

The Power of Abstraction and Its Antagonism: On Some Problems Common to Contemporary Neuroscience and the Theory of Cognitive Capitalism.

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Life cleaves to matter, elaborating and contracting matter, bringing to life the virtualities within the material in unknown directions. Life emerges as a becoming-concept, a becoming-thought or—as a consciousness, a becoming-brain. (Grosz 2012)

We accept far too easily that there exists a fundamental conflict between knowledge and life, such that their reciprocal aversion can lead only to the destruction of life by knowledge or to the derision of knowledge by life. [...] Now, the conflict is not between thought and life in man, but between man and the world in the human consciousness of life. [...] It is not true that knowledge destroys life. (Canguilhem 1965)

The philosophical debate of the last years, at least at the boundaries of French and Italian political theory, has been marked by a conceptual oscillation that has alternately emphasised immaterial labour or affective labour, knowledge economy or desire economy, the cognitive or the biopolitical. No research or political agenda have been immune from such a hypnotic spiral, which can be traced back to a millenary low-intensity hostility between the Western concepts of body and mind. After a period focusing on the knowledge economy and immaterial labour, for instance, at the end of the '90s, the *affective turn* of the humanities forced political theory to give a specific attention to *affective labour*. On this conceptual journey, theorists rediscovered the reproductive and care labour that feminism attempted to politicise already in the '70s. In the same period, biotechnologies and the notion of *bios* occupied centre stage in debates around new forms of power. A common critique emerged that took the paradigm of cognitive labour to be overlooking the biological and genetic materiality of the body, and more importantly its libidinal and affective dimensions. Lazzarato (2006) proposed interestingly the idea of *noopolitics* as an extension of the definition of biopolitics to cover also the flesh of the collective imaginary and mind technologies. It must be underlined, however, that the

sphere of affective production was originally considered within the sphere of immaterial production and never opposed to it (Hardt & Negri 2000, 293). How can these two spheres once again be put in relation to each other?

This essay intervenes in the oscillation between these two poles and advocates a monistic paradigm, where the opposition between body and mind, or *bios* and *abstraction*, may hopefully vanish—as in the works of Spinoza, Marx, Bergson, Merleau-Ponty, Canguilhem, Foucault and also Deleuze and Guattari. Yet this time the French lineage is not followed and the genealogy of the notion of biopolitics is traced via the German tradition of *Lebensphilosophie*, where ‘the living’ was rarely detached from a dimension of cognition and abstraction. In particular, the German-Jewish neurologist Kurt Goldstein and his ideas of *abstract behaviour* and *normative power* of the organism are located at the root of Foucault’s intuition of biopower. In this reconstruction the cognitive paradigm is turned inside-out: it is in order to understand the body that we start once again from the brain, it is at very core of the *bios* (and the whole matter) that *abstraction* is found at work. The cognitive does not emerge *after* the evolution of a naked life (and maybe just to become its very enemy), but it innervates the living matter since its constitution (as we are reminded in the opening quotation by Grosz). Eventually in this essay, the brain is taken to be as the first model and terrain of biopower. Going deeper in this genealogy, the *power of abstraction* will be disclosed at the original core that inspired the paradigm of biopower. It is not an exaggeration to affirm that neuroplasticity (as understood by Goldstein) was the original inspiration of the notion of biopower. Exhuming the forgotten ‘neurological roots’ of the notion of biopolitics helps to clarify the affective vs. cognitive opposition and to describe differently the so-called psychopathologies of cognitive capitalism.

This essay is divided in five sections. The first three sections focus the notion of abstraction in relation to neurology, political economy and ontology—that is, the notions of *abstract behaviour* in Goldstein, *abstract labour* in Marx, and *abstract machine* in Deleuze and Guattari. Abstraction is here understood as an immanent power that makes and undoes connections, that territorializes and deterritorializes, that projects bodies and identities beyond themselves, onto the surrounding environment and towards the infinite cosmos. The power of abstraction is intended also as the power of differentiation with respect to neural matter, the power to produce further bifurcation of information and perception flows, as described by a long tradition spanning from the *Gestaltpsychologie* to Merleau-Ponty. The fourth section shows how the recent discovery of *mirror neurons* in neurology has further implications for political philosophy. It also explores Virno’s discussion of mirror neurons within the tradition of Italian *operaismo*, and finally how the notion of abstraction can illuminate them in a different way. By way of conclusion, against a certain fatalistic tone, I propose to reverse the approach to the problem of the psychopathologies of cognitive capitalism by moving away from the *neuropedagogy* advocated by Metzinger.

1. Goldstein and the power of abstraction of the organism.

There is a nodal point in the history of the relation between French and German philosophy when the notions of *life* and *abstraction* are found still bound together. This is, for instance, a crucial issue in Foucault's analysis of the relation between modern forms of power and modern systems of knowledge, but a more interesting conceptual nucleus is found in the inspiration of Foucault's biopolitics. The idea of biopower emerges in his course *The Abnormal* (15 January 1975) where it is described as *biopolitical normativity*. The innovative idea of the course was that power is no longer investigated as a discipline of the body (*the negative power of repression*) but via the invention of new Norms (*the positive power of normalisation*). The normalization of post-Napoleonic French society is the creative act of power that invents new norms in the fields of industry, administration, education and public health. The Norm and the Normal are the keywords of this institutional consolidation: it is at this time, for instance, that the École Normale is established. Incidentally, the first definition of *dispositif* is given by Foucault in this course, which refers to the genealogy of normativity. Foucault describes this form of power as a *dispositif* of normalization: "This general technique of the government of men comprises a typical apparatus [*dispositif*], which is the disciplinary organization I spoke to you about last year. To what end is this apparatus directed? It is, I think, something that we can call "normalization"" (Foucault 1975, 49). Foucault's idea of *biopolitical normativity* is inspired by his mentor Canguilhem's (1966) idea of *socio-organic normativity* as discussed in "The Normal and the Pathological", which presents the latter's research on the definition of normality and illness in medicine and life sciences. Curiously, Canguilhem himself built upon the neurologist Kurt Goldstein's idea of *organic normativity*.

Goldstein is not an esoteric figure in the history of thought. The cousin of Ernst Cassirer, he was the head of the neurology department at the Moabit hospital in Berlin when he was arrested by Gestapo and expelled from Germany. His seminal monograph "Der Aufbau des Organismus" [The Structure of the Organism] was dictated in exile in Amsterdam in 1934. Goldstein was also an extremely significant inspiration for Merleau-Ponty, who cited him hundreds of times in "The Structure of Behavior" (1942) and "Phenomenology of Perception" (1945). Foucault himself opens his first book "Maladie mentale et personnalité" (1954) with a considerable critique of Goldstein's definitions of mental illness and organic medicine based on the notions of *abstraction*, *abnormality* and *milieu*. These three notions return consistently throughout Foucault's career. In a bizarre circular coincidence, the last public and authorised text by Foucault is the new version of the introduction to the English edition of "The Normal and the Pathological". Following again Goldstein's track, Foucault states famously in this introduction: 'life is what is capable of error' (Foucault 1985).

In Goldstein *normative power* is the ability of an organism (specifically the human brain) to invent and modify its own norms, internal and external habits, rules and behaviours in order to better adapt to its surrounding environment,

particularly in cases of illness and traumatic incidents, in those conditions that challenge the unity of the organism. Goldstein's originality is conceiving sickness and all that is considered 'psychopathological' and socially 'abnormal' as a manifestation of a positive normative process, which today would be defined as *neuroplasticity*. Thus truly 'sick' is the organism that is not capable of invention and experimentation of new norms, the organism that is paradoxically not able of making mistakes. For Goldstein, psychopathologies express the positive self-actualization power of the organism, but Goldstein defines this positive power as a *power of abstraction*. The so-called 'psychopathologies' are just the attempt of our body to invent new norms in adverse conditions, to project and protect our body beyond itself. This amounts to an *abstract attitude* that goes beyond everyday *concrete attitude* (Goldstein 1934).

2. Marx and the power of abstraction of capitalism.

The notion of abstraction has been widely shared and debated within Western philosophy, political economy and cognitive sciences throughout the 19th and 20th century, before being recently eclipsed by the rise of the affective studies and desiring philosophies. How can the model of neurological abstraction be linked again to the notions of abstract labour and cognitive labour found in the contemporary theory of cognitive capitalism (Hardt, Negri, Vercellone, etc.)? It is not the time to repeat here the well-known theses about knowledge, language, information and attention as productive and valorising forces in post-Fordism. Also there is not enough space to go back to Sohn-Rethel (1978) and his intuitions on the similarity between the abstraction of money and abstraction of thought or to classic texts in Soviet Psychology such as Ilyenkov's "Dialectics of the Abstract and the Concrete in Marx's Capital" (1960). For the time being, it is sufficient to recall how Marx framed abstraction as both the general movement of capitalism and general movement of the resistance to it. Regarding this power of abstraction in Marx, Hardt and Negri shed some light in the following passage:

Abstraction is essential to both the functioning of capital and the critique of it. Marx's point of departure in *Capital*, in fact, is his analysis of abstract labor as the determining foundation of the exchange-value of commodities. Labor in capitalist society, Marx explains, must be abstracted from the concrete labors of the tailor, the plumber, the machinist to be considered as labor in general, without respect to its specific application. This abstract labor once congealed in commodities is the common substance they all share, which allows for their values to be universally commensurable, and which ultimately allows money to function as a general equivalent. [...] Marx views abstraction, however, with ambivalence. Yes, abstract labor and the system of exchange are mechanisms for extracting surplus value and maintaining capitalist control, but the concept of abstract labor [...] is what makes it possible to think the working class. Without abstract labor there is no working class! (Hardt & Negri 2009, 127)

The abstraction of capitalism is a very material process, as stressed in Sohn-Rethel's notion of *real abstraction*. Furthermore the definition of cognitive capitalism should be framed in this manner. Cognitive capitalism is not simply the domain of knowledge production or computer-based labour but, as Vercellone has explained, a whole new division of labour (that is a new different machinic bifurcation, articulation and organisation of flows of matter, energy and information). The history of capitalism is read by Vercellone (2007) in three stages: formal subsumption (*manufacturing capitalism*), real subsumption (*industrial capitalism*) and general intellect (*cognitive capitalism*). As such, capitalist production appears to follow movements of deterritorialization and reterritorialization: the industrial revolution reterritorializes the division of labour of manufacturing inside the factory, whereas cognitive capitalism deterritorializes the division of labour once more across all society. The logical chain described by Vercellone between antagonism, division of labour, machinery and the general intellect perfectly describes a *general abstract machine*. The evolution of the division of labour is indeed this process of abstraction. However such a power of abstraction must not be understood merely as an evil external force that belongs only to capitalism, but rather as a common potentiality of the multitude. As Negri and Hardt would have it, without abstraction there is no multitude.

3. The ontology of abstraction in Deleuze and Guattari.

The problem of abstraction is central for Deleuze and Guattari too, despite emphasis throughout the last few decades on the desiring and affective side of their ontology. In their mission to sketch a materialistic ontology and materialistic logic they transformed and subsumed all the metaphysical and transcendental models of modern philosophy within the immanent notion of the *abstract machine*. Here the term 'machine' indicates the very contingent and productive process of abstraction, the connection of different and even radically different substrates and also the projection and 'assemblage' with the infinite and the void. The Abstract Machine is a universal concept introduced so as to ground a manifold ontology: 'The plane of consistency of Nature is like an immense Abstract Machine, abstract yet real and individual; its pieces are the various assemblages and individuals, each of which groups together an infinity of particles entering into an infinity of more or less interconnected relations' (Deleuze and Guattari 1980, 254).

The abstract machine marked a final rupture with the holistic tradition of abstraction, which had been inherited by German idealism, and inaugurated the abduction of the Outside by the double pincer of the Lobster-God (Deleuze & Guattari 1980, 40). Despite having such a cosmological depth, the notion of abstract machine can also be used to explain the role of abstraction in the mundane paradigms of both biopower and cognitive capitalism: the abstract machine points to a power of abstraction that is able to *ab-stract* from its substrates and to produce the universal equivalent of capital and power

(biopolitics).¹ This is also the ability of mind: its ability to make connections, but also to sever them, to negate them or to repeat them to infinity, the ability to produce general assemblages. Indeed, Deleuze and Guattari's notion can be very useful to mediate between political economy and neurology, where the abstract machine could be intended as the ability to escape the limit of the brain and the organism, to expand towards an external memory and include the whole universe as an extension of the mind. It is interesting though how the philosophy of Deleuze and Guattari has been received mainly as a celebration of infinite flows of desire. It is true that Spinoza's infinite substance is the essential ground of this philosophy, but without abstract machines construction of any system would not be possible, hence there would be no *becoming* in their ontology.²

4. Socialist cortex and mirror neurons.

The notion of abstraction is not just a resonance between distant authors. There is indeed a common background in the contemporary history of cognitive sciences and political philosophy. Wolfe (2010) has underlined this background in an important essay on the fascinating history of the so-called 'socialist cortex', which captures the idea of collective brain spanning from Spinoza and Marx to Vygotski and Negri and the whole Italian *operaismo*. Another interesting case of the encounter between cognitive sciences and political philosophy is found in Virno's (2004) commentary on the famous research on mirror neurons. Mirror neurons were discovered by a team from the University of Parma, consisting of Giacomo Rizzolatti, Vittorio Gallese and a number of others. They implanted electrodes in the ventral premotor cortex of the brain of few monkeys and recorded neuron activities while these monkeys were engaged in some specific actions. They discovered that: 'a particular set of neurons, activated during the execution of [...] hand actions, such as grasping, holding or manipulating objects, discharge also when the monkey observes similar hand actions performed by another individual' (Gallese 2001). These neurons were firing both when the monkey was doing the action of *grasping* a banana and when the monkey was *seeing* another monkey grasping a banana: for this reason they were called *mirror* neurons. Other studies have since demonstrated the activity of mirror neurons in human animals (Mukamel et al. 2010), but just the discovery of this simple link in a specific area of the primate brain brings incalculable consequences for cognitive sciences and the

¹ 'The abstract machine in itself is destratified, deterritorialized; it has no form of its own (much less substance) and makes no distinction within itself between content and expression, even though outside itself it presides over that distinction and distributes it in strata, domains, and territories. An abstract machine in itself is not physical or corporeal, any more than it is semiotic; it is diagrammatic (it knows nothing of the distinction between the artificial and the natural either).' (Deleuze & Guattari, 1980, 587)

² The relation between organism and abstraction, the organic and the abstract, can be located in their aesthetic model. See their response to "Abstraction and Empathy" by Worringer (1908), where primitive art, the first art of humankind, was precisely about the rise of the abstract line.

philosophy of mind. Virno takes Gallese's description of mirror neurons as the proof of a naturalistic basis of human nature and as the basis of the pre-individual sphere of inter-subjectivity that is supposed to be a given before the constitution of the human identity: 'The relation of a human animal to its own kind is assured by an original 'intersubjectivity' that precedes the very constitution of the individual mind. The "we" exists even before we can speak of a self-conscious "I" (Virno 2004, 175). In this view there is a common empathy between the individuals of the same species that is rooted before any linguistic faculty. Mirror neurons allow Virno to sketch a theory of political agency based on a collective intersubjectivity that is only afterwards crossed and cut by the ambivalence of language and the violence of negation. Virno poses here the common as a pre-given structure of human nature, as a sort of pre-individual space *à la* Simondon. Thereafter, in an elegant way, Virno critiques this substrate of human nature with the introduction of two other logical steps: first, the power to negate natural empathy and communality with other human beings; and, second, the power to negate this negation, to reconstitute the public sphere in a proper constituent sense. What is interesting for Virno is the fact that mirror neurons do not explain the power of negation, while the most peculiar trait of human thought is precisely the ability to negate.

Language inoculates negativity into the life of the species. It enables the failure of reciprocal recognition. The linguistic animal is the species capable of *not* recognizing its own kind. [...] Language is the antidote to the poison that language itself pours into the innate sociability of the mind. Aside from the being able to cancel out neural empathy, completely or partially, language can also remove this contradiction. [...] In other words the public sphere is derived from a *negation of negation*. (Virno 2004, 176)

Virno's account appears to be rigorous within the tradition of Analytical Philosophy, but mirror neurons can be contextualised in a different way within the holistic logic that spans from German Idealism and *Gestaltpsychologie* to the more recent theory of 'enaction'. Virno seems to forget that the very power of negation (which I prefer to call 'power of abstraction') can be innervated deep into the structure of perception and sensation. There is no ontological difference between thought and perception, abstraction and negation. As much as a century ago, *Gestaltpsychologie* showed that the visual perception of figures is based on the brain's holistic power to generalise points and abstract lines. More recently Noë (2004, vii) has recalled this position: 'perception and perceptual consciousness depend on capacities for action and capacities for thought; perception is... a kind of thoughtful activity'. The theory of mirror neurons finds itself along the epistemological border where the scientific data of neurophysiology and the holistic logic of neurophenomenology look into each other as through a broken mirror. For sure, a new paradigm will emerge along this fault line.

Indeed, the results of the first experiments on mirror neurons can be explained in a different and more dynamic fashion. Evolutionary scientists

agree that mirror neurons are an achievement of evolution: very few animals are capable of imitation and learning by imitation to the same degree as primates. The ability of mirror neurons is something that our organism developed. But how? For a long time, to be sure, primates had neurons that were firing independently when an action was performed and when the same action was seen as performed by somebody else: see for instance those monkeys that take up to four years to imitate an action to source food that was discovered or invented by a member of the same group. Then, one day, a link was established in the brain: two different neurological 'circuits' were connected to the same one. In this way empathy can be described as the power of abstraction in an organism that is able to associate with another one that which beforehand was only considered its own. If Gallese points to a pre-individual commonality, here the commonality is only post-individual—the effort and the projection of our power of abstraction. Empathy is then possible only thanks to the power of abstraction and not the other way around. While negation can be considered a subset of abstraction, abstraction cannot be considered a subset of negation. In a similar vein to Virno, but arriving via a different philosophical tradition, I advance the idea that *the power of abstraction is the only way to the common*.

5. Neuropedagogy vs. psychopathologies.

If a renewed notion of abstraction is advanced between the domain of neuroscience and political philosophy, it is also to invert the common understanding of the so-called 'psychopathologies of cognitive capitalism' and to frame them from the point of view of an *empowered* subject rather than from the point of view of an *alienated* one. Cognitive capitalism should be defined as the exploitation of the power of abstraction, intended as the cognitive power of the human organism, as the very living force that can project the human beyond its own identity, build empathy and the common, manipulate objects, machines and information. The main thesis of this text is the following: we develop psychopathologies when we lose our power of abstraction, not when we overuse it.

In Goldstein the failure of the power of abstraction is what produces catastrophic behaviour, in a similar way to how Berardi (2010) and Marazzi (2002) have described the reaction of our body to semio-capitalism and digital mediascape as panic and attention disorder. But in Goldstein psychopathologies are a 'positive' symptom, they are the manifestation (sometimes desperate) of the affirmative force of the organism in its antagonism with the environment. So the point is how to defend or expand the power of abstraction of the mind and not simply to make the body an object of passive care, for instance when Berardi (2010) claims that 'if we want to find the way towards autonomous collective subjectivation we have to generate cognitarian awareness with regard to an erotic, social body of the general intellect. The way

to autonomous and collective subjectivation starts here: from the general intellect searching for a body.'

The 'psychopathologies of cognitive capitalism' risks an inadequate conceptualization via which we sever again the mind/body unity and we abdicate to the colonisation of our mind by capitalism, leaving our political attention only to body, libido and affects like unaware slaves. The very basic body, the poorest form of perception, do not exist without the power of abstraction, articulation and differentiation (described also by Merleau-Ponty 1945: 35, 85). In this way the solution is not about reclaiming the body, affection, libido, desire and so on. Rather it is about reclaiming abstraction, the power to differentiate, articulate and bifurcate: in order to *perceive* at a higher degree of detail, and *to perceive our feelings at a higher degree of detail*. Instead of the fatalistic tone that meets the current information overload, I prefer to advocate Metzinger's idea of neuropedagogy. In his book *The Ego Tunnel*, Metzinger has framed the so-called psychopathologies of the digital age with these words:

The Internet has already become a part of our self-model. We use it for external memory storage, as a cognitive prosthesis, and for emotional autoregulation... Clearly, the integration of hundreds of millions of human brains... into ever new medial environments has already begun to change the structure of conscious experience itself... Today, the advertisement and entertainment industries are attacking the very foundations of our capacity for experience, drawing us into the vast and confusing media jungle... We can see the probable result in the epidemic of attention-deficit disorder in children and young adults, in midlife burnout, in rising levels of anxiety in large parts of the population... New medial environments may create a new form of waking consciousness that resembles weakly subjective states—a mixture of dreaming, dementia, intoxication, and infantilization. (Metzinger 2009: 234)

As a response to this scenario Metzinger advances the idea of neuropedagogy, which revolves around the ideas of introducing classes of meditation at the high schools, preparing the young against the commercial robber of attention and teaching different techniques of empowered consciousness. Of course, for Metzinger these classes should be free of any religious or new age tinge: 'They might be a part of gym classes; the brain too is a part of the body—a part that can be trained and must be tended to with care' (Metzinger 2009: 236). Metzinger reserves a particular attention also to the chemical dimension of neuropedagogy (a part that cannot be expanded upon here) and discusses the popular and recreational uses of substances such as mescaline, ketamine, Ritalin, MDMA and 2CB, pointing to the humorous, but indeed very serious, concept of *cosmetic psychopharmacology*.

Neuropedagogy is only the first step of what Metzinger describes as the project of a new Consciousness Revolution, where his tone becomes more militant. As Metzinger (2009: 238) remarks, 'a true consciousness culture will always be subversive'. This political focus on the technologies of consciousness is not new and its fertile influence has been recorded, for instance in the California of the '60s where psychedelic underground, technological innovation

and philosophical research were mutually entangled (see the holistic and hyper-textual milieu of the Whole Earth Catalogue that paved the way for the brain frame of the World Wide Web). In conclusion, Metzinger's neuropedagogy and Consciousness Revolution can be described also as the militant response of contemporary living labour to the regime of cognitive capitalism. There seems to be neither fatalism nor victimism in this proposal: it is about reclaiming, defending and expanding the power of abstraction that is continuously colonised by capitalism. At the end it is about organising an epistemic acceleration, to become more cognitive than cognitive capitalism, not less.

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