagination portrays monsters as always local, existing nearby in the neighbourhood or even in our own homes (Ingebretsen 1998, 31). Monsters are inherent in society and that is obvious when analyzing discourses of AIDS: homosexuals are invaders, and intruders, but at the same time they are always already inside, lurking silently within the nucleus of a society.

The same paradox of the homosexual monster recurs in the scientific modes of thinking about AIDS as well. While in the virological framework the virus is invading from the outside of the general public in the body of homosexual man, the immunologic explanation suggests that for a society, AIDS and gay man are not "an overwhelming enemy, but a slow degeneration that occurred after the tolerant host had diminished its controls or surveillance" (Patton 1990, 60). What joins these two sides of the paradox is anxiety and fear caused by the uncertainty and unpredictability that the paradox brings. Such a long and deadly history of failure and mistakes that modern science had with HIV/AIDS shows that anxiety and fear coming from biomedical discourses were not the last factors in constructing the paradoxical monstrosity of AIDS and gay men.

Making a gay man a monster is about delineating the boundaries of what is human and what is non-human or in-human. Thus monster-making is also human-making (Ingebretsen 1998, 30): through the denial, rejection, and marginalization of homosexuals and other groups on the margins, society reinstates its values, norms and rules. A monster is itself a paradoxical creature: he is an invader that lives within a society to embody its fears and anxieties.

4. Political enemy as monster

During the AIDS crisis, the ACT UP movement was fighting not only against the actual ineffective state politics but mainstream representations of AIDS as well. In the context of massive disinformation about HIV/AIDS and the hostile discourses demonizing homosexual men, the ACT UP movement used various forms of visual activism to produce counter-representations and counter-information of AIDS (Crimp 1987, 14). The posters that were used by the movement in various protests, I claim, are one of those counter-representations of the AIDS discourse. In this section, I will analyze posters of two kinds (all from the late 1980s and early 1990s): first, those which depict the faces of the movement's political enemies (various politicians and priests) as different types of monsters and, second, those which criticize monstrous biomedical politics. These two types of posters represent two directions of ACT UP critique: a response to popular and scientific discourses.

My analysis shows that these ACT UP posters were used strategically and deliberately as a response either to prevailed demonizing scientific-popular discourses directed against homosexuals and promoted by the political figures or to the ignorance of political leaders and biomedical politics in the face of the AIDS epidemic that let this crisis and those discourses to thrive. The posters were created to visualise the monstrousness of those political enemies and those biomedical policies for not taking responsibility for the public health crisis. This strategy of ACT UP is about giving back the monstrousness, reconstructing monstrosity in the AIDS discourse and turning back the responsibility of AIDS crisis. The posters convey the messages that it is biomedical politics that are monstrous because of their ineffectiveness, that it is politicians who are monsters because they ignore thousands of deaths, that it is their responsibility to take measures and stop this public health crisis, and that it is they who are serial killers destroying the society and who let the virus spread. Turning to a short visual discourse analysis will show how the monstrosity genre was created by visual means and how this visual discourse turned the monstrosity (previously ascribed to gay men) back. Since this article aims to delineate the logic of inverting monstrosity genre, my short analysis will serve as an illustration of discourse inversion strategy rather than a detailed account of the visuals, including the specific contexts from which the posters emerged.

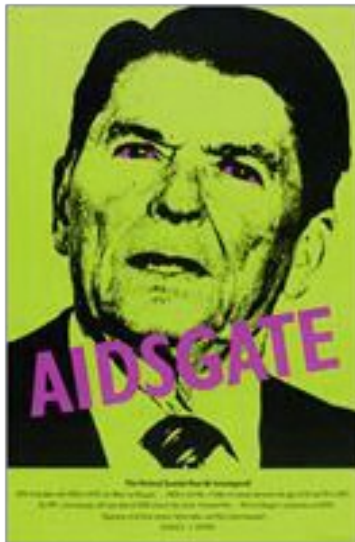


Figure 1. ACT UP New York, *AIDSGATE*. 1987, Offset.

In the first group of posters, probably the most famous one used in many ACT UP campaigns was the “AIDSGATE” (fig. 1). It portrays then-president Ronald Reagan by using direct visual allusions to monstrosity because of his scandalous ignorance to take any significant measure towards AIDS crisis or even address it publicly as an issue until 1987. The face coloured green, demonic red eyes and face expression reminds the viewer of Frankenstein or at least persuades us that what we see is some kind of monster. In these graphics the responsibility, guilt and monstrosity of the AIDS epidemic is redirected to Reagan as the specific political figure as well as the main icon signifying homophobia at the time. The second poster (fig. 2) that was mainly used in the 1990s continues within the monstrosity genre: the eyes and the facial expression of the conservative homophobic politician Newt Gingrich looks crazily demonic and this depiction works again to readdress the hostile discourse back to where it came from (as in “it is not homosexuals or AIDS, it is you and your homophobia that is a heartless monstrous killer”).



Figure 2. ACT UP New York, Newt Gingrich image. 1996-7. The New York Public Library.

A different visual rhetoric is employed in portraits (fig. 3 and 4) criticizing religious leaders and the homophobia coming from the Catholic Church. The spiral eyes in both faces suggest that they are hypnotized (by religion or homophobia) and thus mad and insane. That is why they are dangerous to society ("Public health menace") and need to be stopped ("Stop the Pope"). That is the exact inversion of the public discourse of AIDS which normally presented homosexuals as those who endanger public health and society by spreading the virus.



Figure 3. ACT UP New York, Stop the Pope. John Paul is a drag. 1996-7. The New York Public Library.



Figure 4. Vincent Gagliostro, Public Health Menace. 1987. International Center of Photography



Figure 5. ACT UP New York, Buchanan AIDS disaster. Campaign '92. 1992. The New York Public Library



Figure 6. ACT UP New York, SERIAL KILLER

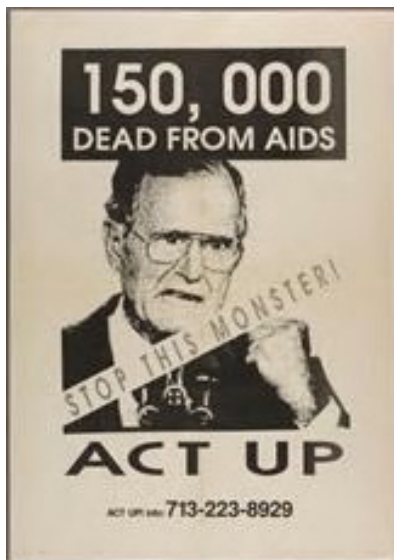


Figure 7. ACT UP New York, 150,000 dead from AIDS. Stop this monster! 1996-7. The New York Public Library

The last four posters (fig. 5, 6, 7 and 8) present politicians as an embodied ultimate evil. In the first poster (fig. 5) Reagan's Chief of Communication Patrick Buchanan is called an "AIDS disaster" and made to look like Hitler (by drawing Hitler's moustache and red eyes), hence, the human monster. This poster is a direct reaction to Buchanan's homophobic discourse and his infamous public statements: for instance, he once claimed that AIDS is "an awful retribution of nature" (Volsky 2014). This poster works similarly to others – it inverts the discourse: "it is not we, it is you who are "AIDS disaster"". The other two posters depict President George Bush and name him as a serial killer and monster ("Stop this monster", fig. 7) by stressing his failing responsibility to manage the AIDS crisis. It again sends back the discourse of monstrosity and guilt (attached to gay men) to the most important political figure responsible for not taking sufficient measures in the face of thousands of deaths. The last graphic (fig. 8) resembles the others: the Governor of Puerto Rico, Hernandez Colon, becomes another target of ACT UP and is called the "AIDS criminal", or rather labelled as one.

Labelling is an important visual motif that is common in most of these posters. Labels such as "Serial killer", "Monster", "AIDS disaster",

and “AIDS criminal” attached to the faces of political enemies signifies the power to label, or to put things into categories. In the context of inversion strategies, this means detaching and redistributing the social labels attributed to homosexual men in the AIDS epidemic. Labelling is also the power of naming and of holding some kind of discourse, which means having at least some control over the categories that are attributed and distributed. Thus this strategy of labelling is an active and powerful response to social stigmatization of gay men: labelling here is another way of expropriating and redistributing power and discourse in a manner of inversion.

The second group of ACT UP posters is about the monstrosity of biomedical politics. In order to address the importance and urgency of national health care system in the face of an epidemic, ACT UP used highly visualized posters. One depicts dead bodies lying on the street and ignored by those passing-by – this quite literally displays that “health care cuts kill” (fig. 9). It directly addresses the specific biomedical policies and exposes their deadly effects. The poster also depicts a shocking ignorance and indifference of those policies to those dying of AIDS, so it raises again the questions of responsibility and guilt.

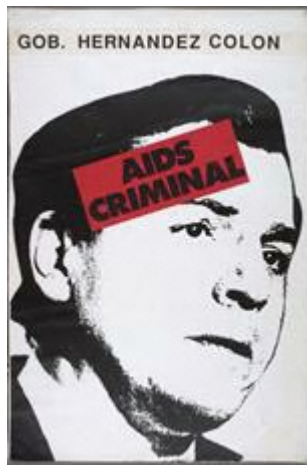


Figure 8. ACT UP New York, GOB. Hernandez Colon. AIDS criminal. 1996-7. The New York Public Library.



Figure 9. ACT UP New York. Health care cuts kill. 1996-7. New York Public Library.

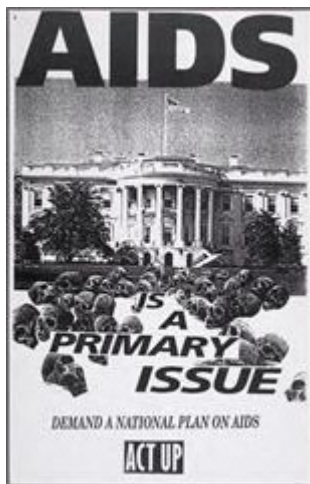


Figure 10. ACT UP New York. AIDS is a primary issue. 1996-7. New York Public Library.

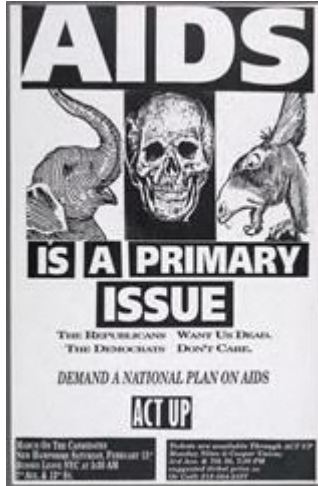


Figure 11. ACT UP New York. AIDS is a primary issue / The Republicans Want Us Dead. The Democrats Don't Care. 1996-7. New York Public Library.

Another poster (fig. 10) shows a mass of human skulls lying in front of the White House with the text “AIDS is a primary issue / demand a national plan on AIDS”. Similar to this one, the two other posters (fig. 11 and 12) use the same motif of skulls and the same slogan, adding to it “The Republicans Want Us Dead, The Democrats Don't Care”. All of these posters direct the responsibility for the deaths of AIDS victims to political power and biomedical politics (in particular, health care cuts and a lack of national strategy) that failed to take the proper measures to tackle the crisis. ACT UP was criticizing the American health care system in general: activists used to stress that in the AIDS epidemic the U.S. still remained the only industrialized country other than South Africa without a nationalized health care system. The skulls and dead bodies in these posters function to invert the popular-scientific discourse by appealing to the monstrousness of biomedical politics which neglected and abandoned those who were in the need of medical protection.

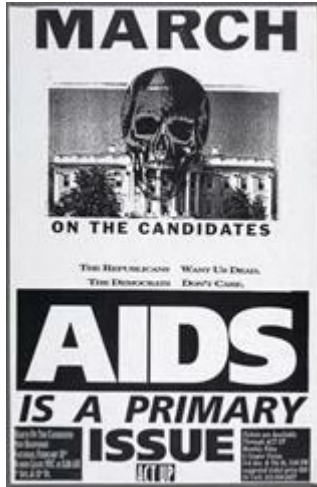


Figure 12. ACT UP New York. March on the candidates / AIDS is a primary issue. 1996-7. New York Public Library



Figure 13. ACT UP New York. *Mandatory HIV testing is here!*. 1996-7. New York Public Library.



Figure 14. ACT UP New York. Healthcare not wealthcare. n.d.

Another ACT UP poster is part of the campaign against mandatory HIV testing for immigrants that resulted in exclusions and deportations (fig. 13). In this poster, activists used the black and white American flag with a crazy-looking doctor holding a syringe in his hand and pointing his finger straight to us. These visuals were used to create a portrait of a mad, obsessed and dangerous doctor – the inversed portrait of how usually doctors are perceived. One more poster that uses an image of a doctor as well portrays a greedy-looking male doctor and tells: “healthcare not wealthcare / greed=death / we die they profit” (fig. 14). This was ACT UP’s attack on pharmaceutical companies profiting from selling AIDS drugs when the expensive pricing of AZT raised the controversy. This image again transforms the medical authority and scientific objectivity of a doctor into something totally opposite: a morally corrupted figure.

5. Conclusion

To conclude, in the visual campaigns of ACT UP the monstrosity genre had a different function and purpose than in homophobic discourses. The monstrosity genre for ACT UP was a way to respond to those scientific-popular discourses that portrayed gay men as monsters destroying a healthy society. The movement took this genre to appropriate and invert it and in this way resignified what is monstrous and who are

monsters in the AIDS epidemic. This appropriation and resignification served to redirect responsibility and guilt to the homophobic discourses and homophobic politics that made the AIDS crisis so deadly. This analysis also allows us to better understand the role of monstrosity in the time of the crisis: the figure of a monster is usually employed to reinstate and reassert the norms and values of a society through the rejection and marginalization of the Other. However, the example of ACT UP reveals that a monster has agency to respond with appropriation, resignification, redistribution, and inversion of his own monstrosity as a resource of power.

It is important to note that this visual strategy was not the only one or exclusive to the ACT UP movement. ACT UP and its artists collective, Gran Fury, that produced a big part of ACT UP's visuals were using many different visual tactics and strategies and this analysis only adds another small detail to a vivid and diverse picture of this political and cultural movement.

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¹ Treichler (1987) claims that "the major turning point in US consciousness came when Rock Hudson [a famous American actor] acknowledged [in 1985] that he was being treated for AIDS" (43).

The Ideology of Choice: Abortion (Bio-) Politics, Prenatal Screenings and Women's Liberation

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1. Introduction

It is eight o'clock in the morning and I am sitting in the doctor's room of the department of endocrinology in a hospital in Prague, waiting for my regular check-up. Like every other year since I was seven. When I was a kid, I was diagnosed with hypothyroidism, which is an autoimmune disease that causes the underproduction of certain hormones necessary for the well-functioning of my body. For several years, I have visited the hospital and my doctor has advised me on what to do with my thyroid if I become pregnant. Each time, I say that I have no desire to become pregnant but the doctor continues to talk, no matter my stance on pregnancy. The same situation happens also this day, at 8 o'clock in the morning. I am sitting at the doctor's room, obtaining my "perfect" results while listening to her recommendations concerning my future. I feel obliged by the tone of her voice, by the sanitary environment and her arguments to become a disciplined patient, a reasonable responsible woman who wants the best for her and her maybe-future baby. But it is the emphasis on the quality of the baby that makes me question whether the interest in my responsabilisation is more about me or the future citizen represented by the idea of my baby. As the doctor says, "We want a baby of the highest quality."

First, I do not understand who she meant by that "we." Second, I do not understand what she means by the "high quality" standard, which provokes my fast answer: "So you think that babies that are not able-bodied are not good?" I am not expecting for my question to cause such anger and hostility. The doctor continues, "Of course you don't have to do it. You don't have to follow my advice. It is your choice." Even though the doctor frames my action through the rhetoric of choice and emphasizes my individual agency, I feel that it is not my "real" choice if I feel that I should act in the name of my future offspring. Especially when the doctor carries her thoughts on with a story about a couple of doctors who refused to undergo prenatal screenings when the woman was pregnant. "They also refused, convinced

how anti-ethical the procedure is and they ended up with a child with Down Syndrome,” the doctor utters. I feel threatened despite the fact she thinks that she is giving me the best non-coercive advice. I feel like I am trapped and the only decision I can make is the one that complies with the dominant one. Leaving the doctor's room in a cranky mood, I start thinking about choice, women's liberation and the dominant machinery, in which certain lives are deemed less desirable than others.

In this paper I explore the borders of one's autonomy and self by analysing contemporary feminist and other critical scholarships that problematize the concept of reproductive freedom articulated as an individual “right to choose.” The contemporary critical feminist scholarships disclose how class, age, racial status and (dis)ability greatly nuance the meaning of *choice*, dividing good mothers from those whose reproduction is deemed undesirable. In particular, the case of prenatal screenings highlights the limits to women's freedoms set by the newly emerging reproductive technologies and medical/cultural discourses which imagine the production of a “perfect child” in a neoliberal context of choice. In this paper, I argue that reproductive freedom articulated as an individual right to choose is an ideological construct serving the purpose of white able-bodied supremacy that masks its interests to control women's sexuality and reproduction under the veil of women's liberation. This paper is divided in two main sections. The first part is concerned with the critical feminist scholarship and the limits of freedom set by neoliberal discourses of choice. The second part of the paper discloses the parallels between biopolitics and critical feminist scholarship while emphasizing that biopolitical theories are a useful feminist tool, which propose a different concept of freedom: a freedom which cannot be possessed or lost but which is discursively negotiated, i.e. ideologically structuring the field of women's possibilities/choices. Biopolitical understanding of freedom discloses that the choices women make are not only influenced by different juridical regulations but also by the various medical and cultural discourses that form and split good/bad motherhood along the ageist, ableist and racist lines. These theories further emphasize the impossibility of escaping power relations and therefore represent an attempt to deviate from the abstract concept of rights resting on the autonomously deciding self, which dominates the contemporary understanding of reproductive freedoms. As my personal story shows, regardless of their age or ambitions to become pregnant, women are subjected to different regimes of truth represented by various cultural and medical discourses on good motherhood/ “perfect child” that

structure the possibilities of how she can *be* and what she can *choose*. The choice she makes thus not only depends on what she *has* but also on what she *can have* since the decision is never truly just hers and therefore is (inter)dependent on its context and the differently interlocked systems of oppression she is positioned into.

2. Feminism(s) and the right to choose

In the 1970s, the legalization of abortion was a key issue for many women's liberation groups in the USA. It was believed that access to a reliable form of contraception and safe abortions would make women the primary judges of their reproductive lives. Feminists argued that the right to control one's body was an integral part of women's full citizenship and autonomy (O'Brien Hallstein 2010, 12-13). The attribution of this right made many white second-wave feminists believe that the struggle over women's freedom was over and that the dilemma was resolved for all women (Solinger 2001, 4). It was assumed that the recognition of abortion as a negative right, as a right to privacy, would emancipate women from the dominant masculine ideology and that motherhood/reproduction will become a matter of *free* unlimited *choices*. However, the *Roe* decision¹ already set clear limits to women's freedom by defining foetal development and therefore defining the state's "legitimate" interest to intervene in women's private lives. Furthermore, it was the Hyde amendment in 1977 which abolished all public funding for abortion that raised attention between many critical and mainly feminist scholars and activists of colour who pinpointed its discriminatory character.

The "right to choose" came to be criticized, I argue, from two directions. First, it was the neutrality principle based on privacy claims and the utopian egalitarianism of all women that evoked a response from feminist scholars and activists (Lublin 1997; Petchesky 1990; Price 2010; Roberts 1999; Sethna 2012; Smith 2005; Solinger 2001). Second, it was the emerging foetus rights, the shifting of the living threshold facilitated by technological development that was challenged by many feminist critical thinkers (Duden 1994; Lublin 1997; Petchesky 1990; Roberts 2009; Rothman 1985; Samerski 2009). All of these aforementioned scholars show that having a *free* choice is an ideological construct veiling the "fact" that class, age, ability, and race nuance the meaning of choice. First, I will disclose the critique aiming at dismantling the neutrality principle while pondering choice as a social construct. Second, I will demonstrate the impossibility of decisions many critical scholars pinpointed when confronting the newly emerging foetus rights and the dominant discourse of a "perfect child."

Feminism(s) against the Neutrality Principle

Critical feminist scholars made clear that abortion access cannot be defended through the articulation of reproductive freedom understood as a woman's right to choose because such a strategy overlooks the complex socio-cultural context, in which such choices occur. Jael Silliman commented on the choice paradigm by arguing that,

[Ch]oice is rooted in the neoliberal tradition that locates individual rights at its core...[thus obscuring] the social context in which individuals make choices, and discounting the ways in which the state regulates populations, disciplines individual bodies, and exercises control over sexuality, gender and reproduction (Silliman in O'Brien Hallstein, XXVII).

In the logic of the law, women are allowed to have abortion but the state is not responsible for securing their access to abortions (Lublin 1997; Petchesky 1990; Roberts 1999; Sethna 2012; Solinger 2001). This logic springs from the fact that the law is based on a neutrality principle through which every citizen is perceived on the same basis, without taking into account the broad structural elements that either limit or facilitate one's choices. However, minimizing government involvement can seriously limit the access to such services, especially in the case of young women (Petchesky 1990).

This problem with accessing abortion services is convincingly demonstrated by Christabelle Sethna and Marion Doull (2012) in their study concerned with abortion tourism, that is, women who travel to access abortion services. The so-called extra-legal impediments, i.e. the cost of the services, the geographical distance to obtain abortion, the time-consuming parental referrals or approval policies, but also the anti-choice harassment, complicate access to abortion even in places where abortion is legal. As these scholars pinpointed, "While there is no doubt that some women want to journey away from their home communities in order to protect their anonymity, the geographical distance to abortion services remains one of the major barriers to abortion access" (164). It is possible to say then that state non-intervention creates a social division in society according to wealth and geographic location, complicating the possibility to choose for many women (Lublin 1997; Sethna 2012; Solinger 2001).

The rhetoric of free choice overlooks that some women have choices and some don't while also delineating the borders of proper and responsible motherhood. Rickie Solinger (2001) shows that choice has become a consumer privilege enjoyed mostly by white middle-class women. The author

compellingly criticizes the concept of “choice” by making a distinction between “rights,” understood as “privileges or benefits that one can exercise without access to any special resources”; and “choices” for which one needs to possess some resources (6). In the dominant discourse of unlimited choices, women who have some resources are labelled as good choosers whereas poor mothers that depend on welfare are perceived as burdens of society, beggars who did not make the right choices. Choice and privacy is then something that poor women do not have, the author convincingly claims. Under such circumstances, a poor woman can hardly afford to pay for the service or travel to the closest location where she could access it.

Moreover, race has always separated the experiences of childbearing and pregnancy for white middle class women and for women of colour (Roberts 1999; Smith 2005; Solinger 2001). Many critical scholars pinpointed eugenics and genocide as effects of the state's commitment to non-intervention. They identified that what is perceived as a right for some can be a duty for others. For example, mainstream feminist agenda celebrates the emergence of safe birth control as a sign of women's liberation and a symbol of feminist achievements. However, it was African American women who had sponsored access to birth control long before other women. They were the target of early population control policies which kept an eye on those whose reproduction was deemed undesirable (Roberts 1999). These practices, based on racist attitudes and depicting women of colour as welfare queens in need of control, do not belong just to the first half of the twentieth century. Solinger shows how many poor American women were forced to opt for sterilisation when abortion funding was cut down immediately after *Roe v. Wade*. She argues that “[f]or many poor women after *Roe*, perhaps especially for poor women of colour, reproductive choice came to mean deciding between an abortion they didn't have the money to pay for and a sterilisation they also did not have the money for, but for which the federal government would pick up the tab” (Solinger 2001, 11). Reproductive politics in North America thus inevitably connotes racial politics, and the rhetoric of free choice seems to be facilitating its functioning.

This review of the critical feminist scholarship shows that without taking the complicated historical and socio-economic context into account, we cannot understand the decisions of certain women (Petchesky 1984; Roberts 1999; Smith 2005; Solinger 2001). These scholars thus lead us to a new paradigm of social justice, which does not abandon the notion of liberty but attempts to make it stronger and aware of the different systems of oppression that form who we are. As Roberts states, “[t]he abstract freedom

to choose is of meagre value without meaningful options from which to choose and the ability to effectuate one's choice" (1999, 309). It is believed that the social justice framework, by employing the positive notion of liberty and racial equality, can enhance one's autonomy and self-determination. According to these scholars, the state would not just make sure that women have rights to not have children but also the rights to have them and parent them (Price 2010; Roberts 1999). Even though choice can be understood as just for *some*, the case of prenatal screenings shows that *all* women (regardless whether their bodies are read as pregnant or pre-pregnant) are subjected to different regimes of truth represented by medical and cultural discourses on a perfect child, which further problematizes the liberal understanding of choice.

Feminism(s) against the "perfect child"

The second main critique of abortion rights articulated through the rhetoric of choice can be read as a response to the emergence of new technologies of power and the invention of a "perfect child." Many scholars criticized the newly emerging discourse of foetus as a living object on its own, as an entity that is separable from women's bodies, as an autonomous subject endowed with rights and therefore in need of protection. As Barbara Duden (1994) demonstrated, "[t]he noun 'fetus' (...) has assumed imperative connotations. It now refers to an object in need of care that demands tests, diagnosis, protection, and management, if not transplantations and abortions" (134). The changing discourses regarding reproduction, complemented by the development of new technologies, have re-signified how we understand child-bearing, pregnancy and reproduction in general. Children are seen as products, as planned products of conception (Rothman 1985, 188) whose quality depends on their mother's behaviour and actions.

In the neoliberal era of choice women are hailed by the scientific, medical and popular discourses in becoming responsible parents who want the best for their children, and the responsibility to make a decision is placed on them (Samerski 2009; Roberts 2009). The focus on the "perfect baby" represents a new tendency which treats pregnant women only in regard to the outcome, i.e. the baby whose quality is assessed by different genetic prenatal tests such as amniocentesis (Dumit and Davis-Floyd 1998, 5). We can see that the new meanings of reproduction are based on a technocratic model, which allows for the separation of the mother and her child. Women are seen as empty containers, their foetuses as separate beings implanted in their wombs which have to be controlled by the newest technologies to

achieve the highest quality (Rothman 1985). Despite the fact that the new technologies have brought new possibilities of controlling the undesirable outcomes of pregnancy they have also, according to many, posed a threat to women's freedoms and rights (Petchesky 1990; Roberts 2009; Rothman 1985; Samerski 2009).

Gradually with the developments in science, women became subjected to the modern regimes of truth, subordinated to the hegemony of medical personal, and positioned in "the decisional trap" (Samerski 2009, 754) to choose what is *right* to do. Women cannot just wait for the baby to come; instead they have become managers of foetal risk profiles. As Silja Samerski pointed out, "freedom, choice and autonomy are being redefined in a way that requires scientific input and guidance services in order for them to be appropriately exercised" (755). The multiplicity of options offered by the spawning technologies present women with more choices. Yet, these choices made in the context of medical truths (i.e. dominant able-bodied norms of healthiness/fitness) and the calculus of risk seem to be limiting women's autonomy and self-determination rather than allowing it, as exemplified by my personal story. Women, regardless whether they are pregnant or not² (or even ever planning on becoming a mother), are interpellated by the various discourses to become responsible citizens who first and foremost want the best for their future offspring (and therefore experience pressure to stay healthy and not smoke, drink or take drugs, for example).

Despite the fact that any procedure cannot be done without *informed consent*, according to Samerski such professionally imposed self-determination is rather disempowering and a woman saying "no" to the genetic testing is almost impossible. Women find themselves in "the decision trap" (754) since they soon realize that being pregnant (or being a woman with a potential to reproduce) means making decisions and calculating with risk. She either delivers a disabled child, or she agrees with the risk of induced miscarriage that can be caused by the invasive technique of amniocentesis. If the test does not provide a "green light," she has to make decision whether to terminate the pregnancy or not (735-736). It is obvious that under such conditions, "to choose is compulsory" (736). Women are not obliged to fight for their rights but they are expected to exercise them in a certain way, as responsible citizen-mothers who want the best for their child according to the standards of what is consider normal. As Samerski describes, "Only those who submit to the rationality of fetal development and manageable risks are asked to make free decision," (737). Therefore, genetic counselling

represents a new social technology through which one is governed, a technology dividing good choosers from the bad ones and allowing to choose only those who comply with the norm of responsabilisation, not those who exceed it.

Moreover, most of the feminists concerned with the foetus quality assessment have emphasized the eugenic consequences that the liberal understanding of “choice” puts in place disclosing how women’s bodies are being turned into the sites of self-governance in the name of a healthy child (Meekosha 2010; Roberts 2009). This scholarship draws explicitly on Nikolas Rose’s concept of biological citizenship representing the shift in the new biopolitical regime, which Rose calls ethopolitics. The new biopolitical regime works through our individualized selves which are supposed to exercise autonomy and freedom in the range of available options. Rose comments on the situation by claiming, “the new pastors of the soma espouse the ethical principles of informed consent, autonomy, voluntary action and choice, and non-directiveness” (Rose 2001, 9). In the next section, I will elaborate how critical feminist scholarship can be enhanced or is further complementary to biopolitical theories, emphasizing that a biopolitical understanding of freedom might be useful for women’s liberation since it departs from the classical juridico-political concept of power.

3. Biopolitics, Feminism, and Choice

Biopolitical theories and the critical feminist frameworks that defy the understanding of reproductive freedom as a “right to choose” can lead to a very productive and co-enriching relationship. At this point, it is important to remind us of what biopolitics is and how it could be useful for understanding women’s liberation.

What Is Biopolitics?

The concept of biopolitics, which departs from the classical juridical concepts of sovereignty that conceptualizes power in purely negative terms, was mainly popularized by the writings of Michel Foucault (1990, 2003, 2008) and Giorgio Agamben (1995). Both of these philosophers pointed out that the relationship between life and politics was transformed since the ancient to the modern times. Agamben showed that ancient Greeks had two words for describing what we nowadays understand as “life”: *zōē* (bare life), “a living common to all living beings such as animals, men or gods”; and *bios*, a human way of life characteristic for an individual and groups. These two concepts can roughly be understood as representing a biological and political

existence. In the modern times the modes of government have been changing by including bare life, a pure biological existence, into the calculations of State power. In *The History of Sexuality*, Foucault (1990) writes that “[f]or millennia man remained what he was for Aristotle: a living animal with the additional capacity for political existence; modern man is an animal whose politics calls his existence as a living being into question” (143).

From Foucault’s description we can understand that life, especially its biological capacity, became an object of state interests in the late 18th century. One of the aims of the politics from now on was to secure bare life thereby giving the state the responsibility to take care of its population and secure its desirable growth. According to Foucault, this new power originated in two basic forms. First, human “anatomy-politics” disciplines individual bodies, which are through the processes of individualization, normalization and hierarchization made to be docile. The other pole of the power represents regulatory controls, a biopolitics of the population, which developed later in the 18th century with the emerging modern science, its classificatory system and invincible truths. These two poles, initially separate, were conjoined on many levels by the end of the 19th century. Foucault uses the example of sexuality, which is permeated by both modes of the power. He shows that by acting upon the healthy reproduction of society, the state enacts different disciplinary techniques (e.g. control of masturbation which is deemed unhealthy) to ensure good and healthy sexuality of its citizens (sexuality that leads to procreation). From this perspective, the bodies of citizens are not just regulated and controlled but through productive power they are constituted as subjects of certain ideological practices, which he calls discourses.³ Discourses are understood as “practices that systematically form the object of which they speak” (Foucault 1972, 49), i.e. as sets of statements/assumptions and expectations that guard/guide what is sayable and what is not, whose being is recognized and how, who is deemed normal and who is deviant, what is possible or what is not. Discourses are the locus where knowledge and power intersect and thus delimiting the options and conditions of our liveability.

Abortion discourses represent such ideological practices and though gender-blind,⁴ biopolitical theories can be a useful tool for a feminist analysis. As both of these positions defy liberalism, I argue that there is a mutually enriching relationship between the two. The critical feminist voices can contribute to the theories of biopolitics by showing that the splitting mechanisms of modern nation states are not neutral but rather differentiate life along the ageist, ableist, gendered, and racialized lines. On the other

hand, biopolitical theories can enhance critical feminist positions by proposing a new concept of power, in which power is not perceived as a possession but as a productive mechanism through which women are constructed as desirable/undesirable beings/mothers in the nexus of regulatory and disciplinary mechanisms. Biopolitical theories thus offer feminism a new concept of personhood that does not rest on the humanist notion of autonomous and freely deciding individuals. By departing from the classical juridical concept of power, biopolitical theories transgress the traditional dichotomies of freedom/unfreedom, public and private, outside and inside, liberal (having a choice) and authoritarian (not having a choice).

The Productivity of Power

As I have demonstrated through my analysis of the feminist literature that defies the neutrality principle implied by the “right to choose” rhetoric, these feminist scholars disclosed the biopolitical strategies of the modern North American nation-states that divide good mothers from the bad ones along the ageist, racialized, and ableist lines while emphasizing that choice is a privilege enjoyed only by some. However, their analysis is rather political than biopolitical, as it focuses on negative aspects of power, i.e. on the controlling and regulating aspects of state policies. In Rickie Solinger’s (2001) words, somebody has a choice and somebody does not, i.e. somebody has power to decide and somebody does not. Along the same lines, by stressing the value of liberty, Dorothy E. Roberts proposes that the meaning of liberty has to change for women of colour to gain the same level of autonomy as other women. According to her it is necessary to maintain the notion of liberty since “liberty stresses the value of self-definition, and it protects against the totalitarian abuse of government power” (Roberts 1999, 302).

In contrast, biopolitical analysis of abortion discourses operates along a different concept of power, through which *all women* are understood to be subjected to a certain regime of truth. In particular, perceiving risk as a social technology (Samerski 2009) and women’s bodies as the sites of self-governance (Roberts 2009) complies with the biopolitical understanding of how power works. Jana Sawicki (1991) distinguishes three main characteristics of power from such a perspective: “1. Power is exercised rather than possessed. 2. Power is not primarily repressive, but productive. 3. Power is analysed as coming from bottom up,” (21). This understanding of power rejects both liberal theories of sovereignty and Marxist theories, which perceive power as possession, as something that one can or cannot

have, highlighting that power is everywhere. It seems that even some of the critical feminist scholars too often assume the notion of authenticity that can be usurped by state or its elites, which actually might not be sufficient for understanding women's liberation.

As Clare Chambers (2008) reminds us, even if there are no repressive mechanisms that would coerce us to make certain decisions, the productivity of power stays untouched and our decision is moulded according to the dominant social norms. Chambers argues, "Even if we were to eradicate all repressive power we could leave creative power untouched" (44). Therefore, as much as it is important to challenge the dominant liberal paradigm of choice by pinpointing the repressive character of different juridical sanctions, it is also important to challenge the dominant norms that structure our desires and beings, i.e. it is important to move to the zone of everyday practices. Even if everybody had secure access to abortion services there would still be the dominant social norms guiding women's decisions (for example being a 16 year old mother is stigmatized, or bringing a disabled child to this world works in a similar way by stigmatizing the mother while challenging the dominant liberal models of normalcy).

Biopolitical theories then draw our attention from the realm of law to the realm of norms by highlighting that the individualized aims of national happiness are achieved through one's subjectification into the "normal" order of things. As Foucault emphasized, we cannot exist outside of discourse. We are discursive beings whose freedom can be understood only in relational terms and therefore he saw the possibilities of freedom in resistance. Such a fight for one's freedom, understood in forms of opposing and local knowledges, is represented by the social justice movement, by feminists of colour who have reconceptualized the mainstream feminist paradigm of choice by creating a discursive space for the needs of marginalized women to be expressed. Another form of resisting dominant power relations is the interdisciplinary effort of feminism and critical disability studies, in which scholars disprove genetic testing as empowering and turn our attention from the realm of state and laws to the realm of medical control and the dominant able-bodied norms.

If we understand biopolitical theories properly, we know that, according to Foucault, there is no difference between freedom and unfreedom in the classic sense of the binary since freedom is always socially constructed. It is a material freedom that works through differently disciplined bodies whose autonomy is regulated according to the dominant social norms, i.e. it is a freedom that rather than resting on the abstract

concept of citizenship it recognizes its flesh-bound and physical character. Therefore, even though freedom is a construct, it is a construct that has detrimental material consequences on one's life, as demonstrated by critical feminist scholars in different cases. I argue that women's freedom cannot be understood through the binary logic of free and unfree subjects, liberal subject and its totalitarian counterpart, otherwise it will always become an illusion based on the assumption of autonomous, active and free subjects exercising their unlimited choices. Understanding women's liberation through this binary logic further sustains that the power to decide ultimately rests in the freely and autonomously deciding individual, and not in her interactions and negotiations with the ideological frameworks that form the possibilities of how she can recognize herself and of actions she can take.

Feminist Biopolitics

Building on the theories of Foucault and Agamben, many feminist scholars have already commenced the move from feminist politics towards feminist biopolitics. In her ground-breaking work, *The Limits of Bodily Integrity*, Miller departs from the liberal concept of citizenship and perceives rights and citizenship as tools in the construction of the physical, flesh-bound citizen, rather than in the construction of the abstract, law-bound citizen. She disputes the binary of free and unfree subjects, maintaining that "the opposition between the post-eighteenth century liberal and the post-eighteenth century authoritarian is a fantasy" (2007, 5). According to her, it is exactly the process of granting rights that creates bio-political spaces from women's wombs while subjecting the physicality of the womb into politics. Women's wombs thus represent spaces where boundaries between the inside and outside, public and private, totalitarian and liberal are blurred.

Another feminist scholar, Penelope Deutscher, shows that the case of abortion politics demonstrates the impossibility to escape power relations and the unstable boundary between one's choice and state interests. She claims that "abortion has relentlessly and internationally been its own state of exception" (2008, 60) by pinpointing that principally abortion is outlawed and therefore its legalization represents its own state of exception. From her work, we can understand that the exceptional character of abortion rights delineates the relationship between the sovereign and its subjects, the limits of one's freedom and expected behaviour. Her article also challenges the anti-abortion rhetoric which is always ready to re-appropriate Agamben's vocabulary and designate women's wombs as camps in which the decision on the bare life of the foetus takes place, representing the foetus as a pseudo *homo sacer* (66). Deutscher defies such a position and claims that we should

rather think of women's wombs and bodies as representing lives from which humanity can be stripped.

Feminist biopolitics thus understands the concept of liberty outside of the positive and negative dichotomy, emphasizing that there are not just limits to one's freedom but rather that freedom is structured and formed by the limits. It is an understanding that we cannot escape power relations, we can only mould them and make them liveable. The limits of bodily integrity construct the bodily integrity itself, they form the possibilities of how to be. This is why Miller states that the question for feminism is not what kind of juridical identity one has (whether passive or active), but rather to what extent is one's life inscribed in the juridical and political order, i.e. what sorts of bodily borders one bears (Miller 2007, 9). It is because the borders represent the borders of the thinkable, the borders of one's self. Therefore a biopolitical understanding of reproductive politics should ask: What kind of exclusion/inclusion does the discourse of choice delineate? Which and whose choices are deemed (ir)responsible? What is good and bad motherhood and according to who? How I can resist and refuse who I am supposed to be? What kind of (bio-)ethics should be proposed that would take the relational character of our being into account? How to think of an ethics that would acknowledge the interdependent character of our being?

4. Conclusion

In this essay I attempted to complicate the meaning of reproductive freedom articulated as an individual right to choose by showing that framing abortion (bio-)politics in such a way is an ideological construct serving the purposes of white able-bodied supremacy that masks its interests to control women's sexuality and reproduction under the veil of women's liberation. The abortion politics is an example of biopolitical strategies *par excellence*, the cutting and splitting mechanisms of modern nation-states, in which the main focus became the *life itself*. By theoretically engaging with the critical feminist scholarship, I have disclosed that these processes are not neutral and that age, class, race, and (dis)ability nuance the meaning of choice. We have learnt that the rhetoric of free choice veils the fact that some women have choices and some don't. In the second section of my paper I attempted to complicate this understanding of choice even more by making the critical scholarship communicate with biopolitical theories. I pondered the abortion discourses as ideologically practices, i.e. practices delimiting the options of the possible and thinkable for women in regard to reproduction. Departing from the classical juridico-political concept of power, biopolitical theories

rather assume that all women are somehow subjected to different regimes of truth and that it is through one's subjectification how the desirable optimum of population is being maintained and regulated. In the new biopolitical regime, we are (paradoxically!) becoming the masters of our lives: we are allowed to exercise our autonomy and freedom only according to pre-existing options and under the threat of being perceived as irresponsible if we don't make the *right* choices, as was exemplified by the case of prenatal screenings as well as my own story.

Women regardless their age and ambitions to ever become pregnant are subjected to different regimes of truth represented by the various cultural and medical discourses on good motherhood/ "perfect child" that structure the possibilities of how she can *be* and what she can *choose*. Biopolitical theories thus disclose these mechanisms and offer to go over the limits of one's self by showing that any politics resting on the assumption of a freely deciding individual is misleading. Therefore the question is how can we resist and redefine the choice paradigm in a way that it suits better the realities that many women and other oppressed groups experience? A feminist critique, informed by biopolitics, has to ask these normative questions and aim at verbalizing ethics that would better respond to how we are situated in this world, which is not as individuals but as social and (inter)dependent beings. A feminist critique must aim to dismantling power relations while disclosing the repressive mechanisms of the state, as well as exposing the social construction of normalcy, health and other material ideals to which we are subjected. Otherwise, women's liberation will always stay an illusion. Some women will have the right not to have children, whereas others will never have the choice to keep them and parent them.

I am 28 years old. I have an autoimmune disease. I am white and I am working on my PhD. I have never had an abortion. I have never had a baby. Was it all my choice? Will I ever have a baby? Will the conditions of my life allow me to have some? What if it "just happens"? What will I know and have to decide? And If I decide to become pregnant, how much will be my pregnancy curtailed by others? How much will I feel the norm of responsabilisation, the trap to be a good woman, a good mother? What will I *choose*? How will I become to be?

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¹ Roe v. Wade is a landmark decision by the US Supreme Court announced on the 22nd of January 1973. It recognizes a woman's decision to have an abortion as a right to privacy, as founded in the Fourteenth Amendment of the American Constitution. The right to personal privacy allows women to have an abortion during the first trimester of a pregnancy. However, abortion can be prohibited after the point of viability except in the cases where a woman's life or health is threatened.

² Even though it is true that some women make the decisions on whether to abort the foetus or not together with men, it would not be proper to argue that men are subjected to the same politics since they are usually confronted with the "right to choose" only when some "defect" was found. However, women are subjected to that regardless whether or not they are ever planning on having babies. Rather, the fact that women do not make these decisions alone further underscores the problems with the liberal understanding of choice, which places the responsibility to decide solely on women while overlooking that women seldom make these decisions alone.

³ Even though Foucault maintains the distinction between ideology and discourses, I do not. I understand ideology not as false consciousness but rather in terms of maps of meanings which delimit the options of the thinkable.

What Do Cyborgs Gossip About in (Cyber)space?: Tracing Posthuman Discourses in the Rosetta Space Mission

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1. Introduction

This paper examines machine/human boundary-breaching examples in social media discourse on the Rosetta mission, a recent European space mission to a comet visiting our solar system, in order to speculate on the posthuman and perhaps even post-cyborgian implications of these transgressions.

Using Donna Haraway's conception of the cyborg as a "hybrid of machine and organism, creature of social reality as well as creature of fiction" (1991, 149) as my springboard to critically think through how the machine/human boundary was complicated and made ambiguous during the climax of the space project, I aim to show that the unstaffed spacecrafts of the mission (named Rosetta and Philae) largely fit the Harawayan definition of the cyborg in that they are both discursively constructed 'living' organisms and artificially made 'lifeless' objects. In other words, I argue that the spacecrafts are indissoluble assemblages of the human and machine; they are ambiguous associations that are made elusive and, somewhat paradoxically, all the more integrated by being spatially and temporally dispersed in cyberspace and outer space.¹

But while I am drawing on Haraway's thoughts on the cyborg, I do not think that completely mapping her cyborg ideal onto the spacecrafts, Rosetta and Philae, would be possible or that this would provide a radical enough challenge to the dominance of humanist narratives and their politics of hierarchies, exclusions, and silences. This is because I understand Haraway's cyborg as a predominantly organic-human plane (still intrinsically defined with the human implicitly in the centre) which has been overlaid and entangled with myriad kinds of technological, mechanistic, and informatics creatures/creations. What I would suggest instead is that the case of Rosetta and Philae is something of a reverse-cyborg situation, where Haraway's presumed cyborg-causality is turned inside out so that the 'pre-existing' technology of the spacecrafts is enmeshed in 'added' humanistic relatability and personhood. Although constructed by the organic hands of their makers, in a sense the spacecrafts can be seen as purely artificial entities. As such,

social discourse would insist on classifying them as lifeless, non-human machines, and we would be expected to relate to them as such. However, the argument I propose here is that these inorganic machines are (re)suscitated to what I call reverse-cyborgs, where an ambiguously alien but affectively appealing human-ness is melded with the 'original' machine bodies through the social media examples that are analysed throughout this paper. This is not so much a negation of the image of the Harawayan cyborg but an invitation to think about the possibility of reverse-cyborgs and their posthuman (even post-cyborgian) potential to perhaps radically displace the human from the centre by allowing us to look at the cyborg *from the other way around*.

Within this speculative theoretical framework, the next section will provide some necessary background information on the Rosetta space mission, setting the scene for the second half of the paper, in which the machine/human transgressions and subsequent (reverse-)cyborgian becomings hinted at in the first part are demonstrated through examples selected from the European Space Agency's (ESA) Twitter accounts and mission blog, and from third-party news articles and blog posts.

2. Real life space opera with celebrity spacecrafts

As comets are ancient leftovers from the Solar System formation, examining them is expected to yield clues as to how our planetary system evolved. This makes cometary missions an integral part of the (never-ending?) quest to find out more about the origins of life (with clearly humanistic implications for the question of the 'origin of *man*'). Thus, on 12 November 2014 and for the first time in the history of space exploration, the ESA's remotely controlled spacecraft (Rosetta) sent down a smaller spaceship (Philae) to the surface of comet 67P/Churyumov–Gerasimenko (67P/C-G) to investigate its structure. The landing and surface examination were not completely successfully since after the 7-hour free fall from Rosetta, Philae landed in shadow and therefore was only operational for about 60 hours before its solar-powered batteries were depleted, shutting down the robot.² Scientists are hopeful that Philae will come alive again in mid-2015 as the amount of sunlight reaching the machine gradually increases during the comet's approach toward the Sun.

The ESA, its partners, and the public (indirectly through the ESA) invested much into this mission. Rosetta travelled for over 10 years and 6 billion km with the sleeping Philae on-board to reach comet 67P/C-G, with the project running up a bill of €1.4 billion in total. The mission's overall scientific and operational success can decide the fate of future ESA space ventures and whether the European public gives a vote of confidence to

these programmes. As over 2,000 scientists and engineers are involved from various space industry firms and research institutions, there are also high-flying scientific careers and research funds at stake. Recognising these interests and wishing to raise the mission's profile through increased public engagement, the ESA's press team and the mission's science teams consciously maintained a significant social media presence for Rosetta and Philae in October and November 2014, both prior to and during the comet landing.

This media presence was built up through two Twitter accounts (@ESA_Rosetta and @Philae2014), the ESA's own Rosetta blog, and regular live streams of interviews with mission scientists. The present paper mostly focuses on the machine-to-human material-semiotic discursive transformations within the official ESA Twitter conversations because (1) these appeared to be the most popular and most memorable aspects to the public and (2) both accounts consistently use first-person narratives as if the spacecrafts themselves were directly talking to each other, human supporters, and non-human supporters through the microblogging site, thus creating a curious intimacy and relatability. Arguably, it is in great part due to the online presence of the two machines that the Rosetta press campaign was remarkably successful: Rosetta and Philae became 'media celebrities' almost overnight with followers in the hundred thousands (the Philae Twitter account had around 27,000 followers the day before the comet-landing but over the subsequent two days this increased to almost 400,000 followers, with the Rosetta account seeing a similar growth in subscribers).³

3. Spaceships are “heart-meltingly human” – or are they?

By deploying a humanising discourse for the missions through social media, the ESA succeeded in coupling hard-to-digest niche science with contemporary modes of (digital) consumption. But, as I will show, they also contributed to the creation of the spacecrafts as (reversed) cyborgs by discursively constructing Rosetta and Philae as feeling, thinking, breathing, and, ultimately, mortal material-semiotic actors. The spacecrafts have humanised-mechanic body parts such as eyes that watch out for each other, arms that sneak into candid pictures, legs that need stretching, and backs that get chilly. They can hear and smell their surroundings, and they feel excited, nervous, tired, or sleepy. They take selfies and send each other postcards, bantering and nudging one another along the way. They jump and bounce and float, and they sleep and dream (perhaps echoing Philip K. Dick's *Do Androids Dream of Electric Sheep?*). They have a proper home address (the comet!) and they lead busy and exciting lives. They are mother and child, friends, lovers, and siblings *all at the same time*. Humans and other

anthropomorphic creatures (for instance, NASA's Mars rovers personified on Twitter) caringly look out for them, root for them, love them, and cry and mourn when Philae dies. Similarly to cyborgs, but in what I propose is a reversed and more complicated causality ([human-to-]machine-to-human as opposed to purely human-to-machine), Philae and Rosetta breach the machine/human boundary by being both real-life machines and fictional "heart-meltingly human" organisms (Ruberry, *Discovery*), while at the same time (technologically integrated) humans create and act through them.⁴ Crucially, because the spacecrafts 'start out' as machines, they participate in the intimate enmeshment of non-human/human characteristics in social media *from the other way around*. I argue that this approach to the human/non-human imaginary results in a reverse-cyborgian becoming of Rosetta and Philae in opposition to Donna Haraway's human subjectivity originated cyborg, and I suggest that perhaps such a 'reversed' causality places Rosetta and Philae in a better position to subvert the centrality of the subject in modern humanism.

In line with their ambiguous similarity to Haraway's (feminist) cyborg, Philae and Rosetta could pass as genderless (Haraway 1991, 150). No gender is visible on their material surface; their mechanical bodies and scientific functions are not *originally* inscribed with the binary meanings of gender. But as a creature of (human) fiction, Rosetta is the *mother* ship; matching a feminine gender role, *she* is the provider of care and emotional support to *him*, the (infantilised) "baby space probe" Philae (Gilbert, *CNN*). In the mother-child assignment, Philae is the male child "leaving home to go out into the universe" (Said-Moorhouse, *CNN*), while mother-hen Rosetta watches over him undertaking his heroic mission and as he falls asleep later, due to his depleted batteries. Consequently, although the robotic bodies are not inherently gendered (fittingly for their reverse-cyborg image), the differential allocation of 'she' and 'he' is based on the social interpretation of the functions of the spacecrafts, discursively yielding a sexual division of labour. Due to human discomfort with the ambiguousness of the cyborg, Rosetta's body must be read and inscribed as female because she is the carrier, the one who is 'pregnant' with Philae. In opposition to Rosetta's feminised care work and support, Philae is coded as male because he is the one conducting the crucial manly work of discovering the world of the comet; he is physically conquering the cosmic rock and inseminating it with the (intellectual) seed of humanity. Ultimately, the spacecrafts could not live as genderless entities: gendering them is mandatory if they are to make sense to 'us' as agential and, above all, relatable beings who can be accepted into our social (cyber)realities. It appears that gender is a social prerequisite for (humanistic) personhood, even when it comes to cyborgs. Therefore, the

social image of their labour was used to assign the spacecrafts semantically gendered roles, with the relevant pronouns firmly maintained in their every ‘utterance’ on social media. So while the robots do not *originate* (that is, they were not conceived) as gendered bodies and gender as a concept would not make sense to *them*, their gender had to be purposefully assigned and put to work by the *humanist* culture they were crafted and immersed in before the robots could be legitimately enfolded into our social fiction that is clearly still very real in its (gendered) consequences.

Yet, the relationship between Rosetta and Philae is not just a mother-child bond. The machines are also narrated as siblings, with “Grandpa Giotto” (another unstaffed ESA spacecraft that studied a comet in the mid-1980s) telling them a bedtime story (European Space Agency 2014) and they are also depicted as friends with Rosetta calling Philae “buddy” and “my friend” (figures 1 and 2). These friends merrily banter away throughout the separation preparations for the comet landing, during Philae’s descent to the comet, and in the wake of the landing (see panel 1 in the Appendix: Rosetta counts back for Philae and gives him advice on what to pack for the trip). There are even traces of incestuous tones in the relationship between the spacecrafts: Philae and Rosetta are related *and* relatable as lovers who are going through a “love affair millions of miles away” from Earth (Said-Moorhouse, *CNN*) and their separation for Philae’s landing on comet 67P/C-G was called “the most high-profile break-up” of 2014 (*Channel 4 News*).



Figure 1. Following separation and planned loss of connection, Rosetta can “hear” her “buddy” again.



Figure 2. Rosetta congratulates her friend for landing and getting a new home address.

I suggest that the constant writing and overwriting of ‘humanly’ conflicting and mutually exclusive relations between Rosetta and Philae (friends, mother-child, lovers, and siblings) is part of an almost frantic scramble to create a humanist relatability and personhood for the spacecrafts, essentially *from scratch*. These cyborgian robots do not have a socially acceptable origin story: they were not organically conceived and born but mechanically planned and crafted; they are not ‘natural’ beings like humanity (is narrated to be) but are ‘artificial’ and impure assemblages. They do not come with a blood-tie based lineage, therefore they may be perceived as lacking any basis for a legitimate claim to personhood to such an extent that this lack can only be turned around and filled in by grafting and piling multiple relational ties on top of each other.

Although these relations are often ‘morally’ conflicting, human society makes an exception to tolerate these conflicts because cyborgs are *known* to be “monstrous” and “completely without innocence” (Haraway 1991, 151). Thus, these reverse-cyborgs too can be intimate, illegitimate, and perverse (Ibid.) but in a more alien and jarring manner than Haraway’s cyborg, which I suggested is causally still only predicated on the technology-perverted human. Rosetta and Philae are not only dispersed in (cyber)space as humans living/transferred through technology but they are also machine-agents perverted by (their) humanity. I propose that while most of the ‘human’ crafters and supporters/followers of Rosetta and Philae are unlikely to be aware of theoretical conceptions of the cyborg as used in this paper, they (unknowingly or tacitly) accepted and embraced the monstrous perversity of the spacecrafts because of an infectious imperative to affectively relate to these charming and fallible entities, who are simultaneously familiar and foreign so that one can curiously relate to them both as the self and as the other. It is because of this relatable otherness that

Rosetta and Philae's engagement in multiple forbidden relationships (mother-child versus siblings; mother-child versus lovers; siblings versus lovers) was not perceived to pose the kind of transgressive, ruinous threat to 'normalcy' and to social order that similar relational becomings could have posed between those only familiar to us and to each other as humans.

Incestuous and forbidden relationships are not the only striking aspect of the lives of these reverse-cyborg spacecrafts. The most tragic aspect of this story is the fact that Philae and Rosetta were built with finite lifespans. What is more, these machines are so "disturbingly lively" in social media (Haraway 1991, 151) that they effectively became mortals just like the humans who crafted and befriended them – they will die sometime in mid-2015 as the comet reaches too close to the Sun. While the timing is uncertain, death is a certainty; the friends of the spacecrafts keep the unavoidable fact of death in (silent) discursive circulation by avoiding discussions of the demise of the robots, similarly to how we pointedly avoid talking or even thinking about the finitude of the lives of our loved ones.

With Philae, the dramatic mortality has been particularly compelling. The machine, which was expected to conduct scientific experiments for months on the surface of the comet, landed in shadow on 12 November 2014 and was unable to recharge its batteries through solar panels, shutting down after a mere 60 hours of work. Philae's battery depletion was broadcast on social media in near real-time (figure 3: Philae is "feeling a bit tired" and "might take a nap" and figure 4: Philae is to "rest well"; Rosetta, his supportive mother/sister/[girl]friend says she has "got it from here"), resulting in the machine being hailed not just as brave for completing the risky landing manoeuvre, but also as heroic for transmitting scientific measurements until the last moment before dying (figure 5: Philae "sniffing the comet until *the last gasp*" – emphasis added). As Philae neared the end of his life, followers flooded the ESA's Twitter accounts with hopeful theories of 'resurrection' through the power of the Sun as the comet travels closer to the star in 2015, eerily reminiscent of mythical and religious narratives. Once Philae shut down (figure 6: Rosetta thinks Philae is dreaming), supporters were said to experience a "period of mourning" for the machine (Coyne, *Why Evolution is True*), while still resolutely believing in the coming of a miraculous resurrection (figure 7: Rosetta responding to worried supporters of Philae).



Figure 3. Philae checks in with Rosetta and indicates his batteries are depleting.



Figures 4. Rosetta responds to Philae that she has “got it from here” so Philae can “rest well.”



Figure 5. Rosetta tweets about Philae doing science until his “last gasp.”



Figure 6. Rosetta thinks sleeping Philae “is dreaming about science.”



Figure 7. Rosetta updates worried supporters about “little Philae.”

Along with the two spacecrafts, comet 67P/C-G is also made ‘lively’ as a humanistic but alien creature. As the date of the landing approached, published scientific data that was gathered by Rosetta’s magnetometer and ion-analysing instruments deliberately attributed animate characteristics to the comet such as voice and body odour: not only can 67P/C-G sing (Mignone 2014), but Philae and Rosetta also “sniffed its perfume of rotten eggs and cat wee” (Lakdawalla 2014; Aron 2014). At the same time, the comet remains an integral and inseparable part of the ‘book of nature.’ It is a “tough nut” that humans can “crack” by the robotic extensions of themselves and transgress (violate?) its bodily boundaries through “drilling and hammering” into its surface (*UK Space Agency*).

Although it is seen and dissected as part of nature, the comet (similarly to the two spacecrafts) is appropriated to create ‘new’ scientific knowledge and used as a resource for the production of cultural values (Haraway 1991, 150). In this instance, the Rosetta mission scientists are using the colonised comet to (re)imagine the universal beginnings of the ‘human

race.’ But in this anthropomorphisation of the machines and the comet, it is “not clear who makes and who is being made” (Haraway 1991, 173). While Rosetta and Philae are artificial objects external to us, once Philae lands on the comet, it/he becomes the colonising discoverer ‘us’ in the sense that ‘we have landed on a comet.’ The world of the comet remains ambiguous in this narration as it is both natural and (hu)man-made: it is a *really real* “alien world” out there (figure 8), yet in a way it only exists as an imaginary construct crafted through robotic instruments, never to be directly experienced by humans. In this sense, the comet demonstrates the concept of naturecultures, which Donna Haraway built on the human/non-human melded image of her 1980s cyborg. As a natureculture emerging through the Rosetta mission, comet 67P/C-G materially and figuratively brings together in surprising ways “the organic and technological, carbon and silicon, freedom and structure, history and myth, [...] and nature and culture” (Haraway 2003, 4).



Figure 8. Data from Philae shared as “science from an alien world.”

4. Conclusions

This paper investigated machine/human transgressions in the European Space Agency’s Rosetta comet mission and the surrounding social media rhetoric to argue that while Donna Haraway’s cyborg remains implicitly predicated on a humanistic core, which is then modified by and enfolded into technology, the two spacecrafts of the Rosetta project allow us to look at the cyborg from the reverse and perhaps therefore carry a more radical potential for displacing the human subject from the centre. It was suggested that the spacecrafts do not carry marks of gender, but as genderless creatures do not make sense to us, allocating gender to them (in part through Twitter conversations) is a prerequisite of accepting them into our social realities. Similarly, while they are deeply embedded in a web of

networks, the spacecrafts lack blood-tie based origins and relations (they were not born but made), so in a rush to make them humanly legible, multiple conflicting relations were grafted onto their bodies that eventually acquired not just origin(s) but also mortal ends. The spacecrafts could live within these mutually exclusive relationships because cyborgs are impure, perverse, and alien; and yet, they are also familiar to us in more than one sense. Ultimately, comet 67P/C-G and consequently the entire Rosetta story are part of what Haraway called naturecultures, where the dichotomic elements of the human/machine/nature imaginary co-emerge and coexist in surprising and potentially subversive ways.

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¹ A note on quotation marks: in this paper, double quotes (“...”) are used for direct quotations from other (referenced) sources, while inverted commas (‘...’) are used in a gesture of doubt or skepticism as to what the marked concepts may signify – this is to express discomfort with these words but at the same time take responsibility for using them.

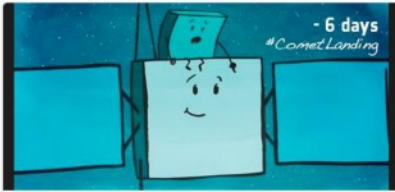
² For an official yet very accessible story about Rosetta, Philae and the dramatic comet landing, the reader is advised to consult the ESA’s brief cartoon titled “Once upon a time... #cometlanding,” which provides an impressively factual account of the missions operational and scientific milestones, such as the Go/NoGo checks before starting the landing, Philae’s unresponsive harpoons and the resulting multiple landings, the breaking of Philae’s hammer during one of the experiments, the depletion of Philae’s batteries, and its eventual shut-down.

³ For comparison, the followers of the ESA’s non-anthropomorphic Twitter account for a Rosetta-like spacecraft, Gaia (operated under @ESAGaia since early 2009), is numbered under 10,000. Data correct as of 2 January 2015, sourced from www.twittercounter.com.

⁴ As it would be difficult to demonstrate all mentioned examples within this paragraph, some of the human/machine transgressions are showcased in the appendix to indicate the general idea.

Appendix – panels 1,2,3 and 4

Panel 1. Collection of tweets from Rosetta, counting back the days to Philae’s landing and featuring Philae as, variously, putting on his trekking boots, packing sandwiches, stowing away his camera, as ready to jump, and then finally sticking his flag into the comet after landing.



ESA Rosetta Mission
 @ESA_Rosetta
 #CometLanding -6 days! @philae2014 just loves to point out his Agilkia landing site! youtu.be/AvkPFxdpOQQ
 5:13 PM - 6 Nov 2014
 277 RETWEETS 199 FAVORITES



ESA Rosetta Mission
 @ESA_Rosetta
 #CometLanding -5 days!
 1:58 PM - 7 Nov 2014
 580 RETWEETS 390 FAVORITES



ESA Rosetta Mission
 @ESA_Rosetta
 #CometLanding -4 days! Don't forget your camera, @philae2014!
 10:17 AM - 8 Nov 2014
 319 RETWEETS 223 FAVORITES



ESA Rosetta Mission
 @ESA_Rosetta
 .@Philae2014 and all sandwiches onboard too!
 #CometLanding -3 days!
 4:44 PM - 9 Nov 2014
 173 RETWEETS 164 FAVORITES

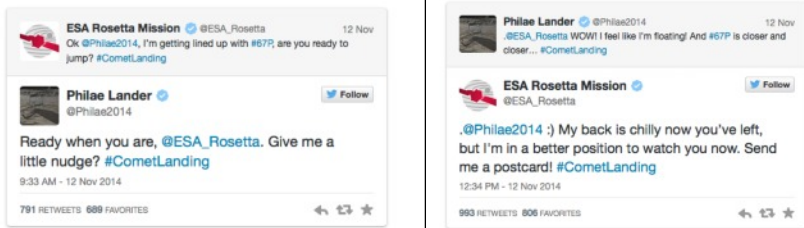


ESA Rosetta Mission
 @ESA_Rosetta
 Last chance to enjoy the view from up here before you visit #67P @Philae2014! #CometLanding day is here!
 8:34 AM - 12 Nov 2014
 1,095 RETWEETS 735 FAVORITES

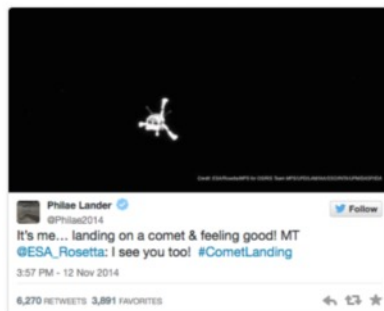


ESA Rosetta Mission
 @ESA_Rosetta
 Good thinking to wear a yellow hat and wave a flag @philae2014 - much easier to see you :) #CometLanding
 6:55 PM - 13 Nov 2014
 1,300 RETWEETS 1,406 FAVORITES

Panel 2. Just before and after separation, Rosetta and Philae are chatting about getting/giving a nudge for the jump, feelings of floating and a chilly back, and about sending postcards to each other.



Panel 3. After separation and while in descent, Philae sends a postcard to Rosetta – of the mother-ship. In response to Philae’s postcard, Rosetta also posts a picture back to Philae feeling good. Then Philae notes he is quite photogenic and thanks Rosetta for watching out for him.





Panel 4. Philae responds to the Mars Curiosity Rover (NASA’s anthropomorphic Twitter account for one of the Mars rovers), who is rooting for Philae, and a third-party Twitter account for ‘The Solar System’ reassures ESA and Rosetta that Philae is in good hands.



The Twitter posts in this appendix are from the “ESA Rosetta Mission” account (<https://twitter.com/philae2014>); last accessed on January 2015.

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Massimiliano Simons is a graduate student in Philosophy and Sociology at the University of Leuven, Belgium. He is mainly working on contemporary French philosophy and sociology of science.

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Tamara Szűcs has an academic background in politics and international relations, with a focus on the intersections of sex, gender, and violence, and is currently reading for an MA in Gender Studies at the Central European University in Budapest, with a particular interest in feminist science studies and new materialist thought.

Journal Staff

Matthew Baxendale, Editor

Matthew Baxendale is a Philosophy PhD Candidate at Central European University Budapest. He completed his MA in philosophy at the University of Sheffield and his BA in philosophy at Queen's University Belfast. His thesis concerns scientific pluralism, specifically building an account of scientific pluralism that rejects the 'layer-cake model of the world'; a particular articulation of the levels into which phenomena in the world are organised. He maintains a research interest in the Vienna Circle, particularly the work of Otto Neurath, as well as in communitarian approaches to epistemology, and multiculturalism and citizenship in political theory.

Kylie Boazman, Copy-editor

Kylie Boazman is an MA student in Sociology & Social Anthropology at Central European University. Her thesis research focuses on disability simulations in Budapest and combines phenomenology, performativity, and ethnomethodology with disability theory to analyze how bodily experiences convey knowledge. Outside of academia, she reviews disability representation in books for Disability in Kid Lit and interns at the Autistic Self Advocacy Network. She is interested in feminist and queer theory, disability studies, activist anthropology, and visual/museum studies.

Frank Karioris, Editor-in-Chief

Frank Karioris is a PhD Candidate in Comparative Gender Studies with a Specialization in Sociology & Social Anthropology at Central European University in Budapest, Hungary. His doctoral research is on men's homosocial relations in an all-male university residence hall in the United States. He has published on the topic of masculinities in various contexts, including the Institute of Development Studies Bulletin (Jan 2014); and has just published his first edited volume (co-edited with Cassandra Loeser), *Reimagining Masculinist Epistemology*. He is also the co-editor, with Nancy Lindisfarne and Andrea Cornwall, of the forthcoming book *Masculinities Under Neoliberalism* (under review by Zed Books).

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Alexandra Claudia Manta is a 3rd-year doctoral student in the Gender Studies Department at Central European University. She has previously graduated from a B.A. degree in Philology, Foreign Languages and Literatures, French Major and English Minor, and from a M.A. in Critical Gender

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Andreea Roş, Copy-editor

Andreea Roş is an MA student in Gender Studies at Central European University. Her MA research is on the Marianne North Gallery in Botanic Gardens, Kew and deals with formal and informal networks through which scientific knowledge was created and transmitted. Her previous work was on popular women poets in the 19th century and different kinds of Victorian femininities. Her research interests include the colonial history of botany, women’s history, museum studies, feminist theory and intersectional analyses of scientific methodology.

Maria Temmes, Editor

Maria Temmes obtained her MA degree in Gender Studies from CEU in 2011 and her MA degree in History from University of Helsinki in 2012. She is currently a PhD candidate in Comparative Gender Studies at CEU. She is interested in historical, social and philosophical aspects of contemporary biomedical research. More specifically, her PhD project examines the role of gender in current biomedical research focusing on the relationship between clinics and basic research in the wider context of consumer society.

Eva Zekany, Editor

Eva Zekany is a doctoral candidate in Comparative Gender Studies at Central European University, Budapest. Her dissertation focuses on implementing new materialist thought into biopolitical approaches to the use of media technologies, with a particular focus on the work of Bernard Stiegler. She maintains a strong empirical (as well as theoretical) interest in computer game research and feminist game studies.

