

## Book Review

# On Complexity

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*On Complexity*

Edgar Morin

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Not coincidentally, systems thinking and complexity theory are still in growing evidence. New texts have been constantly updated and reissued; authors who were relatively little published in some languages begin to be more translated. This is the case of the book *On Complexity*.

Edgar Morin is a French philosopher and sociologist of world renown. He is Emeritus Director of Research at the CNRS (the French National Research Center), and has honorary doctorates from many universities around the world. According to Alfonso Montuori, from the California Institute of Integral Studies, for many people and in various fields of systemic knowledge his influence is even greater than that of authors such as Gregory Bateson.

Morin's works have been published in French, Spanish, Portuguese, Japanese, Italian and several other languages, but few of them have been translated into English. This new edition of his *On Complexity* maintains the original chapters and is expanded with the addition of some new texts and two appendices. It also includes a preface and an introduction by Montuori.

The book begins with a foreword ("Edgar Morin's path of complexity"), which includes a bibliography and makes an overview of the author's extensive list of books, essays and articles, which includes philosophy, epistemology, philosophy of science, education, sociology, politics, ecology, cinema, journals, psychology, biography and, last but not least, *The Method*, his well-known six-volume study on complexity, published between 1977 and 2004.

In his foreword Montuori makes a detailed presentation of Morin's work, highlighting the philosophical and epistemological aspects. Next come the essays, which make up the body of the work and are arranged in seven chapters and two appendices, as follows:

1. **Blind intelligence:** Including the texts “Becoming aware”, “The pathology of knowing”, “Blind intelligence”, and “The need for complex thought”;
2. **Complex pattern and design:** Including the texts “Indo-America”, “Systems theory”, “Open systems”, “Information/Organization”, “Organization”, “Self-organization”, “Complexity”, “Subject and object”, “Coherence and epistemological opening”, “Scienza Nuova”, “For a unity of science”, “Integration of the realities banished by classical science”, “Beyond classical either/or alternatives”, and “The paradigmatic turning point”;
3. **The paradigm of complexity:** Including the texts “The paradigm of simplicity”, “Order and disorder in the universe”, “Self-organization”, “Autonomy”, “Complexity and completeness”, “Reason, rationality and rationalization”, “The necessity of macro-concepts”, “Three principles”, “Toward complexity”, and “Reason, rationality and rationalization”;
4. **Complexity and action:** Including the texts “Action is also a wager”, “Action escapes our intentions”, “The non-trivial machine”, and “Preparing for the unexpected”;
5. **Complexity and the enterprise:** Including “Three causalities”, “From self-organization to Self-eco-organization”, “Strategy, program, and organization”, “To live and make a deal with disorder”, “Complementary and antagonistic relations”, and “The necessity for a lived solidarity”;
6. **On the notion of subject:** A seven-point historical/anthropological/philosophical approach to the notion of subject;
7. **The epistemology of complexity:** A nine-point approach to the epistemology of complexity, which also includes a multidisciplinary methodology.

The Appendices include:

**Appendix 1 - The concept of system:** A concise and well-structured approach to the concept of system, with special emphasis on the whole-parts relationship).

**Appendix 2 - A new science of autonomy:** A short but well informed approach to autonomy and self-organization with some highlights on biology.

As often happens in other areas of knowledge, the diversity of schools of studies on complexity and systems thinking has created some initial misunderstandings. Morin, for example, had some restrictions to the first moments of systems thinking which, as we know, had a somewhat exaggerated mechanistic tendency. But all that is past. The most important current approaches to systems thinking (which some authors call “the systemic view”) are much broader and effectively include diversity, multiplicity and uncertainty – that is, complexity.

Yet some peculiarities remain. According to many Continental European and Latin American theorists of complexity – many of which follow Morin’s ideas –, systems thinking is part of complexity theory. On the other hand, for most Anglo-American authors it is complexity theory that is part of systems thinking. Historically, systems thinking emerged just about the same time as cybernetics. Complexity theory, as we know it today, came a little later.

There are also those who say that all these approaches are companions that go hand in hand, and suggest that Morin is among the authors who gave them a new vigor. In my opinion all these authors are correct, each in their own way. These conceptual and terminological issues are part of the development of all theories. This is especially when it comes to complexity theory, which is an interdisciplinary effort still in progress and by no means should be seen as a replacement of systems thinking. So we should always speak about complementarity, never about antagonism or mutual exclusion.

According to Morin, complexity is a phenomenon of nature as well as of human cultures, which is studied by complexity theory, which is put into practice through complex thinking (or complex thought), which in turn is a set of methods and techniques that include what he called the “cognitive operators of complex thinking”.

In the same manner as complexity theory and complex thinking are no substitutes for systems thinking, simplicity is no substitute for complexity. Things are not as simple as many would like them to be. Hence the well-known Morin's statement: "Complexity is a problem word, not a solution word".

In this book he revisits some of the main topics of his approach to complexity. As a special contribution, he brings a philosophical and literary sophistication that is not common in most of the texts of the current literature on complexity and allied matters.

This sophistication has led the late South African scholar Paul Cilliers to say that Morin has "a unique capability to move between the natural and social sciences – without doing either of them any injustice –, and is ideally placed to address the epistemological, ethical and practical problems of our times. What makes Morin unique amongst complexity theorists is the way in which he turns a critical eye on complexity theory itself, resisting a return to determinism, reduction and disjunction".

For the same reasons Jean-Louis Le Moigne, Morin's fellow countryman, compares *On Complexity* to Locke's *Essay concerning human understanding*, to Spinoza's *Tractatus de intellectus emendatione*, and to Vico's *De nostri temporis studiorum ratione*. As a matter of fact, if we add Pascal to these authors, we will have four of the thinkers who have most influenced Morin's ideas.

Morin searches in first place what he calls "reconnection of knowledge", that is, the closing – or at least a significant narrowing – of the gap that separates the humanities (the comprehensive/intuitive knowledge) and the scientific worldview (the explanatory/demonstrative knowledge).

In terms of complexity theory, this gap manifests itself through two major strands of complexity studies: the "social/anthropological/humanistic" and the "technological/mathematical/computational". In all writings of his extensive work Morin has opted for studying the first approach, although always recognizing the importance and indispensability of the latter.

Morin's definition of complexity emphasizes four fundamental aspects: 1) systemic relations; 2) circular causality (retroactive and recursive); 3) the hologrammatical principle (the parts are within the whole and the whole is within the parts); 4) dialogic (the coexistence of opposites that are at the same time antagonistic and complementary).

Furthermore – and coherently with Cillier's remarks –, it can be said that the core of Morin's works includes a deep study of human nature approached from multiple perspectives. Inspired by these ideas I have been saying, in my recent writings, that one of the most effective ways to introduce complexity in any subject is to include human nature among its variables.

It is in this regard that Morin meets various authors, including classics like Pascal. This calls for some further considerations, among which I put some of my personal views.

When we consider that the social side of knowledge and human development is more connected to the humanities, and that the technical side is more connected to the "exact sciences", some ideas of authors such as Morin, Charles Percy Snow, Enid Mumford and John Gray are especially pertinent.

The "two cultures" concept is well known. It comes from "The Two Cultures", a lecture delivered in 1959, in Cambridge, by Charles Percy Snow. The talk referred to the opposition between the humanistic/literary culture and the scientific culture, and was later resumed in a book (*The two cultures and the scientific revolution*), followed by another one (*The two cultures: and a second look*).

Everyone knows that this two-culture gap has been harmful for the advancement of knowledge in many areas, so it is necessary at least to reduce it. This is precisely the point where Morin's concept of "reconnection of knowledge" meets Mumford's socio-technical approach.

But there is a much older analogy. If we go back further in time, we will find that the 17th century French philosopher Blaise Pascal, in his book *Pensées*, had already detected the same separation between the "social" and the "technical" realms, so to speak. In his time, Pascal identified two antagonistic ways of thinking: the *esprit de géométrie* (that is, the mathematical mind) and the *esprit de finesse* (that is, the intuitive mind).

The mathematical mind corresponds to explanatory/demonstrative knowledge, which operates through principles that are clear but somewhat distant from our common uses and practices. The intuitive mind corresponds to instinctive/intuitive knowledge. Its principles are in common use and in

plain sight. The intuitive mind (*esprit de finesse*) understands things synthetically; on the other hand, the analytical approach is a characteristic of the *esprit de géométrie* (that is, the mathematical mind).

In Pascal's own words: "All mathematicians would therefore be intuitive if they had good sight, because they do not draw false conclusions from principles that they know. And intuitive minds would be mathematical if they could adapt their sight to the unfamiliar principles of mathematics". The philosopher is obviously talking about the necessary complementarity between these two ways of thinking.

Following Pascal's steps, Morin says that this opposition between reason and intuition does not necessarily mean mutual exclusion, as they are polarities that complement each other without ceasing to be antagonistic. That is why Morin transformed this Pascalian view in one of the main principles of complex thinking – the dialogic principle.

Analogously to Mumford, Morin argues that the tension created by the coexistence between opposites leads to the continuous emergence of new properties that lead the systems to rearrange themselves at higher levels of complexity. Mumford's socio-technical approach is an excellent example of how the reconnection of separated (and opposites) modes of thinking is essential to the production of emergent phenomena.

Thus when we look for some more analogies, it is gratifying to find out other examples of how Mumford's sociotechnical approach is helpful in many areas of knowledge. Let us see one of them, taken from my own experience.

The need to reduce as much as possible the distance between the polarities ethics/politics and knowledge/technology has led me to develop a complex definition of sustainability, which is in the last chapter of my book *Complexity and sustainability: what can and cannot be done*.

My starting point was the gap – mentioned by the English philosopher John Gray – historically created between the advances in knowledge/technology and ethics/ politics. This is the essence of Gray's point: in our culture, knowledge and technology (that is, the "technical" side) are far ahead of ethics and politics (that is, the "social" side).

This gap hinders the task of ethics/politics, which is to moderate the spurious uses of knowledge, technology and the practices inspired on them. This can be seen in Figure 1, that shows that as long as this gap is as wide as it currently is, this moderating role cannot be played as expected.

In other words, advances in ethics/politics tend to increase environmental sustainability and therefore slow down the environmental entropy. Their retreat tends to produce the opposite effect. On the other hand, a decrease in the predatory use of technologies could also help slowing entropy, with the consequent expansion of sustainability.

That is why it is so difficult to establish a "simple" definition of sustainability. As a complex concept, sustainability will always be fluid, flexible and a constant object of negotiation. Nothing is in equilibrium; everything is in interaction and linked to sociopolitical and technical disputes.

Pragmatically speaking one could say that the very last stage of the economic process is the production of waste. According to the laws of thermodynamics this means turning low-entropy materials in high-entropy rubbish.

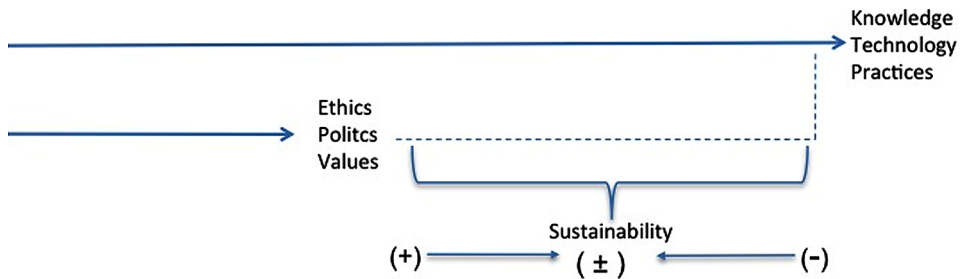
Thus, as has just been said, everything that slows down entropy and decreases the production of waste tends to increase sustainability. As a consequence, the narrowing of the above-described gap can only be achieved through the composition between ethics/politics on the one hand and, on the other hand, knowledge/technology.

This issue cannot be resolved through the elimination of one of its polarities, simply because it is not a problem; it is a paradox, and this means that the two polarities must get along together.

In the course of this coexistence there will always be fluctuations: sometimes one side will predominate, sometimes the other will prevail and so on. But the gap should never be so large that a given predominance turns out being a kind of dictatorship of one pole over the other.

This has been the case in our culture, where ethics has always been in short supply. That is why Mumford's emphasis on it is so important. Not coincidentally, Morin's views are very similar. As a

Figure 1. The gap



- 1- The narrowing of the gap increases sustainability.
- 2- The narrowing of the gap can only be achieved through a composition between ethics, politics, and values, on one side, and knowledge, technology and practices, on the other side.
- 3- To what extent is this composition possible in practice? Each country, people or institution will achieve different results, depending on their culture and the action of their leaders.

mater of fact in *The Method*, his seminal six-volume work on complexity, the title of the sixth (and last) one is precisely *The Method 6: Ethics*.

Accordingly, all who are interested both in systems theory and complexity theory should read Morin's extensive set of works, of which *On Complexity* is an important sample. There is no doubt that everyone can benefit from these readings, in philosophical, epistemological as well as in practical terms.

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