

MAKING A MOUK

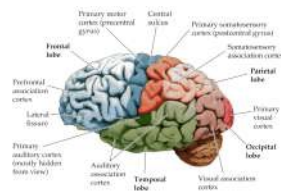
Seminar on contributory research,
Given in the framework of the Chair in Digital Natives
Of the Grenoble School of Management

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Today we often hear that your brains and my brain are not the same.



You are digital natives – whereas I am a ‘child of TV’. We are told that our frequent use of these media as children has ‘wired’ our brains differently. Is this true? If so, in what way? Is it a problem?



Is it something we should find especially worrying with respect to the transmission of knowledge?



If so, what kind of problem does it pose, in particular in the field (or fields) of knowledge? And how could this be solved – if it *is* solvable?

These are the questions we will explore today, and we will do so by trying to invent something new, namely, what I am going to call here a contributory organology for higher education, for research and for primary and secondary teaching.

In other words, we will talk about knowledge: what binds the generations together is knowledge – life knowledge, that is, knowledge of how to live, then knowledge of how to do things and how to make things, and finally formal knowledge – forms which are all intergenerational and transgenerational. And what plays out in *all* knowledge is a relationship between the generations, and I will try to show you why I believe this is always constituted by a techno-logical nativity.

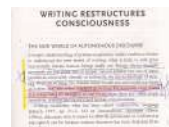
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My grandparents and my parents did not have the same kinds of brains, and neither do I: I don't have the same brain as them, and you don't have the same kind of brain as me or as your parents.

This is so because, as Maryanne Wolf shows in *Proust and the Squid* (a French translation of which will soon be published),



the brain is recoded and restructured by what it learns by interiorizing, in the form of automatisms, functions of external memory that I call organological. The literate brain, in particular, radically modifies the relations between the cortical areas – which is what Maryanne Wolf shows using brain imaging, and referring to the thesis put forward by Walter Ong

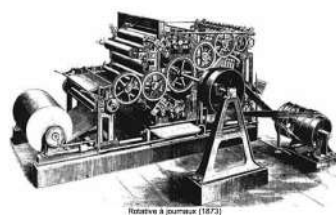


thirty years ago, when he analysed the conditions leading to the emergence of what he called the *literate mind*. This amounts to the question of what I call technological nativity.

Is there a mind or a spirit particular to printed writing? Indeed, responds Elisabeth Eisenstein in this book:



And as printing itself evolves, so too does the organization of brains: with printed newspapers



there came the rise of print dailies, of which *Le Petit Journal* was the first to have mass distribution.



This was in the era of my great grandparents. And it also saw the birth of the so-called tabloids,



which profoundly changed the very nature of public opinion. My grandfather, who was born in 1901, knew cinema,



which developed at the same time as the assembly line – and this is something to which we will return.



My father grew up with radio



and I grew up with television,



but also with the transistor radio,



which made possible Europe 1 and the 'yéyé' world of pop music, which was invented through a radio program that was also a magazine.



The generations have now become targets for what arose in those years, namely: marketing. What problems does this cause?

Firstly, it provokes a certain malaise in young people:



Previous generations were constituted by their relations, which were themselves subject either to religious prescriptions



(Biblical genealogies, etc., under the authority of God the Father), or to cycles of the knowledge taught from the cumulative progress of reason,



according to a model inspired in particular by Condorcet, and so on.

Before the modern world and monotheistic societies, there were societies based in magic and spirits, into which one was initiated through rites and rituals.



Furthermore, at the end of the nineteenth century psychoanalysis revealed a general economy of relations between the generations, founded on complex relations and where there are prohibitions and irreversible transitions, and fundamental stages of the formation of the psychic apparatus, and in particular the processes of primary and secondary identification, through which the ego ideal and the superego are formed.

With marketing and media aimed specifically at the generations, which begins in the twentieth century and continues in the twenty-first, there occurs a destruction of ascendance for the generation who are the descendants: the processes of identification and therefore of idealization are short-circuited – and this leads to a form of capitalism founded on the drives (I will return to this).

In the fifties and sixties, the Europe 1 radio network appeared,



and in the eighties and nineties, in France, there arose the TF1 television broadcast network, which was privatized by Mitterrand and which defined itself as a purveyor of ‘available brain time’,



while in the first decade of this century Baby First,



a Fox affiliate, tried to set itself up in France.

Then, in the last ten years, Facebook arrives on the scene.



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Attention is what is formed between the generations, and firstly as the attention that the older generation pays to the younger generations, the ascendants to the descendants, and also vice versa. But attention is something that must be formed – it is not an innate faculty, and this is what is shown by the life of Victor of Aveyron.



But if attention can and must be formed, this means that it can also be *de-*formed, as Zimmerman and Christakis argue in their article on early media exposure:



They show that when children receive early exposure to media, it profoundly changes the formation of their synapses.



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It is on the basis of these questions of the formation and deformation of attention that I want to reflect with you on the future of knowledge in a world that has become massively digital and in the epoch of so-called MOOCs (massive open online courses).

A form of knowledge is a form of attention. Such a form is not fixed: it is transformed across generations. This is why ways of life transform themselves. This means that the trans-*mission* of knowledge in all its forms is always also its trans-*formation*, its evolution, that is, its transindividuation. In a few moments I will explain what I mean by this.

In any case, there is knowledge in the strong sense of the term only when it is in one way or another *individuated*, that is, singularized by the knower. And in the case of taught knowledge and rational knowledge, the knower is *therefore* the one who is put in the position of knowing in what it is that rational knowledge consists.

That is to say, such is the case in principle: in fact, most of the time one is not such a 'savant', not a scholar or an expert but just someone who knows something. But to know something is not the same as being able to repeat in a mechanical way what has been acquired: this is what a computerized

machine does when it executes a program, or what we do when we learn to use some procedure without knowing whether it is rational or correct. This amounts to the question of what Socrates called *anamnesis*, where to know is to know how to begin from oneself and from the origin of knowledge itself.

Anamnesis: this is what Socrates refers to in the *Phaedrus*, when he retells the Egyptian myth in which King Thamus says that writing will weaken memory, that writing is a threat to memory. Anamnesis, then, according to Socrates in the *Phaedrus*, is what can be interfered with or impeded by writing, which he also calls *hypomnesis*. But writing is also the *condition* of anamnesis when the latter becomes rational, as Husserl explains in *The Origin of Geometry*:



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The question this raises is that of the pharmacology of writing. *Either* writing leads to a *re-interiorization* and to a *transformation of the brain* through the interiorization of written knowledge, which is also to say, by acquiring automatisms of writing and reading,



and then by learning, understanding and appropriating texts in a critical way, *texts that come to be the criteria for a memory that has itself become literal*, and that has become capable of in a way reading itself like a book, and that in its turn externalizes and inscribes itself externally, for example by participating in the writing of the law,



or in voting, for example, by delegating one's votes, etc., or by writing books,

either writing does all this, *or*, on the contrary, it allows one to learn a text by heart even though one understands nothing about it, and *even though one may repeat it like a parrot*.

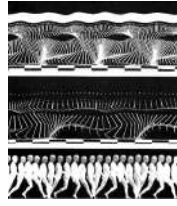
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What Socrates says here is that the *pharmakon* can 'proletarianize' the mind, that is, make it lose its knowledge, or as Thamus said its memory – just as much as it can enable the constitution of knowledge. This question of externalized knowledge is therefore that of proletarianization understood as the loss of knowledge. Proletarianization is first and foremost what is provoked by the loss of knowledge, inasmuch as the latter leads to impoverishment.

To understand this more closely, consider the history of exteriorization. Look at what happens, for example, with cinema, and before that, with the rise of industrial machines, of which cinema is a particular case: cinema mechanizes perceptual functioning – but before this, with machinism, it is the same thing that happens with the grammatization of movement in general.

In the twentieth century we see the rise of what I call industrial temporal objects: films, radio, television. All these are *audiovisual* temporal objects.

A cinematographic temporal object is composed of photographs that are linked one after the other in a sequence on a timeline: they are *chronophotographs*



that inherit the ‘reality effect’ that a photo generates.



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Consisting of chronophotographs, cinematographic technology belongs to the *analogue* stage of a very large and very old process of *grammatization* through which, in the course of human history, all human movements and flows have become progressively reproducible.

It is only after analysing this process, starting from the reconstitution of its history – which begins in the Upper Palaeolithic –



that we can make clear the stakes of *cinematographic grammatization*. In a general way, grammatization synthesizes the fluxes and flows produced by the movement of this technical life-form that we call human being: it synthesizes them by making them discrete, discretizing them, and by making them reproducible. Hence the process of the grammatization of speech is what makes it possible to transform phonemes into *grammata*,

Α α	α alpha	Ν ν	ν nu
Β β	β beta	Ξ ξ	xi
Γ γ	γ gamma	Ο ο	ο omicron
Δ δ	δ delta	Π π	π pi
Ε ε	ε epsilon	Ρ ρ	ρ rho
Ζ ζ	ζ zeta	Σ σ	σ sigma
Η η	η eta	Τ τ	τ tau
Θ θ	θ theta	Υ υ	υ upsilon
Ι ι	ι iota	Φ φ	φ phi
Κ κ	κ kappa	Χ χ	χ chi
Λ λ	λ lambda	Ψ ψ	ψ psi
Μ μ	μ mu	Ω ω	ω omega

and this grammatization of speech enables the transformation of the *temporal* object that is an oral discourse into a *spatial* object, called a text, such as this papyrus, which is a page of the manuscript of Plato's *Republic*:



Beginning in the epoch of the great empires and proto-history, linguistic grammatization entered a new age in the fifteenth century with the printing press, which gave rise to intense *ortho-graphic* and *grammatical* activity,



which transformed idioms, and which profoundly transformed the *understanding* speakers had of those idioms: this is what Sylvain Auroux described as the constitution of a spiritual power, and as the basis of Western power formed during the colonial era via missions and missionaries, as well as forming the context of the appearance of the Port-Royal Grammar, and with it the modern philosophy of the subject.



The eighteenth century saw the beginning of the reproducibility of *gestures*, of which Vaucanson's automaton



would form the template that would then be transferred by Jacquard to textile production in 1801, becoming the basis of what we describe, even before the implementation of this machinery,



from Adam Smith to Georges Friedman, via Karl Marx and Simone Weil, as the *proletarianization* of workers, with its formidable effects on their mind and spirit, and with the loss of knowledge in which it above all consists.

With the machine tool,



which brings about the general spread of this transfer of know-how to machines and the loss by workers of their knowledge, it is bodies and their movements that are grammaticized, when Taylor takes advantage of chronophotography and its new physiology.



It is bodies and movements, and so it is no longer just language – and that to which it testifies and which it expresses: the life of *logos*.

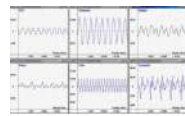
As *logos* is grammaticized it comes to be constituted as *logic*, then as *grammar*, the grammaticized *soma* inaugurating a *kinetic era* within which arises the cinema – and along with it, the automobile assembly line.



The rise of cinema is made possible because in the nineteenth century, it is the emission of light waves



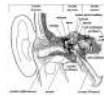
and sound waves that becomes grammatizable,



that is, capable of being made discrete, recordable and reproducible.



Through this discretization and this reproducibility the grammatization of perception takes place, the grammatization of the perception that occurs via the organs of vision and hearing.



In fact, this resembles how speaking is changed by the grammatization of speech:

- either because the speaker, who now has a spatial understanding of the temporal flow of his speech, becomes a speaker *capable of critiquing his statements* on the basis of being able to *discern the parts that make up his speech*,



the change in this case consisting, then, in an intensification of the individuation of the linguistic milieu, and through that, of psychic apparatuses;

- or because the grammatization of idioms allows spiritual, political and economic powers to control and to alter the rules, in particular to *homogenize* them, thereby imposing a *synchronization* of *idiomatic differences* or *diachronic* idiolects – and this is, for example, what was at stake in the Edict of Villers-Cotterêts.



Similarly, the sensorimotor skills of workers are altered, and in truth degraded, by the destruction of their gestural culture, submitted to a technical milieu that in addition,



and as Adam Smith acknowledged, befuddles their minds by annihilating their attention



– a situation that was analysed in a profound way by Simone Weil, the question being, then, of knowing what could and should be a politics of the grammatization of the body, in the service of a new individuation. And I believe that this is precisely the question of art, and in particular of cinema, in the epoch of its digital grammatization.

At the end of the nineteenth century, it is the functions of the understanding that begin to be grammatized, that is, automated,



because they are delegated in the form of data calculation operations, firstly through mechanography,



which is also a kind of extension of Jacquard's adaptation of Vaucanson,



but an extension into the field of tertiary industry, also called the service sector, then, with the rewritable magnetic supports of toroidal inductors



and magnetic tape, leading to data processing,



itself lying at the origin of the digital, that over-grammatizes writing, both through machine tools having become completely automatic – for which the proletariat receive sincere thanks, that is, they are made redundant



– and through the *over-grammatization of analogue sounds and images* in a form that becomes, instead, *analogico-digital*, which then replaces film



– but which nevertheless allows Jafar Panahi to invent, both artistically and politically,



and which at the same time utterly transforms the *industry* that cinema *also* is.

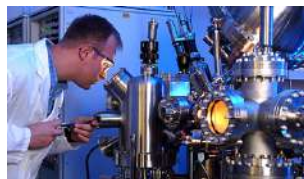


But digital grammatization also affects yet other dimensions of movement, including at the biological level of DNA



Automated production line for the preparation of samples for sequencing the human genome at the Whitehead Institute – Center for Genome Research, in 2001

and on the quantum scale of matter.



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I am recalling all these developments

- on the one hand, in order to situate the technological history of cinema, and more generally of the audiovisual, in which electronics leads to the development of the specific effects of tele-vision through the discretization of electronic flows capable of producing electromagnetic waves



analogically reproducing and transporting sound and light waves much more quickly and much further; and

- on the other hand, in order to recall that the eminently pharmacological character of such developments, of such a ‘becoming’ – that is, of all these possibilities of delegating knowledge and skills to writing, whether alphabetic, photographic, cinematographic, electronic or digital, and all the apparatus this requires (including the neuronal psychic apparatus of readers, who are *themselves grammaticized*)



– that all this has effects that are always and above all proletarianizing, which has in recent years become a matter of serious public concern with respect, for example, to the effects of television.



But it is also the pharmacology of the 'new media' that is beginning to worry economic powers, which are themselves seriously threatened – given the seemingly inevitable character of this destruction of every form of attention:



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Now, I believe that it is starting from this question of proletarianization that we can and must think cinema, and it is very precisely from this pharmacological perspective that I interpret the famous statement by Frank Capra in which he claimed that



Film is a disease. When it infects your bloodstream, it takes over as the number one hormone; it bosses the enzymes; directs the pineal gland; plays Iago to your psyche. As with heroin, the antidote to film is more film.

Let's consider more closely the meaning of this last sentence. The reason a *pharmakon* can be dangerous is because it can substitute itself for something that you and your body (including your brain) know how to do, which is also to say, to produce – for example, ‘as with heroin’, endorphins. With the *pharmakon*, you find *outside* yourself something that produces something that you know how to do, but you find that *it does it better than you do*, and so you ‘unlearn’ how to produce it yourself. This is what happens to the heroin addict.

But it is also what happens to the reader of the texts of the sophists, who grammatize *logos*, if we are to believe what Socrates says in the Platonic dialogue known as the *Phaedrus* – Socrates, who would



nevertheless be condemned like the Sophists, in 399 BC.

This destruction of knowledge by the very thing that was created to increase it is what Marx called proletarianization – which occurs when this overall increase of knowledge is channelled and *expropriated* by what Marx called capital and the bourgeoisie at the expense of work and workers, who become proletarians, that is, *workless*: they cannot *work* because they *no longer know*.

The pharmacological analysis of processes of grammatization in all their stages shows that the latter always begin by causing such processes of proletarianization, that is, losses of knowledge. I am saying that this is how they *begin*, but I must immediately add that this also produces *new* processes of individuation, that is, movements of de-proletarianization (for example, in relation to a previous stage of grammatization) in which new circuits of transindividuation form –



which could be confined to the bourgeoisie, or to the children of the bourgeoisie, who thus again join a ‘revolutionary’ becoming.



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I end this overview of the analogue culture of the culture industries with the French New Wave in order to highlight that it was conceived and realized by amateurs, and that it emerged from a technological revolution that occurred thanks to the Nagra tape recorder and the 16mm camera. The program of the New Wave was to make cinema not just a culture industry but a new art of living, and one opposed to proletarianization.

It is the digital, however, that raises this question on a grand scale: the digital network constitutes a peer to peer space, installing a bottom-up logic and opening the possibility of an economy of contribution that could make possible an exit from the impasses of consumerism.

The digital enables a totally different way of conceiving intergenerational relations, notably in the field of knowledge, and especially with what I call contributory research.

It is now widely accepted that the digital constitutes a major epistemic and archiviological mutation – in the sense that Foucault accords to the word *episteme* and Derrida to the word *archivology* – a mutation of comparable breadth to the printing press revolution, and even comparable to the

appearance of alphabetic writing itself, as Simon Nora and Alain Minc already said in 1978 in *The Computerization of Society*.



There are two possible ways of thinking about this:

- either to posit that the life of the mind is now experiencing a new milieu, to which it must *adapt*, but which does not affect it at an ontological level – and which thus remains functionally exterior;
- or to posit, on the contrary, and on the principle that the life of the mind and spirit is *essentially* constituted by its exteriorization, that is, by the conditions of its expression, which are also those of its impressions, that the digital evolution of technical exteriority, and of the processes of interiorization that the latter provokes in return, amounts to a new age of the spirit, a new life of the mind, a new spirit that would be made possible by this new form of writing that is, according to us, the digital, and that demands that mind and spirit themselves be completely rethought.

At IRI, we maintain the second position – and we do so from a ‘pharmacological’ point of view. We argue:

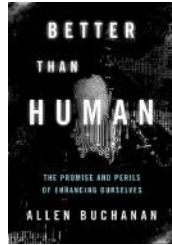
1. that technical exteriorization,



which, for Leroi-Gourhan, begins with the feet, that is, with bipedalism, freeing the hand from its locomotive function and opening its pathway to fabrication,



which is today also called *enhancement* – for instance by Allen Buchanan in his book, *Better Than Human* –



can always still lead to the atrophy of the life of the spirit;

2. that the role of academic structures



and of rational human enterprises is to cultivate therapies and therapeutics through which the poisonous *pharmakon* can become curative.

For that, today, and with respect to the care we can and must take of the contemporary *pharmakon* that is the digital so that it will become curative, that is, a vector of new knowledge, and not destructive of forms of knowledge, it is necessary to study the role that is played, in the genesis of all forms of knowledge – knowledge of how to do and how to live, and theoretical knowledge – by what Leroi-Gourhan described as the process of exteriorization characteristic of ‘technical life’ (in Canguilhem’s sense).

We posit that this process always produces toxicity, and that without therapeutic measures – which consist in laws, education, disciplines, techniques of the self, and so on – it inevitably causes more harm than good.

This ever-threatening toxicity is what Allen Buchanan ignores in principle, despite the title of his book. But the potential positivity of the *pharmakon* is such that it can and must be cultivated by therapies that are political options irreducible to economic interests alone, and this is what Nicholas Carr, in

his analysis of the internet and Google, and even though he himself refers to the concept of the *pharmakon* via Plato, has *given up* thinking – what he no longer believes in.

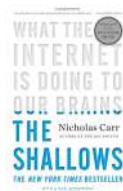
Now, I would like to show here that this kind of *disbelief* derives from an *epistemological error* with respect to the relations between the brain and technics, that is, with respect to what makes humanity shift from an organic reality to a reality that I call organological, and that radically changes the relations between organs.

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The pharmacological point of view is not new: it is in certain respects that of Plato in *Phaedrus*,



as Eric A. Havelock also recalls in 1963 in *Preface to Plato*, as does Walter J. Ong in 1982 in *Orality and Literacy*, and even Maryanne Wolf in 2008 in *Proust and the Squid* and Nicholas Carr in 2010 in *The Shallows: What the Internet is Doing to Our Brains*.



Such a pharmacology, fully assumed, that is, positing *at the same time* and as irreducible principles both the toxicity and the curativity of the *pharmakon*, presupposes, if we are to be capable of constituting a therapeutics of the contemporary *pharmakon*, what we call an organology of knowledge – the latter itself presupposing a *general* organology.

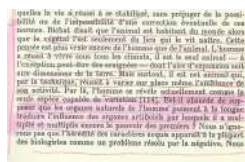
I have spent the last thirty years attempting to outline the general principles of a general organology of what Georges Canguilhem called technical life, starting from what Leroi-Gourhan described and conceptualized as the process of exteriorization that I mentioned a moment ago, in particular through his analysis of the corticalization of the brain that occurred between Australopithecus and the Neanderthal.



Leroi-Gourhan then placed side-by-side the opening of the cortical fan and the evolution of stone tools – and he showed that, over the course of two million years, technical evolution frees itself from the *pressures of biological selection*, and in a certain way sets off a *pressure of technological selection*.



Certainly Leroi-Gourhan was not about to argue that we should abandon Darwinism: in 1965, when molecular biology was triumphant, such a thing could not really be said. And yet, Canguilhem *did* envisage such a point of view when in 1943 he wrote that



man currently shows himself to be the only species capable of variation. ‘Is it absurd to assume that in the long run man’s natural organs can express the influence of the artificial organs through which he has multiplied and still multiplies the power of the first?’¹

General organology posits that technical life constitutes a new form of life in that it is *irreducible* to the forms of life emerging from the struggle for life and natural selection: it introduces criteria of artificial selection, that is, both

¹ Georges Canguilhem, *The Normal and the Pathological* (New York: Zone Books, 1991), p. 178.

technical and social, which means that it is a life that is capable of itself directly bringing about variations in its milieu. And it is through the interiorization of such criteria of artificial selection, which of course tend to be naturalized by society, that there forms what Freud called the psychic apparatus – a modern name for what Aristotle called the noetic soul.



A recent book by H  l  ne Mialet, *Hawking Incorporated*, about Stephen Hawking, shows the degree to which this artificialization of life is the condition of its noetization – Hawking being something like the conductor of an orchestra of instruments,



that is, an organological orchestra, of incomparable scope. It is worth noting the subtitle of H  l  ne Mialet’s book: *Stephen Hawking and the Anthropology of the Knowing Subject*. Here, it is not a question of *cognition* but of *knowledge* – it is a question of elaborating not the ‘cognitive’ subject but the *knowing subject*.

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It is this passage from the question of cognition to that of knowledge that Nicholas Carr does not seem to see clearly in *The Shallows*. Carr refers to Plato, to Eric Havelock, to Walter Ong and to Maryanne Wolf in order to recall that already in fifth-century Athens, an artifice that is then the artificial organ of knowledge par excellence, that is, the organological support of knowledge at that time, and that constitutes the noetic milieu of the city – via geometry, law, tragedy, history and so on – this hypomnesic

(mnemotechnical) support that is writing, seems already to be that which *destroys* memory, conceived by Plato as *anamnesis*.

Carr highlights this point, then he takes up the perspectives of Havelock and Ong in order to show that deep attention (in the sense also of Katherine Hayles), which he wants to defend against the digital *pharmakon* that seems to him to inevitably destroy this depth, is what writing has made possible – which is why Plato promoted it against the oral tradition, as Ong argues. Plato, however, is *not* opposed to the oral tradition: what he breaks with is the tragic culture that *is* the culture of the *pharmakon*, as I have tried to show by referring to Vernant.

The ‘oral state of mind’ [...] was Plato’s ‘main enemy’.

Implicit in Plato’s criticism of poetry was [...] a defense of the new technology of writing and the state of mind it encouraged in the reader [...]. ‘Plato’s philosophically analytical thought’, writes Ong, ‘was possible only because of the effects that writing was beginning to have on mental processes’.²

Reading and deep attention are *historical and noetic conquests conditioned by mnemotechnical conquests*, which obviously means that the literate brain – the *reading brain* that is the noetic brain founded on the apodictic rationality of geometry³, and that is the foundation of the *literate mind* – is *constituted* by the technical interiorization of the letter, which profoundly reshapes cortical organization, as Maryanne Wolf shows via Stanislas Dehaene and Lev Vygotsky.

Now, what makes alphabetical writing possible, which is a technical exteriorization of memory, is, if we are to believe Carr, what another technical exteriorization, the digital, would make impossible. Hence Carr poses in principle that electronic memory can only destroy organic memory:

Governed by highly variable biological signals, chemical, electrical, and genetic, every aspect of human memory – the way it’s formed, maintained,

² Nicholas Carr, *The Shallows: What the Internet is Doing to Our Brains* (New York and London: W.W. Norton & Co., 2010), pp. 141–2.

³ On this relationship between geometry and Greek thinking in general, see Bernard Stiegler, *States of Shock: Stupidity and Knowledge in the 21st Century* (Cambridge: Polity, 2015), p. ???

connected, recalled – has almost infinite gradations. Computer memory exists as simple binary bits – ones and zeros – that are processed through fixed circuits, which can be either open or closed but nothing in between.⁴

Such a point of view, however, completely contradicts what he argued with respect to the role of writing in its formation of rational noesis – as if writing inscribed on paper, papyrus, parchment or marble was not itself totally different from the living memory located in the cerebral organ (which was already Thamus’s objection to Theuth).

What Carr seems to ignore here is that the psychic apparatus, which undoubtedly takes root in the brain but is not reducible to it, passes through a *symbolic apparatus* that is situated not *only* in the brain but *in society*, that is, in the other brains with which this brain exists in relation, these *relations between brains* forming an associated milieu and a dialogical milieu within which psychic apparatuses take shape, that is, their potentials for psychic individuation – and ‘*between brains*’ here means: *within or on the supports of artificial memory* that condition every form of technical life.

Psychic individuation is *also and immediately* a collective individuation, as we learn from Simondon, and this is so first and foremost because psychic individuation always *participates* in a process of transindividuation. By asserting that the memory Carr calls ‘biological’ is organized in a completely different way to technical memory, and by excluding the possibility that this different organization, which is organological rather than organic, can contribute something to organic memory by recoding it, that is, by disorganizing it and re-organizing it,

1. Carr contradicts what he said about the role of written memory in the formation of deep attention, and
2. assumes that hypomnesic memory, that is, technical memory, and anamnestic memory, that is, biological memory, have *nothing to do with each other*.

We must, on the contrary, distinguish *organic* living memory from *organological* living memory – the latter being what is described, for example, by Havelock, Ong and Wolf. This organological memory is the interiorization of a traceology consisting of the supports of hypomnesic memory.

⁴ Carr, *The Shallows*, pp. 142–3.

In technical life, the organic in general and the cerebral organic in particular are recoded by organology, through a threefold process of psychic, technical and collective individuation.

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A form of knowledge is a circuit of transindividuation, and this circuit of transindividuation gives rise to knowledge, and not just to information, when the individuals for whom it is intended interiorize this circuit, and tend to reshape their cerebral organicity according to this social organology – by interiorizing these circuits of transindividuation as synaptic circuits that constitute processes of psychic individuation, and not simply of social individuation.

This is the cerebral translation of the fact that, according to Simondon, there is no psychic individuation that is not *also* a social individuation. This would also be to translate into other terms the argument put by Vygotsky.

This recoding can be partial and harmful: it can produce a disindividuation of the psychic individual, by creating automatisms that short-circuit a part of the psychic apparatus – and this is one of the major issues of neuromarketing and neuroeconomics, but I don't have time to go into this here. This disindividuation is an economic and political challenge.

The question of the relationship between psychic individuation and collective individuation, as mediated by technical individuation, in the sense where the latter is analytical, as Ong showed in relation to writing, is what leads to the question of categorization.

Categorization has been thought by philosophy and since Plato's *Republic* by starting from the *a priori* domain of what he presented as the *chorismos*, of which dialectics is the science, and this categorization then leads to Aristotle's table of categories, which itself leads to what we call formal logic, and which constitutes a transcendental logic in the sense of Kant and Husserl.

This transcendental logic is a translation, two thousand years later, of Socrates's response to Meno's aporia, in terms of his concept of anamnesis and by getting Meno's slave to calculate the surface of a square – this question of anamnesis being what, in the *Phaedrus*, Plato argues precisely cannot be reduced to hypomnesis. Anamnesis, however, requires the interiorization of a circuit of transindividuation that is itself of hypomnesic origin: this is what Plato failed to see, but which was indeed what Husserl uncovered in 1936, in *The Origin of Geometry*.

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Today, the question of categorization is examined by Tim Berners-Lee under the name of what he calls 'philosophical engineering'.

In this context, the question of categorization must be conceived starting from that of annotation, and I pose in principle that someone who conceptualizes categories (to conceptualize is to categorize) in reality consolidates indexations, annotations in a broad sense, and that he or she does this by producing and projecting categories that are constituted in his or her memory through processes that Hume described as dynamics of associations and associative projections that intersect with associations consolidated by history via hypomnesic retentions, through the mediation of what I myself, referring to the Husserlian concepts of primary retention and secondary retention, call 'tertiary retentions' (that is, artificial retentions realized by mnemotechnical supports), and as collective memory. The latter itself consists of circuits of transindividuation that form what in the academic world we call the disciplines, and what Simondon called the transindividual, that is, meaning.

Thinking is what articulates processes of idiolectical categorization – that is, produced by the psychic individual on the basis of his or her own heritage of retentions – with hypomnesic traces, such that it composes with existing circuits of transindividuation in order to form new circuits of transindividuation.

At the Institut de Recherche et d'Innovation, we have begun a seminar on these subjects with the goal of testing new annotation technologies in the service of a rigorously and collectively projected categorization. We believe that an organological understanding of the digital can be produced only through an approach that is both theoretical and practical, that is, experimental, and this experimentation must in this instance come from what we call contributory research.

It is for this reason that we are currently working on tools for annotation, indexation, editorialization and social networking, and more precisely to constitute an *organology of disputation* that enables the *articulation* of:

- an approach to categorization via the pathways of the social web,
- with an approach that stems from the semantic web, the latter being based exclusively on computational automation.

We believe that the future consists in articulating these two approaches. But this requires instruments to be designed and built for communities of annotators, polemical communities that will reintroduce non-automatic criteria of interpretation in the operations of search engines on the basis of languages and systems of contributory annotation, that is, of deliberative transindividuation. We believe that such a model must be constituted as an alternative to the model Google has been implementing for the past ten years. The academic community must be at the forefront of these annotation processes, which must produce spaces in which conflicts of interpretation and scientific disputes can occur, which are indispensable to any rational implementation of what today we refer to as 'open source', 'open science', 'social innovation' and so on.

Translated by Daniel Ross.