

The Emergence of Thought

Edgar Morin

If we consider human thought as the, so far, ultimate, if not supreme, stage in the evolution of life on Earth, we must also try to understand the evolutionary conditions that allowed it to emerge, and that leads us to look again at living organization.

The Prehistory of Thought

Whatever the origins of life (cf. the text of Jacques Reisse, p. 53), it is clear that the oldest living organization, that of a protobacteria, is extremely complex in its functional and complementary association of extremely diverse macro-molecules, and that this complexity includes in particular: a) the organization of exchanges with an environment from which it draws both matter-energy and organization; b) a permanent process of self-reorganization through the replacing of molecules that have deteriorated and through the production of new ones; c) the organization of the self-reproduction of the creature through division. An organization of this kind includes a quasi-informational dimension (the hereditary message inscribed in the genes and the capacity to extract information from the environment), a quasi-computational dimension (the processing of data, via indices or quasi-signs from the interior and exterior), and a communicational dimension (internal RNA-protein communication and external communication with its congeners). In short, from the beginning, a living being is the product/producer of a self-eco-organization the nature of which is at the same time computational, informational, and communicational. *In other words, within every living organization, there is a cognitive dimension, but this cognitive dimension is undifferentiated within it.*

This cognitive dimension not only allows the self-eco-organization of the living being, but also allows it to distinguish the self from the non-self, to move toward food sources, to flee from danger, and to resist aggression. Without this original cognitive

dimension, inherent in living self-eco-organization, the developments of knowledge and intelligence that have led to thought would not have taken place.

When one considers the world of bacteria, which spread throughout the Earth, one sees that there are "gifts" of information from one bacteria to another. Initially, these were interpreted as a sexual act, because the donor bacteria put out a sort of tube, like a tanker aircraft, that became attached to the receiver in order to inject it with a gene, in other words with some quasi-information or a program. It has been observed that this is the method through which resistance to antibiotics is communicated. Sorin Sonea has proposed the hypothesis, taken up by Lynn Margulis, that the totality of bacteria on Earth form a kind of macro-organism that is necessary to the life of all living species and whose constituent parts exchange information from one to the next.

Polycellular plants have neither a nervous system nor the equivalent of a brain. Yet, they devise various strategies to enjoy the sunshine, absorb water, repel neighboring roots (in this way, radishes secrete a poison that puts off intrusive roots), and attract nectar gathering insects. It has recently been discovered that trees of the same species are able to communicate with one another in order to pass on the alarm against a pathogen. This means that the whole network of inter-computations between the cells of a plant constitutes a sort of natural computer that is undifferentiated and that not only implements the genetic quasi-program, but also elaborates strategies that are adapted to circumstances.

Here we can differentiate between the notion of "program" and of "strategy." A program determines a sequence of operations according to a goal, but, whereas a program, which is fixed and without any variation, assumes a stable environment, strategy includes plans and scenarios that can be modified according to risks, threats, and opportunities.

The animal adventure, especially the development of vertebrates, allowed – starting with the formation and increase in complexity of the neuro-cerebral system – the differentiation and development of cognitive abilities, especially cognitive strategies, which, starting from a certain number of signs, allow the recognition of traces or the presence of food, prey, or a predator. The development of cognitive strategies, that is to say, intelligence, goes hand in hand with the development of behavior strategies, that is to say not just cognitive but also practical intelligence. This

strategic intelligence, which is highly developed among birds, mammals, and primates, includes an ever greater ability to improvise and invent. It is these abilities that allow new and unexpected problems to be resolved. There are already many observations that show that tits, mice, and squirrels succeed in overcoming a sequence of difficulties and obstacles that the human experimenter puts between them and their food.

One can talk of intelligence when there is a cerebral ability to appropriately combine programs and strategies. Intelligence can be defined as the ability to process and resolve problems in complex conditions (a wide variety of information, interference because of "noise," the presence of uncertainties, confusion of inter-retro-actions, variations in the situation, and sudden risks).

Societies are complex systems of association between animals endowed with means of locomotion and a cerebral or ganglionic nervous system. Societies are much more numerous than had been thought for a long time and they show us the coming together of individual intelligences with a collective intelligence resulting from interaction between the individual intelligences. In this way, an anthill can look to us like a sort of collective brain with myriads of legs. The anthill has cognitive and strategic organizing abilities that the ants, taken individually, do not have, each one being like a neuron of the collective brain. But this brain would not exist without the incessant inter-retro-actions between the individuals.

There is certainly a collective intelligence in mammalian societies, in particular in hunting strategies like that, for example, put into effect by wolves. But intelligence develops, above all, in and through the individuals. It is there that the strategic qualities of a cerebral system capable of correctly posing problems and resolving them – qualities that, as we have seen, define intelligence – manifest themselves and are developed.

The cerebral system processes and organizes, through perception or representation, the information that the sensory networks have elaborated, starting from the stimuli that have been captured by their nerve endings (ocular, olfactory, tactile, and so on). It operates an analytic and synthetic understanding of the perceptions, and effects its cognitive strategies to detect danger, opportunity, prey, predator, enemy, congener, and so on. It determines scenarios for conduct and chooses the one that seems the most promising and the least risky. It uses stratagems from its repertoire or invents them. This same brain stores acquired experience. It is capable of

learning. The richer the brain is in innate abilities or aptitudes, the more it is able to acquire knowledge and invent strategies. One sees that, among primates and above all with hominization, innate programs tend to decrease and concentrate on sexual behavior, while innate structures, appropriate for the elaboration of strategies to resolve problems, tend to increase.

We also see that affective development and the development of intelligence go hand in hand. One might think that affectivity, in the form of fear, anger, and blind desire, would interfere with intelligence. But affectivity, understood as the deep involvement of the whole being in relations with others and with congeners, develops, along with affection, friendship, love, and interpersonal and social relations; it gives rise to a great need to communicate, and it stimulates and intensifies a curiosity that goes beyond the immediate interests of security, feeding, and copulation. Certainly, curiosity is dangerous and, as the proverb says, killed the cat. But it gives life to a drive to explore and examine that, remarkable in primates and chimpanzees (“as curious as a monkey”), turns, among humans, into intellectual curiosity, the search for hidden meaning, and gives human thought a stimulus that is unknown to artificial computers.

For their part, chimpanzees, our cousins and not our ancestors as Coppens has indicated (p. 112), have developed a strategic intelligence capable of making tools for special purposes from a branch or stone. They have abilities that have been revealed by communication with humans. In this way, Washoe, the young female chimpanzee raised by the Gardners, was able, on the basis of a language similar to deaf-and-dumb language, to learn a vocabulary of several dozen words, to use a rudimentary syntax, to be capable of metaphor (having learned the meaning of the word “dirty,” she was able to say “dirty rascal” to a person who had annoyed her), and to name herself when looking at her reflection in a mirror (Gardner and Premack).

Language and the Emergence of Thought

The adventure of hominization brought about related developments of the brain, of technology, of social interaction, of individuality, and the appearance and development of culture – a set of rules, norms, and knowledge that make up the generative capital of human social complexity. The emergence of a doubly articulated

language, in which groups of phonemes devoid of meaning formed meaningful words and phrases, constituted a decisive stage. Examination of skulls shows us (cf. Coppens, p.124) that *Homo erectus* already had the cerebral and glottal capacities to use a language of that kind. As with all the great moments of creation, such as the creation of the Earth or the beginning of life, we are unable to grasp the event, or chain of singular events, that caused this language to be born. It is quite plausible that, up to a certain moment, hominids possessed a language that was both gestural and phonic ("call system"), which enabled them to express and to communicate a certain amount of information and a certain number of emotions. In the same way that, with the origin of life, the organization of multiple, diverse macro-molecules constituted a "pressure of complexity" that allowed the emergence of a chemical, organizational, doubly articulated language that we call "genetic code," a sociological and psychological "pressure of complexity" was necessary, so that as soon as there was a need, there emerged a vocal language with greater, in fact almost unlimited, possibilities that went beyond a saturated "call system." If it is probable that this language was necessary for the emergence of *Homo sapiens*, it is certain that it has been found to be consubstantially essential in all the societies of *Homo sapiens*.

Human language is very varied and has many functions. It expresses, observes, describes, transmits, conceals, proclaims, prescribes, and argues. It is present in all inter-human, cognitive, communicative, and practical operations and even allows the individual spirit to communicate with itself (inner speech, an interior monologue that is more of an interior dialogue). It is necessary to cultural preservation, transmission, and innovation. It is consubstantial with the organization of all human societies in enunciating their rules, norms, and myths.

In every tongue, language obeys very complex rules of grammar, syntax, and vocabulary, and these rules themselves obey cerebral abilities that are themselves very complex. Language is a kind of machine that functions in a way inseparably associated with a system of logical and analogical computation.

Thanks to language, every cognitive operation, every gain, every fantasy can be named, classified, stored, remembered, communicated, examined, criticized, made conscious. Words, notions and concepts act as discriminators, selectors and polarizers for all intellectual activities. The human spirit can explore infinite possi-

bilities of thought through combining words, sentences, and ideas.

In other words, at the same time as language, the ingredients proper to thought sprang up. They were added to intelligence, developed it, and precisely transformed it into thought. Whereas an animal intelligence exists that functions through computation without language, human intelligence was able to develop in an extraordinary fashion through language, and language furthermore allowed cogitation or thought. Cogitation (thought) emerges from the computational operations of the cerebral machine, retroacts on these computations, uses them, transforms them and develops them, while expressing itself in language. Language allows thought to process not only those things that precede language (action, perception, memory, dream) but also those that arise from language itself – discourse, ideas, and problems with ideas.

By and in language, thought can consider, elucidate, conceptualize and study, that is to say it can act as thought.

Consciousness is inseparable from thought, that is itself inseparable from language. Consciousness is the emergence of reflexive thought, turning on itself, on its own operations, within a subject aware of itself and of its actions or feelings.

Thus, we can recognize thought as a specific and complex activity of the human spirit that encompasses the spheres of language, logic and consciousness (while it also includes sublinguistic, sub-conscious and sub- or meta-logical processes). Thought is the full, dialogic use of the cogitative abilities of the human spirit. This dialogic elaborates, organizes and develops conceptions, models, configurations and plans of intelligibility, that, in philosophical thought, become concepts and systems of ideas.

The Use of Dual Thought

Our prehistoric ancestors, hunter-gatherers whose societies were pushed back by historical societies and then exterminated during the nineteenth and twentieth centuries, had for tens of thousands of years used, in their strategies of knowledge, craftsmanship, and action an empirical, rational, technical thought that allowed them to produce, organize, and accumulate an extraordinary botanical, zoological, ecological, and technological knowledge that constituted a real ancient science. But these same ancient peoples accompanied all their practical and technical actions with rites, beliefs,

myths and magic, and, very naively, early twentieth century anthropologists believed that these "primitive" people were enclosed in magical, mythical thought and knew nothing of rationality. In fact, ancient humanity (as contemporary humanity continues to do, but in a very different way) elaborated, associated, and combined empirical, rational, technical thought with symbolic, mythological, magical thought.

Symbolic, mythological, magical thought has a collective pole and an individual pole. The collective pole is found in the myths that situate the society in a universe populated with gods and spirits and that give its members a common ancestor. They are inseparable from rites, gestures, sign language, and spoken words of a symbolic and magical character. Mythical, ritual associations give a society its unity, identity, and cohesion. The individual pole is to be found in ancient self-consciousness, where the individual recognizes his own being in his double that manifests itself in an image or reflection and that, being non-corruptible by nature, escapes death in order to become a spirit or ghost. One of the most powerful sources of human thought, not only in its mythological forms but also in its reflexive forms, comes from the traumatic awareness of death, a simultaneous awareness and refusal of the loss of individuality. This is the place where, in all human societies, myths, rites, and religions find one of their permanent sources of nourishment.

The rise of the great historic civilizations, which began 10,000 years ago, brought about the development of the two kinds of thought as well as the dialectic between them. Symbolic, mythological, magical thought was developed, transformed, and integrated into religious thought. Empirical, rational, technical thought was able to carry out admirable and enormous tasks of building cities, palaces, pyramids, and temples, and was able to create irrigation, pipework, navigation, and transportation systems. This empirical, rational, technical thought brought about progress in many directions, not only outside the religious sphere but also within it, in particular in the field of astronomy that, for a long time, remained closely linked to astrology.

The emergence and use of writing in these civilizations provided thought with a support and a vehicle that allowed communication and confrontation. It also made it possible to abstract, correct, reflect, and meditate on texts. These conditions allowed philosophical thought to take flight.

The Secularization and Individualization of Thought

In the era of the great theocratic empires, according to Jaynes' hypothesis, everything took place as though the spirit of every individual was made up of two separate rooms: one in which the divine, imperial order reigned, the other occupied by everyday affairs and problems. Only a narrow theological elite devoted itself to thought. Then, everything took place as though, with the retreat of the theocratic order and the secularization of politics (as in fifth century B.C. Athens), a hole appeared in the hermetic seal separating the two rooms. From that time on, the personal spirit of the subject become citizen, was no longer limited to the everyday life of the self and those around, but was able to think about the city, the gods, and the world, and it dared to question them. *Thought became both individual and problem-oriented.*

In China, it was during a period of instability when the foundations of power and noble society were called into question, as a circle of clients in the princely courts was formed in which rhetoricians, moralists and philosophers flourished. (Lao-tzu and Confucius date from the fifth century B.C.).

In the Mediterranean, at around the same time, the social, economic, and cultural conditions of communications and exchange between maritime cities and the collapse of the great theocratic despotisms created cultural ferment, the necessary condition for a great excitement of ideas and a multitude of argumentative confrontations.

It was then that personal thought was able to emerge. Personal thought was not the privilege of a cultivated and literate elite. Through language, it could express itself in discussions between close relations and friends, in the public square, and, in places where democracy existed, between citizens. But, and this has not yet come to an end, thought also developed by means of literature: there is thought in poetry and there is thought in all the great novels. And, in addition, it constitutes a secular sphere properly devoted to the exercise of rational thought and argument: the philosophical sphere.

Philosophical thought is a type of thought that, through systems of ideas referring to abstract entities or concepts, strives to conceptualize the questions that Man asks about the world, life, reality, and humanity itself. In the East, especially in India, philosophical thought was able to find its niche in the heart of religion, where it

elaborated its concepts, key relationships (the Atman – Brahman relationship), and propositions. But it was in the Greek islands, starting from the sixth century B.C., that with thinkers who were no longer priests, but who were still semi-magi and already sages, there appeared a personal thought that looked beyond religion and the gods for ideas and concepts that allowed the world to be understood. Logos, fire, being, the one and the future became the first fundamental notions of Greek philosophy. Then the great systems of ideas began to form. They tried to understand human and natural phenomena by means of causality and ends, to know “true” reality hidden behind phenomena, and, finally, to establish the rules and methods for a correct thought.

Philosophy is born of “astonishment” in the sense that it sets out from problematization. As we have seen, intelligence involves immediate or practical problem setting and problem solving. Philosophy poses, in terms of ideas and reasoning, the fundamental problems that Man cannot resolve in an immediate or practical way.

Unlike religion, philosophy creates a new sphere of thought in which systems of ideas and arguments conflict with one another without there being any sanctions against or physical liquidation of opposed ideas. Philosophy and rationality emerged together. Rationality and argument go hand in hand. Rationality is both a critical method of argument (as opposed to arbitrary or inconsistent systems of fables) and an attempt to elaborate coherent systems of ideas, that is to say, those organized logically and not arbitrarily with respect to what is being elucidated, which are able to take account of the realities of the phenomenal world. Above all, rationality is a dialogue between human thought and the empirical world. Rationality elaborates strategies adapted in each case to the object of its research (cognitive or practical), which include the use of logical procedures, of tests, of multiple observations, of tests of the hypothesis, and so on. In this sense, it is a system of stratagems of thought (*metis*) to unmask the real that disguises, hides, and transforms itself. When dialogue with the real is interrupted, rationality degenerates into rationalization, a coherent system of ideas that will no longer accept being disproved by facts or arguments that negate it.

There is certainly great wisdom contained within the myths of ancient civilization, and there are profound thoughts in the great religious orthodoxies that are radically rooted in what is most

ancient and most unconscious in the human spirit. But the conditions for the fullest blooming of the thinking abilities of the human spirit are to be found in centers of cultural ferment, that is to say in socio-cultural conditions of communication, exchange of ideas between civilizations, opposition of contrary theses, and great intellectual agitation – in other words, cultural “heat.” This was the case in fifth century B.C. Athens, Renaissance Italy, seventeenth century Amsterdam, eighteenth century Paris, and so on.

The Modern Adventures of Thought

Starting from the end of the ancient world, Western European thought underwent a singular adventure. After Christianity, the first great religion of salvation, had become the official religion of the Empire, philosophical thought was enclosed within the bosom of theology, was forbidden to question or contest revealed, dogmatic truth, but it did not cease to pose fundamental questions on the nature of thought (dispute of the Universals) and to preserve in its heart part of the Greco-Latin heritage that had found a new vitality within Arab civilizations.

Then, in entirely new historical conditions marked by the increase of trade between the North Sea and the Mediterranean, the formation of modern capitalism, and, from the point of view of the conception of the world, the discovery of America and then the understanding that the Earth was a satellite of the sun, new centers of cultural ferment were created. Starting with the sixteenth century, a formidable problematization once again raised questions about the cosmos, nature, life, and Man, and then dared to question not only nature, but the existence of God. From then on began the adventure of modern Western thought. The generalized problematic was the search for irrefutable foundations to replace divine revelation.

The most remarkable event was the separation, starting from the philosophical/critical branch, of a new kind of thought whose roots certainly went deep into Greek and Indian antiquity and into the mediaeval Arab world, but that took on an autonomous consistency in the seventeenth century in the western world: scientific thought.

Scientific thought has undergone an enormous development because it has been animated by a four-pronged dialogue: imagination/verification, empiricism/rationalism.

Whereas philosophy constitutes an environment for the free discussion of all problems, including those that are insoluble, science applies itself to the study of empirical reality through the perfecting of methods of observation, experimentation, verification, precision, and exactitude. They allow the elimination of inadequate or irrelevant theories and allow research to link up with techniques that are more and more closely associated with and assimilated into it, to form modern techno-science. Whereas philosophy devotes itself to the search for an ideal truth as well as to the search for moral truth, science eliminates all value judgements and concentrates solely on judgements of fact. At the same time, science makes itself independent of politics or religion. But it has become blind to the ethical problems posed, in the twentieth century, by the enormous, uncontrolled development of the manipulative and destructive powers of techno-science.

In the twentieth century, the problematic raised by Western philosophy has become universal and, at the same time, Western science has become universal. The creative character of this universalization should not allow us to forget the cultural destruction, the misunderstanding of the great traditions of thought that emerged from other civilizations, and the threat that the uncontrolled development of techno-science presents for the future of the human adventure at the dawn of the millenium.

Perhaps a new turning point in the history of thought is taking place in the twentieth century. The frantic search for foundations, characteristic of Western philosophy from the seventeenth through the nineteenth century, led to the discovery that it is impossible, not only for philosophical but also for scientific thought, to find an irrefutable and unchanging foundation. It led to the discovery that the ultimate foundation, discovered in the nineteenth century, that of progress assured by the historic future, has itself been seen to be problematic. Perhaps, a form of thought will emerge that is capable of allying science's concern for verification with philosophy's reflexive concern, which can recognize the hidden paradigms that structure and govern it in an occult fashion, which is able to integrate the observer/conceiver into the observation and the conception, which can, through an open rationality, meet the challenge posed to it by the complexity of the real. The history of thought has not come to an end and never will, except through natural or human catastrophe.

Conclusion

Thanks to language and culture, human thought could only emerge and develop in the course of a process of hominization that itself may only appear as a perhaps unnecessary but, in any case, possible branch of the evolution of the order of mammals, which had arisen from the branching out of the vertebrates in an animal kingdom that was itself the consequence of the abilities of a living organization, itself dependent on a very long and complex chemical and physical evolution that began in the first seconds of our universe.

In a way, thought gives the impression that there is nothing more cognitive, more noble, or more disinterested in the human adventure. But it can put itself at the service of authority, power, faith and illusion. Nevertheless, it also possesses a self-correcting and self-critical ability that allows it to argue with itself and to pursue a search, born with the human spirit, to try to conceptualize and understand the great adventure not only of the world, of life, and of humanity, but also of thought itself.

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