

RELATIONAL ECOLOGY AND THE DIGITAL *PHARMAKON*

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In French as in English, *attention* is a word derived from the Latin *attendere*, ‘to shift one’s attention to’ or ‘to take care.’ The verb form has kept this sense in English: ‘to attend a patient’ means to take care of his or her illness. In French the verb *attendre* has today a temporal dimension, and in general *attention* supposes an expectation of some kind, be it positive or negative. *Faire attention*, like ‘paying attention’, is in this sense a synonym of taking care (*prendre soin*). This is why a philosophy of care assumes a philosophy of attention, especially in our epoch where an ‘attention economy’ dominates, one which puts to work relational technologies both analogue and digital.¹

Toward the object of concern, the French say one is *attentionné*, that is, ‘thoughtful’. To be thoughtful means to be *civil* or *urbane* (in the original sense of the word). Although we normally take attention to be a mental capacity for concentration, it is nonetheless a social phenomenon. *Être attentionné*, in English ‘to be thoughtful’, also means to be pensive or reflective. Attention has a significance at once psychological and social, and the one does not work without the other. This is fundamentally what distinguishes attention from vigilance – something we share with animals. And this is why attention must be formed, which is the role of education. Attention has two inseparable faces, psychic and social, constituting a kind of *interface* for what Gilbert Simondon called psychic and collective individuation (2007). Without it, there is simply no longer any such individuation.

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As attention forming, education is the modality through which the social being that is always also a psychic individual *individuates itself at once psychically and collectively*. Let us briefly recall here Simondon’s thesis:

1. A psychic individual is neither a stable state nor an identity but a phase in a process through which she never ceases to transform herself.

2. This process of psychic individuation is only truly accomplished to the extent that it is inscribed in a process of collective or social individuation.

It is in and through education that the link between these two inseparable dimensions of individuation is formed and concretised via what one could call *attentional forms*. The acquisition of these forms begins with the first moments of life, and according to Winnicott is built on the attention the mother gives to her child as the basis of all attention (2005, 14). They permit the individual to have her own experience, that is, to learn something by herself in her constant confrontation with the real.

It is only possible to have this apprenticeship *on one's own* that we call *experience* on condition of *knowing how to pay attention*: individual experience, which is in effect the conquest of autonomy, supposes that one has received as heritage, through education, the *lessons of collective experience out of which the attentional forms are elaborated*. Collective experience itself comes from what were once individual experiences that have become collective through a process of *transindividuation*.

Education is the fruit of the accumulated experience of generations. It develops a patina over time like the pebbles rolling in the current along the riverbed that they themselves constitute. Education is the transindividuation of individual memories engendered by individual experiences, ones which, through being transmitted and developing a patina – that is, in being regulated, in forming a body of procedures, and sometimes in becoming formal regulations – have resulted in a collective memory constituted by the *attentional forms of knowledge: knowhow, lifeskills, cognitive and theoretical knowledges*.

Only a being that is educated can develop these faculties at once psychic and social that become the shared attentional forms of knowledge of how to live, to do things, as well as cognitive and theoretical knowledge. A being that has not been educated, whose attention has not been formed to any extent, firstly from lack of attention from its mother, does not know how *to do* anything, does not have a *mind*, and cannot theorise (that is, contemplate abstract concepts).

Consideration and concern in all their forms, affection of all kinds, amorous, ethical, religious, artistic attention, attention to theoretical, mathematical, scientific, philosophical objects and to objects of knowledge in general, and of practical forms of attention, dexterity, talents, motor skills, etc. – without this forming of attention, without an education in the forms that automate, ritualise, repeat and develop habits, in turn forming a *habitus* that constitutes the politeness and civility that is the essential basis of all relations, without this, the faculties of the individual, including the social ones at the heart of which individual particularities emerge (and in doing so re-form the social in return), remain latent, unexpressed and unknown.

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The individual faculties, in developing and opening up the educated being to those knowledges connecting her to other beings educated in a similar manner, form and accomplish the process of an *incessant* collective individuation. As this strict correlation between the psychic and the collective of which it is the interface, attention is the heart of psychic and collective individuation. Every society is a type of psychic and collective individuation. All these types, that is, all societies, are characterised by types of attention: types of attentional forms and knowledges that are also types of concern, systems of care, of techniques for care of the self and of others, together constituting ways of life that characterise cultures and civilisations.

But this is only because the formation of attention in which psychic and collective individuation consists is conditioned by material techniques. As I will discuss below, today these have become industrial technologies. The memory of the human entity is essentially exteriorised, materialised and spatialised. It is spatially, materially and technically projected into what is constituted as a common space and time, projected if not out of time then at least beyond its own original temporality and in a certain way put into reserve in space, enabling it to become at once the memory of the individual and of the group. It is through this *external memory*, and as this exteriorisation that is a socialisation and an *expression*, that attention is able to constitute itself as interface between the psychic and the social. Attention always leads in one way or another to a (not necessarily verbal) expression through a mode of behaviour.

The technique of the spatialisation of memory is what permits the trans-formation of individual time into this social space where a

society is constituted and individuated (that is, transformed). Social space, the support of social time, is ceaselessly re-run, recommenced, reformed, deformed and transformed by the individuals who re-temporalise it.

The spatialisation of memory is the consequence of the technicisation of life. This is what humanity consists of in the view of André Leroi-Gourhan (1993), namely, the development of what I have called an epiphylogenetic memory (Stiegler 1998, 177). In humankind – and this is the difference from what characterises animal life – individual memory, the fruit of experience, is not lost to the species when the individual who has lived it disappears. The experience has been technically exteriorised in the form of the technical object. As such (as hypomnesic memory), it constitutes the *hypokeimenon proton* of culture, that is, its primordial support in the sense that the Presocratic thinkers used this term in relation to *physis* (nature). Culture is the intergenerational transmission of attentional forms invented in the course of individual experience which becomes collective because psychosocial memory is technically exteriorised and supported.

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This intergenerational transmission crosses a threshold where humanity passes from prehistory to protohistory when the first techniques allowing the transmission of temporal contents appeared. These were symbolic and mental *as such*, that is, not only transmitted via a concretisation in the form of objects, but in the form of symbols, and as graphic *recordings*. The intermediary period known as protohistoric, commencing around 10,000 years before the beginning of settlements, led to the Great Empires which engendered the historical period by forming recording techniques that we still practice today, including tapping on the keyboards of our digital devices everywhere in the world at just this moment.

Alphabetical vocalic writing, which appeared between the 8th and 7th Century B.C., allowed the constitution of a singular attentional process which is the very basis of ancient Greek civilisation. They called it the *logos*. At the same time, an equally alphabetical, but consonant-based form of writing allowed the construction of the kingdom of Judea. When the two civilisations will meet through Paul of Tarsus, the West will be formed – and ceaselessly reformed, deformed and transformed as the process of psychic and collective individuation based on writing as the technique of the formation of

attention. This includes what are known as the Scriptures, which will come into their own with the printing press, inaugurating the *attentional revolution* which was the Reformation.

In this way the elements of what Katherine Hayles has called ‘deep attention’ came together – an attentional form allowing its own replacement by another form that she calls ‘hyper-attention’ produced by the digital technologies of attention capture (Hayles, 2007).

If we want to analyse and understand the stakes of this transformation (insofar as this is possible), we must analyse what, as process of ‘grammatisation’, leads us from the appearance of the writing of *grammata* up to the digital apparatuses and the new attentional forms that they constitute. For these inaugurate a new process of psychic and collective individuation that emerges at the heart of what must be understood as a *network society* of planetary proportions.²

Today we will only have time to examine the questions concerning the principles of such a genealogy of attentional forms, in order to get to the essential issue for our time, that I want to demonstrate resides in the question of the new forms of metadata and the original process of transindividuation that they allow us to envisage.

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The process of grammatisation is first and foremost a process of *making the continuous discrete*, something prefigured in this respect by the first systems of counting in the epoch of hieroglyphics before the appearance of *grammata*. Grammatisation is firstly the making into discrete units of the elements constituting language. It is a breaking down which is done technically and not intellectually: it is not the grammarians who conceived of writing, but on the contrary it was writing which made grammar possible. The writing of the *grammata* enabled the spatialisation *to the letter* of the time of speech. What I mean by ‘to the letter’ here is that speech could be reproduced wholly without ambiguity, at least in its semantic dimension if not its prosodic one.

In this literal synthesis there is no loss of signification. It can be repeated, compared, analysed and criticised, becoming transmissible to the letter, along with the commentary upon it (also literal), from generation to generation, as the *noetic experience of an individual*

becomes collective, forming in this way a *logos* – in the first case as what Husserl described in *The Origin of Geometry* as the experience of protogeometry (Derrida, 1989).

Geometry consists in the elaboration of a *literal attentional form* in just the same way as do law, philosophy, history, literature, geography, etc. These comprise an ensemble of mental disciplines that each *constitute an attentional form furnished with its own particular rules*. It is the concert and unity of this always diverse collection of literal techniques for the formation of attention that amounts to the *deep attention* that the Greeks named *logos*. These attentional forms generate the circuits of transindividuation that thread and weave together the process of collective individuation. The operations of this process never stop being transformed through the goings on of disciplinary sub-groupings *where the conditions of transindividuation are ceaselessly redefined more or less locally*.

Plato, however, condemned writing, that is, this exteriorisation of attention. It provoked, he said, short-circuits: it deceives those who believe they know something. As *hypomnesis*, it tends to atrophy what Plato considered to be the only worthwhile attentional form: *anamnesis*, that is, thinking within oneself (individuating oneself, which means here mentally, but through a collective individuation of which Socratic dialogue was the anchor).

This is why Plato had Thamus, king of Egypt, in dialogue with Thoth, god of arithmetic and writing, say that it

will produce forgetfulness in the soul of those who learn it because they will cease to exercise their memory and will put their trust in what is written when they remember (*anamimneskomenous*), in what is outside, in external print, instead of what is on the inside, in themselves; therefore it is not memory (*mnemès*) but reminding (*hypomnesis*) for which you have found the remedy. As to knowledge, it is only the semblance of it that you procure for your disciples, and not the reality (*aletheian*). (*Phaedrus*, 275a)

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Obviously, this affirmation of the poisonous character of writing as remedy – that is, as *pharmakon* – of which the side effects here appear to be much worse than the ill that is the finitude of memory, does not mean that Plato condemns outright the practice of writing or of reading. He himself writes ceaselessly, and if he never stops noting that Socrates does not write, it is evident that Socrates was very well read. The reference to the alphabetized textuality and the consideration of discrete elements of language are constants in the *Dialogues*, and the entire dialectic that Socrates engages in across each of these dialogues is based on the Greek cultural heritage which itself is founded through writing.

Socrates is a citizen, which is to say he is a psychic individual in a specific relationship to the collective individuation he participates in *literally*. And *through the law*, which itself rules literally these two poles of individuation, like all citizens Socrates is *constituted* through reading and writing. This is the case in the whole of Greek antiquity since at least the sixth century B.C., which is why Henri-Irénée Marrou can write that

An institution like Ostracism, which was introduced by Cleisthenes in 508-507, entailed a written procedure of voting, assumes a knowledge of writing from the bulk of the citizens. ... there can be no doubt that from the time of the Persian wars onward there existed a system of instruction in reading and writing: thus, in 480 ... on the eve of Salamis, the Trezenians, in their kindness welcoming the women and children who had escaped from Athens, engaged schoolmasters to teach them to read at their city's expense. (1956: 43)

In opposing what, in writing, could lead to a psychic disindividuation (that is, to false knowledge, or what Winnicott would call a *false self*), Plato opposed the Sophists who he accused of misusing writing: in their hands it became extremely poisonous precisely to the extent that it permitted them to *short circuit* the psychic individuation of *anamnesis* (Winnicott, 2005: 19). The literal attentional technique became with them a *detouring of attention*, and a *deformation* of it, through which collective individuation itself was threatened. For if it is true that there can be no psychic individuation if it is not projected into a collective individuation where it weaves itself into circuits of

transindividuation, the converse is also true: there is no collective individuation which holds together (which maintains its metastability, that is, its unity) without going through these psychic individuals, without being individuated and transindividuated by them.

I offer you this analysis of the origin of the attentional form that we call the *logos* so that we can pose a question about digital relational technologies – which today allow the capturing of attention in a destructive fashion and seem much more to deform than to form it if, as child psychiatrists Frederick Zimmerman, Dmitri Christakis and Andrew Meltzoff (2007) argue, there is a correlation between Attention Deficit Disorder and the hyperconnected mediated milieu, a hypothesis that Katherine Hayles also explores in her work (2007). If in fact an appropriate therapeutic response to this pharmacology of attention is conceivable and able to be transindividuated, then the question would be to what degree can and even must these digital relational technologies also give birth to *new attentional forms* that pursue in a different manner the process of psychic and collective individuation underway since the beginning of grammatisation; new forms that make this network society arrive at a new stage in the individuation of this plural unity of the *logos* where the attentional forms we recognise as our culture abound?

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To pose this question properly I must now show exactly why and how the process of psychic and collective individuation always develops through the concretisation of *circuits* of transindividuation. (I would also note here that I am unable to take the time to recall how, in the twentieth century, analogue technologies were put into the service of the capturing of the attention of the masses, and of a *massification of attention* in which Adorno and Horkheimer (1986) already saw a deforming of attention that detoured the desire or *attentional energy* of the masses toward commodities.)

Apprehended in the midst of its unfolding, a process of psychic and collective individuation presents itself as a series of parallel processes of transindividuation. Each of these operates across the progressive convergence of phenomena of co-individuation. Thus, in the *anamnesis* which constitutes a Socratic dialogue, each interlocutor is individuated on one side while being co-individuated with the other.

At the very moment in the conference in Sweden at which the paper was delivered from which this text was prepared, I and the assembled participants co-individuated ourselves around the question of attention. But at the same time, other people, in Sweden, in Europe, and the rest of the world, if not for all we know on other planets and in other solar systems, also worked on this question. Trans-individuation is the trans-formation in the course of which psychic individuals, co-individuating dia-logically in this way, enter into a resonance with others who seem to be individuating themselves. Between these individuals and these groups of individuals circuits form through which they converge toward certain attractors: toward points of transindividuation.

What we call 'truth' is the privileged modality of a transindividuation that is *ideal* – if not perfect, since it is always re-commencing. More generally, transindividual convergences (that Simondon calls significations) are produced by rules, some of which are explicit and apodictic, as in the case of geometry, while others are explicit but deictic, and others still are non-explicit. These convergences form metastable systems: relatively stable dynamic systems, and therefore also relatively unstable.

As I alluded to above, there can be no collective individuation if it is not incarnated in psychic individuals who individuate themselves in it and with it. Now, if we take seriously the Freudian theory of the psychic apparatus that appeared at the start of the twentieth century, we have to say that the psychic individuation that produces this *attentional energy* or libido can only be formed – as the formation of a psychic apparatus that constitutes the framework of all the attentional energies, constituting thus the *attentional archi-form* – to the extent that it goes through a *process of idealisation*.

This process of idealisation concerns the libidinal economy of the psyche, and it assumes a *process of identification* – primary identification with the parents firstly, then secondary identifications with objects of desire and, through all kinds of other instances, as identification with the objects of sublimation through which an *authority* of some kind or another is established: superego, index, author, institution, etc. It is only through these processes of identification and idealisation that a psychic individuation is projected, by and as a collective individuation.

In passing through idealisation and identification, the formation of the psychic apparatus makes the psychic individual pass through the

circuits of transindividuation that weave and metastabilise collective individuation. The authorities established produce *collective and social synchronisations of the psychic diachrony* that is individuation, and it is through these synchronisations that the attractors of the process of psychic and collective individuation converge and are metastabilised. This convergence, however, can be produced in two opposing ways:

- It can be accomplished *when the common desires of psychic individuals converge on an idealised object* – such as the truth of space from the triangle as theoretical object, or justice from the law, or language from poetry and literature, etc. At this moment, the convergence toward the attractor is achieved by the intensification of each person's individuation, but inasmuch as each is turned toward the object of everyone's attention, this attention converges on the object, constituting in this way an ideal object which tends toward universality in maintaining the diversity that it spans.
- On the contrary, it can be a process of synchronisation through alienation, coercion, dependency, submission, short-circuit, and finally by a proletarianisation of psychic individuation by collective individuation (the extreme form of which has been called totalitarianism); in this regard, it concerns a process of disindividuation.

This second way, poisonous, engendered by a misuse of the *pharmakon* of the literal attentional technique, is what Plato denounces in the Sophistic practices. The problem is that this leads him to absolutise *anamnesis*, that is, to oppose it to the *hypomnesis* which is however its condition of possibility. This is why Derridean deconstruction is necessary – it shows that from Plato to Heidegger, all of the metaphysical oppositions are overdetermined by this opposition to the *pharmakon*.

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I just mentioned that all the circuits of transindividuation produced by the attentional forms put to work rules of transindividuation which may be explicit or implicit. There cannot ever be a completely irregular process of individuation or transindividuation for the reason that I indicated at the beginning of this essay: an *already there* precedes the experience that it renders possible. This already there is

transmitted: it is constituted by the attentional forms inherited from culture. Since Freud, we know that its acquisition is accomplished through the process of identification, and as idealisation.

Language is a primordial attentional form. Husserl characterised it as a process of spontaneous *ideation*, that is, of generalisation through categorisation (constituting in this way for him the matrix of intentionality). And Winnicott teaches us (2005: 6) that its acquisition rests on play with the transitional object (play which, as an *attentional space*, is the first *pharmakon*). This primordial form never functions alone, and primordial does not mean here that it is the first, since the transitional object precedes language. But language prepares all the attentional forms that are post-transitional object and overdetermines them *as a process of categorisation*.

The grammatisation of language also makes possible a linguistic activity of *meta-categorisation* forming what we call a *metalanguage*. As a language about language, all metalanguages are critical languages. It is from the transformation of the conditions of individuation by grammatisation, inasmuch as it produces metalanguages, that one can and indeed must distinguish *critical* processes of transindividuation from *acritical* ones.

Critical processes of transindividuation always put their rules of transindividuation to work while *putting into question* the rules themselves, inasmuch as they constitute a *synchronic unity*. In other words, they put their rules to work in submitting them to a questioning of the experience they make possible. They put them to the test by making them work in a manner that is formal and explicit, whereas the acritical processes of transindividuation put to work rules not explicitly examined: their rules are *known*, but not *recognised*. This does not mean that they are not challenged. But when they are, this is not done in a *reasoned* manner.

It is hypomnesic exteriorisation that makes critique possible; but what Plato tells us is that this also makes the de-formation of attention possible, a deformation he describes as a *short-circuiting of memory*. This is a short-circuiting of the *process of individuation as process of interiorisation* in this *critical process of identification and idealisation* that for Plato is the city, that is, public and political space ruled by the *logos*.³

The circuits of transindividuation, which go through the processes where identification is formed, and which link up therefore to

collective individuation, cannot therefore be purely anamnestic. They only form to the extent that they produce at the neurological level of the psychic individual circuits of transindividuation that go on to thread the nervous system of the psychic individual in a mirroring of the threads that form in collective individuation. This is what Zimmerman, Christakis and Meltzoff show in their analysis of infantile synaptogenesis (2007).

In other words, the neurological system and the brain form a surface of inscription of the processes of transindividuation. In the course of this inscription, however, transformations of these processes are produced: these are the phenomena of diachronisation. If in effect experience is preceded by the transindividuated attentional forms, nonetheless each of us has on each occasion a singular experience. This is because the singular memory of each individual makes different selections from the singularity of their experience, which is never totally transindividuated and absorbed by collective individuation.

Each of us lives the same event differently. For example, at the moment I delivered the conference talk from which this essay was prepared, each person listening heard something specific because each interpreted my words from their own experience, that is, from their own memory – even if we can understand each other because we share transindividual significations.

A discipline tends to constitute a process of transindividuation which comes to metastabilise the collective rules across which this variability is not eliminated, but finds itself submitted to the conditions of evolution shared by all. We saw at the start of this essay that it is because memory is always exteriorised that psychosocial individuation is possible. That said, what we must retain from the Platonic critique of the *pharmakon* is the thought that all exteriorisation leads to the possibility, *not only for knowledge but for power*, to take control of these processes of transindividuation by mastering the development of categorisation. In particular, since the formation of the Greek *logos*, what is key here is taking control of meta-categorisation, the production of a metalanguage, as all rational disciplines in our societies, and more generally all forms of *deep attention*, rest on these metalanguages.

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Scientific and academic disciplines are communities of peers: all the *scholars* belonging to them are in principle equals. But in reality they are not equal. For in fact, some of them individuate themselves more intensely than others, and in doing so contribute more than others to the collective individuation which is, in this case, meta-categorisation. This means there is no knowledge which does not establish, in the form of institutions, power.

Such power produces a meta-noetic activity that is synchronising and normative, defining the institutional criteria by which such activity retains its influence. This production of criteria is produced in a 'top down' fashion. This does not mean there are no 'bottom up' activities, but that there are more or less centralised organs which have *de facto* control over the circuits of transindividuation through which noetico-psychic individuations participate *in principle* in the collective individuation that an academic discipline is fundamentally.

These institutional organs, the authority of which can be legitimate (when, that is, the *de facto* control they exert coincides with the actual superiority of the psychic individuations that constitute the institution), these organs exercise their power over knowledge by controlling directly or indirectly the metalanguage-producing sites: journals, publishing houses, peer review boards, etc.

If this is true of academic institutions which claim as their first principle the equality of all their members, this *ascendancy* of the *authorities*, through which a body of knowledge is sometimes *reduced* to the power of influence, is much greater in other social spheres where processes of individuation are also in train. The criteria produced in these are translated into norms, laws, theorems, rules, models and prescriptions of all kinds.

These institutional controls and the criteria that produce them all come in one way or another from something equivalent to what in the current terminology of relational and attention technologies we call metadata. Today, however, transindividuation has become the object of industrial technology, based on a *social engineering*, where attention and relational technologies develop via *folksonomies*, that is, collaborative metadata, the reputation technologies of social networks, etc. This *social engineering* has as its goal the *grammatisation of the social relation itself* – and through that the *capacity to render it industrially discretisable, reproducible, standardisable, calculable and controllable by automata*.

This development is extremely complex if one considers the fact that the rolling out of reputation technologies comes to modify radically the constitutive conditions of what the ancient Greeks called *kleos*. It was in the name of *kleos* that Socrates decided to drink the hemlock, allowing him to 'dine with Homer, Hesiod and Orpheus' after his death (*Apology*, 41a). It is what Hegel will call recognition, with all that this term implies, and in particular what Freud will think as narcissism, identification and idealisation.

I cannot go into any depth on these points here. In moving toward a conclusion, then, I would say that a crucial issue emerges from these analyses. As I tried to demonstrate recently, metadata first appeared in Mesopotamia and, in general terms, the production of metadata has been the principal activity of those in power from the time of the protohistorical empires right up to today (Stiegler, Giffard and Fauré, 2009: 25). To generate metadata is also of course to grammatisate and vice versa, since each is to meta-categorise. The production of metadata happens, therefore, in all the fields of grammatised transindividuation. The powers that be take control of the circuits of transindividuation – and all the forms of knowledge – through the hegemonic production of this metadata.

Today, something extraordinary is happening in this regard. With collaborative, that is, 'bottom up' processes, each and every person suddenly seems able to participate in the production of metadata. The pure 'bottom up' *data* that the digital networks produce *en masse* is unexploitable: it is always necessary to 're-top down' it and this is what the collaborative production of metadata makes possible. (I am leaving to one side here the question of metadata that comes from the semantic web, that is, from the autonomisation of grammatisation, and I am speaking only of the social web.)

The problem is that the *exploitation* of *collaborative metadata* is not itself collaborative in any way, and it is never made the object of a critical scrutiny through which these collaboratively transindividuated knowledges would become precisely critical knowledges. That is, they are not coupled with the processes of psychosocial individuation through which *deep attention* is produced.

This concerns at once a general organology and a cultural therapeutic, that is, the forming and organisation of the care and attention through which a particular kind of social existence is developed.

The entire organology of the contemporary social web is constructed to smooth out the diachronies and singularities of psychic individuals in order to aggregate them through relational technologies with the aim of unilaterally controlling the fruits of the collaborative production of metadata. But this situation is absolutely contingent. It can and indeed must be transformed by an organological invention that puts into motion critical collaborative instruments. In particular, these should permit the formation of collaborative spaces of discussion which produce conflicts and critical debates that are made formally explicit in and through transindividuation.

This organological invention itself requires the activation of explicit *rules* of transindividuation, based on a pharmacological critique, and constituting the therapeutic of this *pharmakon* that is the space of digital relational technologies.

The principal objective of the Institute for Research and Innovation is to contribute to the conception of psycho-social techniques capable of supporting digital processes of critical transindividuation. The project of a pharmacological critique governs Ars Industrialis' programme of activities, and in particular the 'Relational Technologies' group and its work with 'skholé.fr' on education in the digital age, and the Epineuil School of Philosophy whose activities can be found on www.pharmakon.fr. The School's task is to explore new conceptual models that could contribute to an organological development of heuristic digital instrumentalities.

The stakes of these activities are those of 'digital studies' around which the whole scholarly and academic project of the university has to be rethought – if it is true that the digital is the contemporary form of writing when writing will have been the organological support of the *logos* as attentional form.

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To theorise the digital organology of contemporary knowledge in all its forms requires one to study and take account of the organologies which, down through the ages, from the very beginning of hominisation, will have always conditioned forms of knowledge. If anthropogenesis is a technogenesis, with the digital this process arrives at a new stage where the techno-logic of knowledge as such must become central both to the reconsideration of the history of established knowledge in the light of the contemporary moment and

to the interrogation of the new forms of knowledge that digitisation brings forth.

Digital organology profoundly affects contemporary physics and experimental sciences more generally as much as it does the human sciences. For example, as an applied quantum mechanics, nano-physics is only constituted through the digital *organon* of the scanning tunneling microscope. It therefore reanimates the questions that Gaston Bachelard posed in the 1930s concerning a 'phenomenotechnics', questions that confronted him in the face of the new scientific instrumentation and its relation to the new physics (Bachelard, 1968). Similarly, genomics and biotechnologies, which presuppose that the nucleotides that form life develop as digital information-processing organs, encounter similar questions about how to theorise the place of what Bruno Bachimont (1992) calls an 'artefacture' in what Georges Canguilhem described as the form of technical life characteristic of humans (2009).

At the same time, these are questions posed by the cognitive sciences, questions which must be revisited and redefined in a context where, for example, paedopsychiatry and neuroscience provide evidence of the effects on the cerebral organ of its being inserted into the psychic apparatuses of the networked milieu that characterise the analogue and digital epochs (this is one of the themes of Nicholas Carr's *The Shallows*). Accompanying the emerging mental (dis)organisation there are also the effects on social organisations which seem to be transformed and sometimes overturned by what we increasingly apprehend today as attentional technologies (in relation to which research into the micro-economics and cognitive process of attention has emerged).

Technologies of attention can be described as both cultural and cognitive technologies and, in what in France is called the science and technology of the digital, the coupling between societies, technologies, bodies and psychic apparatuses becomes a common question for most of the disciplines, which concern themselves with all kinds of social agents (from industrialists, judges and political representatives to doctors, artists, parents and citizens etc.). At the heart of this is emerging the broad themes of an engineering philosophy and a 'web science' in the sense that Tim Berners Lee envisages, in light of which the fundamental questions about rational knowledge should be reposed (www.webscience.org). These new fields of research are articulated with recent advances in neuroscience in a context in which new social practices appear that

seem to proceed in an essential fashion from the specifics of digital organology in such a way that both human and social sciences (and artistic practice) find themselves intimately affected. They reactivate and illuminate anew questions which appeared in cognitive science through the work of Edwin Hutchins (1995) and Larry Chalmers and Andy Clark (1998) under the names of 'situated cognition' and 'extended mind'. They also reactivate Lev Vygotski's research at the start of the twentieth century.

But what is also at stake is the status and the social relevance of research: digital technologies allow for new forms of research – a *contributive research* linking the academic and scientific research of actors who are not themselves professional researchers. Here the questions put by Kurt Lewin under the name of 'action research' are reposed – but also the question of knowledge or wisdom outside of the university. Kant, in discussing the 'Republic of Letters', had already envisaged this issue in *The Conflict of the Faculties* (1797) when he emphasized the specific question that the knowledgeable communities and the amateurs of his epoch posed to the 'corporate experts' (the professors).

Thank you for your attention.

Translated by Patrick Crogan.

Endnotes

¹ I refer here to the thesis of Jeremy Rifkin (2000), but also and above all to the recent analysis of these issues by Christian Fauré of *Ars Industrialis* (Stiegler, Giffard and Fauré 2009).

² This is not to ignore that beyond these social relations, grammatisation is what henceforth affects the living, as genetic code, and inert matter, through the manipulation of atomic structures at quantum scales.

³ This word, interiorisation, is clearly dangerous and tricky. It seems to suggest that something found on the outside is passed into the interior. What is the origin, however, of this interior? Is it the exterior? Certainly not, for if that was the case, it would mean that one could have an experience that is not preceded by any attentional form, something which I challenged at the outset. So there must be a third term, which is neither interior nor exterior, and which is

indicated in what Winnicott calls the transitional object. At the origin of the interior there is an object of desire, of which the transitional object is a precursor. It is an object which is neither interior nor exterior, because it is expected – and an object of attention in this regard – and that much more expected to the degree that it does not exist. It is not the *infinite* object, for the infinite does not exist. This object, so anticipated, object of an infinite expectation that sometimes produces that infinite patience that sustains all *deep attention*, is always what attention leads towards inasmuch as it is both psychic and social. It is this that Lacan, after Freud, called the *Thing*.

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