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Cerebral Drawings between Art and Science: On Gilles Deleuze's Philosophy of Concepts

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Abstract

In *What Is Philosophy?*, Gilles Deleuze and Félix Guattari distinguish the functions of philosophy, art and science. According to this distinction, the primary purpose of philosophy is to invent *concepts*, the purpose of art to bring forth *percepts*, or sensorial aggregates, and that of science to delineate *functions*. This article aims to show that these distinctions are not as clear-cut as they appear. Using Deleuze and Guattari's proposition that 'philosophy is the art of forming, inventing, and fabricating concepts' as a reference point, it suggests that the corresponding philosophical practice is intimately connected to art *and* science. Studying the conceptual drawings in Deleuze's texts, the article situates his philosophy in the French tradition of epistemology (Cavaillès, Bachelard and Canguilhem). As a result, the conceptual work of this philosophy can be seen as intensively responding to the creative problems posed by the dynamics of science in contemporary societies.

Keywords

brain science, Deleuze, Guattari, historical epistemology, modern art, philosophy of concepts, visualization

In an important article in 2005, Isabelle Stengers argued for a renewed and engaged reading of Gilles Deleuze and Félix Guattari's last book, *What Is Philosophy?* (Deleuze and Guattari, 1994). According to Stengers, many readers have found the clear distinction between philosophy, science and art that the authors propose to be 'enigmatic'. Instead of favouring 'machinic' couplings and 'rhizomatic' networks between philosophical *concepts*, scientific *functions* and artistic *percepts*, Deleuze and Guattari emphasized the specificity of each of the corresponding

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'disciplines'. For Stengers, however, this is precisely where the political provocation of *What Is Philosophy?* lies. According to her, Deleuze and Guattari highlight the specificity of science in order to resist the well-known tendency to conceive of the image of science as a simple case of social construction. What is at stake, she claims, is to escape the power of the 'functions of the lived' (Stengers, 2005: 155) so that we become able and willing again to appreciate the products of science as authentic constructs. From this perspective, science appears to be leading to irreversible inventions that have the potential to subvert our established way of thinking and doing.

This article takes issue with what Stengers, in reference to *What Is Philosophy?*, calls the 'strong differentiation between the creations which are proper to philosophy, to science, and to art' (Stengers, 2005: 151). Closely looking at the textures and contexts of Deleuze's writings and taking into account their relation to science *and* art, this article argues that the concepts created by Deleuze (and Guattari) cut across the boundaries between philosophical, scientific and artistic activities. Focusing on Deleuze's striking use of drawings inside and outside of his publications, I suggest that his concepts function like drawings and, vice versa, that his drawings function as concepts.

The most important quality of these *concept drawings* can be defined by making reference to the art theory of painter Paul Klee. They do not present visually perceivable things. Instead they *make* phenomena and processes *visible* (Klee, 1991: 60). In other words 'desiring machine', 'bodies without organs', 'rhizome' and other concepts that Deleuze developed (with and without Guattari) do not simply refer to real, existing objects. Rather, they operate as probes, detectors or instructions for seeing new realities, and it is only gradually that one learns what can be recognized with their help, what they show and what they point to.

In a first step, I will discuss the status and function of this conceptual practice by making reference to Deleuze's drawing 'Sickroom', first published independently of any text in the journal *Chimères* in 1994 (Deleuze, 1994a). To better grasp the process of making visible, this drawing will be compared, in the course of this article, to similar drawings from philosophical and scientific works that Deleuze occasionally refers to, in particular Ernst Mach's *Analysis of Sensations*, Jacob von Uexküll's *Foray into the Worlds of Animals and Humans* and Raymond Ruyer's *Néo-Finalisme*. The point of these comparisons is to shift emphasis and attention away from the well-known business of defining concepts. It is true that definitions can be helpful, and in many places in his work Deleuze himself has attributed considerable importance to working with, reflecting upon and spelling out concepts. Examples are provided by the 'Dictionary of the main characters in Nietzsche' (in Deleuze, 1965: 39–44) and the 'Index of the main concepts in [Spinoza's] *Ethics*' which Deleuze compiled (in Deleuze, 1988: 44–109), as well as the *Abecedary*

concerning his own philosophy which he prepared for television together with Claire Parnet (Deleuze and Parnet, 2004). As a result, one might also be tempted to create an explanatory index of Deleuze's concepts. But the glossaries of Deleuze's and of Deleuze and Guattari's published books (Sasso and Villani, 2003; Zourabichvili, 2003) miss the crucial dimension of these concepts, which is the inner connection between concept and drawing, or thinking and seeing.

In a second step, I will highlight the importance of science as a resource for Deleuze's conceptual creations. Deleuze has openly admitted that he took up and used concepts that are reminiscent of the sciences or even used in the sciences, for example, 'black holes', 'fuzzy sets', 'neighbourhoods' or 'Riemann spaces'. According to him, however, such concepts are not formalizable concepts of the exact sciences but concepts used by scientists – the rigorousness of which is not directly scientific (Deleuze, 1995: 29). The next two sections ('The Art of Philosophy' and 'The Line of Cavaillès, Bachelard and Canguilhem') connect this peculiar kind of 'rigorousness' to the specific contexts in which Deleuze was working in postwar France, that is, his collaboration with practising psychotherapist Guattari and his involvement with the French philosophy of concepts as developed by Jean Cavaillès and, in particular, Georges Canguilhem.

These two sections also demonstrate how much impact the biological sciences had on Deleuze's philosophical concepts. For example, the famous 'body without organs' can not only be found in the writings of Antonin Artaud, as Deleuze (with Guattari) suggested in *Anti-Oedipus* and *A Thousand Plateaus*, but also in the general physiology of Claude Bernard. Similarly, the notion of *pensée sans images*, or imageless thought, that Deleuze spelled out in *Difference and Repetition*, can be traced back to the experimental psychology of the Würzburg school. Even the concept of 'concept', as it figures in *What Is Philosophy?* and insofar as it stresses the traversing of heterogeneous components 'from a point of absolute survey at infinite speed', can be referred back to similar notions in the work of neurophysiologists such as Karl Lashley, Robert Woodworth and others.

At this point, it will have become clear that the ability of concepts to *make* phenomena and processes *visible* is not restricted to art and/or philosophy. This feature of concepts is at the same time an important element of scientific practice. In his writings Deleuze repeatedly referred to Georges Canguilhem, and it was Canguilhem who in 1955 made this point. Canguilhem described concepts as vital units of scientific practice in his book-length study on the formation of the reflex concept in the 17th and 18th centuries. According to him, concepts can combine in the laboratory with scientific instruments *in order to create or construct what they designate* (Canguilhem, 1977: 161). Conversely, Deleuze also emphasized this practical, perhaps even technical aspect in the creation of

concepts: 'To create concepts is, at the very least, to make something' (Deleuze and Guattari, 1994: 7) and, just like Canguilhem, he has argued that this activity is not carried out for its own sake but is related to specific problematic contexts: 'All concepts are connected to problems without which they would have no meaning' (Deleuze and Guattari, 1994: 16). For example, the reflex concept was created in order to respond to the problem of human responsibility by distinguishing voluntary from involuntary motions (Canguilhem, 1977: 148–9).[1]

In a third step, the present article tries to answer the question of what kind of problems Deleuze's notion of concept refers to. The two sections 'What is a Concept?' and 'From Concepts to Problems' suggest that this concept of 'concept' makes the changing relationship between philosophy and science in the French scene visible. Whereas 'imageless thought' and 'desiring machine' referred to a dialogue between philosophy and the human sciences, in particular psychology and psychiatry, the conceptual distinction between 'concept', 'function' and 'percept' as it appears in *What Is Philosophy?* emerged from an encounter between philosophy and the human sciences on the one side, and the sciences on the other. Stressing the difference between philosophy and science, then, can be seen as a reaction to the increasing ambition of the natural sciences, in particular biology, to address philosophical issues. At the same time, this reaction is not simply defensive, but in a sense affirmative and subversive, since it takes up scientific concepts in order to imbue them with different and potentially more interesting and relevant meanings.

In this way, this article confirms Stenger's conclusion that the last book by Deleuze and Guattari is an eminently 'political' book (Stengers, 2005: 152). However, the strategies of these politics only become transparent if we take into account the philosophical contexts in which, and in part against which, Deleuze was working, and the constructive relationship of his philosophy to art.

Concepts and Drawings

Let's start with a drawing by Deleuze (Figure 1). It shows the interior of a room. In the background there is an empty chair, a radiator, a candelabra with several arms. In front to the right stands a lamp on a side table.

In the middle of the drawing is one of the dominant motifs: an open window. To its left one can see another candelabra. On the window sill there are two jugs standing across from each other, almost as mirror images. There remains the white, rectangular area that projects into the drawing from the lower left: it is apparently a bed or a cot. With two or three lines a sheet and a cover are suggested. It almost looks as if an arm is entering the drawing from the right and above that as if knees have been drawn up.

Figure 1. Gilles Deleuze, *Chambre de malade*.

In any case, Deleuze's drawing has apparently been done from the perspective of the person who is lying at the moment on the bed or who will soon come back to lie down on it. Although the body of the artist cannot be seen clearly, one gains the impression that it extends itself into the field of the drawing. This turns the work into a kind of extension of the body of the creator, and the observer has the feeling that the body of the artist has replaced his or her own.

Chambre de malade, 'Sickroom', is the title that Deleuze gave to this piece. Looking at this picture, the reader familiar with books by Deleuze (and Guattari) will be reminded of various passages from his work – for example with regard to the open window, the following passage from *A Thousand Plateaus*: 'A season, a winter, a summer, an hour, a date have a perfect individuality lacking nothing, even though this individuality is different from that of a thing or a subject. [. . .] We reserve the name *haecceity* for it' (Deleuze and Guattari, 1988: 261). The title of the drawing also reminds one of a formulation in *What Is Philosophy?*

> In this respect artists are like philosophers. What little health they possess is often too fragile, not because of their illnesses or neuroses but because they have seen something in life that is too much for anyone, too much for themselves, and that has put on them the quiet mark of death. (Deleuze and Guattari, 1994: 172)

And since occupancy of a sickroom seldom goes smoothly, one recalls the beginning of *Anti-Oedipus*: 'The mouth of the anorexic wavers between several functions: its possessor is uncertain as to whether it is an eating machine, an anal machine, a talking machine, or a breathing machine (asthma attacks)' (Deleuze and Guattari, 1992: 7).

Not only texts but images are also called up: on the one hand, drawings by Deleuze, which appeared increasingly in his books once he began his collaboration with Guattari; on the other, images that in a similar manner extend the body of the artist and by this means virtually draw the observer into them. Think of the photographs from Max Burchartz and Aenne Biermann which only show the forearms and hands of someone, so that looking at them one has to struggle against the impression that one is holding the photograph in one's own hands. Or of the lithograph of Maurits Cornelis Escher that shows the face of the artist which is reflected in a sphere which itself is held by a hand that projects from below into the space of the picture (Ernst, 1976: 74; Krauss, 1982).

But above all, it is a sketch done by a physicist and psychologist which is evoked by Deleuze's 'Sickroom'. The subject is very similar, the perspective almost the same, but more radical. This is the figure that Ernst Mach used in the introduction of his *Analysis of Sensations* (Figure 2). This piece seems to make it possible for the observer to actually see with the eyes of the person who is lying down in the drawing – more precisely: to see with his left eye. Mach himself did the sketch that served as the basis for the engraving. Therefore it is Mach's mustache, his nose and eyebrow that the observer is led past – over the body that is lying down, past a bookcase on the left side, towards the window (Mach, 1914: 19–20; see also Mach 1988: 180, 211).

The perspective of the drawing is remarkable. The focus is the same for all distances. The floor seems to be curved. The chaise longue that

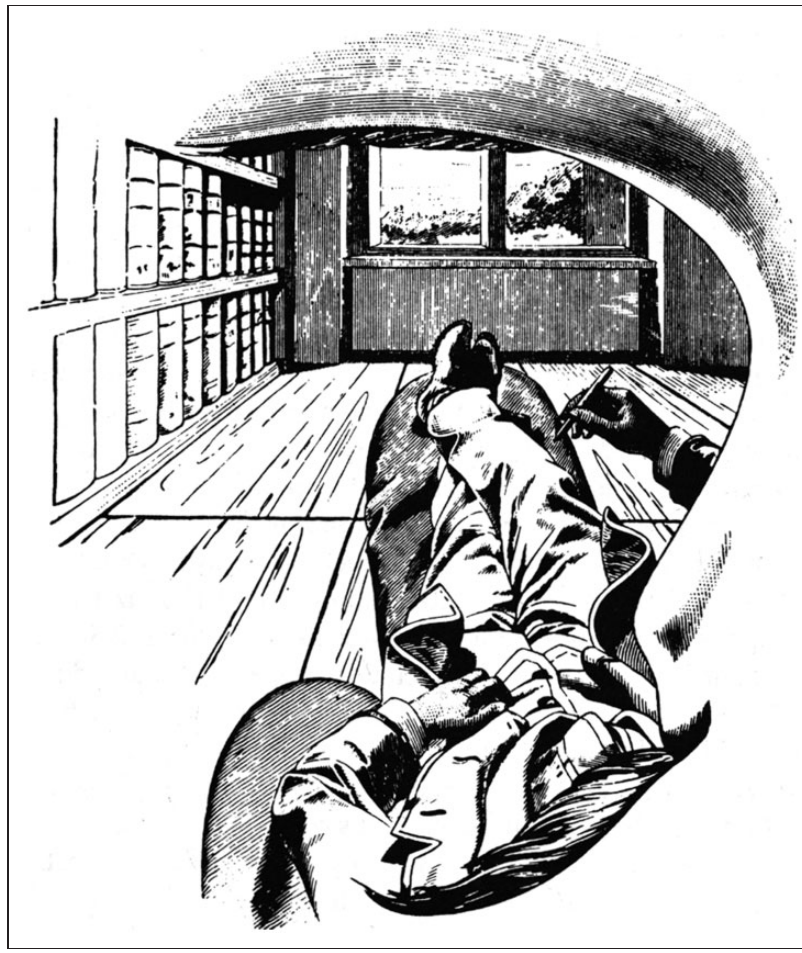

Figure 2. Ernst Mach, *Self-Inspection of the Ego.*

Mach is lying on could just as well be his tongue. Mach placed this drawing at the beginning of his *Analysis of the Sensations*, within the context of his 'Introductory remarks: Anti-metaphysical'. In an 'amusing' distancing of himself from neo-Kantianism, he wanted to make clear with the drawing what self-observation actually meant. 'Problem: To carry out the self-inspection of the Ego. Solution: It is carried out immediately' (Mach, 1914: 20). In other words, it is not a room that is presented here, and in the same measure it is not a self-portrait. Mach drew a portrait of self-inspection, he created an image of the 'Ego function' – sober, pragmatic, almost naïve (Bezzola, 1996).

It has been said that this drawing illustrates the connection between Mach's positivism and Husserl's phenomenology: 'The drawing shows

that even in the simple act of seeing the world does not exist as a phenomenon the subject is not already present in and that no subject exists that is not already in the world' (Lübbe, 1972: 60).[2] Following this argument, the particular sense of reality that manifests itself in the image points to a corporeality as 'embodied meaning'. Conversely, it has been argued that the intention of Mach in the drawing 'to show as much body as possible, more than can ever appear', is suggestive of a condition of 'maximal disturbance'. At least as an artist Mach was 'almost a pathological case' (Sommer, 1996: 24–5). In other words, the phenomenological connection to the world and the body is exaggerated in Mach's positivism, in particular when it is visualized. In a certain sense, this reinforces the similarity to the drawing by Deleuze. Both pictures show a sickroom. However, whereas with Deleuze the room is emphasized, with Mach it is the sick person himself that is the foreground – not a *Chambre de malade*, but a *Malade de chambre* ...

However, both comments on Mach's 'anti-metaphysical' drawing hardly mention a detail which is its most interesting element, that is, the hand holding the pencil which thrusts into the field of the view from the right (Clausberg, 1996: 13–16).[3] It only *seems* that this hand is a prosthesis of the observer. In reality, it pushes him off to the side, since the drawing hand is the basis for a puzzling circularity. The person lying down does not only see himself. Simultaneously he is drawing himself, looking down along his stretched-out body. However, there is no sheet visible in the drawing on which, if it was there, the drawing of the drawing of the drawing, etc., would be shown in succession.

Where, on what surface is Mach, then, doing the drawing? The only sheet there is, is the one that is in the book with the title *Analysis of Sensations* on which the drawing has been printed – hundred-fold, thousand-fold. If one takes the hand for what it is, if one sees it as if it were finishing the drawing while one was looking at it, then the observer who is lying down, the self-observer, the seeing I, is outside the paper, next to the observer, so to speak. The drawn body then becomes strangely flat, transforms itself into a sheet of paper which is bent back upon itself, rolled up in itself. It is a kind of Möbius strip on which the drawing body is drawing itself. A surface that, as Ernst Bloch has suggested, eventually turns into an abyss (Bloch, 1965; see also Hart Nibbrig, 1987: 37–9).

Deleuze's drawing distances itself from such Escher-like effects. There is no drawing hand in it, on it, and no eyebrow that one would look past. The perspective is not even exactly that of the person lying down but somewhat elevated, from a point above the head, as if from a moderate aircraft perspective, shortly after take-off. In addition, Deleuze is not interested in carrying out a 'self-inspection', to contemplate his own or somebody else's 'Ego'. His drawing visualizes a reality, an effectiveness that cuts across, in a different way than in phenomenology, the borders between subject and object, Self and Other. As the title says very

precisely, it is a drawing of a 'sickroom', that is, of an assemblage in which subjective and objective, one's own body and the surrounding space, have become connected in such a way that one can no longer speak of Self and Other. This can be seen in the distortions of the walls, for example, but also in the fact that openness in the drawing by Deleuze is associated not with the body or the act of seeing but with that heterogeneous ensemble formed by the empty chair, the lamps, the jugs, and the drawn-up knees. In Mach, it is the eye that is open, with Deleuze it is the window that becomes the open eye – and at the same time the nose, the mouth, the lung of the room-body, the body-room: not a Machian cyclops, but also not a closed monad.

At this point Deleuze's *Chambre de malade* can be connected with other drawings – for example with the partly coloured illustrations that are to be found in Jakob von Uexküll's *Foray into the Worlds of Animals and Humans*. There the room of the human being, of the dog and of the fly are shown in such a way that in the same room only those objects are coloured which are of biological meaning for the human being, the dog and the fly, respectively. One proceeds from a completely four-coloured drawing, the domestic environment of the human being, to a two-coloured drawing in which – as the central elements of the fly's environment – only the glasses and dishes on the table are marked (Uexküll, 2010: plates 2–4). Von Uexküll writes about this: 'Every subject spins out, like the spider's threads, its relationships [to the environment] to certain qualities of things and weaves them into a solid web which carries its existence' (Uexküll, 2010: 53).

With this sentence in mind, we could say that Deleuze's drawing presents neither the corporeality of the author nor the room as an extension of the body, but the specific environment of a (human) organism in a concrete state. It visualizes a tissue of relationships with vital meaning into which various aspects enter such as *air* (the open window), *light* (again the window but also the candelabras and the lamp), *water* (the jugs on the windowsill) and, finally, the friend (the empty chair), although not as a concrete person but as a vital relationship to a 'companion' (Uexküll, 2010: 108) within one's own thinking. In other words, Deleuze makes visible the web of a spider waiting, before the vibrations begin which the body at the edge of the web will leap onto as onto a trapped prey (Deleuze, 2000: 181–2).

The Art of Philosophy

'Philosophy is the art of forming, inventing, and fabricating concepts', we read in the introduction to Deleuze and Guattari's *What Is Philosophy?* (Deleuze and Guattari, 1994: 2). This is an irritating sentence and not only because it gives a warning to the philosophically half-educated, by calling up shreds of phrases from Kant and Hegel. If there was a choice,

one would perhaps prefer not to be reminded of these phrases. They seem too difficult, too weighed down. However, the sentence from *What Is Philosophy?* can also be a cause of irritation after one has finished reading the book, because it seems that the book brings together again precisely what Deleuze and Guattari attempt throughout the book to keep apart: philosophy, art and science. At the end of the book one thinks one has understood that the true object of science is to create functions, the object of art to bring forth sensorial aggregates and that of philosophy to invent concepts. Each of these 'disciplines' is, as the authors say, creative in its own way and none of them is privileged with respect to the others (see also Deleuze, 1995: 123).

However, the quoted sentence calls this relationship into question. First, it directly connects philosophy to art, if not the arts. One might be reminded of Nietzsche here, of his 'thought acrobatics', of his 'conceptual exercises' and of a philosophy that was developed in constant reference to one of the last coherent world visions expressed as art, that is, the *Gesamtkunstwerk* of Richard Wagner (Görner, 2000). Or one might think of Michel Foucault and his philosophical art of living, *The Care of the Self*, etc. (Gente, 2004).

Deleuze, however, is interested in more concrete relationships. He is not talking about philosophy and art as such, but rather about philosophical concepts, about concepts that arise along with percepts and affects: 'Affects, percepts, and concepts are three inseparable forces, running from art into philosophy and from philosophy into art' (Deleuze, 1995: 137). This might mean that a philosophical text can have an effect on us like that of a painting: one receives a blow, one is astounded, one is the recipient of an intense sensation. And it is not simply that one *has* this sensation, but one becomes it, one is absorbed into it. Deleuze put it this way in his seminar on 1 November 1983:

> the philosophical concept is not only the source of some opinion or other, it is the source of a very special transmission. Or: Between a philosophical concept, a pictorial line and a musical block of sound, there are correspondences, very, very interesting correspondences, which I feel one should not even attempt to theorize about and which I would rather call affective: the domain of affect or of affectivities, a domain something can leap out of, for example from a philosophical work: a concept, a line, a totality of sounds. Those are privileged moments. (Deleuze, 1983)

What is expressed here in terms of a special type of 'reception aesthetics' (which is also applied by Deleuze [2000: 145] in his reading of Proust) also has a productive side. In contrast with Nietzsche and Foucault, Deleuze's philosophy *as* art is closely connected with the labour of drawing. Here he comes close to Pierre Klossowski, whose pictures –

'canvasses of great beauty' (Deleuze, 1990: 285) – Deleuze admired. Works such as *Difference and Repetition*, *Spinoza and the Problem of Expression in Philosophy* and *The Logic of Sense* still follow the ideal of pure textuality, but this changes both with *Anti-Oedipus* and after it. The books he wrote with Guattari, as Deleuze himself said, can be seen as illustrated works. Deleuze's book *Foucault,* and in particular *The Fold: Leibniz and the Baroque*, interrupt the flow of text at certain points with drawings, which open the text to other planes and then continue it on these other planes. In the hand drawings that Deleuze inserts into his texts we encounter a body with its own ethos, its irreducible singularity.

There is a concrete indication that it was the beginning of the collaboration with Félix Guattari that was decisive for this turn towards drawing and that it was also in this context that Deleuze's conception of philosophizing as the creation of concepts developed.[4] The earliest point at which Deleuze talks about philosophy as the creation of concepts seems to be in a catalogue that was published in 1973 for an exhibition of the Polish artist Stéphane Czerkinsky. The booklet *Faces et surfaces* not only contains a conversation between Deleuze and Czerkinsky but also six drawings by Deleuze which, together with 'Sickroom', were republished in *Chimères* in 1994. The tone of this conversation is quite different from that of *What Is Philosophy?* In 1973 Deleuze is still talking about 'therrory' and the unconscious which has to be 'violet'. In response to Czerkinsky's question 'What precautions should be taken when producing a concept?' Deleuze answers in the manner of *Anti-Oedipus*: 'You put your blinker on and check in your rearview mirror to make certain another concept isn't coming up behind you; once you've taken these precautions, you produce the concept' (Deleuze, 2004: 282). Producing a concept is, therefore, a kind of philosophical passing manoeuvre. Philosophy is not a quiet activity undertaken within one's own four walls but a motorized race, best of all on a stretch of road without speed limits. That is definitely a different constellation than at the hour of dusk when, among friends, one asks what philosophy is, what one has been doing all these years.

In a note to the high-speed answer of 1973, Deleuze claims: 'Concepts are not in your head: they are things, peoples, zones, regions, thresholds, gradients, temperatures, speeds, etc.' (Deleuze, 2004: 312). This suggests an idea of philosophical car-driving as a specific way of gaining experience: as an evocation of images, for example, which arise by means of the velocity of the change in position carried out by one's own body.[5] At the same time Deleuze emphasizes, in an almost futuristic manner, the sculptural aspect of the production of concepts. For him a concept seems to have less to do with words and sentences than with a kind of sculpture *à la* Boccioni. However, the note quoted above also refers to a scientific dimension of philosophical concept-creation, as we will see in a moment.

The Line of Cavaillès, Bachelard and Canguilhem

'Philosophy is the art of creating, inventing, and fabricating concepts.' It is not only the identification of philosophy with art which is interesting in this sentence. One might also wonder whether the invention or creation of concepts is actually something that we would first and foremost want to assign to philosophy. At least today, philosophy is closely associated with the business of defining, historicizing and formalizing already existing concepts. It is in this sense that Deleuze and Guattari say that etymological exercises often degenerate into a 'specifically philosophical athleticism' (Deleuze and Guattari, 1994: 7).

However, in contemporary culture it is mainly science that confronts us with new concepts. One need only think of 'black hole', 'quark' or 'gene'. And this is not just a common-sense argument. With respect to French post-war philosophers, Foucault pointedly referred to the connection between concepts and science in the middle of the 1980s. As he explained in his late text 'Life: Experience and science', there were two basic ways of connecting to Husserl's phenomenology which characterized post-war French philosophy. On the one hand, there was the network of Sartre and Merleau-Ponty, which pursued a philosophy of experience, meaning and the subject; on the other, there was the line of Cavaillès, Bachelard and Canguilhem, who pursued a philosophy of knowledge, rationality and concepts (Foucault, 1998: 466–7).

It can hardly be doubted that Deleuze belongs to the latter lineage. It was Georges Canguilhem who was the second adviser for the thesis on Hume which Deleuze (1991) wrote for his *Diplôme d'Études Supérieures* with Jean Hyppolite in the early 1950s. In 1955, Deleuze published in Canguilhem's series *Textes et documents philosophiques* the volume *Instincts et institutions*. In addition, in the books he wrote with Guattari he often quotes Canguilhem, even if he does not always identify his source – for example in the appendix to *Anti-Oedipus* when he describes, in quasi-evolutionary terms, the relationship between organism and machine as a continuous one (Deleuze and Guattari, 1977: 121) or in *A Thousand Plateaus* when von Uexküll's example of the tick is quoted in the context of affective-ethological observations about living organisms in their environmental contexts (Deleuze and Guattari, 1988: 257). In both cases one can find corresponding passages, including further bibliographic references, in Canguilhem's 1952 essay collection *La Connaissance de la vie*. In fact, almost all the biological literature that Deleuze refers to (for example, works from Raymond Ruyer, Pierre Vendryès and Albert Dalcq) can be found in the annotated bibliography of this book (Canguilhem, 1992: 122–7, 146, 191–8).[6]

Prior to Canguilhem, the historian of mathematics Jean Cavaillès, who was murdered by the National Socialists in 1944, made significant contributions to separate the philosophy of concept from all philosophies of

the subject. At the beginning of the 1930s Cavaillès had already come to the conclusion that Husserl's phenomenology of science, as it was described in detail later in the *Krisis* text, was too strongly influenced by Kant's ideas: Husserl, like Kant, associated concepts and the formation of concepts too closely with the individual consciousness. According to Cavaillès, the progress of science, indeed its very existence, cannot be understood or reconstructed by referring to such a consciousness. In his eyes, science is in essence a collective undertaking that continually questions itself, and the meaning of the concepts that are created, used and then rejected once again in the course of this process cannot be determined by going back to Greek individuals and intentionalities. If philosophy doesn't want to lose contact here, Cavaillès argued, it would have to accept the idea of an independent existence of concepts, more or less removed from isolated subjects. In this sense the former student of Brunschvicg insisted that the history of mathematics is characterized by a 'becoming' that cannot be determined in advance. Given its intricate history, one could even say that mathematics is an 'experimental' discipline. At any rate, the necessity of mathematical connections and the unpredictability of the development of mathematics are brought together somewhere other than in a Kantian subject. Therefore, in the programmatic conclusion of Cavaillès' work *Sur la logique et la théorie de la science*, which was edited posthumously by Canguilhem, the author says: 'It is not a philosophy of consciousness but a philosophy of the concept that can lead to a theory of science' (Cavaillès, 1994: 560, 601; see also Sinaceur, 1994, and, more generally, Hyder, 2003).

The impact of such a subjectless philosophy of the concept can be found repeatedly in Deleuze. In fact, aside from Michel Serres, there is no contemporary French philosopher who has drawn so strongly on the knowledge and vocabulary of the sciences as Deleuze, whether it is the Belgian school of embryology with its theory of gradients (Dalcq, 1941), or the microbiology of the uncertain brain as it appears in Steven Rose (1973) and Deslisle Burns (1968), or, finally, the ethological work of William Thorpe (1956). Even such a central concept as the 'body without organs' can hardly be conceived of without reference to scientific knowledge. Deleuze and Guattari credit Artaud with the discovery of this body: 'Antonin Artaud discovered it wherever it was present, without form or shape' (Deleuze and Guattari, 1992: 8; translation modified). However, the reference to bodies without organs as eggs that are shot through with gradients is also inspired by embryology and general physiology in particular. If one wants to find the originator of this concept in the sciences then in all probability one should not go back only to embryologist Albert Dalcq or zoologist Charles Manning Child (1915), but also to physiologist Claude Bernard.

In Bernard's lectures on the phenomena of life that are common to animals and plants (which first appeared in 1878, and was republished in

1966 by Canguilhem) one can find the following with regard to single-cell organisms and protozoa: 'It is not important whether a living being has organs or more or less distinguishable and complicated apparatuses, lungs, a heart, a brain, glands, and so forth. All that is not necessary for leading a complete life. The lower organisms live without such apparatuses, which are characteristic only of the luxurious organizations [of the living]' (Bernard, 1966: 151). Around a hundred years later Deleuze and Guattari write in *Anti-Oedipus* (quoting Artaud): '*No mouth. No tongue. No teeth. No larynx. No esophagus. No belly. No anus.* [. . .] The body is the body/it is all by itself/and has no need of organs/[. . .]' (Deleuze and Guattari, 1992: 8–9).

It is encounters with concepts of this kind that characterize the life of concepts in the philosophy of Deleuze. Artaud meets Bernard. Via the concept of the diagram, the painter Francis Bacon meets philosopher Charles Sanders Peirce (Ruf, 2003: 119–26). In addition, 'thought without images' is the interface for an encounter between Deleuze, Alfred Binet and the psychologists of the Würzburg School, who, as early as around 1900, spoke of *pensée sans images* (Deleuze, 1978, 1994b: 167).

In this regard, his philosophy fits independently into the series of historical and theoretical works that Cavaillès and Canguilhem devoted to the becoming of scientific concepts. To be sure, Deleuze is not primarily interested in investigating the emergence and development of scientific concepts; nonetheless, where his works have drawn on science they have made an important contribution to 'mediating' between philosophic and scientific research. When, at the beginning of *What Is Philosophy?*, one reads that philosophy is the art of creating concepts, this is then hardly a sentence that defines the radical specificity of philosophy in contrast to art and science. The interest here is more in describing connections, overlappings and 'neighbourhoods' between philosophy and the other two 'disciplines', that is, to grasp commonalities that had previously not been thought of or seen, but which then allow for new differences, and new lines of differentiation to be worked out. More than a differentiation between philosophy, science and art, the goal of the sentence quoted above ('Philosophy is the art of creating, inventing, and fabricating concepts') is to open up a space which can create 'unexpected convergences, and new implications, new directions, in other people's work' (Deleuze, 1995: 30).

It is from this that a first determination of what 'concept' means for Deleuze can be attempted. Similar to Cavaillès, whose epistemological position leads us to think more in terms of construction than of givenness (Sinaceur, 1994: 69), Deleuze is interested in the creation, determination and assessment of the way in which concepts function as tools, as components of constructive practices.

If we now take the quoted sentence ('Philosophy is the art of creating, inventing, and fabricating concepts') itself as a concept, it approaches

other, more well-known concepts such as the 'desiring machine', since the latter fuses, as if in a *coup de main*, the common contrasts of organism and mechanism, individual and society, base and superstructure. Or take the concept 'abstract machine', which brings together language and technology, semiotics and materialism; or that of the 'fold', which enables the brain and thinking to be conceived of as united in novel ways. The dissolution of the antitheses between commonplace concepts, of established oppositions, that is what one might call the critical-constructive dimension of the conceptual work of Deleuze (and Guattari).

To side with Georges Bataille, the goal of this philosophy of the concept is *not* to put a 'long coat', a 'mathematical riding-coat' over everything, but to introduce at certain points and in certain contexts *formlessnesses* (Bataille, 1992: 27; see also Bois and Krauss, 1997): not concretions, but novel abstractions, which can lead to different concretions – just as in *Anti-Oedipus* and *A Thousand Plateaus* the common concepts of capitalism and schizophrenia are transgressed and no longer understood as products but as processes that other products are related to. The statement that philosophy is the art of creating concepts does not serve to define philosophy as a product but to relate it to a more general process: to creativity, to creation or to life. With regard to this, not only philosophy but also science and art have to be determined anew in their respective independence. In this work of dissolution, of the crossing of boundaries, Deleuze's use of concepts resembles the function of the *informe* that Bataille praised in his *Critical Dictionary*.

What Is a Concept?

Speaking positively, what does Deleuze mean by 'concept'? The question almost gets stuck in one's throat since this philosopher is not primarily interested in defining concepts. He is interested in the construction and functioning of them. In keeping with this, his texts define their concepts above all by the special use they make of concepts. In addition, Deleuze is not primarily interested in 'What?' questions, but more in questions implying a dramatization: 'Where? When? How many?' It is therefore surprising that in *What Is Philosophy?* a definition of 'concept' is actually offered. It reads as follows: 'The concept is defined by *the inseparability of a finite number of heterogeneous components traversed from a point of absolute survey at infinite speed*' (Deleuze and Guattari, 1994: 21).

This rather complex definition leads us back to the 'sickroom'. By means of drawing, Deleuze's picture integrates a finite number of heterogeneous components: bed, chair, window, etc. Speaking of 'overflight' or 'survey' (*survol*) even seems to refer precisely to the somewhat elevated perspective of the drawer of the picture. Further, 'concept' is explicitly compared to images and drawings in Deleuze's text – for example when he says that every concept has 'an irregular contour' (Deleuze and

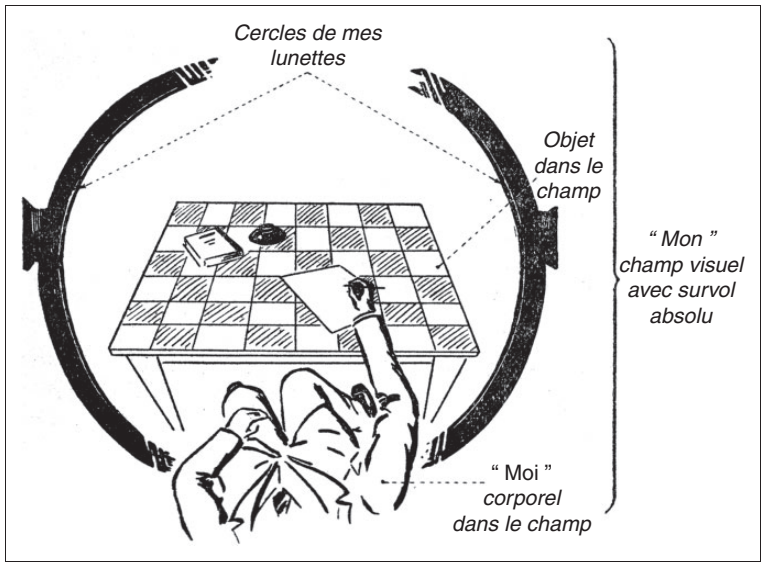

Figure 3. Raymond Ruyer, *'My' Visual Field with Absolute Overflight*.

Guattari, 1994: 15) or a specific silhouette which is determined by the number of its components. In Deleuze's drawing this contour would not be formed by a single line, but precisely by making visible such components as bed, lamp, window, water jug and chair: essential elements for the drawn concept of the sickroom.

However, the closeness of concept to the art of drawing, which appears here once again, is also relativized in *What Is Philosophy?* And again, it is not only a question here of philosophy and art, but also of philosophy and science. The overflight (*survol*), that Deleuze (and Guattari) speak of in their definition of 'concept', is nothing other than a cerebral process, a process that Raymond Ruyer has described based on the research of psychologists and physiologists such as Karl Lashley, Robert Woodworth and Wolfgang Köhler. In his book *Néo-Finalisme*, Ruyer explains this process (and its special form) by making use of a figure (Figure 3), which, in its unusual perspective, is reminiscent of the drawings by Deleuze and Mach that we discussed at the beginning of this article. Again, the dominant perspective is one down along one's own body (although here the body is sitting, not lying down), so that the reader has the impression that he himself is being extended into the drawing. One not only thinks that one is seeing with the eyes of the person drawn but also that one is looking through his glasses. However, here no 'Sickroom' or 'Self-Inspection of the Ego' is shown but, as the title has it '"My" Visual Field with Absolute Overflight' (Ruyer, 1952: 101).

In Ruyer's visual field there are the objects on a table with a chessboard pattern (an ink-well, a sheet of paper, a book), the body dressed in a suit (seen from the chest down), as well as parts of the frame of the glasses. Because the glasses extend into the visual field it seems that Ruyer's drawing is closer to Mach's than to Deleuze's. Does this confirm a closeness to phenomenology, which Merleau-Ponty believed he could recognize in the 'profound' writings of Ruyer (Merleau-Ponty, 1968: 194; see also Valdinoci, 1995)? Hardly, since with his explanations in the text Ruyer relativizes his drawing to such a degree that it is much closer to the Deleuzian concept of a room than to the Machian view of the 'Ego'. The *survol absolu* that interests Ruyer categorically excludes a position from which the visual field could be observed, that is, the visual sensations of a subject, regardless of whether it was one's own or that of another person.

Ruyer's drawing places the observer in a fictional, almost fantastic position. As the accompanying text explains, the drawing is intended to clarify the idea that on the level of sensations there is, and can be, no observer. In other words, for Ruyer it is clear that no 'transcortical' inspector exists who observes the images projected into the brain – that is, there is no subject inside one's own body that relates to the brain as to an object. If one were to assume there were such a subject one would fall into an infinite regress – an argument that can also be found in recent brain research, for example the work of Gerhard Roth (1997: 99).

According to Ruyer, order, unity and consciousness are primary properties of the cerebral processes themselves. In other words, these processes don't have to be observed with respect to such properties. They are inscribed into the brain tissue itself – although not in any way that can be easily or precisely localized. 'Topics and meanings', which, according to Ruyer, are decisive qualities of conscious experience are, as he says, 'in principle not localizable' (Ruyer, 1952: 49). They exist outside the space-time plane, at least insofar as one considers this plane to be a totality of fixed, solid bodies next to each other, in which actions are transmitted stepwise from one point to another. Cerebral space is the exact opposite of the chessboard-like space formed by the table: it is not an adjacency of separate elements but a flexible totality in which everything is bound to everything else.

With Ruyer, the circularity of Mach's drawing undergoes a revealing interruption, an opening. Ruyer's drawing acquires its actual meaning from its ground, that is, from the paper as a surface. It is the paper's surface that shows the observer that a totality of visual sensations in the brain becomes a kind of absolute surface, a surface which, so to speak, is viewed and scanned as a whole and without a third dimension, which observes itself (without eyes) and is nowhere lost to sight. Instead of excluding the observer from the drawing Ruyer allows him to become the surface the drawing is being done on.

It is to this surfaceness that Ruyer attributes a fundamental property of consciousness – and at the same time it is its essential paradox. What we call consciousness or the self is present at all points of 'my' field of view – observing this field but not, however, the way a reader observes illustrations in a book. It flies over this field but not the way a pilot crosses a landscape. Rather, the flight of consciousness is written from the outset into the texture of the sensation. It is an *absolute* overflight, without an external point of perspective, without a subject – which means without an actual flying over.

The *survol absolu*, therefore, has nothing to do with space, but with time. In an absolute surface there is no route to follow, no stations to pass through, no actual distances to be traversed. Everything becomes a question of high or infinite speeds. Which brings us back not only to Deleuze's conceptual car-driver of 1973 but also to *What Is Philosophy?* from 1991. It is here that Deleuze and Guattari expand on their definition of concept with the following note: 'the concept is an act of thought, it is thought operating at infinite (although greater or lesser) speed' (Deleuze and Guattari, 1994: 21).

What then is a concept according to Deleuze and Guattari? A half cerebral, half drawn event, one might want to say: a drawing in *and* of the brain. A concept cannot be thought independently of the perceptions and sensations it is extracted from – where perceptions and sensations are, however, not perceived, noted and summed up from a neutral, higher perspective but derived from the topics which, so to speak, are implied in the perceptions and sensations themselves, as in the paper that literally underlies the drawing by Ruyer. But a concept does not only sum up. It has an effect in turn on perceptions and sensations, changing or producing them – like a drawing whose perspectives and contours open up states of affairs to view that have not been seen before, or at least not been seen in that way. Outside the drawing things, objects or connections become visible which previously were completely unfamiliar. Seen in this way, concepts in the sense of Deleuze (and Guattari) express the double-sidedness of the concept/percept relationship.

The constructive nature of concepts was also emphasized by Canguilhem in 1955 in his study about the formation of the concept of reflex in the 17th and 18th centuries. At the end of a comprehensive study that goes back to ancient medicine and traces the first formulation of this concept, not back to Descartes' mechanistic philosophy (as is usually the case) but to the writings of the vitalist Thomas Willis, Canguilhem writes:

> By 1850 the concept of reflex had become inscribed in books *and* in the laboratory, in the form of exploratory and demonstration equipment which had been built for this concept and which, without it, couldn't have existed. The reflex has stopped being simply a concept

> and has become a perception. It exists because it allows objects to exist that it makes understandable. (Canguilhem, 1977: 161)

From the perspective of Canguilhem's technological vitalism, therefore, concepts are 'phenomeno-techniques' (Bachelard, 1998), that is, tools which can connect up with other instruments and machines, actually creating what they designate. Similarly, concepts as stated by Deleuze are to be understood as means of production. They don't represent something given, they don't simply depict givens, but they reveal new types of facts by constructing together with other 'machines' (texts and drawings, but also photographs, films and sound recordings) what they refer to. The creation of concepts comes down here to a production of experiential events.

From Concepts to Problems

It seems that at least two objections can be raised to defining the concept as a partially drawn, partially cerebral event. The first one is that it is an example of aestheticism. If 'concept' is identified with drawings as such, then every drawing could be seen as a concept. Why should we then read philosophical texts at all? This is, it seems, how the Deleuze commentaries of Alain Badiou are to be understood. Despite the egalitarian pronouncements made in *What Is Philosophy?* with respect to science, philosophy and art, according to Badiou the book suggests a hierarchy in which art is at the pinnacle, and only then does philosophy follow (Badiou, 1996: 247, 2000).

The second objection that can be made with respect to such a definition of concept is that it is scientistic, that it is an instance of neurological and/or biological reductionism. The nature of the concept and how it is formed is deduced by Deleuze (and Guattari) at least in part from assumptions as to the activity of the brain and the nervous system. This would seem to make Deleuze and Guattari dependent upon the current stage of development of brain research. Philosophy, then, would come to occupy a weak, defensive position with respect to science, since it leaves to science the ultimate right of determination and definition.

Both these objections, however, are not particularly pertinent. In a word, they manifest themselves on a level that does not do full justice to Deleuze (and Guattari). Finally, this can be seen more clearly when a further definition of concept from *What Is Philosophy?* is taken into consideration. 'All concepts are connected to problems without which they would have no meaning and which can themselves only be isolated or understood as their solution emerges' (Deleuze and Guattari, 1994: 16). What this means can be made clear by coming back to two concepts for which Deleuze and Guattari have become especially famous: desiring

machine (*machine désirante*) and body without organs (*corps sans organes*).

As has already been suggested above, on a formal level 'desiring machine' served as if in a *coup de main* to fuse pairs of opposed concepts: organism and mechanism, individual and society, base and superstructure. That is the external, functional feature of this concept. The problem which turns it into more than simply a corrosive, formless formula can be presented as follows: how can one act theoretically and practically in a discourse situation which is dominated by an alliance between structuralist Marxism and structuralist psychoanalysis, in which, on the one hand, every dimension of true desire is excluded from societal life and, on the other, an increasingly formalized understanding of language is being developed which leaves no room for other forms and matters of expression? In this situation the concept of desiring machine provided a way out since it confronted (not only in terms of content) the structuralist standpoints mentioned above with a different conception which reconnected the debates on social matters with concrete situations – explicitly allowing other semiotic regimes than the spoken and written word.

At the same time, the concept of desiring machine was itself embedded in a discourse whose form, at least in part, already expressed its contents. *Anti-Oedipus* cultivated an anti-style directed against the disciplined type of writing common in both philosophy and the humanities. Not only were voices and songs brought into the text, but paintings, drawings and complex diagrams. One may doubt, however, that the concept 'desiring machine' eventually delivered an opening of perspectives. It is not for nothing that in *A Thousand Plateaus* the concept *agencement*, 'assemblage', appears more or less precisely in its place, since the machine concept was too often (mis)understood mechanistically.

In contrast, 'body without organs' can be found in both volume 1 and volume 2 of *Capitalism and Schizophrenia*. The problem that this concept was a response to can be described as follows: how can one think about a body without reasoning backwards from its developed state, from what is finished, to what is in the process of development? Psychoanalysis and phenomenology proceed from complex body organizations: from the finished adult, from a conscious corporeality. Where they speak of early and/or minor modes of bodily experience, they tend to analyse them with regard to their final and/or major forms and as a consequence often conceive of these modes as deficient.

Deleuze and Guattari therefore undertake to grasp the body before its expansion, as an egg or a cell, and to trace the existence of this kind of body to concrete experiences. In so doing, they point the way to considering experiences of organlessness not as a lack but as a clue to the foundation of bodily experience as such – as a rustling, a breathing, a circulation of blood. By this means the body is freed of images. It becomes an 'imageless body', a *corps sans image* (Deleuze and

Guattari, 1992: 8). Its essence can no longer be seen but can only be approached by means of continual experimentation, as a temporary condition, an intensity. In addition, a shift occurs here from the visual register to the auditory one. In *A Thousand Plateaus* this becomes clear not least with reference to Artaud's experimental radio programme *Put An End to God's Judgment*. Put otherwise, the body is understood more temporally than spatially, not as time which is bound to individual organs but as a duration deeply embedded in the organism.

This provides at least a rough idea of the level on which the problem of concept creation originally existed for Deleuze and Guattari. In the 1970s and 1980s this problem was nothing less than the position occupied by philosophy in a developed society as opposed to that of the humanities. How should the philosopher relate to sociology, to psychoanalysis and to linguistics? It is interesting to note that this question posed itself to Deleuze not only theoretically but practically, that is, in the form: How do I cooperate with a co-author who is well-versed in both psychiatric and psychoanalytical practice? How do I write a book together with Guattari? It is during this time that the idea first arose that the task of philosophy was to create concepts that can be understood as an answer to this problem and, even more concretely, as a result of cooperating with Guattari. Criticism of the dominance of a generalized linguistics of the signifier led not only to a theory of different semiotic materials (a theory that to this day has hardly been utilized) but also to a search for other forms of expression, forms that had already been in part prefigured (literally) by Lyotard (1971) in his book *Discours, figure*, and which, over the ensuing years, Deleuze and Guattari filled and developed in their own manner: by integrating paintings, photographs and sketches into their texts – not as ornaments but as concrete materials of the investigation (the photographs in Kafka, Bacon's paintings), and also in terms of method, as a tool of analysis (for example, the sketches of the despotic regimes of signs in *A Thousand Plateaus*).

In the 1990s, the situation apparently changed for both the philosopher Deleuze and the psychoanalyst Guattari. The problem now was no longer the relationship of philosophy to the humanities but the localization of philosophy *and* the human sciences with respect to those sciences that people have become accustomed to calling 'hard'. The latter have not only continued to create new concepts but also attempted to exercise an increasing right to determine the meaning of concepts that have been known and in use for a long time already, for example: 'life', 'death', 'heredity', or 'consciousness' and 'thinking'. The numerous borrowings that Deleuze and Guattari make in their later texts from the life sciences are to be understood as a proactive response to this changed situation. It consists not of withdrawing and going on the defensive but, on the contrary, of seeking increased contact – with neurology, behavioural research and molecular biology.

However, the goal of this contact is not a problematic reconstruction of philosophy on the basis of scientific facts. The goal is rather to use contemporary scientific research and the vocabulary developed by it for participating in the generation of meaning and the production of concepts. An exemplary case of this is Deleuze's concept of folding, or the fold. This concept relates not only to protein research but is also formulated in such a way that brain and thought can be understood together in a new, non-trivial manner, with respect to a continuity that runs from the convolutions of the brain, to the wrinkles in our foreheads, to lines on paper. In all these cases routes are traced in a surface under tension, an idea that Deleuze 'unfolds' above all in his book on Leibniz.

The constructive nature of these conceptual efforts becomes clear when one thinks of the extraordinary drawings of the brain that Deleuze included in various later works – in the book on Foucault, for example, but also in *What Is Philosophy?* They project a new image not only of the brain – one that contrasts clearly with the coloured images in popular scientific magazines – but of thinking as well.

Perhaps it is at this point that, beyond all the divergences between them, the strongest convergence between Deleuze and Foucault can be found. They meet as radically contemporary philosophers, as working on and with the actuality of the present. However, they do so in different directions. Where one finds the material for his analysis of the present in the discourses of history, reworking it to fictions (Bellour, 1992), the other discovers his material in the sciences, transforming it into unfamiliar notions and concepts.

Conclusion

Deleuze's conceptual practice cuts across the three 'disciplines' distinguished in *What Is Philosophy?* As a genuinely philosophical activity, Deleuze's creation of concepts is connected to art, since the main goal of these concepts is to *make* phenomena and processes *visible* rather than representing things that already exist. At the same time, however, Deleuze often finds the raw material for his concepts in science. He adopts and stretches scientific notions such as 'imageless thought', 'body without organs' and 'neighbourhoods' in order to relate them to the problems he is actually struggling with. Both the artistic *and* the scientific aspects of Deleuzian concept formation contribute to a resistance against what Stengers calls the 'functions of the lived' (Stengers, 2005: 155). Deleuze's concepts work against the grain of introspective and phenomenological evidence. They do not refer to our everyday experience. Instead, they make use of scientific notions that contribute to teaching us how we could see and sense realities that have hitherto gone largely unnoticed.

By the same token, the creation of concepts is in itself transformed into an activity working against the 'functions of the lived'. As we have seen, even Deleuze's (and Guattari's) sentence, 'philosophy is the art of creating concepts', can be understood as a concept in its own right. As such it responds to the tense relationship between science and philosophy in our time and simultaneously proposes a constructive philosophical attitude toward this relationship. With respect to current developments in the sciences, in particular biology, Deleuze's philosophy functions as a power that aims at drawing images of a different possible nature and a different possible life. To quote Stengers again, his emphasis is not on 'reflecting on science' but on 'diverging from science' (Stengers, 2005: 158).

If one wants to avoid treading water by defining Deleuze's concepts or simply imitating a jargon, then it is on this level that one has to connect with his conceptual philosophy. In other words, every reader of Deleuze – however closely related their problems might be to those of Deleuze (or of Deleuze and Guattari) – has to begin to produce their own specific drawings and concepts for their own situated problem. Beyond phenomenology and positivism, the task is to work on the objectivization of the subjective and the subjectivization of the objective, on revealing zones of perception and sensation that make thinking possible once again because it confronts its own necessities. As Deleuze put it in a lecture in May 1987, 'A creator is not someone who works for the pleasure of it. A creator only does that which he absolutely needs to do' (Deleuze, 1987).

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Notes

1. In a remarkable article, Elie During (2004) has suggested that Bergson's anti-positivist attempt to conceive of the history of ideas and science as a 'history of problems' was taken up by Canguilhem.
2. Unless otherwise stated, all translations from the German and the French are my own.
3. Clausberg shows that Mach only inserted the hand into the drawing after making a series of sketches.
4. The path to this understanding of concepts was prepared by Deleuze's study of empiricism. In this connection Deleuze speaks in the introduction to *Difference and Repetition* of the 'most insane creation of concepts ever seen or heard' (Deleuze, 1994b: xx).

5. Simone de Beauvoir, for example, writes:

> A book or a film shows me the world without me seeming to have to make any personal effort – I forget my own existence. In a car, I am present and I have the feeling that it is I myself who, by my bodily movement, gives rise to the visions that are presented to me – there is something intoxicating about motion when it makes the flow of time coincide with the unfolding of a space rich in meaning. [. . .] As I drive smoothly along a road I am perpetually at the meeting point between memory and fresh discoveries; I am both memory and expectation, intensely aware of what is leaving me and of what is just about to come. (Beauvoir, 1974: 213)

6. For unclear reasons, this bibliography is not reproduced in the recent English translation of this book (Canguilhem, 2008: 112–13). For Uexküll's tick, see also Agamben (2004: 45–7). Agamben refers neither to Deleuze nor to Canguilhem. One may add, however, that Canguilhem refers to the von Uexküll example as previously quoted in Bournoure (1949: 143).

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