Proceedings of the European Society for Aesthetics

Volume 7, 2015

Edited by Fabian Dorsch and Dan-Eugen Ratiu

Published by the European Society for Aesthetics

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Proceedings of the European Society of Aesthetics

Founded in 2009 by Fabian Dorsch

Internet: http://proceedings.eurosa.org
Email: proceedings@eurosa.org
ISSN: 1664 – 5278

Publisher
The European Society for Aesthetics

Department of Philosophy
University of Fribourg
Avenue de l'Europe 20
1700 Fribourg
Switzerland

Internet: http://www.eurosa.org
Email: secretary@eurosa.org

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Science, Art, and Knowing-How: Merleau-Ponty on the Epistemic Qualities of 'Experimental Practices'

Iris Laner*
Husserl Archives, KU Leuven

Abstract. This paper introduces a systematic framework for comparing the epistemic qualities of science and art based on the phenomenological thinking of Maurice Merleau-Ponty. I will draw on some of Merleau-Ponty's key writings in which he, on the one hand, stresses the main differences of science and art regarding their aims, purposes, and output, but, on the other hand, also emphasizes their similarities when it comes to describing the scientist and the artist being 'at work'. In my reading, Merleau-Ponty's approach calls for considering science and art as knowledge-generating practices: In scientific, but also in artistic practice, not only is it important that one acquires a field-specific know-how, but that one is able to alter the modality of one's own agency in performing a task. Learning how to do something in the sciences and arts amounts to an ongoing critical engagement with things, sorting out worse and better ways of approaching them. Therefore, scientific and artistic practices can be regarded as experimental practices that are not only valuable within the constraints of their respective field. Rather, they generally contribute to improving the knowledge of how to approach the world in an experimental and critical fashion.

1. Introduction

Science and art can be considered as two sides of the same coin. Ideally, both the scientist and the artist are free from the constraints of societal, cultural, religious or political norms.[1] Both seek to unveil some kind of

* Email: iris.laner@unibas.ch

[1] As a matter of fact, science and art are always subject to societal, cultural, religious or political norms. See, for instance, Max Horkheimer and Theodor W. Adorno, *Dialektik der Aufklärung: Philosophische Fragmente* (Frankfurt/Main: Suhrkamp, 1987), Paul De Man, *Aesthetic Ideology* (Minneapolis: Univ. of Minnesota Press, 1992), Jacques Rancière, *The*

truth, a truth about the world we live in, about nature, and about human beings. However, although the sciences and arts seem to share some of their basic objectives and intentions, the differences between them are conspicuous: While science normally aims at knowledge of facts, and laws of nature the arts seldom take an interest in knowledge or in facts. Indeed, the arts are free to produce their own system of truth, while science is restricted to seeking the truth in what is given. The arts are allowed to generate a fictional world, while science has to stay on the firm ground of reality. As a consequence, scientific findings are generally considered to have epistemic value while artworks are often not regarded as generating or imparting knowledge. It is the question of knowledge that reveals a profound difference between science and art.

In this paper, I want to reconsider this ostensible difference by taking a look at science and art in terms of epistemic, that is to say knowledge-generating practices. I claim that when focusing on the practices of scientists and artists, viz. the way scientists and artists engage with their objects when they are "at work,"[2] they can be considered as eliciting a similar kind of knowledge, namely a practical kind of knowledge. Although the declared aims of science and art might be incongruous, especially in terms of the kind of knowledge they are said to generate (or fail to generate), they tend to proceed in a like manner in order to achieve their disparate objectives. One might say that they set about achieving different goals while they act similarly. I contend that this similar way of acting, which basically comes down to a profound examination of the object of interest, while varying and 'checking' different possible stances towards it is a practice that is itself epistemic. Not only is it a technique that allows for producing knowledge about something; rather, it also generates and trains a know-how, i.e. knowing how to approach a matter critically. By "critical" I mean the ability to make out differences (on perceptual and conceptual levels) and to balance the pros and cons of taking on different perspectives.

Politics of Aesthetics: The Distribution of the Sensible (London: Continuum, 2004). However, it is interesting to note that the freedom of scientific and artistic practices is still underlined as a distinguishing feature when it comes to comparing them to other practices, such as explicitly political, cultural, economic, educational etc. practices.

[2] Maurice Merleau-Ponty, *The Visible and the Invisible* (Evanston: Northwestern University Press, 1968), 17.

Therefore, on a practical level one can acquire a similar kind of knowledge through engaging in scientific and artistic practices, while the epistemic results of this engagement can still be regarded as profoundly different.

In order to develop my argument I will draw on some of Merleau-Ponty's illuminating remarks concerning scientific and artistic practices. One of the main reasons why I think it is fruitful to bring in Merleau-Ponty's position is that his approach focuses on the similar practices scientists and artists engage in while he underlines the important epistemic differences between scientific findings and artworks. In his later writings this two-level approach is especially important for developing a methodologically sophisticated ontology, which envisions the perfect philosopher as a scientist and an artist at the time.

The paper has four divisions. (1) I will start by sketching what I mean by 'knowledge from practice' and 'practical forms of knowledge,' drawing on some key concepts and distinctions from Gilbert Ryle and Michael Polanyi. (2) I will then outline distinct epistemic practices and relate them to certain exemplary forms of practical knowledge they elicit. On a systematic level, I will introduce a difference between everyday practices and experimental practices and argue that while in everyday practices we are inclined to learn something useful, in experimental practices we are free to train ourselves to perform tasks critically. (3) Having conceptualized scientific and artistic practices as experimental practices, I will turn to Merleau-Ponty's understanding of scientific and artistic practice. I will focus on what he says concerning the scientist and the artist being at work. (4) Finally, I will consider the main parallels and differences between scientific and artistic practices and conclude that both are experimental practices that can improve critical abilities.

2. Knowledge from Practice and Practical Knowledge

Contemporary epistemologists often distinguish between two[3] different kinds of knowledge: Knowing-that, i.e. propositional or theoretical know-

[3] Fantl stresses that there is a third kind of knowledge commonly referred to: We cannot only know how or know that, we can also know a person. This knowing a person is neither knowing-how nor knowing-that, but it describes a kind of being acquainted with somebody or something. Cf. Jeremy Fantl, "Knowledge How," in *The Stanford Encyclopedia*

ledge, and knowing-how, i.e. practical knowledge, often referred to in the prominent 'embodied cognition'[4] debate. The main differences between knowing-that and knowing-how concern the object of knowledge, the way knowledge is acquired and the way it is expressed. The object of theoretical knowledge can generally be considered as a "concept" in the broad sense of the word. Theoretically, I can know that Barack Obama is the president of the United States or I can know that water freezes at a temperature of zero degrees Celsius. In contrast, the object of practical knowledge is an "action" or a "practice."[5] Practically, I can know how to cook, how to ride a bicycle or how to play the guitar.[6] Here, knowing-how amounts to practical knowledge. What is more, while theoretical knowledge can be acquired without practical engagement, but rather through reflection, insight or testimony[7] for instance, practical knowledge depends

of Philosophy (Fall 2014 Edition), ed. Edward N. Zalta, retrieved October 2, 2015, from http://plato.stanford.edu/archives/fall2014/entries/knowledge-how/.

[4] Theories of embodied cognition underline that cognition consists not only in acting out cognitive capabilities in the narrow sense, but entails also perceptual and motor capabilities. A great many authors claim that a cognizing agent actively engages with the world and, herein, interacts with the environment as a physiological organism. Cf. Francisco Varela, Evan Thompson, and Eleanor Rosch, *Cognitive Science and Human Experience* (Cambridge: MIT Press, 1991), Alva Noë, *Action in Perception* (Cambridge: MIT Press, 2004), Shaun Gallagher, *How the Body Shapes the Mind* (Oxford: Oxford University Press, 2005), Anthony Chemero, *Radical Embodied Cognitive Science* (Cambridge: MIT Press, 2009).

[5] Glick stresses that, in some cases, talk about knowing-how seems to be confusing, as one might use the proposition "S knows how to do something" also for describing a theoretical kind of knowledge, for instance, in cases when somebody who has read a great deal of theory about, say, painting, theoretically knows how to paint. He, therefore, suggests that we refer to the more precise epistemological distinction between theoretical and practical knowledge. Cf. Ephraim Glick, "Two Methodologies for Evaluating Intellectualism," *Philosophy and Phenomenological Research* 83/2 (2011), 398–434.

[6] The "object" of practical knowledge is, further, qualified in a certain way. Ryle underlines this when he argues that knowing-how can be partial while knowing-that must be total. I either know that or I don't. In contrast, I can also know how to do something better than you do. See Gilbert Ryle, *The Concept of Mind* (London: Penguin Books, 1990), 57–8.

[7] Testimony is an important source of theoretical knowledge, since we learned most of what we know through reports of others. One of the first authors to stress the epistemological importance of testimony is David Hume. See David Hume, *A Treatise of Human Nature* (Oxford: Clarendon Press, 1978), 1/3/9.

on repeated practice and training.[8] Accordingly, knowing-how can be classified as knowledge from practice.[9] Finally, while knowing-that is normally expressed by means of propositions – "Barack Obama is the president of the United States," "Water freezes at a temperature of zero degrees Celsius" – knowing-how is closely connected with agency and is articulated in the course of bodily[10] actions.

One author who famously introduced a two-fold epistemological distinction between a theoretical and a practical kind of knowledge already in the late 1940's is Gilbert Ryle. For instance, he discusses cases such as knowing how to play chess or knowing how to play an instrument. He emphasizes that, although there is some sort of theoretical knowledge involved in playing chess or playing an instrument, the ability to perform these tasks "well, i.e. correctly or efficiently or successfully"[11] goes beyond a mere execution of theoretical prescriptions. Accordingly, Ryle emphasizes that actually knowing-how to do something cannot be reduced to knowing that something has to be done in a certain way.[12] Like Ryle, Michael Polanyi underlines the epistemological importance of practical knowledge. He introduces the term 'tacit knowing' in order to account for a non-theoretical dimension of knowing. 'Tacit knowledge' is meant to describe implicitly knowing how to do something in the very act of doing it.[13] It is called 'tacit', since it cannot be reduced to what can be expressed by words. For Polanyi, focusing on tacit knowledge means to revolutionize the very idea of what it means to know: "I shall reconsider

[8] This is because learning in a practical respect is closely connected with a process of embodiment.

[9] Ryle hints at this difference regarding the acquisition of knowledge, too: "Truths can be imparted, procedures can only be inculcated, and while inculcation is a gradual process, imparting is relatively sudden. It makes sense to ask at what moment someone became apprised of a truth, but not to ask at what moment someone acquired a skill." (Ryle, *Concept*, 58).

[10] By "bodily" actions I mean also perceptual or emotional actions.

[11] Ryle 1949, *Concept*, 29.

[12] In his own words, Ryle tries to account for "what it is for someone to know how to perform tasks" (Ryle 1949, *Concept*, 28).

[13] In this respect it can be compared to Ryle's stressing the difference between *knowing that* and *knowing how*. Polanyi explicitly hints at the parallels between Ryle's and his own conception of knowledge. See Michael Polanyi, *The Tacit Dimension* (Chicago: The University of Chicago Press, 1966), 7.

human knowledge by starting from the fact that *we can know more than we can tell*."[14] For Polanyi, just as for Ryle, this 'knowing more than we can tell' cannot be acquired by pure reflection, insight or through testimony; it can only be acquired in the course of repeated 'practice and training'[15]. Polanyi designates tacit knowledge as a process of 'indwelling'.[16] Regarding the relatedness of theoretical and practical knowledge, he claims that even in cases where knowing-how seems to be dependent on knowing-that, theoretical knowledge can never fully determine practical knowledge: "Rules of art can be useful, but they do not determine the practice of an art; they are maxims, which can serve as a guide to an art only if they can be integrated into the practical knowledge of the art. They cannot replace this knowing."[17] What is more, according to Polanyi, somebody who intends to become an expert in a certain practical field – such as specific crafts, but also in specific sciences[18] – needs to "learn by example."[19] Accordingly, practical knowledge as a qualified skill is passed from a master to an apprentice. Personal contact between master and apprentice is indispensable for acquiring a skillful way of doing something. "To become an expert wine-taster, to acquire a knowledge of innumerable different blends of tea or to be trained as a medical diagnostician, you must go through a long course of experience under the guidance of a master."[20] Consequently, somebody who wants to acquire knowing-how must submit to tradition and authority.[21]

Ryle, by contrast, emphasizes that it is the practical engagement itself that serves to sort out the right way of doing something from the wrong

[14] Polanyi, *Tacit Dimension*, 4.

[15] This is a phrase I borrow from Nelson Goodman. He stresses that one can only come to see like an expert through a process of practice and training. See Nelson Goodman, *Languages of Art: An Approach to a Theory of Symbols* (Indianapolis: Hackett, 1976), 103.

[16] See Polanyi, *Tacit Dimension*, 17.

[17] Michael Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy* (Mansfield Centre: Martino Publishing, 2013), 50.

[18] For Polanyi the case of the scientist is crucial, since he himself worked as a chemist before turning to philosophy.

[19] Polanyi, *Personal Knowledge*, 53.

[20] Polanyi, *Personal Knowledge*, 54.

[21] A serious problem Polanyi's account faces is that it cannot explain the development of new skills. If a learner must submit to tradition and authority in order to learn from them, it seems impossible to acquire any new knowledge.

way. As such, teaching through tradition and authority plays a minor role in his account. In order to understand how repeated practice and training can lead to a skilled way of doing something and not just any way of doing it, it is, however, necessary to have criteria and standards that distinguish the right way of doing something from the wrong way. For Ryle, knowing how to do something therefore amounts to a qualified way of doing something. Knowing how to cook amounts to cooking well, knowing how to play football amounts to playing in a strategically and technically adept way. Therefore, know-how entails awareness of those criteria and standards that qualify a performance as a good performance. What is interesting about Ryle's account is that, for him, these criteria and standards do not have to be acquired through teaching; they can be acquired in the very course of practical engagement, which is viewed as a process of trial and error. Thus, it is through repeated practice and training that one can learn to do something skillfully. "We learn *how* by practice, schooled indeed by criticism and example, but often quite unaided by any lessons in the theory."[22] Practice and training, however, must not be restricted to simply repeating former performances, since mere repetition is not enough for learning how to do something well. Here, a skill essentially differs from a habit. According to Ryle, skills are intelligent practices whereas habits are non-intelligent practices. For him, it is "the essence of intelligent practices that one performance is modified by its predecessors. The agent is still learning."[23] During the learning process an agent engages in acts of reflection upon his performance, he "thinks what he is doing, he is ready for emergencies, he economizes in effort, he makes tests and experiments," he acts "with some degree of skill and judgement."[24] While Polanyi contends that the novice has to submit to authority in order to benefit from a historically, culturally or socially established standard, Ryle argues that in order to engage in an intelligent practice, it is indispensable that the novice acts as a critical and judging agent who critically evaluates her own performance constantly: "Training [...], though it embodies plenty of sheer drill, does not consist of drill. It involves the stimulation by criticism and example of the pupil's own judgement. He learns how to do things thinking

[22] Ryle, *Concept*, 41.
[23] Ryle, *Concept*, 42.
[24] Ryle, *Concept*, 42.

what he is doing, so that every operation performed is itself a new lesson to him how to perform better."[25] When Ryle states that know-how ultimately stems from "performing critically in trying to get things right,"[26] he basically refers to this process of ongoing reflection and self-evaluation that the novice performs hand in hand with the action itself. As a consequence, his account allows one to consider the novice's learning process and self-organization not only as apt, but as essential for constituting practical knowledge. Since know-how consists in hitting upon the right way to do something, a learning agent needs to be open in the course of an ongoing process of experimenting and testing in order to sort out the right way of performing the task. What Ryle does not explain, though, is how one comes to acquire the skills of performing critically and sorting out the best option for doing something. The self-organizing structure of practical learning processes seems to be stuck within a black box.

Based on Ryle's and Polanyi's approaches, know-how can be defined as the practically enacted knowledge of how to do something in a skilled way, which is derived from repeated practice and training. The learning agent needs practice and training in order to distinguish and select the best way of doing something. While Polanyi emphasizes that, on top of practical engagement, the novice needs to follow an example, Ryle stresses the learning process as potentially independent and self-organized.

3. Epistemic Practices

Both authors, Ryle and Polanyi, emphasize the importance of being involved in a particular practice for acquiring know-how. However, not every practice qualifies in the same way for learning a skill. Some practices can be regarded as bearing more epistemic potential than others. In the following, I will argue that practices which are qualified as 'experimental' are of particularly great epistemic value. This is because, as I will show, these practices trigger the self-organizing structure of the learning process.

Let us start by considering the kind of practices Ryle and Polanyi have in mind. While Ryle mainly focuses on craftsmanship, sports and intellec-

[25] Ryle, *Concept*, 42.
[26] Ryle, *Concept*, 29.

tual practices, Polanyi also takes an interest in scientific practices. Neither Ryle nor Polanyi extensively elaborate on specifically artistic practices.[27] What is more, neither of them introduces a conceptual framework which would help to distinguish between different types of epistemic practices. Ryle is generally much more concerned with practices that are dependent on established rules and standards, such as playing chess or golf. A skilled chess player has to follow the rules of the game. However, although playing chess is dependent on knowing the rules of the game, it must not be understood as the execution of theoretical prescriptions. For Ryle, knowing how to play chess entails that a player is able to practically enact the rules of the game, which can be learned in the course of playing several games. Polanyi, on the other hand, takes an interest in professional expertise and scientific practices. Accordingly, he considers practical knowledge as something that is learned by example in consulting with established professionals and scientists. According to Polanyi, a scientist has to stick to certain rules or standards. One learns these standards by following the example of somebody who already knows how to do something well.

With their respective accounts, Ryle and Polanyi lay emphasis on different aspects of epistemic practices. While Ryle is mainly interested in how a performer can come to know how to do something correctly in the course of repeated practice and training, Polanyi stresses that the epistemic qualification of a practice is something to be learned from an expert in the respective practical field. From my point of view there are advantages and disadvantages in both accounts: With Ryle it is possible to explain the self-organizing structure of learning. Yet his account does not provide much insight into how one ought to organize the learning process. It seems to be plainly given. With Polanyi, on the other hand, somebody else guides and organizes the learning process: a teacher, an expert in the field, an authority. Following the example of a teacher guarantees the quality of practice and training, i.e. that the know-how acquired is qualified as a knowing how to do something well. Nevertheless, the submission to tradition and authority does not allow one to understand the further development of better ways of doing something. It is clear, however, that creative devel-

[27] One exception must be noted, namely playing an instrument. Nevertheless Ryle does not describe playing an instrument as an artistic activity, in the sense of a creative practice, but rather as some sort of sophisticated technique.

opment of the existing and established know-how is crucially important especially when it comes to scientific and artistic practices.

In order to account for the specific epistemic nature of scientific and artistic practices, it is necessary to understand to what extent they differ from other practices and, eventually, from each other. A first step in considering the specificity of scientific and artistic practices lies in distinguishing between everyday and unusual ones. Drawing on Merleau-Ponty's systematic investigations of human practices in *The Structure of Behavior* and *Phenomenology of Perception*, it is possible to introduce a basic distinction between those practices aimed at learning how to do things normally[28] and those practices aimed at learning to do something in a way that differs from how we do things normally. While in the course of everyday practices we usually learn something useful for our ordinary lives, in the course of unusual practices we do not acquire habits that are useful for our everyday conduct, but that are apt to break out of the common. Let us consider one everyday practice that Merleau-Ponty offers as an example: Driving a car. We learn to drive a car by repeated practice and training. Somebody who wants to drive a car not only needs to understand the technical mechanisms –, she also needs to integrate the machine into her own "body-image."[29] This expansion of one's own body is dependent on becoming slowly acquainted with the body-machine interaction. [30] As soon as

[28] Merleau-Ponty calls everyday practices "habits." A habit "is knowledge in the hands, which is forthcoming only when bodily effort is made, and cannot be formulated in detachment from that effort." Maurice Merleau-Ponty, *Phenomenology of Perception* (London: Routledge, 2003), 217. Authors like Annas point out that, although habit and skills depend on habituation, they have to be distinguished. See Julia Annas, "Practical Expertise," in *Knowing How: Essays on Knowledge, Mind and Action*, ed. John Bengson and Marc A. Moffett (Oxford: Oxford University Press, 2012), 101–112.

[29] "To get used to a hat, a car or a stick is to be transplanted into them, or conversely, to incorporate them into the bulk of our own body. Habit expresses our power of dilating our being-in-the-world, or changing our existence by appropriating fresh instruments." Merleau-Ponty, *Phenomenology*, 127.

[30] Merleau-Ponty refers to the case of knowing how to use a stick for the purpose of orientation: "If I want to get used to a stick, I try it by touching a few things with it, and eventually I have it 'well in hand', I can see what things are 'within reach' or out of reach of my stick. There is no question here of any quick estimate or any comparison between the objective length of the stick and the objective distance away of the goal to be reached." Merleau-Ponty, *Phenomenology*, 127.

somebody knows how to drive a car, she knows how to operate the machine in relation to and in accordance with her own bodily movements. To a certain extent, she needs to forget about the technical nature of the machine in order to perceive it as a transgression of her own bodily limitations and as an extension of her own body. As a consequence, she must not engage with the machine in a critical way; once she knows how to drive a car, she simply has to practically execute her practical knowledge, and does not need to consciously compare the width of the car to the width of obstacles on the road, for instance. She has literally incorporated the possibilities and the limitations of the machine: "If I am in the habit of driving a car, I enter a narrow opening and see that I can 'get through' without comparing the width of the opening with that of the wings [...]. [T]he car ha[s] ceased to be [an object] with a size and volume which is established by comparison with other objects."[31] For Merleau-Ponty, practical knowledge is closely connected with bodily adaptation. One knows how to do something only if one's body knows how to do something: "As has often been said, it is the body which 'catches' *(kapiert)* and 'comprehends' movement. The acquisition of a habit is indeed the grasping of a significance, but it is the motor grasping of a motor significance."[32]

In cases where somebody knows how to do something in theory, but not in practice, this person is considered to have some kind of disability.[33]

[31] Merleau-Ponty, *Phenomenology*, 126–7.

[32] Merleau-Ponty, *Phenomenology*, 126. "We say that the body has understood and habit has been cultivated when it has absorbed a new meaning, and assimilated a fresh core of significance." Merleau-Ponty, *Phenomenology*, 130.

[33] For Merleau-Ponty pathologies and disabilities are important objects of phenomenological research. He thinks that in many cases we can understand how the body and consciousness normally work in the very moment that they cease to work normally. His analysis of apraxia, a severe motor disorder, is thus fundamental for his concept of the motility of the body: "What we have called the body image is precisely this system of equivalents, this immediately given invariant whereby the different motor tasks are instantaneously transferable. It follows that it is not only an experience of my body, but an experience of my body-in-the-world, and that this is what gives a motor meaning to verbal orders. The function destroyed in apraxic disturbances is therefore a motor one. 'It is not the symbolic or sensegiving function in general which is affected in cases of this kind: it is a much more primary function, in its nature motor, in other words, the capacity for motor differentiation within the dynamic body image'.[] The space in which normal imitation operates is not, as opposed to concrete space with its absolute locations, an 'ob-

For Merleau-Ponty, everyday practices constitute bodily incarnated knowledge[34] and this lays the foundation for being-in-the-world. Practical, bodily knowledge is the basis for all other forms of knowledge, including theoretical, intellectual knowledge. Since Merleau-Ponty considers habits to be the primary kind of practical knowledge, repetition is a key element of know-how. In everyday life, we tend to repeat actions in a way that 'prove themselves' in practice. It is through this repetition that one becomes habituated to doing something a certain way.[35] Usually, habits guide behavior and actions while not being thematic on a conscious or reflective level. A habitual way of doing something amounts to doing something in the same way it has been done in the past.

Whereas everyday practices are essential for constituting the habits that guide common behavior and actions, unusual practices can break the cycle of ordinary life. Scientific and artistic practices are two examples of non-everyday practices that explicitly require one to criticize established ways of doing something and generating new ways of doing it. According to Merleau-Ponty, the arts transgress the given: "One might show, for example, that aesthetic perception [...] opens up a new spatiality, that the picture as a work of art is not in the space which it inhabits as a physical

jective space' or a 'representative space' based on an act of thought. It is already built into my bodily structure, and is its inseparable correlative." Merleau-Ponty, *Phenomenology*, 125 .

[34] Merleau-Ponty rejects the term "knowledge," since he regards it as a term stemming from an intellectualist paradigm that he intends to criticize. He introduces various terms in order to account for what I consider as practical knowledge or know-how, for instance "habit," "knowledge in hands," or, referring to Lhermitte and Trelles, "praktognosia:" "Our bodily experience of movement is not a particular case of knowledge; it provides us with a way of access to the world and the object, with a 'praktognosia', which has to be recognized as original and perhaps as primary." Merleau-Ponty, *Phenomenology*, 124.

[35] "One acquires a habit by repeatedly doing the same thing. Through this repeated activity, the body becomes familiar with the behavior, so that engaging in it comes to feel like 'second nature'." Komarine Romdenh-Romluc, "Merleau-Ponty: Actions, Habits, and Skilled Expertise," in *Philosophy of Mind and Phenomenology: Conceptual and Empirical Approaches*, ed. Daniel O. Dahlstrom, Andreas Elpidorou and Walter Hopp (New York: Routledge, 2016), 98–116, here: 100. See also: Komarine Romdenh-Romluc, "Habit and Attention," in *The Phenomenology of Embodied Subjectivity*, ed. Rasmus Thybo Jensen and Dermot Moran (Cham: Springer, 2013), 3–19.

thing and as a coloured canvas. That the dance evolves in an aimless and unorientated space, that it is a suspension of our history[.]"[36]

Artistic and scientific practices implement a kind of know-how that is slightly different from habitual ways of doing something. We learned to walk by practice and training, by repeating those actions that have proved themselves in practice and thus develop a habitual way of walking. However, if an anthropologist or physicist seeks to understand the development of the erect posture of man or the physiological requirements of walking, she will have to suspend the tacit, habitual knowledge of how to walk in order to approach the phenomenon from another perspective. In order to be able to walk, one does not need to take a scientific approach to walking. And it also seems to be obstructive to engage in a habitualized practice if one wants to investigate the origins of that habitual know-how. For a physicist who wants to understand the physiological conditions of walking, the observation and study of similarities across many different cases of walking are indispensable.

While habitual behavior and actions are derived from mere repetition, knowing how to do something in the fields of science and the arts depends on critically referring to established ways of doing it and experimenting with alternative approaches. Progress is possible only upon the condition that one can transgress given practical knowledge by finding and exploring other possibilities of approaching the task or object. In his lecture notes on "Nature," Merleau-Ponty emphasizes that scientific engagement precisely consists in an open and experimental way of approaching the matter of research. Accordingly, he states that the scientist "intervenes" by exploring various possibilities to start off her research. The concern of "the scientist is to find a foothold. His thinking is directed by the concern not of seeing, but of intervening. [...] Does he also often work like a blind man by analogy? Did a solution work out for him? He tries it on something else, because that time it was successful."[37] The essence of the scientific attitude, as Merleau-Ponty presents it in this passage, is that one approaches or a matter of interest in an experimental way: The scientist directly plunges into the midst of diverse possibilities in order to finally

[36] Merleau-Ponty, *Phenomenology*, 258.

[37] Maurice Merleau-Ponty, *Nature: Course Notes from the Collège de France* (Evanston: Northwestern University Press, 2003), 86–7.

"find a foothold." Unlike the philosopher, the scientist does not engage her object through a reflective distance, with trying to understand, but she begins with actually doing something, i.e. arranging a scientific setting and observing the scientific object that interests her from different angles. In the process of scientific investigation she proceeds by applying the principle of 'trial and error'. If something works out, she will move onward, if an experimental set-up does not produce the output intended, she will design a different one. In order to be open for different approaches, it is necessary, however, that the scientist suspends her habitual behavior and actions. The ideal point of departure for scientific research is a state of relative ignorance, i.e. where one does not already know how to do something, in order to then be able to freely explore various possibilities. Accordingly, scientific practices essentially differ from everyday practices in that they require one to consciously suspend established, useful ways of doing something. Thus, they can be regarded as experimental practices.

Like scientific practices, aesthetic practices are characterized by reflecting upon and transgressing existing approaches to phenomena. The artist paradigmatically explores the ways the world and its objects can be seen and, further, tries to evaluate the strategies for translating the different ways of seeing into artworks. Merleau-Ponty claims that these artworks have finally "led us back to a vision of things themselves"[38] and have, in this sense, managed to overcome historically and culturally established practices of seeing. In order to "view the things themselves" it is necessary to suspend the views of those objects that operate according to existing norms. Hence, aesthetic practices – just like scientific practices – involve a critical distance from everyday practices, a distance achieved by taking on different stances that are, according to my definition, experimental in nature.

4. Merleau-Ponty on Scientific and Artistic Practices

So far, I have argued that scientific and artistic practices essentially differ from everyday practices by virtue of their experimental approach to the matter of interest. In this section I will further explore Merleau-Ponty's

[38] Maurice Merleau-Ponty, *The World of Perception* (New York: Routledge, 2004), 93.

understanding of scientific and artistic practices with the aim of uncovering their similarities and their differences. I will show that although scientists tend to be less guided by "primordial experience" than artists when they are at work, they still have an analogical approach to their matter of interest in terms of critically relating themselves to established ways of viewing things within an experimental process of finding new perspectives. Finally, I will contend that it is exactly this practice and training that strengthens the critical faculty in a practical respect and makes both science and art fields of immense epistemic impact.

Let us begin with an exploration of Merleau-Ponty's conception of scientific practices before turning to his consideration of artistic practices. In order to avoid any misunderstandings, it must be stated that Merleau-Ponty's view of the sciences is highly ambivalent, especially when we regard the whole range of his writings. While the early Merleau-Ponty is generally concerned with the positive impact of scientific research on phenomenological analyses, he distances himself more and more from this affirmative view in later works. It could be stated that while in *The Structure of Behavior* and *The Phenomenology of Perception* the phenomenologist at large shows a pro-scientific attitude[39], he becomes a critic of science in *The Visible and the Invisible* and even more evidently in the last essay published during his lifetime *Eye and Mind*. However, I believe it is possible to reconsider this development and introduce a more nuanced understanding of Merleau-Ponty's relationship to science.[40] As I have to restrict myself to some few

[39] He treats scientific findings as one side of a matter and thus considers them within a dialectical setting. That does not mean that his pro-scientific attitude makes him accept scientific findings uncritically. Quite to the contrary, it makes him engage with science and criticize it without, however, neglecting its results.

[40] Kisiel is one of the few authors who emphasizes Merleau-Ponty's positive attitude towards the sciences throughout his work. Theodore J. Kisiel, "Merleau-Ponty on Philosophy and Science," in *Phenomenology and the Natural Sciences*, ed. Joseph J. Kockelmans and Theodore J. Kisiel (Evanston: Northwestern University Press, 1970), 251–273.

Other authors, like Baldwin, contend that already in his early writings Merleau-Ponty shows an anti-scientific attitude. Thomas Baldwin, "Merleau-Ponty's Phenomenological Critique of Natural Science," *Royal Institute of Philosophy Supplement* 72 (July 2013), 189—219. See also Stephen Priest, *Merleau-Ponty*, (London: Routledge, 1998), 26, who stresses that philosophy is not to use scientific methods, or Robert P. Crease, "Phenomenology and Natural Science," in *Internet Encyclopedia of Philosophy* (2012), retrieved September 15, 2015 from http://www.iep.utm.edu/phenomsc: "Others to follow, including Gadamer and

passages here, I will concentrate on his exploration of modern physics, since here he is concerned with a field of research – nature and natural being – in which the artist also takes an interest. Both the scientist and the artist seek to get a grasp of nature, which means, for Merleau-Ponty, that they ultimately try to touch upon the primordial, since "[n]ature is the primordial – that is, the non-constructed, the non-constituted[...]. Nature is an enigmatic object, an object that is not an object at all; it is not in front of us. It is our soil [*sol*] – not what is in front of us, facing us, but rather, that which carries us."[41]

The scientific investigation of nature is a topic that starts to intrigue Merleau-Ponty in the second half of the 1950's. It is one of the big issues in the development of a new ontology, which he designates as 'indirect' or 'lateral' ontology.[42] A reconsideration of the investigation of nature is also a centerpiece for Merleau-Ponty's search for an alternative philosophical method. In his last, unfinished work *The Visible and the Invisible* he notes some of the most basic traits of such an alternative method. Just as in his earlier work, Merleau-Ponty turns his attention to the empirical sciences in this context. Once modern physicists came to realize that they are not engaging with independent and unrelated phenomena – with truths in themselves – but that their relation to the observed determines both the very act of observing and the phenomena observed, they should have also come to understand that it is impossible to go on believing that "the physical object in itself pre-existed science."[43] For Merleau-Ponty, the classical scientific notion of truth is still valid in modern science, and this indicates incoherence between the scientific practice of observing and the theory of modern physics. In observing natural phenomena, modern physics presupposes 'perceptual faith', i.e. a way of immediate relatedness to the natural appearance of phenomena. However, in the actual production of scientific knowledge, this perceptual faith, which refers to a dimension of

Merleau-Ponty, for various reasons did not pursue the significance of phenomenology for natural science."

[41] Merleau-Ponty, *Nature*, 4. For Merleau-Ponty's understanding of nature see also Renaud Barbaras, "Merleau-Ponty and Nature," *Research in Phenomenology* 31/1 (2001), 22–38.

[42] See e.g. Merleau-Ponty, *Invisible*, 125, 141, 178, 248, 255.

[43] Merleau-Ponty, *Invisible*, 15.

experience that Merleau-Ponty considers 'primordial', is more and more curtailed, as the scientific findings are still expressed in the terminology of objective, neutral being. It is this objective, neutral being that runs contrary to Merleau-Ponty's understanding of nature. Nevertheless, modern physics' focus on the situated occurrence of observation and, connected with this, its emphasis of the relativity of natural appearances fits well with Merleau-Ponty's peculiar notion of nature. It is the practice of scientific observation, i.e. what the physicist actually does when she is 'at work',[44] that stresses the "interdependence of the whole of the observable with a situated and incarnate physicist."[45] Although the physicist engages with the observed phenomena in a way that allows him to approach nature, a 'prescientific preconception' underlies the production of theoretical meaning in modern physics. As a consequence, in *The Visible and the Invisible*, Merleau-Ponty finds it necessary to stress the limits of the scientific engagement with nature. Hence, he must highlight what modern physics ignores, what it does not focus on in its actual achievements. "We will have to show how the physical idealization goes beyond, and forgets, the perceptual faith. For the moment it was enough to note that it proceeds from that faith, that it does not lift its contradictions, does not dissipate its obscurity, and nowise dispenses us – far from it – from envisaging it in itself."[46]

In *Nature* Merleau-Ponty approaches the operations of modern physics in a more nuanced way. This is mainly because, besides pointing to the normative conditions of scientific research, he also recognizes the critical potential of science. What the philosopher has to do, is to take a close look at modern science and its connected critical operations. "Science is not an unmotivated instance. We have to psychoanalyze science, purify it. Scientific consciousness lives in the natural attitude, as Husserl said, and it ignores Nature because it is there: it is a naive and uncritical enjoyment of the natural certitude. [...] But modern science often criticizes

[44] "This permits us to advance the notion that no ontology is exactly *required* by the thought proper to physics at work [...], that in particular the classical ontology of the object cannot claim to be enjoined by it, nor can it claim a privilege *by principle* [...]." Merleau-Ponty, *Invisible*, 17.

[45] Merleau-Ponty, *Invisible*, 15.

[46] Merleau-Ponty, *Invisible*, 18.

itself and its own ontology."[47] The point of 'criticizing itself and its own ontology' is, like in *The Visible and the Invisible*, linked to questioning the relation between the scientist and the scientific object – the observer and the observed – from which modern science departs when it is 'at work'. So the positive motivation he ascribes to modern science is the same like the one he ascribes to art. Unlike his final work, in *Nature* Merleau-Ponty faces the question of what the philosopher not only can, but also what she must learn from the scientist – and not what the scientist should learn from the philosopher. This is due to the fact that, according to Merleau-Ponty, "the position of the philosopher is not without risk,"[48] especially as regards the practical engagement with the matter of interest. While the philosopher is eager to 'see', i.e. to understand the world, the scientist starts her work by directly engaging with it. Merleau-Ponty thus states that the scientist seeks to intervene while the philosopher distances herself from the world. "The concern of the philosopher is to see; that of the scientist is to find a foothold. His thinking is directed by the concern not of seeing, but of intervening. He wants to escape getting bogged down in the philosophical way of looking at things. [...] The philosopher must see behind the back of the physicist what the physicist himself does not see."[49] The main difference between philosophical and scientific practices, as Merleau-Ponty expresses it in this passage, is that, approaching a problem philosophically, one does not engage with things, but touches on them from a reflective distance, while the scientist plunges into them. According to Merleau-Ponty, the philosopher should follow the example of the scientist. This is because, unlike the philosopher, the scientist does not begin her engagement with trying to understand, but she starts with doing something, i.e. observing the scientific object that interests her. By engaging with the matter directly, the scientist faces an actual experience, while the philosopher merely tries to grasp the phenomenon inhabiting a non-experiential state.

The scientific practice referred to in this context is a particular one. According to Merleau-Ponty, this particular practice has emerged out of the development of modern physics, namely quantum physics. In 1905

[47] Merleau-Ponty, *Nature*, 85.
[48] Merleau-Ponty, *Nature*, 85.
[49] Merleau-Ponty, *Nature*, 86-7.

Albert Einstein revolutionizes the idea of conceptualizing nature as an objective entity.[50] The results of scientific experiments cannot be regarded as ultimate because the physical phenomena examined are taken to be part of a reality that is relative to the scientist observing them. Accordingly, with modern physics one must come to admit that "the existing things are not individual realities, but generic realities."[51] This revolution not only has consequences for the designation of scientific findings, it also has consequences for developing alternative scientific practices based on "the new relation established between observed thing and the measurement."[52] The new conception is connected with a different understanding of the scientific instrument. Instruments are not anymore regarded as an extension of the senses. Rather, they are considered to 'produce' a phenomenal field that turns out to be directly related to them. Accordingly, the modern physicist investigates nature through an "engaged operation."[53] It is the conception of how the action of measuring is 'engaged' that calls for a final revision of the classical "objective" approach to nature. But this is not all. For Merleau-Ponty, it also calls for a revision of the transcendental ability to think in terms of a truly embodied 'cognition'. "The situated and incarnated aspect of the physicist must succeed the universal 'I think' of transcendental philosophy."[54] If philosophy wants to take a page out of the book of modern physics, it has to face the necessity of a situated confrontation with the observed object. It has to stick to a radical notion of experience, not primarily in founding its theory, but in enhancing its practice.

Looking at these passages from *The Visible and the Invisible* and *Nature* is

[50] In his short essay "Einstein and the Crisis of Reason" from 1955, Merleau-Ponty uncovers the paradoxical attitude Einstein has towards revolutionizing the very idea of truth. He says that although Einstein himself claims that he wants to apprehend the world "in a wildly speculative fashion" (Maurice Merleau-Ponty, *Signs* (Evanston: Northwestern University Press, 1964), 192), he still sticks with a classical notion of truth and knowledge. "Einstein held on to both ends of the chain – classical physics' ideal of knowledge and his own 'wildly speculative', revolutionary way. The physicists of the following generation have for the most part let the first end go." Merleau-Ponty, *Signs*, 193.

[51] Merleau-Ponty, *Nature*, 92.

[52] Merleau-Ponty, *Nature*, 93.

[53] Merleau-Ponty, *Nature*, 94.

[54] Merleau-Ponty, *Nature*, 97.

interesting, since Merleau-Ponty here underlines the differences between the physicists' more practical knowledge – knowing how to approach the world – and her more theoretical knowledge – the knowledge generated in terms of scientific findings. The practical aspect of knowledge becomes evident when one considers the scientist at work: She approaches the matter of research with the awareness that she is directly related to it. It is this very relatedness that makes it impossible to simply investigate an objective world from a distanced point of view. Following Merleau-Ponty, scientific practice must therefore be considered as an "engaged operation." The scientist has to start from her situatedness and further explore her own relation to the observed in the course of an ongoing process of "finding a foothold." From there she knows how to "intervene": She is supposed to act out her own bodily, situated perspective of observing in relation to the observed. She can enhance her practical knowledge of how to perform as a bodily and situated scientist, which is fundamentally different from ordinary forms of knowing how to do something bodily: She seeks new ways of relating herself to the observed and thus critically examines the situation given in contrast to other possible points of view, being aware of her own body at work, without merely intellectualizing the situation. She then continually tests and experiments and – drawing on Ryle's concept of knowing-how – "performs critically in trying to get things right."[55]

In the texts referred to above, Merleau-Ponty clearly states that scientific practices are of the utmost importance for his ontological project, since they present a way of approaching natural phenomena in an experimental and critical fashion, without universalizing them in the way that the philosopher normally does. In this, scientific practices are similar to artistic practices. Artistic practices too are important for his philosophical project because they help one to know how to approach natural phenom-

[55] I think it makes good sense to describe what Merleau-Ponty here analyzes in terms of scientific practice as non-normalized scientific practices, referring to Kuhn's notion of "normal science." Cf. Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962). It would be misleading to suppose that all scientific practices are characterized by continually trying to find a foothold. Normalized scientific practices usually simply execute established ways of doing things and are thus probably more similar to everyday practice than to what Merleau-Ponty describes as the scientist's being at work.

ena.

Much of what Merleau-Ponty says about artistic practices is embedded in his analyses of Paul Cézanne's work. In the early text "Cézanne's Doubt"[56] Merleau-Ponty attempts to understand the peculiarity of Cézanne's painting. According to him, Cézanne tries to overcome the problem of impressionism. Impressionists try to capture the impression of the moment and totally focus on the atmosphere, without taking an interest in the object and its nature. Questioning this approach, Cézanne wants to rediscover the object behind the atmosphere.[57] Accordingly, his main intention is paradoxical in wanting to present an object as a solid entity without reducing the occurrence of its appearing. It is this paradox in Cézanne that renders his painting a never-ending endeavor and that characterizes his artistic practice as an open-ended exploration of possibilities. For Merleau-Ponty, Cézanne's artistic practice amounts to an in depth-study of how to view the world. Through his paintings Cézanne inquires into the very nature of perception. As such, the practice of painting can be compared to a scientific study of perception, although it is conducted in a way that is different from the carefully set up experiments in traditional science.[58] Merleau-Ponty still views Cézanne as some sort of scientist who studies the nature of perception by way of painting. What is interesting about the artist's "quasi-scientific" approach is that his "findings" are not presented in the objectifying language of science, but in the sensual expression of images. The painted image reflects the painter's approach to the painted object and thus gives viewers the opportunity to participate in his quasi-scientific practice, rather than just receive information about the results of his investigations.

The epistemic relevance of artistic and aesthetic[59] practices and their

[56] Maurice Merleau-Ponty, "Cézanne's Doubt," in *The Merleau-Ponty Aesthetics Reader: Philosophy and Painting*, ed. Galen A. Johnson (Evanston: Northwestern University Press, 1993), 59–75.

[57] Merleau-Ponty, *Cézanne*, 61.

[58] Again, it might help to refer to the difference between the practices of normal science and non-normalized scientific practices here.

[59] I distinguish between artistic and aesthetic practices in order to highlight the difference between contemplating and producing artworks. In my terminology, aesthetic practices are practices of contemplating artworks or aesthetic objects more generally and artistic practices are practices of producing artworks.

relatedness to scientific practices also becomes evident when one looks at "The Film and the New Psychology." Here, Merleau-Ponty explicitly hints at the parallels between what can be learned about the nature of perception from "new psychology," referring to Gestalt theory especially, and what can be learned about it in the course of cinematic experience. In particular, it is the temporal aspect of the Gestalt that becomes evident in watching films. The time-structure of spontaneous perception can be studied in the very moment a movie shows "how something takes on meaning." "Movies [...] always have a story and often an idea [...], but the function of the film is not to make these facts or ideas known to us. [...] The joy of art lies in its showing how something takes on meaning – not by referring to already established and acquired ideas but by the temporal or spatial arrangement of elements."[60] Gestaltpsychologists try to engage with the structure of spontaneous perception scientifically, while in cinematographic experience this structure is activated without a scientific investigation. Accordingly, the epistemic benefit of engaging with aesthetic practices, like watching a movie, can be characterized as learning about how perception is structured. Hence, aesthetic practices are comparable to scientific practices: in the present case, both study perception. The main difference between aesthetic and scientific practices is, however, that the knowledge acquired through aesthetic practices is practically enacted through and though, that is to say, it is not expressed in terms of propositional statements.

While in these two early essays Merleau-Ponty is mainly interested in new approaches to perception, in the late text *Eye and Mind*, he seeks out an alternative way of investigating Being. It is the artistic practice of painting that opens up this alternative way. While Merleau-Ponty accuses scientific and even philosophical knowledge[61] of neglecting Being by employ-

[60] Maurice Merleau-Ponty, *Sense and Non-Sense* (Evanston: Northwestern University Press, 1964), 57–8.

[61] *Eye and Mind* thus paradigmatically exposes Merleau-Ponty's highly ambivalent rapport with science. My suggestion is to read his rejection of science – e.g. where he stresses that science does not engage with things, but manipulates them (see Maurice Merleau-Ponty, "Eye and Mind," in *The Merleau-Ponty Aesthetics Reader: Philosophy and Painting*, ed. Galen A. Johnson (Evanston: Northwestern University Press, 1993), 121–149) – as a rejection of scientific truth and the objectifying language science makes use of when encapsulating their findings.

ing an objectifying language that fixes its fluctuation and tries to order its naturally unordered aspects, he holds that it is possible to approach Being directly through painting. The artist – again paradigmatically embodied by the painter Cézanne – responds to the natural world that he encounters in the very act of painting. He has what Merleau-Ponty designates a 'primordial experience'.[62] Primordial experience is a mode of experience that is more profound and thus more close to the 'brute' or 'wild' being that Merleau-Ponty focuses on in his later phenomenology.[63] The brute or wild being is a being that grounds beings in the world and is closely connected with the notion of nature. Both refer to an unorganized, unstructured level of experience with which we are unfamiliar in everyday life, since we normally tend to organize and structure our experiences. It is due to this striving to determine and order things that it becomes nearly impossible to grasp the phenomenal appearance of wild being. Philosophy, science and everyday life here present practices which prevent us from acquiring knowledge of Being. It is only through the arts, especially through painting, that one is able to gain some sort of knowledge that has ontological relevance.[64] Interestingly, this ontological knowledge turns out to be a practical kind of knowledge: It consists in knowing how to encounter the world in a primordial way. For Merleau-Ponty, the painter, Cézanne, establishes a practice that allows him to practice and train this kind of knowledge. The reason why it allows one to do this, is that it leaves behind the normative limitations of perception in everyday, scientific and philosophical life. The painter is free to take on different stances towards the world, to test and experiment with viewing things from various sides. She continually seeks and finds new approaches to the visible, new aspects of it. Even in the very moment she makes some kind of statement about it, namely when she has finished producing an image, she does not restrict the view to one and only one perspective. Merleau-Ponty claims that the painted image still evokes a primordial kind of perception insofar as it does not simply show something, but rather exhibits a non-objectifying

[62] For Merleau-Ponty 'primordial experience' is a kind of pre-ordered experience that cannot be translated into language. Aesthetic experience is exemplary for Merleau-Ponty's understanding of primordial experience. See Merleau-Ponty, *Cézanne*, esp. 63–64.

[63] See e.g. Merleau-Ponty, *Invisible*, 168—170, 183, 211.

[64] Merleau-Ponty, *Eye*, esp. 128–129.

way of seeing. According to him, the image somehow functions like a mirror, since it mirrors the practice of painting and thus the painter's bodily engagement with Being. This practice of painting is not to be regarded as a 'knowing' or 'disposing' access to Being; rather, it is based on a challenge. For Merleau-Ponty, the painter is an agent who Being itself challenges to engage in his practice. Since the painter responds to the spectacle of the world – and does not invent anything in the proper sense of the word – the painted image is meaningful to everybody. The image is regarded as a bodily mediated visible, a "visible to the second power"[65] or as a "*coherent deformation* imposed on the visible."[66] As this "visible in the second power," the image is not a material object or an identifiable thing; it is not something that could be *described*. Merleau-Ponty maintains that it is not the image that is perceived in aesthetic experience, but that one perceives "according to" or "with" the image.[67] This means that the image is not a specific object that is experienced aesthetically, but that it evokes a certain kind of experience, namely aesthetic experience. In this, it is a reflected visibility that is an expression "in the second power" exactly because it does not appear as something specific, but that – thanks to its peculiar way of appearing – opens up a specific way of experiencing.

Through the experience of an artwork, one can participate in a practice that opens up a level of perception that directly touches upon Being. This pure Being has not been manipulated and objectified by science or philosophy. Accordingly, Merleau-Ponty's late aesthetics focuses on the possibility of gaining ontological knowledge through participation in artistic and aesthetic practices. While Merleau-Ponty contends that the painter encounters 'Being' while she is painting, her primordial experience is reflected in the painted image. As such everybody can experience it.[68]

5. Experimental Practices with Epistemic Value: Science and Art

Drawing on *Eye and Mind*, we can claim that the painter is a person who is actively at work, bodily engaging with Being. She does not know how

[65] Merleau-Ponty, *Eye*, 126.
[66] Merleau-Ponty, *Signs*, 78.
[67] Merleau-Ponty, *Eye*, 126.
[68] Merleau-Ponty, *Eye*, 126–127.

to state anything about the ontological features of Being, but she knows how to 'intervene', how to proceed in a practical respect in order to touch upon it. Interestingly, in *Nature* Merleau-Ponty also ascribes to the modern physicist the ability to engage with nature and, so to speak, with Being. The reason why the physicist seems eligible for a serious engagement with nature is the same reason why the painter is favored for an ontological investigation. Both of them intervene. Both are at work, situated and embodied. Both know how to approach their matter not by way of thinking, but by way of doing. And both act in a way that is opposed to classical philosophical methods and everyday practices. It might therefore appear to be an enigma that in *Eye and Mind* Merleau-Ponty completely disregards science and its ability to touch upon nature and Being. The enigma falls away when one considers that what Merleau-Ponty actually criticizes in his last reflections on science is scientific output, viz. the theoretical knowledge produced by science, and the scientific strategies developed in order to secure an increase of output.[69] However, Merleau-Ponty still en-

[69] *Eye and Mind* opens with the following diagnosis: "Science manipulates things and gives up living in them.[] Operating within its own realm it makes its constructs of thing; operating upon these indices or variables to effect whatever transformations are permitted by their definition, it comes face to face with the real world only at rare intervals." Merleau-Ponty, *Eye*, 121. Merleau-Ponty begins his last essay with an entire rejection of a scientific approach to things, because he accuses science of neglecting them. In contrast to his remarks in *Nature* he does not regard the methods and the knowledge of modern science as revealing. Rather, he states that science does not 'live in things', because it 'manipulates' and transforms them. Scientific experiments do not reach out to a level of radical experience when scientists stick to their prefigured models. They normally do so because the prefigured models proved to be successful in the past. In *Eye and Mind*, Merleau-Ponty regards science from the angle of its political and ideological intentions focusing on its actual output and how it achieves to generate it. Science is not anymore an approach of interest for his ontological investigations, because he regards it as eager to produce objective, propositional knowledge that can be used for organizing and systematizing the world and that, therefore, neglects nature on a very principal level. In order to become able to produce objective knowledge, it also has to limit the scope and the method of experimenting. Merleau-Ponty here concentrates on what science wants to say, what it seeks to understand, and on what it therefore tries to get a hold in terms of propositional statements. He does not anymore regard science as an experimental practice, as an engagement with nature, as an 'intervention'. One could say that Merleau-Ponty does not anymore lay eyes on what scientists *do*, but on what they *say* and what kind of politics science pursues. Therefore he further does not refer to the process of 'trial and

visages another dimension of scientific practice, namely the more free and experimental, the more critical side to it when he considers the modern physicist at work in *Nature* and *The Visible and the Invisible*.

I therefore suggest that we take the similarities between the practical engagement of the scientist and the artist seriously, and refer to them in order to account for the epistemic content of "experimental practices." Both scientific and artistic practices can be regarded as experimental practices. By 'experimental' I do not mean voluntarily staging a situation in a laboratory environment, for the purposes of analysis in accordance with prefigured models. Rather, by 'experimental' I mean an approach that freely tests different perspectives on a subject that results in the acceptance of some perspective as proper and the rejection of others as improper. An experimental practice, then, is a practice that allows for examining and checking different stances. Viewed against the conceptual framework of experimental practices, there are a number of remarkable parallels between scientific and aesthetic practices.[70] According to Merleau-Ponty, both the scientist and the artist are truly at work, meaning that both really engage with the matter of their interest in an open, experimental way. As such, they touch upon the relationship between observer and observed – scientist and scientific object on the one hand and artist and artistic object (which is not the artwork in the proper sense, but rather the object the artist engages with as a model for the production of an artwork) on the other hand. The scientist and the artist are both incarnated and are exposed to the particular objects they engage with. They open themselves up to the world in a responsive manner and do not merely act in a given, habitual fashion. They are both open to doing things differently. Referring to Ryle, scientific and artistic practices can be called intelligent practices, since scientists and artists experimentally and critically develop new approaches to encounter the world with the aim of finding better methods,

error', to the scientific 'practice and training' he finds intriguing in *Nature*. They do not form an aspect of scientific politics. They represent only a trait of a changing practice in modern science.

[70] Kuno Lorenz, for instance, claims that through aesthetic practices one can acquire perceptual knowledge, while through scientific practice one can acquire conceptual knowledge. Kuno Lorenz, "Perceptual and Conceptual Knowledge: The Arts and the Sciences," *Philosophia Scientiae* 2/1 (1997), 147–160.

stances or points of view. Neither of them amounts to a mere habit. In scientific, but also in artistic practice, not only is it important that one disposes of a skill, but that one is able to alter the modality of one's own agency in performing a task. As such, know-how involves an openness for and responsiveness to having new experiences, specifically in the sense of viewing things from another perspective. At the same time, know-how also involves a kind of attentiveness, or awareness, of one's own actions, which is requisite for being able to change one's point of view. Learning how to do something in the sciences and arts amounts to an ongoing critical engagement with things, a kind of experimental approach to a matter from different perspectives, sorting out worse and better ways of approaching it. This procedure, which can be considered as both experimental and critical at the same time, is crucial, since the repeated performance of a task can only be considered as altering the quality of an action (and, thus, as a learning activity in the proper sense of the word) under the condition that this very action is critically framed and evaluated against the backdrop of other ways to do it.[71]

There still remain a number of differences between scientific and artistic practices. One core difference is that the artist's practical knowledge is directly reflected through the image. Science is forced to put its findings into writing and make use of the objectifying character of language therein. This is why Merleau-Ponty's treatment of the sciences and their value for approaching nature or Being is highly ambivalent, while his appreciation of painting remains unabated. Although in *Eye and Mind* Merleau-Ponty rejects the objectifying character of science as neglecting perceptual faith and primordial experience, he characterizes scientific practice as an experimental practice and, as such, implicitly compares it with aesthetic practice in texts like *The Visible and the Invisible* and in *Nature*, where it is more

[71] Cézanne wants to make an adequate painting and continues to paint, because he never arrives at producing the perfect picture. Merleau-Ponty is fascinated by Cézanne's repeated engagement with the same subject – such as Mont Saint Victoire – and interprets the approach of painting it again and again as the attempt to adequately respond to his primordial perception. This never-ending attempt making an adequate painting is reflected in Cézanne's painting and can be perceived when viewing his images. Therefore, the important epistemic character of an image does not lie in imparting some kind of information about brute or savage being, but in reflecting a certain perceptual mode of approaching the world.

clearly pronounced. Another difference between the two practices can be seen in the distinct intentions the scientist and the artist have when they are at work. According to Merleau-Ponty, the artist aims at having a primordial experience, while the scientist does not intend to do so. The scientist in a way only happens to touch upon the primordial in ultimately seeking a higher truth. The search for a higher truth is something that makes scientists also more likely to fail to engage in a truly experimental practice. The scientist researches for the sake of finding something in the end. The artist – very likely – also engages in painting, sculpting or filming with the aim of producing an image. However, the image, ideally, reflects the practical knowledge of its author and cannot be reduced to some kind of theoretical knowledge that is imparted by way of signs. As such, the image represents the very possibility of passing on the knowledge of how to approach the world in an experimental and critical fashion. Thus my conclusion is that engaging in artistic and aesthetic practices should not be regarded as a mere training for artists or connoisseurs of art. Quite to the contrary, practice and training in the arts – in terms of both production and contemplation – is valuable for improving the knowledge of how to approach the world in an experimental and critical fashion in general. Recent empirical studies have underlined that arts education therefore has a considerable impact on scientific excellence.[72] There is evidence that repeatedly engaging in aesthetic practices improves those practical skills that are of particular importance for free, experimental and critical perception and thinking. The ability to perceive and think freely, experimentally and critically is essential for finding new answers to questions. With regard to practice and training in scientific practices there may also be a positive impact on artistic and aesthetic know-how. Therefore, I think it would be interesting to further inquire into what both scientists and the artists can

[72] See, for instance, Andrew Needle et al., "Combining Art and Science in "Arts and Sciences" Education," *College Teaching* 55/3 (2007), 114–119; Burton, Judith M., Robert Horowitz, and Hal Abeles, "Learning in and through the Arts: The Question of Transfer," *Studies in Art Education* 41/3 (2000), 228–257; Fiske, Edward B., (ed.), *Champions of Change: The Impact of the Arts on Learning*, 1999, retrieved October 18, 2015 from `http://files.eric.ed.gov/fulltext/ED435581.pdf`; Russ Chapman, "Improving Students' Performance Through the Arts," *Principal* 77/4 (1998), 20–26, Elliot W. Eisner, "Does Experience in the Arts Boost Academic Achievement?," *Journal of Art & Design Education,* 17/1 (1998), 51–60.

learn from each other when being at work in the other's "lab." This is to be examined on another occasion.

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