Edgar Morin and the Rhuthmoi of Information - Part 1

- Recherches
- Le rythme dans les sciences et les arts contemporains
- Linguistique et théorie du langage
-

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Rhuthmos

Table of contents

Previous chapter

This leads us towards the last part of *Method* which was dedicated to "information" and "communication." As we saw, the subject had been quite vaguely addressed by Serres at least in *Birth of Physics* since the five-volume series entitled *Hermès* was partly dedicated to it (1969-1980). Let us see how Morin dealt with this question and how far he went on the *rhuthmic* path he had opened in the previous parts.

If "active organizations" could be characterized as "systems" or better yet, "machines," and if these machines were endowed with "flowing selves," this was indeed, Morin argued, mainly and most of the time due to the "signals" or "information" that were circulated in and out of these machines and that ensured their functioning and helped maintain their homeostasis (p. 235). The buckle could thus be closed but the concepts of "information" and "communication" had to be examined first very closely.

Critique of Cybernetics

This informational aspect of "machines" had been revealed by cybernetics as soon as the 1950s. However, Morin noted, Norbert Wiener (1894-1964), as most of his followers as a matter of fact, had from the very beginning "subordinated communication to command," that is, both underestimated the potential "emancipating power" of communicational machines, and "[hidden] the problem of power" that was concealed behind that of command (p. 237). Cybernetics had uncritically developed out of sheer "engineering" and "technocratic" concerns.

> It is on the problem of society which converge, in one great blinding, the deficiencies of cybernetics. The too abstract model of the artificial machine is the fruit of a too concrete practice: engineering. But cybernetics does not have the vision which would allow it to consider its engeenero-social grounding. By that very fact it becomes the theoretical pseudopod of an enslaving organization of work and of a technocentric, technomorphous, and technocratic practice. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 251)

Noticeably, Morin here quoted Georges Friedmann and Henri Lefebvre who had, he claimed, "quite justly denounced cybernetization and 'cybernanthrope,'" that is the "stretching [of] the vision of an engineer on machines onto all the vast anthropo-social sphere" (p. 252). According to this view, human societies were to be "purged of all disorders" and rationally "functionalized."

> Cybernetics tends and pretends naturally to reduce everything to its model of self-styled rationality: the automated, functionalized machine, purged of all disorders (self-styled optimized), end-purposed for industrial production. It can consider society only as a vast machine to be functionalized. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, pp. 252-253)

To oppose the ethical and political biases of cybernetic information theory, Morin suggested, first, to introduce the concept of *appareil* - apparatus, that is, the "original arrangement which, in communicational organization, ties the processing of information to actions and operations."

> I define the term apparatus as the original arrangement which, in communicational organization, ties the processing of information to actions and operations. As such, *the apparatus has the power to transform information into a program, that is to say into organizational constraint*. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 238)

This concept, which was "absent from our theories of cybernetics, biology, and, tragically today, of society and politics," (p. 242) was, according to Morin, the first key to a more adequate perspective on biological as well as social organizations, by allowing not to confuse them with sheer artifacts. In other words, it was a way to translate into social science and political theory the contribution of cybernetics without taking up its limitations.

> Its absence renders these theories blind or servile. I am convinced that all theory of communicational organization (embodying, therefore, organization of life and anthropo-social organization) must be reconstructed by developing therein a theory of [Apparatuses]. Such a theory must from the beginning conceive the radical difference which separates the artifact apparatus which organizes from the genetic and neuro-cerebral apparatuses of living beings. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 242, my mod.)

On the one hand, the concept of apparatus allowed to take into account the power of the most complex communicational machines to "'think' out the situation", and to "choose" adequate action.

> The idea of machine, in the sense that I have indicated, signifies immediately the emancipation of the being in its entirety with respect to external risks and constraints: henceforth, the machine can "think" out the situation; it can find solutions; it can elaborate strategies adapted to the circumstances; it can conceive possibilities of choices and make decisions in function of alternatives; finally, it can trigger action and reaction. The machine, therefore, opens the door to liberty which is: to choose (the second being: to choose its choices). (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 238)

On the other hand, the concept of apparatus did not hide the ethical and political dimension of machines. The same center endowed with self had the power to emancipate as well as that "to live off, exploit, enslave both the parts and the whole."

> The apparatus is, therefore, a part that can appear, simultaneously or alternately: - as the servant of the whole in reference to the dangers which threaten it; - as the executor of the whole with respect to the parts; - as the part which controls the whole, and thereby tends to live off, exploit, enslave both the parts and the whole. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 243)

Indeed, Morin noticed that the evolutionary development of apparatuses, which had become ever more complex until "*the upsurge of the social megamachine with its central apparatus, the State*" (p. 246), had led to both *"the massive enslavement of plants (agriculture) and animals (breeding)"* and *"the enslavement of enormous masses of humanity"* (p. 246, Morin's italics).

Generalizing to the whole universe some Marxist concepts, thereby opening onto an innovative ecological critique, but also joining, by the same token, with Lefebvre's, Foucault's, and Barthes' recent critiques of the mechanization of life rhythms, Morin shed some light, if I may say so, on the obscure face of apparatuses. Through its administrative, military, police and religious sub-apparatuses, the State had "enslave[d] society and organize[d] it into a megamachine." The administrative apparatus had imposed "machine-like organization" and "uniformized rule," while the religious and the military apparatuses had imposed "their own machinality," composed in both cases of "ritual" and "discipline."

> The formidable enslavements of living beings and human beings is inseparable from the formation of a State apparatus, circulating, regulating, decisional which enslaves society and organizes it into a megamachine. The State is the [Apparatus of apparatuses], which concentrates in itself the administrative [apparatus], the military [apparatus], the religious [apparatus], and then the police [apparatus]. The administrative [apparatus] imposes machine-like organization on all of society in the sense that this term signifies uniformized rule, inflexible "mechanics;" religion and army each impose their own machinality, composed in both cases of ritual (preponderant in religion) and of discipline (preponderant in the army). (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 246, my mod.)

However, Morin did not indulge either in the anarchist orientation advocated by Foucault or Barthes, or later Deleuze and Guattari, who rejected any power that was not self-determined. He thought that the State could also have emancipating effects: "The State [apparatus] both emancipates and enslaves" (p. 247, my mod.). Anarchy and State were two sides of the same coin always present in "great historical societies."

> Finally, the great historical societies, from Antiquity to our times, always function between two poles of organization, one pole of rigid order which emanates from the State machine and more broadly from all that is power, the other pole one of infrastructural anarchy, that is to say of spontaneous and spontaneously organizing interactions. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 247)

After having introduced the concept of *apparatus*, which was meant to clear the way to capitalize on cybernetics without assuming its ethically and politically "obfuscating" power (p. 248), Morin came to the main issue: *communication*. This concept, as it had been elaborated by cybernetics, should be fundamentally reformed. Indeed, "information" and "communication" could not any longer be reduced to "program" and "transmission" (p. 251); they should instead become "organizer" and even "creator of information" (p. 253).

Consequently, the third part of *Method* started by elaborating the link between the concept of "active organization" already described in the second part, that of "negentropy" and, finally, that of "information."

Negentropy was the thermodynamic characterization of the regeneration process that allowed an open system to maintain itself for a certain amount of time. It denoted all "recursive, cyclical, rotative loops" by which open systems as living beings oppose both their loss of energy and increasing disorder.

> In dynamic terms, an organization is negentropic if it is endowed with active organizing qualities, which as a last resort necessitate a recursive loop producer-of-self. The concept of negentropy, thus understood, is the thermodynamic face of all regeneration, reorganization, production, reproduction of organization. It springs from and takes shape in the recursive, cyclical, rotative loop, which rebegins endlessly and endlessly reconstructs the integrity or/and the integrality of the machine-being. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, pp. 296-297)

Now, at least in living beings, negentropic processes were themselves driven by both the information "inscribed in DNA" and that coming "from the praxic exchanges with the eco-system" (p. 301).

> Proteins, which play the active role of transformations and exchanges, are unstable, are subjected unceasingly to degradation (entropy) and are unceasingly reconstituted by the fabricative actions of enzymes, thanks to the informational action of genes whose existence depends on the exchanges and transformations of proteins. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 301)

Conclusion: communication was tightly involved in the perpetuation of living beings. Living machines were negentropic islets "in the ocean of disorder and noise" (p. 300) which could survive a certain amount of time based on their "communicational" capacities.

> To be conceived and comprehended, the negentropic organization of life necessitates the introduction of the idea of Information. Living beings can be conceived as negentropic machines constituted by communicational organization of chemical reactions and having a universal informational mechanism inscribed in the DNA of genes. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 304)

From now on, I will introduce at the end or the beginning of each section some comments concerning Morin's astonishing proximity but also distance with another *rhuthmic* trend of thought that was resurging at the time.

Let us first notice a startling aspect of this critique of cybernetics. By linking information to *active* organization, and by making information itself *creative* and *organizing*, Morin resumed with an old trend of thought in theory of language starting with Wilhelm von Humboldt (1767-1835), going through Ferdinand de Saussure (1857-1913), and developing in the second half of the century with Émile Benveniste (1902-1976) and Henri Meschonnic (1932-2009). Like Morin's information theory, these doctrines insisted on considering language firstly as an *activity*. Humboldt was the first to claim that codes or languages recorded in grammar books and dictionaries were only dead corpora *(ergon)*, and that what really mattered was language as *Thätigkeit* - activity *(energeia)* (see Michon, 2010a, 2018b, chap. 7). Similarly, one and a half century later, Benveniste noticed that "we can never get back to man separated from language and we shall never see him inventing it [...] It is a speaking man whom we find in the world, a man speaking to another man, and language provides the very definition of man" (Benveniste, 1974, p. 82). We will return below to this trend of thought because Morin joined again with it on some other significant points.

It also is striking to see how this dynamic premise concerning information led Morin only a few years after the protest of 1968 during which those subjects had been widely discussed and also a few years before Jürgen Habermas' (1929-) *Theory of Communicative Action* (1981) to envisage a new kind of community based on "love" and "communication," provided naturally, he insisted, that the power of command and apparatuses was not underestimated.

> Can we imagine, hope for an organization wherein communication commands, a community of communication? Let us already know here that all hope is silly if it ignores that, behind social communication, there is command by apparatuses, that is to say the link, hazy and unrecognized, between communication and enslavement. Let us also already know that it is in the development more and more existential and subjective of communication that this anthropo-social emergence becomes evident: love. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 256)

Communication could not be reduced to disembodied *information*. The opposition between the two concepts actually was much more than a mere theoretical point. It entailed a radical opposition between two kinds of society: one, authoritarian, based on command; the other, democratic, based on real communication and interaction. Information involved direct ethical and political stakes.

> Informationism not only hides the Apparatus but contributes to every domination by the apparatus, and it can secrete as sociological ideal only an "informational" society, in which information, under the guise of rationality and functionality, commands communication. On the other hand, the complex vision of information leads us to hope for a communicational society, where information works *for* communication. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 371)

Critique of Communication Theory

After this critical examination of the cybernetic concept of information, Morin discussed its reduction since Shannon and Weaver (*The Mathematical Theory of Communication*, 1949) by the ubiquitous theory of communication to "units of information called *bits (binary digits)*."

> The coded message is transmitted, from the transmitter to the receiver, over the channel, under the form of signs or signals which we can break down into units of information called *bits (binary digits).* (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 305)

Here, it is worth noticing immediately how Morin started this new discussion by referring to the tale of *Tristan and Isolde*. He wittingly but quite adequately noted that "when, out of the infinite sea, a sail appears, white or black, the Shannonian observer will invoice: a bit!" More seriously, he underlined the fact that this theory could not give an account of poetry because it missed both the "meaning" or "significance" and "the originality and beauty of the poem."

> The bit is not a unit of meaning *[une unité de sens]*. Shannonian information is even totally deaf or blind to the significance *[signification]*, quality, value, and importance of the information for the receiver. Isolde waits for the return of her Tristan [...] When, out of the infinite sea, a sail appears, white or black, the Shannonian observer will invoice: a bit! Here is a poem, "The Cassis River" [by Arthur Rimbaud]. It is an original assemblage of letters and words, complex therefore improbable in their succession, and it can be detailed in a total number of bits, equivalent to the number of decisions the receiver should make to identify the letters or words constituting the poem. However, such a tally tells us nothing about the meaning *[sens]* of the poem: the latter would carry the same quantity of information if the letters were arranged haphazardly, that is to say became pure noise. The quantity of information does not even give us an indication of the originality or beauty of the poem. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 307)

Starting this way was again rhythmologically significant for two reasons: it argued against the Shannonian theory of information by introducing two crucial aspects that had been at the heart of the poetic *rhuthmic* paradigm since Aristotle: meaning and artistic value, and it took poetry, that is, the most sophisticated use of language, as criterion for testing it. By so doing, Morin was now forcefully introducing poetic concerns that resumed with a trend that had been developing with contrasted results since the 18th century (Michon, 2018b) and pointed to the recent upsurge of the Aristotelian poetic paradigm of rhythm in Meschonnic's work.

Therefore, this was no chance that Morin contrasted, a few pages below, the "digital insufficiency," that is, the reduction of information to "discrete units," the famous "binary digits," and what he called the "'continuous' dimension in information." What we may call the *rhuthmic* aspect of meaning could not be digitalized, that is, reduced to a sheer succession of binary signals, because it entailed a certain "continuous dimension." According to him, "all negentropic/informational activities obey[ed] a dialogic between digital and analog" (p. 319).

> I think that the digital character, considered alone, reduces information to its "particle" aspect of discrete unit; it seems clear that there is also, complementary and antagonistic, a "continuous" dimension in information, which would be sort of "undulatory" in relation to the corpuscular aspect. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 318)

This point was again elaborated at the end of the book. Meaning was "rebellious to digital atomization."

> The engram, the code constitute discontinuous aspects which allow us to consider and manage units of information. Under this angle, information has only one aspect discontinuous, discrete, digital. Now, conceived in its relational activity, information takes on a continuous character and presents analogical/mimetic aspects quite rebellious to digital atomization. It is today with information as it was with light in the Newtonian era, where corpuscular character, alone conceived, excluded its undulatory character. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 350)

In a very clear and educational way, Morin went on by chronologically following the development of communication theory. He again criticized Wiener's "jumping on nascent information to integrate it in the universe of machines" (p. 309). Cybernetics, he repeated, abusively linked command to the communication of information (*Cybernetics: Or Control and Communication in the Animal and the Machine,* 1948). What still was, in Shannon's view, "an entity whose trade we organize between partners," became with Wiener "organizing and ordering," that is sheer matter of power (p. 309). The extraordinary "machines" composing the universe were thus compared and finally reduced to artifacts and the information to "program" and "command."

The decisive introduction in 1953 of the concept of information into biology by Francis Crick (1916-2004) and James Watson (1928-) had contrasted consequences. It was both a "progress," that allowed to get rid of purely mechanical as well as mystical conceptions of life, and an "obscuration at least equal to their virtue of elucidation" (p. 313). Since the reproduction of living beings depended on the sequences of nucleotides that composed the genes carried by the DNA macro-molecule, these sequences "could then be identified with a coded message" and "thenceforth assimilated into a program" (p. 313). Information could be reduced once again to its most simplistic concept generated during its communication and cybernetic debut.

By contrast, Morin remarked, information was introduced during the same period into physics by Léon Brillouin

(1889-1969) in a very different way that underlined the self organizing power of "machines" (*Science and Information Theory*, 1956). Brillouin noticed that "the equation by which Shannon define[d] information coincide[d], but in reversed signs, with the Boltzmann-Gibbs equation defining entropy", that is, there was a strict relation between entropy/negentropy and information measures (p. 310). The process of fighting disorder, noise, disorganization, varied in the same way as the efficiency of a "machine" in transmitting information.

This view was elaborated further by the biophysicist Henri Atlan (1931-) who emphasized at the beginning of the 1970s "the natural priority of negentropic organization over information," in other words of self organizing machines or systems over communication (*L'Organisation biologique et la Théorie de l'information*, 1972). Negentropic system and information were linked but there was no symmetry between them: the former was a prior condition to the latter.

> Atlan reestablishes the natural priority of negentropic organization over information: negentropy must first be transformed into information to then allow information to be transformed, elsewhere and differently, into negentropy. The equivalence information/negentropy is established at the heart of negentropic organization; [but] it signifies neither identity nor symmetry. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 311)

In these contributions, information was not considered as independent. It was part of negentropic process and the latter part of self organizing systems. A few pages below, Morin similarly mentioned "the antecedent and enveloping character of negentropic organization with respect to information" (p. 322).

> *To conceive information in its physical fullness, we must not only consider its interactions with energy and entropy; we must not only consider negentropy and information together; we must consider information, negentropy, and organization together, by incorporating information in negentropy and negentropy in organization.* (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 312)

Information was therefore fully "grounded in physics," while pertaining, at the same time, to the most complex entities in nature. Viewed from this perspective, it bridged the divide between physical and human worlds, between the physical and the mind realms. It was the most powerful tool which allowed us to finally overcome the modern objectivist dualism that had been so many times criticized since the end of the 19th century without never being entirely dismissed.

> The physical citizenship of information is of considerable importance. Henceforth a relation *in principle* (I emphasize since the principle has not yet developed its potentialities and often even remains masked) establishes communication, scientifically, between what science imperatively disjoined until then: the realm of physics and the realm of the mind. Information grounds in *physis* what was looked for until then only in metaphysics, under the auspices of Idea or Mind. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 311)

Morin noted that the concept of information had also been used recently by some neuroscientists and even

sociologists and had thus become, in the last two decades, "a notion which claim[ed] dominion over all things physical, biological, human." But, due to the technical bias impairing its whole development, he rightfully added, it had been wrongly stripped of its "anthropo-social character."

> It intends henceforth to rule from entropy to anthropos, from matter to mind. [...] But a true link cannot be founded on an astounding scission, both effected and hidden by Shannonian theory, aggravated by the cybernetization of programmed information, between on the one hand the physical character of information, on the other its anthropo-social character. Triumphant information mutilated, unidimensionalized; it is the program of artificial machines. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 315)

This particular concept of information could not answer the most simple ethical and political questions. It was therefore "mutilating," "reductionist" and covered a deep "authoritarianism" (p. 316).

> Thus, information becomes a master-notion, a master-word. It is master of the energy which it manipulates, leashes, unleashes (but who manipulates information?). The program which rules the machine is king (where are man and society that wrote the program?) [...] Information rules society *via* norms, rules, interdicts (on condition of forgetting the relations of domination, exploitation, solidarity between the groups which determine the rules, norms, and interdicts as much as they are determined by them). (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 316)

Morin concluded his survey on communication theory by alerting against any physicalist reductionism. Since information was "always tied to negentropically organized beings," i.e. living beings, information must be conceived *simultaneously* from the physical and the anthropo-sociogical perspectives. It could not be entirely reduced to physics.

> There is, to our knowledge and on our planet, no extra-biological information. Information is always tied to negentropically organized beings which are the living beings and the metabiotic beings which feed on life (society, ideas). [...] We arrive at this key proposition: the physical concept of information is inconceivable without the biological concept of information and without the anthropo-sociological concept of information. We mutilate the reality of the physical concept if we claim to isolate it totally, since *it exists only in physical beings which have the quality of being alive, and it develops its potentialities only in the communication between social beings having the cerebral aptitude to exchange information.* (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 321)

Consistently with the epistemological premises introduced in the first part of the book, Morin then underlined "the necessity of a theoretical mega-system" that integrated both *physis*, and life, and anthropo-sociology. Information and communication theory had to be elaborated from a much larger perspective than a sheer technical view induced whether from telecommunication or from computer techniques.

> Whence the necessity of a theoretical mega-system, which, locating itself at the level of the triple articulation, integrates, transforms, and surpasses the concept of information born from Shannon. (*Method*, vol. 1, 1977, trans. J.-L. Roland Bélanger, 1992, p. 321)

Next chapter