Wittgenstein 2.0: Philosophical Reading and Writing after the Mediatic Turn

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Wir sind aufs Glatteis geraten, wo die Reibung fehlt, also die Bedingungen in gewissem Sinne ideal sind, aber wir eben deshalb auch nicht gehen können.
Ludwig Wittgenstein

Glattes Eis,
ein Paradies für den,
der gut zu tanzen weiß.
Friedrich Nietzsche

Introduction[1]

'Although Wittgenstein is widely regarded as one of the most important and influential philosophers of this century, there is very little agreement about the nature of his contribution. In fact, one of the most striking characteristics of the secondary literature on Wittgenstein is the overwhelming lack of agreement about what he believed and why'. These are the opening words of David Stern's article 'The availability of Wittgenstein's philosophy' in *The Cambridge Companion to Wittgenstein* (Stern 1996, 442). In his introduction to the same volume, Hans Sluga even proposes that our fascination with Wittgenstein might be 'a function of our bewilderment over who he really is and what his works stand for' (Sluga 1996, 1).

There are several reasons for this disagreement. In the first place, Wittgenstein's writing is 'extraordinarily compressed' (Anscombe 1996), sometimes inconsistent, and not seldom even obscure. The fact that many of the English (and other) translations are questionable and often reflect much

interpretation on behalf of the translator also has caused much confusion and debate. The circumstance that Wittgenstein's later philosophy in several respects opposes the views he expressed in the *Tractatus Logico-Philosophus,* didn't contribute to the consensus among Wittgenstein scholars either. Next, his writings hardly have a linear character. This already applies to the *Tractatus,* which, rather than a deductive argument, consists of 'a fabric where everything is connected with everything else' (Stenius 1996, 15). It is even more true for the later works. As Stern remarks, the characteristic unit of Wittgenstein's writing was not the essay or the book, but the remark (*Bemerkung*) and as a result, his oeuvre consists of multiple series of interconnected philosophical questions, personal observations, jokes, parables, and propositions (Stern 1996, 444). Moreover, and connected with this, apart from the *Tractatus* and one short article on logical form, Wittgenstein never managed to settle on a form for the publication of his writings. His *Nachlass*, consisting of some 20.000 pages, is a work in progress, a baffling collection of drafts, variations and revisions. For all these reasons, Stern concludes that for many Wittgenstein scholars his writings are a mirror which mainly reflects 'their own thinking' and much of the interpretation is really a discussion of other interpreter's readings, resulting in a secondary literature that has taken on a life of its own. (Stern 1996, 443).

I do not have the ambition to tell 'who Wittgenstein really is and what his works stand for'. However, from a mediatic perspective, I hope to shed some light on what we might call the hypertextual form of Wittgenstein's oeuvre and to give some suggestions how we could deal with its bewildering appearance. Following McLuhan's maxim that the medium is the message, I will argue that the proto-hypertextual form of Wittgenstein's later work not only invites another kind of reading, but also suggests another interpretation of the *Tractatus*. This might help us to re-mobilize Wittgenstein's philosophy in the context of the present informatization of the worldview. My thesis is inspired by a series of articles by Kristóf Nyíri and Herbert Hrachovec, dealing with Wittgenstein's relationship to secondary orality and with the electronic edition of the *Nachlass* respectively. Though my argument will take a different direction, their publications prepared the ground for the claim I defend in this paper.

The paper consists of four sections. In the first section I will briefly introduce the mediatic turn that informs my approach and will also make some remarks on Wittgenstein's contribution to this turn. In the second section, I will discuss Nyíri's claim that the genesis and direction of Wittgen-

stein's later philosophy is connected with the emergence of secondary orality. Although I agree with Nyiri that we should regard the form and style of Wittgenstein's later work in connection with his critique of the Platonic culture of the book, I will defend the thesis that Wittgenstein was not so much – as Nyíri argues – on his way back to an oral culture, but that he – intentionally, unintentionally or perhaps even contrary to his conscious intentions – was struggling his way into a new, post-literate way of thinking and writing. In the third section I will argue that this claim finds (unintended) support from the *Bergen Electronic Edition of Wittgenstein's Nachlass.* Herbert Hrachovec has argued that, given the transitory nature of Wittgenstein's *Nachlass,* an electronic version is more suitable to disclose the proto-hypertextual nature of this oeuvre than a traditional book publication. However, connecting with the development of the Web 2.0, I will argue that this Bergen edition is only a half-hearted starting point to do so. In the fourth section, regarding a specific development in Wittgenstein's remarks on the possibility of 'thinking machines', I will argue that a mediatic rereading of the *Tractatus* might not only help us to understand the database ontology that underlies the philosophy of the later Wittgenstein, but also to disclose the *Nachlass* accordingly.

1. The mediatic turn

In the last decade 'media philosophy' (*Medienphilosophie*) has entered the philosophical arena. According to one of its proponents, Reinhard Margreiter, this name refers not only, and not even predominantly, to the exploration of yet another ontological domain, but rather designates a fundamental transformation of philosophy itself, which is characterized by a turn towards (the descent and history of) the mediatic foundations of philosophy. In his view, media philosophy might become a contemporary '*prima philosophia*' (Margreiter 2003, 151). However, Margreiter does not argue for a modernist kind of foundationalist superdiscipline, but rather for a critical discourse that has to accompany every act of knowing.[2]

Though the name 'media philosophy' is a recent invention, the phenomenon is not altogether new. Already in Plato's *Phaedrus* and *Seventh Letter* we find fundamental reflections on the impact of writing on philosophy, that is: on the type of oral philosophy that precedes written philosophy and which is still reflected in the dialogical form of Plato's writings. However,

in the tradition of Western philosophy, which is strongly connected with the book, this kind of reflection remains relatively scarce and marginal for a long time. Starting from Parmenides' identification of being and thinking, a dominant part of the metaphysical tradition was based on the presupposition that thinking and being – *nous* and *phusis* – share the same form (*eidos, morphe*), guaranteeing the identity of what can be thought and what can be (Allen 2004, 218).

Kant's transcendental philosophy can be regarded as the first radical critique of this metaphysical equation of thinking and being. According to Kant there is no immediate and absolute knowledge of reality, because it depends on the finite *medium* of the human faculties of sensibility, understanding, and reason. However, as Kant deems this medium to be timeless and shared by all human beings, he still could adhere to the notion that the phenomenological world constituted by this medium, is something that has empirical objectiveness and as such is open to scientific explanation, prediction and control. In post-kantian philosophy two further developments can be distinguished that together have resulted in what might be called 'the mediatic turn' in modern philosophy.

The first of these developments has to do with the *historization* of human reason (cf. De Mul 2004, 97-125). After Kant the idea emerged that human reason is not a timeless entity but something that develops in – natural and historical – time. Whereas in Hegel's philosophy this historization was still regarded as a process in which Absolute – that is: suprahistorical – Reason finally becomes conscious of itself (and in this sense returned to a pre-kantian metaphysics), in the hermeneutical tradition – starting with Dilthey and radicalized in Heidegger and his post-modern heirs – the emphasis gradually shifts to the finiteness of human experience.

The second development in the post-kantian philosophy I refer to is what might be called the *externalization* of human reason. It is connected to the realization that the thinking of being always requires an external medium. Already Herder and Von Humboldt emphasised both the crucial role language plays in thinking, and the non-transparency of this medium. In the continental tradition it was again in the hermeneutical tradition – to which we might include Nietzsche, who blamed grammar for our belief in God[3] – that this insight was developed further.

In the analytical tradition this development took place in the so-called 'linguistic turn' (Rorty 1967). This turn was accompanied with the 'belief that the problems of philosophy may be solved or dissolved either by

reforming language (the advocates of this were dubbed "ideal language philosophers") or by a better understanding of the language we actually use ("ordinary language philosophers")' (Hacker 2007). Wittgenstein played a crucial role in both manifestations of the linguistic turn.[4] In the mainstream interpretation of Wittgenstein – sketched broadly enough to abstract from the many disagreements – Wittgenstein in the *Tractatus* held that 'the sentences of our language, fully analyzed, necessarily reflect the metaphysical form of the world' and that 'all philosophy is a critique of language' (Hacker 2007). However, in his belief in the correspondence between being and the logical form of language, Wittgenstein – in spite of his radical restriction of meaningful language to elementary and complex propositions of science and his critique of every philosophy that pretends to go beyond these propositions – remained a victim of Platonic metaphysics. In his later writings – I am still sketching the mainstream interpretation – Wittgenstein criticized his earlier position and developed a therapeutic philosophy which aimed to dissolve philosophical problems by analyzing the many confusions that characterize our ordinary language.

What distinguishes recent media philosophy from the earlier continental and analytical approaches is the fact that its scope goes far beyond the linguistic domain. Inspired by the emergence and impact of new media such as radio, film, television and the computer, and by the work of otherwise diverse thinkers such as Cassirer, Langer, McLuhan, Ong, Goodman and Derrida (to mention a few), the mediatic self-reflection has been extended to (the symbolic and material dimension of) all cultural media of experience. In this 'mediatic turn' the development of computer mediation has become a central topic. One of the reasons for our fascination with computers is that with the development of artificial intelligence the externalization of human reason seems to enter an entirely new phase, which in its radicality perhaps can only be compared to the externalization of thinking in writing, several millennia ago.

In the following I will elucidate this point, as it constitutes a fruitful starting point for a mediametic interpretation of Wittgenstein.

2. Wittgenstein: a philosopher of secondary orality?

One of the crucial claims of media philosophy is that the content of philosophy cannot be abstracted from its mediatic form. Walter Ong's book *Orality*

and Literacy provides us with a good example of this claim, as he connects Plato's philosophy with the emergence of writing (Ong 1982). Elaborating the work of McLuhan (McLuhan 1962) and Havelock (Havelock 1963), Ong argues that Plato's doctrine of Ideas reflects the transformation from oral to written philosophy. Whereas in oral communication language signifies in many different ways (e.g. to command, question, pray, etc.), in the medium of writing words basically signify by designating something. Moreover, because writing abstracts words from the concrete context in which they are used in oral communication, it creates the illusion that the same words always designate the same abstract objects. For that reason Ong argues that the practice of writing gave birth to Plato's eternal and essential Ideas. Hence the structure of the dialogues: again and again Socrates challenges his opponents to make the transition from the manifold uses of a word to its essential meaning.

It is remarkable that Plato does not seem to be fully aware of the role of the medium of writing. It is not without irony that when he explicitly discusses writing in the *Phaedrus* and the *Seventh Letter* he is severely critical of the new medium of writing, because in his view writing deprives man from his most valuable faculty: the art of memorizing that characterizes oral culture and living dialogue. The least we can say is that Plato shows a certain ambiguity towards writing, which is expressed in the dialogical form of his writings.

In 'Wittgenstein as a philosopher of secondary orality', Kristóf Nyíri presents the intriguing thesis that we should interpret the form of Wittgenstein's later writings in the context of his critique of Plato's essentialism. Nyíri points out that in 1931 – during a crucial period in the development of his later philosophy – in his notebooks Wittgenstein refers to Plato at least eleven times, quoting often quite lengthy passages that 'belong to those where Plato's path from a specific view of meaning to a specific ontology becomes particulary clear' (Nyíri 1996/1997). According to Nyíri Wittgenstein was fascinated by these passages because he 'obviously had a feeling that that the point in history of philosophy to which he wanted to return is the one at which Plato had taken the wrong turning' (idem).

To underpin his interpretation Nyíri puts forth a passage from Plato's *Euthyphro* in which the protagonist is forced by Socrates to proceed from giving examples of holy acts to their essential aspect, by which all holy acts are holy,[5] to a passage of the *Philosophical Investigations* in which Wittgenstein goes exactly in the opposite direction: from the essence of a lan-

guage game to the view that the different instances of a particular language game 'have no one thing in common which makes us use the same word for all'.[6] Although we do not find these passages juxtaposed in Wittgenstein's *Nachlass* itself, Nyíri rightly claims that Wittgenstein was aware of his reversal (*Umdrehung*) of Platonism, as in the same year (1931) he writes to Schlick: 'I cannot characterize my standpoint better than by saying that it is opposed to that which Socrates represents in the Platonic dialogues' (MS 302:14).[7]

According to Nyíri, Wittgenstein was inspired to his reversal of Plato by his experience of the phenomenon of 'secondary orality'. This term, coined by Walter Ong, refers to the new media that emerged in the twentieth century, and in which orality again played an important role, such as film, radio and television. Ong calls this kind of orality 'secondary', because, although it resembles primary orality as we find it in preliteral cultures in many respects, at the same time it has recourse to writing and book printing. After all, the spoken texts we hear when listening to the radio or watching a movie or television, often have been written down before they were spoken. Nyíri remarks that Wittgenstein was almost addicted to going to the movies and that he often used the film to illustrate his philosophical points (Nyíri 1996/1997). This should be no surprise, as the spoken words in the then new sound-film – or 'talkies' as they were named – made Wittgenstein realize the different uses of language beyond mere designation.

Nyíri also connects Wittgenstein's style of writing with secondary orality: 'Although he was an obsessive writer, Wittgenstein had a problematic relation to written language, especially to written language in its fully developed form: the printed book. Already in the preface to his *Wörterbuch für Volksschulen*, compiled in the early 1920s in the course of his activity as an elementary school teacher in Lower Austria, Wittgenstein had complained about the distorting effects of typography; and his reluctance to *publish* his writings is of course notorious. Here also comes to mind his poor orthography; his anachronistic predilection for having people read out loud texts to him; the common observation that his favourite readings he really knew by heart; the aphorism and the dialogue as conspicuous stylistic features of his writing; and even his tendency to explain arguments by using pictures and diagrams' (Nyíri 1996/1997).

At this point I would like to make two connected critical remarks with regard to Nyíri's argument. The first starts with the question whether it is adequate to call Wittgenstein, as Nyíri does in the title of his article, 'a phi-

losopher of secondary orality'. Though Nyíri's claim that Wittgenstein was inspired by the emerging secondary orality is convincing, with regard to the *Nachlass* we should rather speak of a secondary *literacy*. After all, Wittgenstein's *Nachlass* does not consist of a series of talks that has recourse to writing, but, on the contrary, it is a new kind of *writing* that has recourse to spoken language. Moreover, as Nyíri himself notices, Wittgenstein never gave up writing, but obsessively and gradually desperately tried to publish his writings in the form of a printed book. On December 4, 1946 he writes in his notebook: 'Ich hätte gerne ein gutes Buch hervorgebracht, ja ein sehr gutes; aber es ist nicht so ausgefallen; und die Zeit ist vorbei ...' (MS 133, 145).

My second remark concerns the apparent Hegelian ring of Walter Ong's concept of 'secondary orality', which also affects Nyíri's interpretation. In Ong's account of the history of the media, secondary orality functions as a Hegelian synthesis between orality and literacy, a synthesis in which thesis and anti-thesis are being elevated (*aufgehoben*) to a higher state in which both are negated yet fully contained. Ong's master story thus recounts the dialectical 'triple jump' that leads from an original paradise (Orality), via a stage in which this paradise is lost (Literacy) into the regained paradise of Secondary Orality. However, in doing so, Ong seems to overlook those medium-specific aspects of new media that go beyond both orality and literacy, and that make them into an altogether qualitatively new stage in the development of media. We can think, for example, of the principle of montage that characterizes the medium of film. And when these new media become computer-mediated and integrated in networks such as the Internet, we definitively enter a qualitatively new stage in the development of the media. In the case of Ong, who published his book in 1982 – only one year after IBM introduced the personal computer –, we must excuse him in so far as he wrote this book before the massive breakthrough of the new information and communication technologies. However, Nyíri wrote his article in 1996 at a time that the contours of the Information Age already had become clear. Although he even mentions 'the electronic recording of texts and data' he does not reflect on their relevance for a mediatic interpretation of Wittgenstein's *Nachlass*.

The thesis I want to defend is that Wittgenstein was not so much on his way back to orality, but rather was attempting to go beyond the printed book in the direction of hypertext. Referring to Plato again, one could say that Wittgenstein not so much aimed at a *reversal* of Plato, but rather at an *twisting out* of Platonism.[8] Given the fact that the culture of the book inevi-

tably brings along the kind of essentialism Wittgenstein attempted to overcome, his inability to give his post-*Tractatus* writings the shape of a book cannot be simply reduced to psychological reasons (such as his perfectionism), but has its ground in the medium he employed.[9] However, though Wittgenstein shows a strong affinity with the practices of oral culture, he might have realized that a return to an oral culture is no option. Rather – intentionally, unintentionally or perhaps even contrary to his conscious intention – he was in search of a new, post-literate way of writing.[10]

There are several passages that suggest that Wittgenstein hints at such a new way of writing. On the one hand we find quite a few remarks in which Wittgenstein complains about the constraints that linear writing forces upon him. For example, on September 15, 1937, he notes: 'Wenn ich für mich denke ohne ein Buch schreiben zu wollen, so springe ich um das Thema herum; das ist die einzige mir natürliche Denkweise. In einer Reihe gezwungen fortzudenken ist mir eine Qual. Soll ich es nun überhaupt probieren?' (MS 118: 94v). At the same time he is thinking of a way out. For example, one day later, in a concept for the preface of the *Philosophical Investigations* he writes: 'Dieses Buch besteht aus Bemerkungen die ich im Lauf von 8 Jahren über den Gegenstand der Philosophie niedergeschrieben habe. Ich habe oft vergebens versucht sie in eine befriedigende Ordnung zu bringen oder am Faden eines Gedankenganges aufzureihen. Das Ergebnis war künstlich und unbefriedigend, und meine Kraft erwies sich als viel zu gering es zu Ende zu führen. Die einzige Darstellung, deren ich noch fähig bin, ist die, diese Bemerkungen durch ein Netz von Zahlen so zu verbinden, daß ihr, äußerst komplizierter, Zusammenhang sichtbar wird. Möge dies statt eines Besseren hingenommen werden,— was ich gerne geliefert hätte' (MS 118: 95v).

It is not easy to resist the temptation to interpret Wittgenstein's reference to 'a network of numbers' that would make the 'extremely complex connection' of his remarks 'visible' as a prefiguration of hypertext. In order to test this claim, let us examine the 'Wittgenstein Wide Web' in more detail.

3. Electrifying Wittgenstein

In his review of Volume 11 of the *Wiener Ausgabe* of Wittgenstein's *Nachlass*, David Lauer described the '20.000 Seiten umfassendes Gewebe' of

Wittgenstein's legacy as 'der Traum jedes postmodernen Texttheoretikers, aber der Alb eines aufrechten Herausgebers' (Lauer 2001). Von Wright's first account of 'The Wittgenstein papers' in 1969 already made clear that this is by no means an exaggeration. The *Nachlass* contains dozens of manuscripts, typescripts and dictations (Von Wright 1969). The chronology is not always clear, because Wittgenstein did not date all of his writings and remarks, often worked at several manuscripts and typescripts at the same time, or returned to earlier texts to revise or supplement them. Moreover, the material is quite repetitious: many remarks are variations of other remarks, and many manuscripts are rearrangements of earlier series of remarks. Often the remarks contain alternative formulations without any clue which of them has his preference. And when Wittgenstein dictated from the manuscripts to a typist, he often kept altering the sentences, adding new ones, and changing the order of the remarks. Usually he continued to work on the typescripts, for example by cutting up the typed text into fragments (*Zettel*) in order to rearrange them again as a basis for new typescripts.

Although one cannot but admire the efforts of Von Wright and the other trustees to publish the *Nachlass* as a series of books, it is clear that all of these have been the result of often quite arbitrary editorial decisions. In many cases these decisions not only concern the title, but also the selection and the arrangement of the remarks. Even in the rare cases where Wittgenstein himself prepared the publication, as with the *Philosophische Untersuchungen,* the published text 'is only one of a number of possible arrangements Wittgenstein proposed, many of which extend, amplify, or cast light on the remarks in the published book' (Stern 1996, 449).

Given the complex nature of Wittgenstein's *Nachlass* and the arbitrariness of the books edited by the trustees, the need for a critical edition of Wittgenstein works soon became apparent. In the mid-seventies, Michael Nedo, supported by the trustees, started the preparation of such an edition in Tübingen. Due to all kinds of quarrels and delays, Nedo finally only got permission to publish the manuscripts and typescripts from 1929 to 1933. From 1994 on a series of volumes has appeared. Like any critical edition, this ambitious undertaking aims at representing the originals as accurately as possible, and supplementing them with sophisticated philological tools. However, in the case of Wittgenstein's *Nachlass*, it is hardly possible to present the *Nachlass* as what it actually is: an ongoing process of creative writing and revision. Although the *Wiener Ausgabe* includes separate vol-

umes with indices and synopses that enable the reader to look for the occurrence of a word, or consult a table of correlations of textual segments, he cannot simultaneously look for the occurrence of a work *and* the history of rearrangements of the paragraph it is included in. 'It seems next to impossible to combine indexing and synopsis. […] No one would finance a series of books (or care to use them) containing the astronomical number of relations between index entries and changes of contexts in gory detail' (Hrachovec 2000).

Hrachovec utters this critique in his article 'Wittgenstein on line / on the line', in which he compares the *Wiener Ausgabe* with the *Bergen Electronic Edition* (BEE)[11] of the *Nachlass*, and it is not surprising that he continues by stating that in an electronic edition such searches are quite easy: 'Since words are encoded by numbers it is quite simple to set up an index and it takes just another couple of numbers to represent the trace of 'words' to and from given contexts. Much of this can be done automatically; there is no need to actually visualize the necessary relational apparatus. If a correlation seems interesting it can be called up at will, with no time lost for browsing, copying or shuffling around papers' (idem).

The fact that the *Nachlass* consists of relatively small text units that are arranged in ever new recombinations, as well as the role played in this corpus by non-linguistic elements such as music, film, pictures and diagrams, makes it tempting to claim that Wittgenstein's *Nachlass* invites or even demands hypertextual treatment. Nowadays, television sets are often advertised as being 'HDTV ready'. In the same sense we could say that the *Nachlass*, thanks to its inherent 'database ontology', is already prepared for digital hypertext. It has – just like for example Raymond Queneau's *Cent mille milliards de poèmes*[12] – proto-hypertextual characteristics that only work out completely in an electronic environment.

Without doubt the BEE, consisting of facsimiles of every page of the *Nachlass*, suitably linked to diplomatic and normalized versions of its content, has many advantages over the *Wiener Ausgabe* when it comes to multiple accessibility and search possibilities. Thanks to special search templates, the reader can search for words and combination of words in the entire corpus, in specific groups, such as manuscripts or typescripts, or in single items. The scope of the search can be narrowed by restricting the search to specific time intervals. Boolean operators, wildcards and proximity searches further expand the range of possibilities. Moreover, it is possible to search for logical, mathematical, set-theoretical and musical nota-

tions or for words in other languages and one can even search for words that for privacy reasons were written by Wittgenstein in coded text. Thanks to this scholars can execute searches through the entire corpus of the *Nachlass* that took traditional 'book scholars' days if not weeks in a couple of minutes. Moreover, the BEE not only simply extends the established tool-set of textual scholarship, but it opens up completely new ways of reading and writing. For example, in addition to the traditional 'chronological' reading of a text, the electronic version invites the scholar to follow the 'hyper paths' that his searches present on the screen and it is not unthinkable that scholars that grow up with electronic versions of texts even prefer such 'hyperlogical' readings. And the possibility to insert annotations and links (by saving searches) may become a new standard for secondary literature. As Hrachovec claims, this opens a completely new set of philological and philosophical perspectives.

However, impressive as the advantages over de traditional paper edition may be, the BEE is still far from ideal. The BEE runs on the Windows platform and uses FolioViews 3.11.3 as its user interface. Apart from the facts that the technological support for this somewhat user-unfriendly and outdated interface is discontinued and that the installation of the BEE on networks can be quite problematic (cf. Hrachovec 2005), the BEE suffers from serious software restrictions with regard to 'semantic data-mining'. For commercial reasons – copyrights, the prevention of illegal copying of the 'source code' – there is a strict separation between the user-interface and the computational deep structure. The user can search the texts, but is not able to touch the indexing mechanism or to modify any of the underlying data.

This is especially frustrating as the FolioViews interface still mimics print culture, whereas – thanks to the Multi-Element Code System (MECS) that has been used to enrich the texts with all kinds of meta-data – the transcriptions in principle would enable scholars to (re)construct the internal dynamics of Wittgenstein's *Nachlass*. As Hrachovec explains: 'Under present conditions one can find a particular paragraph and all of its subsequent instances as they appear in the later volumes. It is, however, impossible to break out of the straitjacket of the von Wright classification and deal with paragraphs as basic data units. […] It *might* be organized so as to mirror Wittgenstein's editorial techniques, starting with single remarks as elementary building blocks and putting them together in a variety of ways, following Wittgenstein's lead. His working process, not its result, could be

taken as the guiding principle. As a matter of fact the encapsulated Folio-Views file is the very opposite of hypertext' (Hrachovec 2000).

A further limitation is that the BEE, despite the fact that it can be made accessible via a network, still has the characteristics of a stand-alone application. The user can make shadow files of the texts in order to add searchable bookmarks, highlighters and notes, but he cannot share them with other scholars within the interface of the BEE. When we realize that the power and value of the Internet is strongly connected with the communication and collaboration that it enables, this is a serious limitation, too. It might be that this is one of the main reasons that in spite of its merits, the BEE so far has attracted relatively little attention.

In order to overcome the aforementioned limitations of the BEE, a Wittgenstein Open Source Movement that would disclose the machine-readable version with its encoded transcriptions and develop 'social software' to stimulate collaboration among scholars would be most welcome. Since the nineties several initiatives in this direction have emerged, such as 'Tracing Wittgenstein', an international research project led by Hrachovec, Köhler and Pichler, that started in 2001 and aims at exploring the *Nachlass* while using and developing new tools for net-based scholarly collaboration.[13] Among its projects are the publication of several manuscripts from the *Nachlass* in normalized and diplomatic versions on the WWW and the development of APE, a software *Assistant for Philological Explorations*. This program does not only consist of a user-friendly interface to display the different versions of the texts in multiple windows, but also a simple editor for writing and managing notes on primary sources. As software developer Dieter Köhler explains: 'These meta-data is stored in XML and can be shared among users via HTTP, hence making it easy for a distributed group of commentators to organize their collaboration and to keep track of the state of their work. In a future version, this approach shall also allow to integrate the meta-data produced by APE into semantic web activities like those recently launched by the World Wide Web Consortium (W3C). Such semantic webs use standardized vocabularies, so-called "ontologies", to mark up meta-data. This provides a way to automatically evaluate and merge data available on an open hypertext system' (Köhler). In 2007, Alois Pichler got permission from Oxford University Press and Trinity College in Cambridge (who presently holds the copyrights of Wittgenstein's *Nachlass*) to publish an 'open' XML and facsimile version of 5000 pages on the Internet.

Although we should applaud these initiatives, the question remains whether such projects really escape the classical print culture, as they seem to subscribe to the sharp distinctions between authors and readers, and between primary and secondary texts, that characterize print culture. I immediately want to emphasize that, being largely a product of print culture myself, I definitively don't want to advocate giving up those distinctions and the scholarly traditions associated with them altogether. Moreover, just like orality has not disappeared since the introduction of writing, it is unlikely that the book, and the scholarly traditions that are associated with it, will disappear in the age of the computer. However, we should realize that it is unlikely as well that these traditions will not be influenced by the new technologies of reading and writing. And if we want to disclose the internal dynamics of Wittgenstein's *Nachlass,* there are good reasons for taking additional steps in the 'digitalization of Wittgenstein'. If we want to try to imagine what this would require, we might have a look at the present development of the so-called Web 2.0. In my view there we already witness the development of technologies that add a new layer on top of traditional scholarship, and that eventually might lead to a transformation of philosophy that is as radical as the transformation from orality to literacy.

4. "Die Maschine hat es in sich, sich so zu bewegen."

Before I will sketch how 'Wittgenstein 2.0' might look like, I want to return for a moment to Wittgenstein's *Nachlass,* since there we find some further evidence for my claim that already Wittgenstein himself somewhat unwillingly considered the possibility of a 'logical machine' that would enable us to disclose the 'extremely complex connection' of his remarks.

Let us, to begin with, return to the passage from the draft for the *Vorwort* of the *Philosophische Untersuchungen* that Wittgenstein wrote down on 16 September 1937 (MS 118: 95v). I came across this passage while doing a search on the word 'Buch' during the preparation of this paper. Among the 319 hits my attention was especially attracted by this passage because of its reference to the 'network of numbers' that perhaps could make visible the complexity of his remarks. However, while reading this remark, my eyes were suddenly captivated by another sentence, written the same day on the same page of the notebook: 'Die Maschine hat es in sich, sich so zu bewegen'. This remark made me think of the encounter of Witt-

genstein and Turing, of their intellectual kinship and of the possible influence Wittgenstein had on Turing's invention of the virtual computer, the Turing Machine. According to some sources Turing attended Wittgenstein's class in 1935, one year before he wrote a draft for 'On computable numbers' (Nyíri 1989, 383). In this epochal article Turing described a hypothetical machine that, though looking like a typewriter, could perform rather sophisticated functions, such as recognizing particular patterns of marks, and looking up the pattern in a 'table of behavior' to see what it should do next. This machine could, according to Turing, compute any number that was computable, though he also demonstrated in the same article that not all numbers can be computed. Against this 'horizon of experience' it was not that strange that I linked Wittgenstein's remark about the 'network of numbers' to the nearby remark about a machine, that has a predisposition to move *itself* in a certain way ('es in sich [hat], sich so zu bewegen'). Especially not, because I also knew that Wittgenstein in his later philosophy again and again touches upon the problem of ascribing mental predicates, such as intentions and even consciousness to machines. The link between the two remarks suggests that Wittgenstein was thinking about a machine that has a predisposition to visualize the extremely complex connection of the countless remarks.

However, I was also aware of the fact that I did not have any guarantee that Wittgenstein himself connected these remarks in this particular way, not even that he connected them at all. After all, between the two remarks we find another one – '"Ich habe gemeint ..." heißt hier: ich habe dies in petto gehabt. Aber dies ist doch ein Bild.' And this remark is separated from the draft for the *Vorwort* by a short diagonal line in the notebook, indicating that Wittgenstein, as often, has jumped to another issue. The 'machine-remark' seems to be connected with the preceding one because they both deal with a sentence in which the word 'in' metaphorically evokes the image of a container. The remark continues: 'Der Fall wird also *verglichen* dem, daß wir etwas aus einem Behälter holen, was dort lag'. Perhaps the connection I made with the remark about the machine was motivated by a romantic-hermeneutical desire to understand the author better than he did himself or, even worse, as an example of *hineininterpretieren*.[14]

However, a further search showed that a couple of months later, on January 1, 1938, in the *Typoskript der zweiten Hälfte der Vorkriegsfassung der Untersuchungen* Wittgenstein himself explicitly connects the same remark on the self-moving machine with the (im)possibility of a 'logical machine'.

Here the remark is immediately followed by one that explains the kind of machine Wittgenstein has in mind: 'Der Mathematiker ist kein Entdecker, sondern ein Erfinder. "Ich kann doch nur folgern, was wirklich folgt!" — D.h.: was die logische Maschine wirklich hervorbringt. Die logische Maschine, das wäre ein Art Weltäther; ein alles durchdringender ätherischer Mechanismus. — Und vor diesem Bild muß man warnen.' (MS 221: 215).

It is clear that Wittgenstein strongly questions the possibility of a logical machine that 'moves itself'. The mathematician who claims just to follow the movement of the logical machine, forgets that actually he himself is the inventor, the 'programmer' of the logical machine. It is also clear that Wittgenstein's warning is part of the therapeutic strategy that characterizes his later philosophy. The therapeutic message here seems to be that the ascription of predicates that are part of the 'human language game', such as the ability to move or to draw a logical conclusion, to machines, an entity that is part of a different language game, leads to conceptual confusion.[15]

However, as Nyíri notes in 'Wittgenstein and the problem of machine consciousness', in some other remarks in the *Philosophische Untersuchungen* Wittgenstein seems to broaden the circle of entities in which the ascription of human and even mental predicates makes sense: 'Aber eine Maschine kann doch nicht denken! — Ist dies ein Erfahrungssatz? Nein. Wir sagen nur vom Menschen, und was ihm ähnlich ist, es denke. Wir sagen es auch von Puppen, und wohl auch von Geistern. Sieh das Wort "denken" als Instrument an!' (MS 129: 178). Nyíri points at the fact that 'by stressing that the word "to think" is but a *tool* he actually gives a new direction to the argument: for the application of tools can change' (Nyíri 1989, 385). Though Wittgenstein's critique of ascribing mental predicates to machines other than metaphorically, Nyíri continues, may have been justified in the time it was written, it may become pointless in an age where the 'behavior' of machines is increasingly less easy to distinguish from human behavior. It may force us to change the rules of this particular language-game. In this context he refers to Sherry Turkle's fascinating empirical investigations that show that in our present age of computers children are prone to ascribe some sort of consciousness to them (Nyíri 1989, 385).[16]

It is within this context that we should understand my proposal to transform Wittgenstein's *Nachlass* into a part of a 'conscious, logical machine'. It consist of two steps, that follow the two stages that characterize, on the one hand, Wittgenstein's development from the *Tractatus* (Wittgenstein I) to his later work (Wittgenstein II), and, on the other hand, the in several

aspects similar development of the World Wide Web from version 1.0 to version 2.0. Where the BEE represents Wittgenstein II using a medium that embodies a Wittgenstein I ontology (Web 1.0), the aim is to represent Wittgenstein II with the use of a technology that is based on a Wittgenstein II ontology (Web 2.0).

In Web 1.0, that is characterized by 'a *Tractatus* approach', the web consists of documents – at present more than a billion – that are linked to one another through Hypertext Markup Language (HTML). Loosely using the terminology of the *Tractatus* we could say that the Web 1.0 is a logical space (*logischer Raum*) in which many links (*Sachverhalte,* as '2.01 Der Sachverhalt ist eine Verbindung von Gegenständen. (Sachen, Dingen).'[17]) between the elementary pages are possible, but only a finite – though at present already astronomically big – number of links actually exist. These actual relationships are *die Tatsache* which together constitute the 'world' of Web 1.0. After all: 'Die Tatsachen im logischen Raum sind die Welt' (1.13). However, the reality (*Wirklichkeit*) of Web 1.0 also contains many negative facts: the possible links that have not yet been realized, no longer exist, or that might be realized in the future.

We could call the reality of Web 1.0 a *virtual reality* in the sense that, at present, it consists of a great number of logically possible, but non-existing relations. We could compare the world of Web 1.0 with the result of a particular query in a relational database. In this way Web 1.0 is a moving picture of the world we are living in. We find this 'database ontology' also in 'modal sciences' such as molecular biology.[18] When molecular biologists look at the organic world, they regard it as one specific constellation of a large number of possible (re)combinations of the gene pool. This also counts for the *Bergen Electronic Edition* of Wittgenstein's *Nachlass*. As we have seen, like the Web 1.0 this edition only presents us with one specific arrangement of Wittgenstein's work, based on the Von Wright classification. It is possible to search this arrangement in many sophisticated ways, but we cannot – like Wittgenstein did and the genetic engineer and other modal scientists do – freely combine and recombine them. The first step to be taken is to change the *Nachlass* into a logical machine that, starting from the 'atomic remarks', is able to present all possible combinations or *Sachverhalte.* Such a 'moving machine' transforms virtual reality into *real virtuality.* It would transform Wittgenstein's *Tractatus* from the doctrine it is often taken for, into a philosophical activity. After all, as Gregory Chaitin remarked: 'If you fix or freeze life, it dies'.[19] Of course, such a machine

would only be able to express the set of all possible combinations: 'Über das, was man nicht berechnen kann, muss man schweigen'.

This, however is only the first step. As Herbert Hrachovec rightly remarks with regard to the BEE: 'Manipulation of the index mechanism *per se* cannot produce *important* results. The disappearance of manifest meaning is, in fact, the price to pay for enhanced electronic facilities. One can easily pick any combination of terms and search constraints – but there is no guarantee whatsoever that this will lead to an interesting result. So where does "importance" come in? This is a category of reflective assessment, crucially different from automated procedures. This discrepancy is at the center of any discussion about computer-assisted philology. […] to put it very simply: elaborate tools are of little help without knowledge of their proper use' (Hrachovec 2000).

This certainly is true. All the euphoric talk that has been uttered about the WWW as 'a global brain' could not conceal the fact that without a clever user it could not even move, let alone think. And even the perfectly automated Wittgenstein Wide Web 1.9 would, in spite of the fact that it would be able to move independently, still be a mindless machine. The Wittgensteinian critique would still apply that only in a metaphorical and for that reason misleading sense we could talk about it as an intelligent entity. But that is exactly the reason why we should take a decisive second step in order to develop Wittgenstein 2.0. One way or another we should blow some life and intelligence into the machine. However, it is important to realize that – at least in version 2.0 – it would be fruitless to try to replace human with artificial intelligence. Although artificial intelligence without doubt is becoming the dominant form of the externalization of the human mind, we should not regard it as replacement for human intelligence, but rather as a tool to enhance the human intelligence in the light of the information overload. (In the same way the externalization of writing has not – as Plato feared – replaced human thinking, but enabled it to deal with the Neolithic information overload that resulted from the agricultural revolution.)

For this reason, the development of Wittgenstein 2.0 not only asks for further *automatization*, but also, in close connection with this, for *user participation*. The recent development of Web 2.0 gives us some hints about what this may look like. In the beginning of the nineties, the web in many respects still mimicked print culture. Although the old WWW was always 'under construction' and in that respect appeared to be much more dynami-

cal and unstable than the world of the book, in many respects it was a rather static medium (Zuniga 2007, 251). In Web 1.0 the visitor of a website largely remained a passive consumer of the texts, images and sounds that were displayed to him. Surely, he got an exciting new exploratory freedom (not seldomly leading to a neurotic following of hyperlinks in the hope to find the sense of closure that characterized the world of the book), but mostly – as a visitor – he was not able to change the content of the websites.

This is rapidly changing. In the emerging Web 2.0 the emphasis shifts from the layout of the webpage, determined by the HTML-code, to the actions of the database that is hidden behind the web pages.[20] This shift results in a transformation of the static web page into a dynamic one, that constantly changes through interaction with its visitors. The driving force behind the development of Web 2.0 is XML, an 'Extensible Markup Language' that is comparable and partly convertible (Pichler 2002) with the Multi-Element Code System (MECS) used for the BEE, and which is also used in the aforementioned 'Tracing Wittgenstein' project and in the coming Bergen online 5000 pages version of the *Nachlass*.

Because of XML it is difficult to keep on using the term 'pages'. In fact the page is no longer the standard unit, but this role is rather played now by the many packets of data, which are individually addressable. Whereas in Web 1.0 you could only link to pages, the basic unit of the Web 2.0 much more resembles the remarks Wittgenstein constantly re-arranged and changed than the static page in a printed book.

What is also crucial is that XML not only manipulates standard data that are publicly available, such as ISBN numbers of books, but also data generated by users. It's not without irony that one of the most successful examples of Web 2.0 at present is Amazon.com, a book seller (O'Reilly 2005). The website of Amazon processes three types of data that are being generated thanks to user participation.

Firstly, the customers are invited to add data, such as reviews of the books, photos of the author or artist, remarks on the message board, and even manuals for computer games and other products. Secondly, Amazon.com uses the metadata that customers explicitly add to the products they are interested in, such as ratings and semantic tags. Unlike the standard approach in the semantic web design, that uses formal and standardized ontologies (and that as such repeats the Platonic and Aristotelian ring of the early Wittgenstein), the tags are being generated idiosyncratically by the customers. The resulting 'folksonomies' are less strict and more fuzzy than

formal standardized ontologies. In some respects this clearly is a disadvantage, on the other hand this makes them very powerful. They are less prone for mismatches then the 'essentialist' ontologies: even searches with typos often result in access to the information one wants. Moreover, they are much more flexible and able to reflect the fuzziness and changeability of the real world. And after all, as the later Wittgenstein claims, the meaning of a word is in the (rule-governed) practices of a community.[21] The third category of user input is especially interesting, because it is being generated by the visitors through their behavior. When the customer shows interest in a certain book, Amazon.com informs him that customers that bought this book, also bought that book.

Thanks to these different forms of user participation, Web 2.0 'pages' not only constantly change at every visit, but they also get strongly personalized. They remind the visitor of her track record. At the same time Web 2.0 is characterized by the development of all kinds of *social networking applications.* Websites such as Flicr, Last, Youtube, Hyves and MySpace[22] enable individuals that share a particular interest to get in contact which each other and to share cultural artefacts and experiences. Because of the aforementioned forms of participation, in these social networks not only content, but also judgements and reviews are being shared. We should think here about wikis such as the Wikipedia and open source communities such as SourceForge.[23] These kinds of social software and their users together constitute new life forms in the Wittgensteinian sense.

Against this background we could now image what a future Wittgenstein Wide Web 2.0 might look like. Its basis will be a relational database containing all propositions, remarks and letters by Wittgenstein. Of course it will still be possible to display the facsimiles and the diplomatic and normalized version of the *Nachlass* as we find them in the BEE. It also might contain the 'frozen texts' as they have been published by the trustees and translations of these texts in other languages. In addition, the user would be able to re-arrange the remarks in all possible ways with the help of sophisticated search functions.

As this logical machine will be very complex, the visualization of this multidimensional complexity will be an important part of Wittgenstein 2.0. We might think of 3D models showing the molecular arrangement of the remarks, in which every atom functions as a portal – a wormhole as it were – that gives access to parallel worlds, that is: alternative arrangements taking this particular remark as the centre of the new configuration.

However, thanks to user participation it will also contain a lot of additional useful information, such as annotations, articles and commentaries. In addition it will contain links to relevant audiovisual material, such as recordings of lectures and debates. Moreover, due to ranking of other users and their behaviors, it directs the attention of the users to specific meaningful re-arrangements of the material and related clusters. 'Researchers that recombined these remarks, were also interested in the following recombinations'. Or: 'If you liked this conclusion, don't forget to read the following counter-arguments'. Even more interesting is the possibility to add your own philosophical remarks to the corpus. In a way, the distinction between reader and writer will get blurred, just like the distinction between secondary and primary literature. And of course users will also be able to communicate, via connected bulletin-boards, blogs, live chat or e-mail.

In Wittgenstein 2.0, which will consist of the various interactions between the sophisticated website and its users, Wittgenstein's logical machine will come alive and will become increasingly intelligent. It will generate new scholarly language games and life-forms. It will become even more interesting when we connect Wittgenstein 2.0 with Turing 2.0 in order to organize a heated debate about artificial intelligence or when the logical machine will connect itself to Bach 2.0 because it recognizes interesting compositional similarities between the *Tractatus* and Bach's cantates. And because there are still many things that cannot be computed, the logical machine will also have at least one corridor that will lead to a virtual sanctuary where one can remain silent.

Before I conclude I would like to emphasize that Wittgenstein 2.0 will not be an ideal machine, neither technically, nor morally. It will not be a completely consistent machine, it certainly will have bugs and fatal system errors once in a while (De Mul 2007). Moreover, as the logical machine includes human users, is will not be immune to human vices, such as free riding, stealing, hacking, lying and destroying, to mention only a few of them. It may also become a commercial machine, a decision machine for the National Science Foundation or result – as Jeron Lanier argued some time ago with regard to Wikipedia – in a machine that produces mediocrity. Just like every technology it will bring along fascinating possibilities and frightening dangers. Probably it is better not yet to start thinking about a Wittgenstein 3.0, who might start to think for itself.

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Notes

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2. 'Darunter ist jedoch keine Fundamentaldisziplin zu verstehen, keine Grund- oder Dachwissenschaft, die alles weitere Wissen reglementieren möchte. Gemeint ist vielmehr der Diskurs einer – unabgeschlossen und unabschließbaren – Auseinandersetzung mit einem Kernbereich kritischer Fragen, die alles weitere Wissen als dessen möglichen Selbsterklärung und Korrektur begeleiten' (Margreiter 2003, 151).

3. 'Ich fürchte, wir werden Gott nicht los, weil wir noch an die Grammatik glauben…'. (Nietzsche 1980, Band 6, 78).

4. 'The young Wittgenstein put language and linguistic investigations onto centre stage, since he held, against Frege and Russell, that "ordinary language is all right as it is"; that all philosophy is "a critique of language"; that the necessary truths of logic are explicable as senseless tautologies by reference to the ineluctable features of any linguistic symbolism whatsoever; and that the sentences of our languages, fully analysed, necessarily reflect the metaphysical form of the world. This heralded, though obviously did not effect, the so-called linguistic turn in analytic philosophy.' (Hacker 2007)

5. '[M]y friend, you did not give me sufficient information before, when I asked what holiness was, but you told me that this was holy which you are now doing, prosecuting your father for murder. – Euthyphro: Well, what I said was true, Socrates. – Socrates:

Perhaps. But, Euthyphro, you say that many other things are holy, do you not? – Euthyphro: Why, so they are. – Socrates: Now call to mind that this is not what I asked you, to tell me one or two of the many holy acts, but to tell the essential aspect, by which all holy acts are holy...' Quoted by Nyíri from Harold North Fowler's translation (Plato 1914).

6. 'You talk about all sorts of language games, but have nowhere said what the essence of a language game, and hence of language, is: what is common to all these activities, and what makes them into language or parts of language. – And this is true. – Instead of producing something common to all that we call language, I am saying that these phenomena have no one thing in common which makes us use the same word for all, – but that they are related to one another in many different ways'. Quoted by Nyíri from *Philosophical Investigations*, Part I, 65.

7. 'Ich kann meinen Standpunkt nicht besser charakterisieren, als indem ich sage, daß er der entgegengesetzte Standpunkt dessen ist, welchen Sokrates in den platonischen Dialogen vertritt.' All quotes from the Nachlass are taken from the normalized transcription of the *Bergen Electronic Edition of Wittgenstein's Nachlass* (Wittgenstein 2000).

8. I am using here the words Heidegger employs when he refers to the development of Nietzsche's relation to Platonism, which took the course from a reversal (*Umdrehung*) of the opposition of Being and Becoming to an twisting out (*Herausdrehung*) of this very opposition itself (Heidegger 1961, 240, 242; cf. De Mul 1999a, 68f., 139f.).

9. It is interesting to note that Nietzsche, no less obsessed with writing than Wittgenstein, suffered from the same inability to give his later philosophy a systematic expression in the form of a book. In Nietzsches *Nachlass* we find many sketches and drafts for a 'definitive book' that he repeatedly entitled *Der Wille zur Macht.* Also in his case we should not reduce his inability to sheer psychological factors. As far as psychological factors are involved, it has not so much to do with inability but rather with integrity. As Nietzsche expresses it in *Gotzen-Dämmerung*: 'Ich mißtraue allen Systematikern und gehe ihnen aus dem Weg. Der Wille zum System ist ein Mangel an Rechtschaffenheit.' (Nietzsche 1980, Band 6, 78).

10. It is far from rare fact that a factual practice (knowing how) is being developed before the explicit awareness of its specific nature ('knowing that'). A notorious example is Husserl's reformulation of his method in the *Logische Untersuchungen*. Whereas in the first edition (1900) he states that his phenomenological method should be regarded a 'deskriptive Psychologie', in the second edition he explicitly claims that phenomenology 'ist keine descriptive Psychologie' but rather 'Wesensschau' (Husserl 1984, II/1,18).

11. The publication of this edition began in 1998 with the publication of Volume 1. The Volumes 2 and 3/4 have been published in 1999 and 2000 respectively. The complete edition consists of one disc containing the transcriptions of the *Nachlass* and other infobases (using Folio Views software as user interface and depending on a MS-Windows environment), and five image discs containing facsimiles (Wittgenstein 2000). In 1993 InteLex Corporation already published in the *Past Masters Series* an electronic version containing most of the *Nachlass* in an English translation, based on the English language portion of the Wittgenstein corpus as published by Blackwell. However, unlike the BEE this edition this edition is mainly an electronic version of the book publications and apart from a standard search function it does not have extra functionality (cf. Pichler 2002).

12. *Cent mille milliards de poèmes* consists of 10 sonnets, but because every page is cut horizontally into 14 strips each containing one line of the sonnet, the strips may be combined arbitrarily to generate 10^{14} (ten thousand billion) possible sonnets (Queneau 1961). On the World Wide Web many versions of this proto-hypertextual 'book of poetry' can be found (see, for example: http://www.yapatoo.com/Queneau/).
13. See http://wittgenstein.philo.at
14. However, as I already remarked with a reference to Husserl, it is not exceptional that an author is not fully aware of where he is going before arriving there. Kant already remarks, 'daß es gar nichts Ungewöhnliches sei, sowohl im gemeinen Gespräche, als in Schriften, durch die Vergleichung der Gedanken, welche ein Verfasser über seinen Gegenstand äußert, ihn so gar besser zu erstehen, als er sich selbst verstand, indem er seinen Begriff nicht genugsam bestimmte, und dadurch bisweilen seiner eigenen Absicht entgegen redete, oder auch dachte' (Kant 1968, A314).
15. This becomes even more explicit in another remark on the self-moving machine, in which he links this idea to conceptual confusion: 'Wann denkt man denn: die Maschine habe ihre möglichen Bewegungen schon in irgend einer mysteriösen Weise in sich? – Nun, wenn man philosophiert. Und was verleitet uns, das zu denken? Die Art und Weise, wie wir von der Maschine reden. Wir sagen z.B., die Maschine habe (besäße) diese Bewegungsmöglichkeiten, wir sprechen von der ideal starren Maschine, die sich nur so und so bewegen könne. […] Wir sind, wenn wir philosophieren, wie Wilde, wie primitive Menschen, die die Ausdrucksweise zivilisierter Menschen hören, sie mißdeuten und nun die seltsamsten Schlüsse aus ihrer Deutung ziehen.' (MS 215: 230).
16. 'The machine … enters into social life and psychological development, the computer … affects the way we think, especially the way we think about ourselves. … The question is not what will the computer be like in the future, but instead, what will we be like? What kind of people are we becoming?' (Turkle 1984, 3).
17. Hence, as Max Black notices in his *Companion to Wittgenstein's Tractatus*, 'the natural reading of *Tatsache* as "molecular fact" (or, "complex fact")' (Black 1964,31). He adds, however, that this seems to have been contrary to Wittgenstein's original intentions, as in one of his letters he defines *Tatsache* as that 'what corresponds to the logical product of elementary propositions when this product is true' (quoted in Black 1964, idem). However, this interpretation seems not to be consitent with many other propositions in the *Tractatus* (cf.: 'Was der Fall ist, die Tatsache, ist das Bestehen von Sachverhalten' (Wittgenstein 1975, Statement 2), and: 'Das Bestehen und nicht Nichtbestehen von Sachverhalten ist die Wirklichkeit' (2.06)). For that reason I will follow 'the natural reading', as it is also practiced by Erik Stenius in *Wittgenstein's Tractatus* (Stenius 1996, 29f.).
18. Modal sciences as Claus Emmeche defines them in his book *The Garden in the Machine: The Emerging science of Artificial Life*, are not so much led by the question of what reality is, but how *it could be* (Emmeche 1991, 161; see also De Mul 1999b). Although Emmeche mainly refers to artificial life research, in the age of (trans)genetic manipulation it is also applicable to molecular biology and the biotechnologies based on it (cf. De Mul 1999). Modal sciences – and here is an interesting parallel with modern art – are no longer primarily aimed at 'picturing' nature, but rather at the creation of new nature. Their language game is, to use a term Robert Musil introduces in *Der Mann ohne*

Eigenschaften, less characterized by *Realitätssinn* than by *Möglichkeitssinn* (Musil 1978, 16).

19. Lecture, entitled 'Metamathematics and Information Theory', presented at the 30th International Wittgenstein Symposium, Kirchberg am Wechsel, August 8, 2007.
20. The following account of Web 2.0 makes use of the results of Jeffery van Bokkum's MA research into the semiotical dimension of Web 2.0 (Van Bokkum 2007).
21. An interesting account of the relationship between Wittgenstein's conception of meaning and the rapid development of computer-mediated communication was given by Anat Biletzki in a lecture 'Meaning as use in the Digital Turn', that was presented at the 30th International Wittgenstein Symposium, Kirchberg am Wechsel, August 7, 2007.
22. See http://www.flickr.com/, www.last.fm/, http://www.youtube.com/, http://www.hyves.nl/ and www.myspace.com.
23. See www.wikipedia.org and http://sourceforg.net/