THE FREE AND THE COMMUNICABLE THINKING

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Abstract

Apparently more than ever along our human history (which, possibly, might be only a subjective impression), we live our lives in uncertainty, however, a vigilant and courageous thinking is finally prevailing. In this respect, I remember the title of a book issued in times in which free thinking was not at all welcome: *Limits or Turning Point*. When one realizes the limitations affecting our initiatives and ideas, the solution to be applied is change. However, such a solution is not a spontaneous one, but a natural consequence of the decision of not accepting that limits cannot be outdistanced, and of finding another path. Obviously, such a decision assumes a double uncertainty: the one imposed by the very nature of our world and the new, urging one, referring to the direction of the change we intend to make. The object of our study is the fundamental *why*, however, the question to which it atempts at offering an answer is *how*. Once, I have asserted that we are more frequently capable of the superficial *how* rather than of the fundamental *why*. The decision of changing this belief is based on why, which demonstrates its utility in *how*.

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For the ancient Greeks, goddess Nemesis, identified in our minds with a personal and powerful enemy, is actually the one that maintains and supervises the moral order and equilibrium of the Universe. Albert Camus used to say she is the goddess of measure: she reveals the limits one cannot go beyond (CAMUS, 2009). In the amoral space, it is only thinking that has no limitations. Unpredictability, namely the lack of absolutely complete information, present in the very essence of nature, assumes limitations, as well, manifested in humans' projects and actions, but not in their thinking. Limits induce uncertainty. Solving uncertainty, a mandatory step in decision-making, needs a vast and complex image of thinking. Nevertheless, a moral-volitive type condition exists here, distinctly expressed by Bertrand Russell (RUSSELL, 1986) :

> *"Uncertainty, in the presence of vivid hopes and fears, is painful, but must be endured if we wish to live without the support of comforting fairy tales. To teach how to live without certainty, and yet without being paralyzed by hesitation, is perhaps the chief thing".*

This means that uncertainty or the unpredictable (a larger notion, while also its background) should not be defined in terms of (comparatively with) the absence of something positive or the absence of something better. Thinking sparkles when manifested against a background balancing between too much certainty and too much doubt. Therefore, we continue to view science as a warrant of the feeling that certainty does exist and that it can be reached. However, science is not about certainty. All we have are only provisional pieces of truth. Consequently, one should get accustomed to uncertainty and unpredictability.

As a matter of fact, science advances, always under uncertainty, towards more profound knowledge, yet without fully eliminating uncertainty. Briefly, science appears as the final sum of a large number, of a multitude of concepts and fundamental laws compatible with unpredictability.

In this respect, science is permanently "hunting" knowledge. The unpredictable structures, such as the turbulence mainfested in nature, are proofs of the manner in which nature always enforces the access paths for reaching it.

Intuitive prediction, so frequently resorted to in situations of uncertainty and promoted as

such (an almost positive prediction), is usually incorrect, and not true. Here are some examples in this respect:

The global economic crisis generated by COVID-19 pandemic should drastically reduce, according to intuitive prediction, the sums of money usually delievered by economic emigrants to their families continuing to live in their mother country. Or, the situation is wholly different. All such sums increased, especially in countries from Central America, firstly Mexic, but also in some European ones, such as Poland.

Another example offered by natural reality provides a highly exact illustration of the above-mentioned idea. It expresses the confronting between human iron will and unpredictability. The biggest artificial lake of the world, "*The dam of the three straits*" on the *Yangtze river*, in China, was built up for definitely avoiding the floods that used to invade the whole neighbouring region. On the occasion of the inauguration of this huge hydroelectric construction, the president of China said that "*the people of this region will never be threatened by the floods that destroyed their dwellings and their fields*". As a matter of fact, he was perfectly entitled to make such an assertion, as the engineers in charge had calculated, during their predictive analyses, the whole set of data available on river' discharge, adopting its maximum probable value for both the dam and the hydroelectric station, registered in the years with the most catastrophic floods ever recorded.

And yet, the year 2020 brought about ravaging, unprecedently intense inundations, caused by repeated and powerful rain episodes. According to a probabilistic analysis, the discharges due to these rains were viewed as hardly probable or even practically impossible. The lack of long-term statistical information excluded calculating such a probability. Involved here are some critical points, with a very low frequency of occurrence, not included in any probabilistic – either Gaussian or Paretian – analysis. Specialists knew that, theoretically, such a phenomenon was possible; however the general belief of both constructors and authorities was that no one will ever be affected by floods in the region of the Yangtze artificial lake. In other words, if such an event will be possible, sometime in the future, nobody would be able to say when. And yet, the phenomenon occurred no later than this year, 2020 – which is a typical example of unpredictability.

A wholly different – as to its nature – example comes from the world of football. During the World Championship of 1986, in a decisive, eliminatory match (England – Argentina), the famous Maradona scored with his hand. The goal was validated, which ultimately contributed to the coronation of world's great player : Argentina. Football still used to accept (no VAR was active by then) goals scored from irregular situations (offsaid, fault); however, the possibility of validating a hand-scored goal, in such an important contest, was viewed as practically impossible (as having not the least chance to befall). In spite of all such predictions, the event was real, once more as a result of unpredictability.

Phenomena permit their representation by means of real structures. In this context, the declaration of Einstein: "*The comprehensibility of the world lies in our eternal incomprehensibility*" is not highly encouraging, instead it is useful. We are still in the position of searching a coherent model of thinking, on the basis of the knowledge at hand. Yet, in too many situations, we see the world not as it really is, but as we'd like it to be.

As we already know, not few economists adopt an Orthodox attitude in their confrontation with uncertainty; immune to the reality of crises, they continue to rely on their own econometric, linear and deterministic models.

The people striving to produce predictions, otherwise necessary and useful, make numerous mistakes, a situation that should not alarm or trouble us. The errors of prediction are simply unavoidable, once the world itself is unpredictable.

In his autobiographic notes, written in 1947, Einstein asserts that the turning point in the sistematically uniform development perceived by people should be distancing from one's personal ideas and attempt at (strive for) mentally grasping things (EISTEIN, 1969). Possibly, because when making efforts to understand complexity, one should be aware of our vulnerability, whose settlement requires taking special steps. One might say that vulnerability is generated by the "*profound duality*" invoked by Mircea Eliade: we are equally facing the essence and the hazard. Indeed, nature itself is not only

essence, it is also chance. That is why one cannot live, one cannot exist rationally in the absence of organization and hierarchization.

For now, a thorough description of nature is not yet available, if ever possible. Consequently, the universal laws in force cannot illustrate the relations established among all conceptual elements here involved. All we have is an incomplete description, so that we must give credit to statistical assertions.

The central issue is that of information. Nowadays, information appears as a concept of ubicuous significance, placed in the very heart of all things. Information bears the connotation of a universal principle of organization and order. Decision-making management, viewed as a result of decisional thinking, is purely and simply a system of information processing. What we attempt at elucidating here is the manner in which information is processed, under conditions of risk and uncertainty. As already suggested, one should firstly rely on logic, on asking YES-NO questions. Some even put forward the revolutionary assertion that "the universe maps out its own destiny". However, even in such a case, and especially in such a case, the reserve of unpredictability does exist in the vary nature of things – starting with primary nature and simultanelusly, deeply inside (upwards or downwards?), up to the most intricate elementary nature, namely quantic nature.

In the opinion of Zarathustra, described by Nietzsche as founder of the moral truth-fatality dualism in the world and in human destiny: *The most necessary soul, that out of desire flingeth itself to chance / The stable soul that plungeth into Becoming, the possessing soul that must needs taste of willing and longing* (NIETZSCHE, 2007). Nietzsche believed that no wisdom ever existed until Zarathustra.

Ada Byron Lovelace, one of the most brilliant women in history, whose vision went far beyond that of many scientists of her time, used to write to Charles Babbage in 1840 (TOOLE, 1998):

> *"You know I am by nature a bit a philosopher, & a very great speculator – so that I look on through a very immeasurable vista, and though I see nothing but vague & cloudy uncertainty in the foreground of our being, yet I fancy I discern a very bright light a good way further on, and this makes me care much less about the cloudiness & indistinctness which is near. – Am I too immaginative for you? I think not."*

This is a lucid expression of a necessary strategic thinking against the background of unpredictability and uncertitude.

Resuming now the idea of quantic nature, a permanently hot topic, far from being elucidated, the attempt at establishing a qualitative, at the most, analogy between QM (quantic mechanics) and unpredictability (in its actual meaning of chaos) starts from two ample themes: 1) information and 2) lack of information. It is precisely the analogy, or perhaps the still unexplained causal chain between wave-matter, as carrier of information, and the sensitivity to initial conditions which bear such a vast and complex amount of information, up to rendering it unmanageable. Under all circumstances, information is stored. However, quite frequently, even such a massive mass of data (pieces of information) does not succeed in transmitting what we do really need to know. Who's to blame?

Is it our fault or of the information we receive? The stages of failure's acceptance are gloriously rendered in the poetry of T.S. Eliot: "*Where is the wisdom we have lost in knowledge?/ Where is the knowledge we have lost in information?*" .

Under conditions of uncertainty , the richer the information, the less utilized is it.

Ultimately, stress should be laid on the fact that a decision taken in conditions of risk and uncertainty leads to change. In this context, the meaning of change should be explained.

A system normally functioning represents the routine, an ordered and hierarchized assembly, settled for its scheduled operation. Uncertainty results from changes in the context or in the data usually employed. This means a new state-of-the-art, created by a change produced beyond our reach. Modification of the normal condition is imposed by uncertainty, which forces either changing in the system, or changing of the system itself. The decisional transformation of the system, not only for the sake of adaptation but, possibly, for qualitative improvement, is either very important, if it means transformation in the system, or decisive, if it transforms the system.

A qualitatively new system, transformed from the old one, demonstrates not only what the old

one used to demonstrate, but also its own stability. An absolutely new system needs a different constancy.

Transformation is transitional for assuring system's stability and competitivity. The change produced by a new uncertainty comes from something having occurred in the past, and yet it is a novelty. Instead, the change induced by decision becomes the – partial or total – future.

Thinking is a free game of the mind, which operates with ideas, without the obligation of proving something. By their very nature, human beings are manifesting in a daily attitude which includes beliefs, judgements, opinions and theories about world's reality and its full significance (as complete as possible, as a function of the available data). A phenomenological attitude involves distancing from this "natural" posture, a categorical refusal of illusions and of "bright" perspectives, alongwith assuming the concern for providing proofs and for rigour, for a permanent need of observing and accepting stratification, limpidity and concretness, all these accompanied by the feeling that all we have at hand is a never-failing source of information. In this way, one will be never confined by either interpretation patterns, various prejudices or language. We know that logic operates with the language, and also that both philosophers and mathematicians felt an absolute need of fully and definitely formalizing the expression of thinking into language. Kurt Gödel distinctly favored incompletitude (ODIFREDI, 2020).

People have a natural propensity to want and to expect to live in an intelligible, comprehensible world. And yet, which would be the reason for which, or in what manner could one plainly declare that "I know"?

Indeed, we permanently and eternally harbour in us both the strive for an intrinsic cohesion of the world, and the compulsive limits of our knowledge. In his essay on Sisyphe, written in 1942, Albert Camus offers a spectacular interpretation to the theme of the absurd human condition (CAMUS , 1942). He asserts that the absurd is a confrontation between, on one side, human consciousness, permanently dominated by the strive for clarity and, on the other, the world as it really is). Human consciousness, the *cogito*, cannot be left aside, once we, people, are continuously living the experience of the world.

We are always aware of something. When confronted with our sensorial impressions, a picture-memory which, according to Einstein, is not yet **thinking**, is born. Neither when such pictures form series, each of them in succession with the previous (the picture-element) one, Einstein does not believe this is thinking. However, when a certain picture is present in several such series, it becomes – exactly through his reiteration – an ordering element for the series. It connects the series which cannot be linked together by themselves. Therefore, such an element becomes an instrument, a concept. From the free game of the mind up to thinking, we raise up – a leap we owe to the concept. Accordingly, the dominating part in moulding and exercising thinking is held by the concept. Ultimately, the path along which, starting from sensation up to thinking, one becomes conscious, can still continue; the concept gets connected to a "word", namely a reproducible and sensorially cognizable sign-symbol, so that thinking becomes **communicable**. Habitually, we do not think by means of signs-symbols. Most frequently, our mind flies freely and, to a great extent, unconsciously. When some change occurs, when something happens, we become instantly bewildered because what we feel in a conscious manner contradicts a whole world of concepts already deeply rooted inside us.

Let us imagine the situation in which such a conflict is powerful and intense, a situation that may be defined as manifestation of uncertainty. Once confrunted with uncertainty, thinking does not fly freely anymore, but it makes efforts to ecape "astonishment" and to develop a strategy. This is the expression of lucidity and of the need of certainty. Thinking possesses the quality of a comunicating action, namely it bears value and precision in the community. Some knowledge may be attained through pure thinking. The fact that a human is capable of reaching a significant degree of certainty and clarity in pure thinking is remarkable, indeed. We inherit it from the ancient Greeks, who first approached it in geometry. Logic follows the same path of pure thinking. The theme of logical thinking is nothing else than that of developing, in a successful manner, the link between concepts and sentences, only and only between them, according to some

strict rules established and imposed by the logician (mathematician and/ or philosopher). A sentence is correct if, inside the logic system, it is deduced according to its rules. A system does have a real content only to the extent to which (its) certainty and completness are coordinated with the sum total of real experience. The truthfulness of an assertion derives from the truth the system contains. From a logical perspective, all concepts are but freely assumed conventions, here included being also the concept of causality, which is the main topic of our investigation.

As one may easily imagine, the topic of uncertainty is approached by means of logic, as well as with the help of the instruments of probabilities.

Indeed, any scientific approach raises questions related to the truthfulness of the existing general results, namely: what is really essential and which is the basis of things' casual side?

On the crest of the wave of his theory of relativity, in 1916, "the young" Einstein, already formulated his empirical credo (EINSTEIN, 1916):

> "*The concepts which have been proved to be useful in ordering things easily acquire such an authority over in that we forget their human origin and accept them as invariable. Then they become "necessities of thought", "given a priori", etc. The path of scientific progress is then, by such errors, barred for a long time [...]. In this way their exaggerated authority is broken. They are removed, if they cannot properly legitimate themselves; corrected, if their correspondence to the given things was too negligently established; replaced by others, if a new system can be developed that we prefer for good reasons*".

Let us accept the idea that, for a moment, we analyze a system from a much larger perspective – for example, a social, economic, or political organization. Einstein's creed is perfectly convincing and agreed upon by us. We do know, or, at least we seem to know what we have to do in our struggle with uncertainty.

More specifically, the accidental side of things appears to be unpredictability itself. Further on, uncertainty appears from unpredictability, once the latter occurs in the heart of nature, while uncertainty exists through the feeling of people, also perceived at society or community level.

However, in the anniversary volume dedicated to Einstein, published 30 years later, in 1947, several reputed physicists, many of them Nobel Prize winners, assert that Einstein's thinking got changed.

To support this, Max Born reproduces a fragment of a letter he had received from Einstein (BORN, 1969):

> "*In our scientific expectation we have grown antipodes. You believe in God playing dice and I in perfect laws in the world of things existing as real objects, which I try to grasp in a wildly speculative way*".

Max Born is convinced that the main goal of Einstein is to elaborate a general theory of the field, capable of preserving the rigid causality of classical physics and also of "*restricting probability to masking our ignorance of the initial conditions or, if you prefer, of all details of the system considered*". Such a characterization is almost fully applicable to the domain of unpredictability.

In a similar manner, the logic of the three values launched by Einstein, Podolsky and Rosen help us better understand the path of mathematical logic. Besides the "true" and "false" values, an intermediary value, named "undetermined", is also introduced.

In the response given by Einstein to the above-mentioned volume, which he calls *Response to criticism*, he makes a highly useful specification referring to a complete description of a quantic phenomenon: "*the result of determination does not permit a conclusion concerning the status of the undisturbed system*". Utilization of a probability function cannot assure a thorough description of an individual system.

One may assume that the difficulty lies in the fact that such an attempt postulates something unobservable, in its common acception: real. Justification of the mental construction, such as, for example that of "being", namely of existing, for representing reality, "*lies alone in their quality of making intelligible what is sensorily given*".

Einstein believes that: "*the lawfulness of nature is thus constituted that the laws can be completely and suitably formulated within the framework of our incomplete description*".

In this context, mention should be made of the "objective factor", namely of all concepts and conceptual relations, understood by us as independent on experience, namely on perceptions.

An incomplete description may offer only statistical assertions, while a thorough one needs to know all relations established among all its conceptual elements. In this latter case, no statistics will be involved.

As a matter of fact, we are confronted with several schemes of thinking, that may be selected from a large, fully available variety. The motivations of selection are given by their usefulness. The quality of the scheme employed is decided by its capacity of rendering "intelligible" the whole content of conscious states. Such an ability of covering and rendering understandable the whole experience one lived is considered as "*knowledge of what is real*".

As known, science establishes connections among the facts it observes (experience), in view of anticipating future events by resorting to the already directly experienced ones. Our strive is that of understanding. Science aims at finding the simplest possible system of thinking, capable of bringing together the observed facts. In Einstein's formulation, the objective is logical unification within the scientific field of physics. As far as we know, the situation is not different in any other domain.

Universal laws are formulated by pure deduction. Anyone who builds up a logical conceptual system has to face the serious obstacle represented by arbitrary selection, characterized by Einstein with a French term: "*l' embarras de richesse*", or by the confusion caused by the richness of the possible options. (The French prefer the term: "*l'embarras du choix*").

"*There is no logic paths to these laws; only intuition, resting on sympathetic understanding of experience, can reach them*" , Einstein asserts (EINSTEIN, 1934).

The concepts and the sentences acquire "meaning", a certain "content", exclusively through the senses-experience connection. The link between experience and senses is purely intuitive, and by no means logical. The degree of certitude with which this relation (intuitive link) may be assumed expresses the difference between an idle speculation (meaningless phantasy) and a scientifically supported truth. Possibly, making of a decision may be supported by a higher degree of intuition from the part of experts, as intuition condensates a vast, previous analytical experience, as well as an extensive utilization of the logical steps already organized and ordered in the past.

Elaboration of a decision assumes metodological uncertitude. Yet, this is not a blind lane. Evolution taught us that, in any moment, and in relation with all conceivable constructions, only one of them will demonstrate its superiority among all the others. Once again, this thesis may be extended to much more domains, an not only to physics. Uncertainty lies in the fact that no logical "bridge" may be built up between phenomena and their theoretical principles. The practical key in such cases is our well-grounded conviction that the world of phenomena influences in a decisive manner the theoretical system. Consequently, even if no one can know all possible theories of reality, we are capable of formulating, starting from the mathematical and logical investigations, the possible ones and, by means of the inductive method, to detect, among all available theories, the only one capable to correctly (consistently) link the empirical data within a unique set of hypotheses.

Decision-making under conditions imposed by uncertainty should not be the consequence of hazard, but of our inner thinking, spurred by the leader in charge. "*I do not want to be dominated by hazard, but to challenge it to stay beside me*".

The opportunities one has are those one created by oneself. In this respect, the assertion launched by Nicolae Titulescu, when presenting his general (all-inclusive) fiscal reform to the Romanian Parliament, in 1923, is absolutely astonishing: "Fate is the excuse of the weak and the work of the mighty".

Another splendid assertion, formulated by Albert Camus, may be also here mentioned: "*Fate cannot be defeated by disdain*".

Our destiny is manifesting in the struggle with hostile uncertainty, a struggle in which the solution does exist; however, this lies by no means in ignorance. "*I will not permit hazard to judge me*", stated Seneca; "*luck involves no moral judgement*". The master of the unknown is the poet of uncertainty.

References

BORN, M. (1969) *Einstein's Statistical Theories*. In: *Albert Einstein: philosopher-scientist*, volume I. London: Cambridge University Press. p.176.
CAMUS, A. (1942) *Le Mythe de Sisyphe*. Paris: Gallimard.
CAMUS, A. (2009) *L'homme révolté* . Paris:Gallimard.
EINSTEIN, A. (1916) Ernst Mach. *Physikalische Zeitschrift*, 17, pp.101-104.
EINSTEIN, A. (1934) *The World as I See It*. New-York: Covici-Friede, Publishers.
EINSTEIN, A. (1969) *Autobiographical Notes*, In: *Albert Einstein: philosopher-scientist*, volume I. London: Cambridge University Press. p.7
NIETZSCHE, F. (2007) *Ecce Homo*. London:Wordsworth Classics of World Literature.
ODIFREDI, P. (2020) *God of logic. The brilliant life of Kurt Gödel, the mathematician of philosophy* Iaşi: Polirom Publishing House.
RUSSELL, B. (1986) *A History of Western Philosophy*. New York:Simon & Schuster.
TOOLE, B.A. (1998) *Ada, the Enchantress of Numbers*. Mille Valley, California: Strawberry Press.

Endnotes

The study is a chapter of the volume entitled "About the unpredictable. Foundations of decisional thinking in conditions of risk and uncertainty", in press.