

# ”What If (There Would Be / Would Have Been)?” The Concept of Alternative From the Physical Domain To the Historical One

Ana BAZAC<sup>1</sup>

**Abstract** The problem of alternatives starts from the epistemological difficulties faced by humans. People have a Janus attitude towards reality and they arrive to know it starting from this bivalent position. On the one hand, they see *what is*, clearly, what is “before their eyes”. Hence, alternative thinking seems absurd: dissonant with reality, illogical, not necessary, even harmful. On the other hand, they see that the existence has problems, *is contradictory*, the determinism of things is not always consistent, necessary and exact, but also vague, with random aspects, evanescent. The worrying contradictions are obvious, even if not very clearly. And from here, the thinking of alternatives seems natural, ordinary. How much and how to think alternatives depends. The weight of the two positions depends on the direct and indirect experience, so also on education.

Which face of Janus is better? Neither, but both. Both constitute a unity, although it is a unity of contraries. This paper tries to show the birth of alternatives with a logical key. Firstly, the problem of alternatives as such relates only to the human actions and decisions: including to the process of knowing that mediates the decisions to approach and imagine the inorganic determinism as well as the non-human living determinism. Therefore, *descriptions* and the *genesis of alternatives*, the differences between the *referent* and the alternatives, and between the individual and the collective referents and alternatives, the problem of *the known* and *the new*, truth and alternatives, the *question* as openness to alternatives, *counterfactual reasoning* and *hypothesis*, *abductive reasoning*, the *paraconsistent logical presumptions* disciplining the formation of knowledge and alternatives, the alternatives without which the *critical spirit* as such does not exist (and the various logical fallacies supported by those who oppose both the critical spirit and the alternatives), the logic of *conclusions all the way to the end* (*anticipation* and alternatives), the *epistemic* and the *logical corruption* negating both the logic of description and the logic of alternatives – are the main facets posited here.

We can finish this abstract not by mentioning the final model of *parrhesia* and

---

<sup>1</sup>Division of Logic, Methodology and Philosophy of Science, Romanian Committee of History and Philosophy of Science and Technology, Romanian Academy. E-mail: [ana.bazac@hotmail.com](mailto:ana.bazac@hotmail.com)

the logical urge to not be afraid of alternatives, but by confessing that one of the reasons of this paper was and is the vastness of the *concepts–criteria* lying in the background of the explanation of alternatives, as a result of the mistakes done by both the individual and society: *the irreparable, the irreversible*. It is these concepts–criteria that generate the urgency of alternatives. At their turn, these ones can be either *ameliorative* (avoiding the necessary transformation, as we see in the present official approaches of ecological problems) and *transformative*. In the creation of both, the epistemological, psychological and social aspects intertwine. We can better understand this by responding to the challenge to make exercises of “what if?”. These exercises always suppose the deeper awareness of things, the looking at this attempt from the outside, as if we were another person.

**Keywords:** alternative, logic, description, criteria, truth, knowledge, the new, question, what if?, critical spirit, anticipation, epistemic corruption, abductive reasoning, *parrhesia*.

**Rezumat:** Problema alternativelor pleacă de la dificultățile epistemologice cu care se confruntă oamenii. Oamenii au o atitudine Janus față de realitate și ajung să o cunoască pornind de la această poziție bivalentă. Pe de o parte, ei văd ce este, în mod clar, ceea ce este „în fața ochilor lor”. De aici, a gândi alternative pare absurd: disonant cu realitatea, illogic, ne-necesar, chiar dăunător. Pe de altă parte, ei văd că existența are probleme, este *contradictorie*, determinismul lucrurilor nu este întotdeauna consecvent, necesar și exact, ci și vag, cu aspecte aleatorii, evanescent. Contradicțiile săcâitoare sunt evidente, chiar dacă nu foarte clar. Iar de aici, gândirea alternativelor pare naturală, obișnuită. Cât și cum să gândim alternative, depinde. Ponderea celor două poziții depinde de experiența directă și indirectă, deci și de educație.

Care față a lui Janus este mai bună? Niciuna, ci amândouă. Ambele constituie o unitate, deși este o unitate a contrariilor. Acest material încearcă să arate nașterea alternativelor cu o cheie logică. Întâi, problema alternativelor ca atare se referă doar la acțiunile și deciziile umane: inclusiv la procesul de cunoaștere care mediază deciziile de abordare și imaginea a determinismului anorganic și a determinismului viu non-uman. Prin urmare, *descrierile și geneza alternativelor*, diferențele dintre *referențial* și *alternative*, și între referențialele și alternativele individuale și colective, *cunoșterea și noul, adevărul și alternativele, întrebarea* ca deschidere la alternative, *raționamentul contrafactual și ipoteza, raționamentul abductiv*, prezumțiile logice *paraconsistente* care disciplinează formarea cunoștințelor și alternativelor, alternativele fără de care *spiritul critic* ca atare nu există (și diferite erori logice susținute de cei care se opun atât spiritului critic, cât și alternativelor), logica concluziilor *până la capăt (anticipare și alternative)*, *corupția epistemică și corupția logică* care neagă atât logica descrierii, cât și logica alternativelor – sunt principalele fațete prezentate aici.

Putem termina acest rezumat nu menționând modelul *parrhesiei* și îndemnul logic de a nu ne teme de alternative, ci mărturisind că unul dintre motivele acestei lucrări a fost și este vastitatea *conceptelor-criterii* situate în *arrière-plan*-ul explicației alternativelor, ca urmare a greșelilor făcute atât de individ, cât și de societate: *ireparabilul, ireversibilul*. Tocmai aceste concepte-criterii generează urgența alternativelor. La rândul lor, acestea pot fi fie *ameliorative* (evitând transformarea necesară, *asa cum vedem în abordările oficiale actuale ale problemelor ecologice*), cât și *transformative*). În crearea ambelor, aspectele epistemologice, psihologice și sociale se întrepătrund. Putem înțelege mai bine acest lucru răspunzând provocării de a face exerciții de „ce-ar fi dacă?”. Aceste exerciții presupun întotdeauna conștientizarea mai profundă a lucrurilor, privirea la această încercare din exterior, ca și cum am fi o altă persoană.

**Cuvinte-cheie:** alternative, logică, descriere, criterii, adevăr, cunoaștere, noul, întrebare, ce-ar fi dacă?, spirit critic, anticipare, corupție epistemică, raționament abductiv, *parrhesia*.

## Introduction

### *Captatio benevolentiae*

Although the question in the title is familiar from discussions on *past* history, speculating on possible events/courses of action “if” certain x, y, z aspects/causes would not have been, it is revealing for the manner in which knowledge occurs and, even more applied, for the permanent presence of the alternative in science and technology.

Indeed, the formula of the alternative (“*if*” – verb in conditional perfect mode / past perfect tense, “*then*” – verb in conditional perfect mode / verb in past perfect tense) was proposed first in the reflection on history, in its multiple form, including ironical<sup>2</sup>, belonging to Pascal. “If Cleopatra’s nose had been shorter, would the entire face of the world have changed”<sup>3</sup>: namely, 1) “all is random, since, look, the struggle between Antonius and Cezar took place only to conquer Cleopatra and the Romans would not have wanted to remain in Egypt/the war in Egypt would not have taken place, nor the Roman Republic would have ended if . . .”; 2) “there is, therefore, disproportion between causes and effects”; 3) “accidents are more important in explaining history, therefore always some persons<sup>4</sup> and their game starting from their individual universe are the root. The idea of alternative is, here, only implied: in fact, the alternative seems here an *impossible possibility*, if I may use this oxymoronic wording: possibility is just a fantasy since it is not abstractions such as economic and political logic, but the reality of individuals with their personal characteristics, therefore the eventual and the unforeseen – and the unpredictable – are what explain the world. The conclusion is that there is no sense in imagining alternatives: everything is a series of eventualities “exactly as they had to be and as they must be”. The historical explanation – that entails, as we know, imagination as well – is the absolute opposite and exterior to the formula “what if (there would be / would have been)”.

And nevertheless, this model of judgement from the ancient historiography is invalidated from the very start even by the *process of knowledge*. People are interested in understanding the object on which they focus: they pursue the truth (always expressed by way of judgements / sentences) concerning that object, from the point of view of the position / perspective from which they view it. The example I have given on other occasions, of the primitive man in front of a bush whose leaves are moving, is very clear. The circumspect man quickly thinks about the possible cause of the leaves rustling: wind, a big or small animal, a man hiding etc. and, of course, he has already outlined his possible behaviour faced with the different variants. Then, he excludes the variants that do not reflect the current situation. Here, truth is just one. But the man in the previous example, as well as men in general knew and know that there are, in principle, also other variants, also other truths.

### Introducing the hypothesis

The hypothesis proposed here is that, even though the manner of thinking<sup>5</sup> “what if (there would be / would have been)” is *natural* – i. e. *integrated* in the human thinking,

---

<sup>2</sup>Because the context of the formula did not refer to history.

<sup>3</sup>Pascal, Blaise. *Pensées* (1670), Léon Brunschvicg éditeur, 1897, Ebook Samizdat, 2010. p. 42.

<sup>4</sup>These persons are mostly part of the leading categories (or aim to belong to such categories). See the historical “solutions” of marriages between royal houses. But see, nowadays, the mainstream idea infused in the general spiritual atmosphere of the appearance (behaviour) of political characters as explaining the political struggles and their purpose: therefore, as giving political objectives (changing X political personage with Y etc.; but not changing the political line).

<sup>5</sup>*The pattern, the motif, the figure*: are as many concepts defining the manners of thinking as thought models (logical structures).

therefore in the common thinking, so that it is interconnected with its other figures, all closely interdependent – it is, however, manifesting depending on its exercise: namely also depending on the way it is formed, educated, including together with other patterns of thinking. If all these are developed, educated within the individual, they – and here the motif “what if (there would be / would have been)” is what interests us – are or become normal, simple habits. The conclusion proposed, but not developed, is that the alternative and the logic of the alternative, specific to sciences in general, are common in natural sciences and technology, however less so in some social sciences. This split – epistemologically explained by the weaker (or indirect) interposition of the social conditioning of knowledge between researchers and the matter investigated in natural sciences and technology – was also transposed into the late stage in which people consider the possibility of alternatives when solving social problems.

The outlined response to the above-mentioned hypothesis is a multi-step reasoning. It refers to the *logical structure* of thinking only in relation to its goals / functions: of adapting the human being to the world or in more clear terms, of achieving the viability of human beings into the world. And this viability means not only survival but also *human* development and control of the world.

And the logical structure is discussed in connection with the paradigm of logic as “theory / normative science of rationality”, that confers “norms and criteria intervening in the assessment of validity or of the correctness of logical interferences”<sup>6</sup>. Of course, we all differentiate between logic as science, scholarly discipline and, on the other hand, the “logic of things”. And this last phrase refers to both the objective causality of phenomena and to the manner of understanding objective interdependencies that reveal causality. Finally, interdependencies and causality are not mechanical but “play” around the processes noticed in the form of concepts of stability and change. All these processes are known, assessed and generative for knowledge with the help of / through the logical framework of thinking.

## The alternative in the birth of thinking

### Description

First, we must question even the first thesis (hypothetical, as we remember): is the motif “what if (there would be / would have been)” natural?

The human thinking, as we render it in one individual person or in a theoretical model, also somewhat reiterates phylogenesis: it was formed as a reaction of the organism to the environment and as a viability of this reaction. In this process, above all it is important to notice the environment to which the organism must react. In logical terms, this need for noticing was transposed into *reflection* or *reflective* thinking. Its importance is visible not only when confronted with reduced levels of attention and of noticing elements from the reality which are of interest in a discursive framework. The first action of methodical development of thinking in primary educational institutions considers the ability to *describe* things. (“What is the object like?”, “What do we see in the picture?”)

The description or reflection is, indeed, a *faculty*, an *ability* of thinking. It is a first manifestation of *intelligence*, namely of the ability to *connect* to things and to connect them or, in more detail, of the *composed* ability of *discerning* or *separating* between aspects and *uniting* and *connecting* them. Of course, this composed ability is formed in relation to the world or the information about the world: the more colourful, numerous

---

<sup>6</sup>Mircea Dumitru, On the Normativity of Logic, in *Normativity, Acta Philosophica Fennica, The 2019 Entretiens of Institute International de Philosophie*, Ilkka Niiniluoto & Sami Pihlstrom (ed.), 2020, pp. 51–66 (64).

and more diverse they are, the more a baby learns to consider them as a whole, the way the parts connect, the different qualities or aspects coming together as a coherent whole. And throughout this entire process, the number of words increases as does the *methodological* baggage of complex networking thereof. Mature individuals who lack a comfortable vocabulary and who lack the semantic property of words – so, using words incorrectly – were deprived precisely of the proper education to describe reality. And if description is precarious, including through a poor number of words, then their internal image concerning that reality is also superficial. That is to say, reality is a cliché for these individuals, or more realistically speaking a set of clichés which they use when they crystallise their reactions or attitudes<sup>7,8</sup>.

A description is not, however, perfectly synonymous with reflection. Not only because reflection is *not* a copy of reality, but a mental processing of the elements of reality and as appropriately as possible to the need to react in a suitable and efficient manner – an extremely clear idea from Kant onwards –. But also, because, even though reflection as such is *ultimately* made only through articulating the mental images, description involves language in a direct and *sine qua non* way, namely the individual self-censorship of the language or descriptive discourse. We do not refer to self-censorship involving, for example, the omission from discourse of certain known aspects, present in the mental picture. But again, and somewhat paradoxically, we refer to the fact that if an individual does not have enough words to employ logically in the description of connections, he is unable to describe these connections, and the picture described is sketchy: namely the individual is, obviously, the one using the words and forcing himself to describe what he *seems* to catch a glimpse of – what he intuits or believes he intuits – but we can also say that his diminished language is the one framing, censoring his description. As such, it is possible that the mental reflection has a richer *potentiality*<sup>9</sup>, but if it is not *actualised*<sup>10</sup> in description, the result is poor. In this respect, the mental reflection remains dependent on the capacity of its development through language: judging potentiality without the criterion of actuality is meaningless, as Aristotle considered.

## The generative power of description

The description is not a copy, but it must be as vivid and as adequate for reflection as possible, so that to be as correct as possible. But then description itself is less blameless in its “neutrality” of reflection because, *on the one hand*, it can create and strengthen the logical pattern of copy: “this is reality”, “therefore, the respective description is the only true one”, “therefore, we must judge and act only based on it”.

In the scientific research, this logical pattern is transposed into the beautiful model

---

<sup>7</sup>In connection with this aspect, Hegel wrote “Wer denkt abstrakt?” (1807), G. W. F. Hegel, Werke in zwanzig Bänden, Frankfurt am Main, Suhrkamp Verlag, 1970, 2 Band (Jenaer Schriften – 1801-1807), pp. 575-580: people who think abstractly do not perceive connections between things, they only label them according to a chosen determination. (AB: in fact, determinations are formed by education in the broad sense of the term, namely by social messages as well as their influence).

<sup>8</sup>In logical terms, a cliché is a description confusing the contextual nature of the truth value of propositions (the fact that something is designated at a certain time or period of time) with the eternal or constant nature of the truth value of propositions (the fact that something is designated, irrespective of time). People who think in clichés do not indicate temporal (and spatial, and we also mention social) operators and they reduce the multiple meanings of terms related to names (therefore to the designed things of names) to some or to just one only. A cliché is, in general, a verdict.

<sup>9</sup>This is the aspect referred to by people who explain intuition as an “alternative” to reason: that man can know “also in another way”, by intuition. Actually, and referring here only to the logical level, intuition is based on previous knowledge acquired: through emotions and rationally. Intuition is a short, synthetic (and, of course, selective) present form of previous knowledge.

<sup>10</sup>Therefore, we use Aristotle’s terms of potentiality and actuality.

of *normal science* (Kuhn) or of the *Apollonian knowledge* in Blaga<sup>11</sup>, and also into the ugly model of false research, of pointless amplification of articles and studies which add nothing to knowledge and only produce noise, counterproductive to knowledge, and even untrue knowledge<sup>12</sup>.

*On the other hand*, a description is not neutral. Only abstract logical models, or more correctly specific models referring to precise aspects of logical thought structure abstract from the *open* nature of descriptions, that is from the richness of inaccuracies which they themselves highlight: in the form of opposites and contradictions. So that: a *description* actually *generates judgements on itself*.

This creativity of the description manifests itself multilaterally. It is easy to see that a description can be considered a thesis that, possibly together with another description (another thesis), generates a conclusion. Logic called this inference – that always leads, therefore, to a conclusion – a syllogism. At *methodological* level – that is, at the *meta* level included in the logical structuring – description conclusions can be of different types, including concomitantly, i.e. generating different types of theses or conclusions.

Some can be *prescriptions*. These are conclusions which require, oblige. (In modal logic, they work through operators such as *it is mandatory* and *it is allowed* – together with their negative variants, of course –).

Other conclusions can differentiate between reality – irrespective how we define it here<sup>13</sup> – and discourses on it, namely exceeding the description of reality or of the situation by *modulating description by adding the doxastic specificity*. In other words, if descriptions of the situation use (classical) propositional logic (“x is so etc.”, together with invalidations and confirmations given by direct descriptive sentences with respect to the physical and logical possibility), doxastic specifying conclusions evidence that they refer to the *opinions* (*doxa*, Gr.) *about* the sentences and, basically, about the situations described by those sentences. (This type of conclusions is very Kantian but, as we can see, *on the one hand*, many people tend to ignore that in their descriptions it is always about the perspective of the person who describes or, more correctly, about a certain theory sustained in the opinion and, *on the other hand*, they tend to consider that opinions are identical to reality, that they render reality).

Also, at methodological level, some conclusions can generate *interrogations*. The main interrogation concerns the *causes* of the described situation / of the description. As such, descriptions are followed by *theories*: developments of reasoning (based on experiment in the broad sense of this word, but here we are not interested in how to substantiate reasoning) about the causes of phenomena. However, since phenomena are complex and the (noticed) causality is complex, theories themselves are *criticised*, namely *analysed* in terms of the correspondence between them and the existing information regarding the studied phenomena – or, simply put, the systems – and, therefore, from the point of view of their internal logical coherence. The criticism of theories is a form of supervision starting from their *description*.

Consequently, the descriptions of theories from these points of view can generate

---

<sup>11</sup>Both models envisage research within a paradigm: namely a general theory, concerning laws or general rules; the paradigm is a general framework for a research programme. In this framework research is fruitful, it creates n solutions/theories for n problems, proving the paradigm. But the logic of research can also lead to disproving not only certain solutions or theories but even the paradigm itself.

<sup>12</sup>John Ioannidis, “Why Most Published Research Findings Are False”, PLOS Medicine, 2 (8), 2005, e124.

<sup>13</sup>Defining reality can emphasise the ontological aspect (posited by questions as “difference or overlapping between reality and existence?”, “between real and virtual?”) or the gnoseological aspects (as “reality is what it is noticed, interpreted and experimented by the subject”), however they are intertwined. In this text, reality is considered in its operational sense of referent of thinking. In this sense, the alternative – the hypothetical structure, the hypothetical existence (not virtual, but hypothetical) - is also a referent of thinking.

conclusions which *invalidate* the theories. Of course, there are different degrees of invalidation, but what concerns us is that descriptions can generate new or alternative *hypotheses* to the criticised theories. “There you go, according to its description it is clear that theory X is not working, therefore it is better to change it, and change is always based on another hypothesis (to be demonstrated etc.)”.

In summary, we can remember that descriptions start from *questions* and take the form of *reasoning* seeking to clarify / understand a fact: that inherently is always inserted in the conditions taken into consideration. Reasoning is – no matter how limited a man’s attention on a fact and its close conditions – always generating new questions; because pursuing the causes, consequences and multiple conditions of a fact evidences their always expanded and rather grey area. The epistemological condition of new questions is given by the need to color the unknown / to give it contents in this growing space of problems.

## How alternatives appear

People know starting from ignorance / non-science. From an epistemological point of view, there are two aspects of the transition from ignorance to knowledge.

*One* is that of the already existing some knowledge. A newborn stores information about his environment. The *multiplication* of such information allows their connection and, later on, inferring within them. But the conclusions of inferences are not only mere connections of known information, because inferences as such are not made only to connect known information. In fact, their role is to *understand*<sup>14</sup> new things and, therefore, to reach new information. In other words, knowledge is not only the *connection* of information, but the *creation* thereof<sup>15</sup>.

More specifically: people know starting from the known, i.e. they relate the unknown to what they already know. They *compare* the unknown to what they know, they see the

<sup>14</sup>The meaning is not the referent. In logic, the referent is the object which thinking refers to, of course not only as a material object. (The referent can be the idea of ..., formula ..., theory ..., music, sound, colour etc.). Meaning is the idea about the referent as it is following the understanding, namely after noticing also the mental processing of the envisaged reality. That is to say, pursuant to the connections between different aspects (“mini-ideas” or constitutive ideas in the thought process concerning the referent). In Frege (1892) there is a distinction between signification and meaning. Interpreted more freely, therefore starting from Frege but going further, signification is the particularity of the word to refer, the correspondence between the word and the referent, i.e. it refers to and is determined as a discrete unit (the correspondence of a word, or more correctly, of a name/of a denomination, with a referent); meaning is what words express, and this power of expression is given by the connections between words and arises from the correlation of the subject’s intention in his relation to the world or, more precisely, to the referent, with the connections between words.

This reference to Frege is not meant to complicate things pointlessly. The idea about or the signification is precisely the meaning, the connections and the correlation of intention with signification; therefore, as we have seen, meaning does not exist unless signification exists, the correspondence with the world. (Mind you: “correspondence with the world” does not mean only the material world, but also symbols, ideal systems of relationships built in the mind).

People noticed this. When they ask the question “what is the sense of saying idea X?”, idea that is untrue, namely it does not correspond to reality, they do not ask about the connection between words but about the correspondence to reality.

Meaning is dependant on signification, namely the subject’s intention is always related to, and depending on the world. So that there is no sense (purpose, meaning) in believing that meaning was something so profound that it cannot be expressed: connections between discrete units can be expressed, seen, and the relationship between these connections and the subject’s intention, i.e. meaning, depends on the world which the phrases refer to. If we analyse this world and the manner in which intention occurs (intention is, ultimately, of grabbing the world, of understanding it), meaning seems to be deciphered.

<sup>15</sup>In this respect it was said that the most important problem in logic is demonstration. See Dragoş Popescu, „Demonstrația matematică și demonstrația speculativă. Linii de orientare” [“Mathematical and speculative demonstration. Guidelines”], Probleme de logică [Logic Puzzles], volume XX, Coordinators: Alexandru Surdu, Dragoş Popescu, Ştefan-Dominic Georgescu, Bucureşti, Editura Academiei Române, 2017, pp. 127-137.

similarities, differences, degrees of similarity and differentiation. The comparison activity *mediates* between the known and what must be known. As such, the unknown becomes known, familiar. And as a result, the known not only broadens, it also increasingly becomes the *basis* or the *criterion* or the *referent* depending on which the child / man knows. “Reality” is what it is known, what can be described. On a more sophisticated level, the image or the description that corresponds to the individual’s knowledge (to the information known and also to the level of its connection) becomes “paradigm”; on a more colloquial level, an individual’s image or his “theory” becomes a fixed idea.

More seriously, all these mean, once again, that, *on the one hand*, knowledge – namely reducing the unknown to the known – always has grounds, and the grounds always offer a first *certainty*; just as, *on the other hand*, it is possible that the grounds and the related certainty to be conceived in an absolute manner, i.e. the process of knowledge is impaired by the idiosyncrasy of the individual towards the inferential logic that can call into question the “reality” or the theory. However, the known is not a dogma in the usual sense of this word – of fix / fixed knowledge, considered in non-critical terms<sup>16</sup> – but it is always simply a structure of knowledge that determines its critical examination from itself, therefore, a horizon of possible changes. And a change is always a first moment when both the previous knowledge and the doubt in relation thereto coexist. [This coexistence gives the meaning of the word *dogma* in Blaga, *methodologically* signalling

- both the coexistence of different and opposing data (previous knowledge and doubt concerning it, therefore, let us say, a first negation, emotional and raw, of them) defying the binary logic of non-contradiction
- also the revolutionary quality of certain moments of knowledge where results (concepts, theories) are not clear but, rather, *a halo of possibilities*<sup>17</sup>. Knowledge is an *open* process: analogous to life (living matter and consciousness).

Hence, the more man compares, and also between unrelated aspects, therefore, the more unusual the comparison is, the more the existing knowledge has the role of humus for knowledge, that is to say for the emergence of new knowledge.

*The second* aspect in the transition from ignorance with respect to certain new phenomena to knowledge is the *assumption*, namely either a reduction of the new to previous knowledge (the new is as the previous or as if it were the previous), or a boldness of the imagination, so a different image (we are not interested here how much, how, in what way the new image is different).

An assumption is not easily outlined. Considering the fact that a man can see / feel that, despite similarities with the old knowledge there are also new elements, relationships, details, he becomes circumspect both towards these and towards the relation between them and the entirety of the new phenomenon. After circumspection, he presumes

<sup>16</sup>As regards the field in question here, that of the logic of knowledge, the concept of dogma – in the above-mentioned sense, of fixed knowledge, considered in non-critical terms, e.g. considered as an axiom whose demonstration is not required (even if possible), or considered as a non-questionable basis – was used in the well-known idea of Munchhausen’s trilemma: which describes three proving possibilities, all similarly unsatisfactory. The trilemma is the formulation of these proving methods, unless mentioning the methodological conditions or premises according to which we approach the demonstration/proving of any truth. If these methodological premises or conditions are absent, then some propositions/arguments end up being proven circularly (namely, ultimately by themselves), either by way of propositions which themselves must be demonstrated, in an infinite regress, either by way of dogmas.

<sup>17</sup>Ana Bazac, “Lucian Blaga and Thomas Kuhn: The Dogmatic Aeon and the Essential Tension”, *Noesis*, XXXVII, 2012, pp. 23-36.

The concept of halo of possibilities is related to the concept of unclarity/vague of L.A. Zadeh (1965; but “Quantitative Fuzzy Semantics”, *Information Sciences*, 3, 1971, pp. 159-176: senses or meanings are vague); or to the concept of nuances of Grigore Moisil (*Lecții despre logica raționamentului nuanțat* [Lessons on the logic of nuanced reasoning], Bucharest, Editura Științifică și Enciclopedică, 1975).



that there is a specificity of the new phenomenon, suspecting the previous definitions or that the new could be subsumed to those previous definitions. He *doubts*, grumbles, speaks against, “gets upset” with the previous knowledge: even if it turns out that it helped him to catch a better glimpse of the new. And he even goes further: *he imagines*; by extrapolation, projection, approximation, estimation, calculation. He speculates, he guesses. The more information he has, the more used to making connections he is, the more possibilities appear before him<sup>18</sup>.

The simple negation – if we logically connect the *previous knowledge* and the yet *new unknown* (as the negation of the old) – is no longer sufficient. Each newly observed particularity, thus different from what he had previously known, pushes him to imagine new knowledge. With each such construction of knowledge, the negation / non-contradiction applies: the new is not the old. Or in more detail: 1. the new could be like the old; 2. but the new does not overlap perfectly to the old; 3. thus, the new is not the old. And since the new has more particularities, if in connection with each one the logical law of non-contraction is applied, the *global logic of the degrees of possibility* (from non-possibility to necessity) applies to the global new. In a meta-logical approach, this is the logic that reveals the entire spectrum from non-certainty to certainty.

Such logic was named *aoristic*<sup>19</sup>, regarding *undetermined* situations. It confronts, for examination purposes, all possibilities, i.e. all the imagined *alternatives* to know the new phenomenon. After such examination, logic selects the most plausible alternative – or even the most plausible alternatives, in an image of degrees of plausibility. Technically speaking, this logic can use *several values* (truth, false, possible, probable, impossible, improbable, undetermined<sup>20</sup>). Anyway, the logical inferences that transpose, in fact but philosophically speaking, the principle of sufficient reason – as Schopenhauer called the logical examination of causality in the order and knowledge of things – highlight precisely the possibilities given by the notified causes. And until the evaluation of the most probable situation, all (as possibilities) are equivalent: this is required by the rigor of the logical method.

Just the assumption involves the idea of *alternative* and the idea of using the alternative as *hypothesis*: hence as a thesis that is not (relatively) certain knowledge, but only possible and that, therefore, must be demonstrated. The intertwining and interdependence of these two ideas are constitutive in the human thinking<sup>21</sup>. At the level of discourse – in the mind and expressed – they are formulated with the well-known question: what if? From this point of view, any knowledge implies that “what if” question, both in relation to the present time to which both science and technology refer, but also to the past time to which their philosophy rather refers.

## Alternatives to what

The idea of alternative and the logic of alternatives are related to the sensitivity of *always noticing the difference between the object concerned and the thinking about it*. In an evocative image of ancient Chinese wisdom, people notice – or should notice – the difference between the finger pointing to the moon and the moon itself. But this means that, since there are two problems to be known, the object and the theory about it, alternatives exist for both of these problems. If we do not know – or, of course, do not

<sup>18</sup>An interesting page on the process of imagining the future with Lucio Giuliadori, Valentina Uliumdzhieva, Elena Notina, Irina Bykova, “Thinking Beyond, Living Beyond: Futurism”, *Wisdom*, 2 (15), 2020, pp. 176-187

<sup>19</sup>Alexandru Giuculescu, Order Versus Chaos or the Ghost of Indeterminacy, World Congress of Philosophy, 1998, <https://www.bu.edu/wcp/Papers/Scie/ScieGiuc.htm>.

<sup>20</sup>Thus, not only that famous included third.

<sup>21</sup>This paper does not discuss the continuity between pre-human and human thought.

know as much as we need to know, as much as displayed precisely by what we have already known – we must assume the degree of ignorance and, at the same time, outline alternative theories both about the object, and about the existing theory about it.

But the object as well as the theory about it raise problems and can be studied from  $n$  points of view, *i.e.* not only that there are  $n$  unknowns but also  $n$  points of view. Isn't this an image of an infinite task of leaning on determinations, too overwhelming? Can we take it?

Yes, we can. Knowledge is good for us, that is, it simplifies the object – apart from any reductionism – it shows it to us as *approachable, cognoscible*. How, why? The unknown is an unsolved puzzle, disorder that leads to cognitive resignation. Still, we have not forgotten, man knows by comparing things with what is already known. And in this process, we go step by step on the thread of connections between things. These connections are inferences. They can only describe – “all men are mortal, Socrates is man, etc.” –: this is how it seems to us, that is, it seems to us that we are only describing reality. But in fact, the description is already the unfolding of *causality* (“Socrates is mortal because...”).

Since things are complicated, we do not easily reach the causes. And before noticing them, we grasp the close connections, the *correlations*. As stated in the epistemology of the second half of the last century, *correlation does not mean causation*. So, the fact that things are close – or at least they appear so in what we know, thus, in (at least some) discourses – does not automatically mean that some things are the causes of others. *Causation must be demonstrated*. And precisely *this demonstration is knowledge*, its core.

And in demonstration we start, as we have seen, from correlations. These draw our attention on the very problem itself and, of course, on the necessity to study them. Examples referred to in other papers – “the rooster crows, the sun rises”<sup>22</sup>, “the bad apple spoils the bunch”<sup>23</sup> – show abundantly clear that close connections between things should not be ignored.

The sun does not rise because the chicken's emperor crows. The conclusion is not at all the consequence of the premise. But the premise is related to the rising of the sun, even a consequence of the rising sun: the circadian rhythm of the rooster is connected to the night – day / darkness and light alternation. The theory of the circadian rhythm was, thus, demonstrated: a theory that has nothing to do with the thesis that only saw the correlation (“the rooster crows, the sun rises”), it even invalidates this thesis, but it was constructed also pursuant to the correlation. The bad apple spoils the bunch of good apples not because of an evil principle carried by it, but because it emanates chemical signals reflecting its stage of transformation of excessive ripening into rot; and these signals are also emanated to the other apples, as if to communicate to them that it is time to become more ripen. The correlation evidenced by experience and related to the practical problem of storing apples was used to discover the causes behind the correlation.

## Precautions

### The ontological precaution

The idea of alternative is not absurd, that is, it does not refer to something that does not support it. From this point of view – and without detailing too much here – we should

---

<sup>22</sup>Ana Bazac, Logica și interesele de clasă [Logic and class interests], 20 April 2020, <http://www.criticatac.ro/logica-si-interesele-de-clasa/>.

<sup>23</sup>Ana Bazac, “From the Objective Information to the Information Created and Received by the Human Beings: And What Does Informatonosis Mean?”, Noema, 2018, pp. 15-47.

distinguish between what the existence of alternative *allows* and *what it does not allow*. Although all ideas involve the mental processing of the data provided by the senses, so although the ideas are not simple copies of reality, they have *referential*, *i.e.* they depend on the intended reference, because otherwise they *do not make sense*, nor do they appear. The reference is the one that gives the criterion of distinction between those who support and those which do not support the alternatives.

Natural phenomena are a referent that does not support alternatives. In what sense can we take this sentence? Physical natural phenomena are *determined* – that is, their existence and movement have inevitable, permanent, and necessary structural *causes*, already known / cognoscible, in principle, according to the laws of nature obtained by analysing the physical, chemical, even biological processes. But the determinism of phenomena involves precise *aspects*, precise *characteristics* that have *precise* physical, chemical etc. causes. For example, the erosion of rocks over time involves physical causes (heat-cold alternation, the rhythm and intensity of this alternation; precipitations, their rhythm and intensity are also cardinal, or in general, weather phenomena such as precipitations and wind), chemical causes (type of chemical reactions between external substances depending on the type of precipitations, the rock material and catalytic physical conditions), and biological causes (type and evolution of micro-organisms and plants in relation to rocks). Determinism – knowing the causation – is never absolute because the above causes have intertwined, and time is a coagulant condition of this interweaving; and if it is, nevertheless, necessary to know the phenomenon in detail, calculations, models, projections, measurements are made. Alternatives appear, of course, in the process of *knowing* the moments, but the natural physical *causation* does not imply alternatives. No matter how complex the natural phenomena – like the ecological ones – the causes of the different *aspects* or *characteristics* are determined *each individually*, as *permanent*, *structural* to each aspect or each characteristic. From a logical point of view, the reasoning that ignores logical necessity (*as if* this logical condition would not exist) is not consistent; and the reasoning for explaining a complex natural phenomenon highlights the “*accidental*” only as a conjunction of the determining causes of the precise aspects, both in their present and past moments.

Alternatives appear only in the evaluation of *human action*. The specificity of this *referent* is that necessity or determinism in its knowing process is presented only as a *tendency*, not as a law, and that the accidental is the conjugation not only of other actions and, more broadly, events, but also of the will of the actors. But the referent is not the same as the idea of an alternative to it.

## The epistemological precaution

Once again, we must distinguish between the *creative role of the knowing subject* – the fact that all ideas appear in the human mind – and, on the other hand, the referent represented by the *human action*. Alternatives appear in the *knowledge* of both, but if we deal only with the referent, then we must make another differentiation: between *individual action* and, on the other hand, *collective action* or, even if they do not overlap perfectly, *collective events*, resulting from the aggregation of *n* individual actions.

Logic is related precisely to these different types of referent.

The idea of an alternative to an *individual action* – as suggested by the *post* reflections with “should have been” and “could have been” – is logical only if the action *is determined exclusively by the will of the individual* and not by the totality of events or other actions among which the incriminated action took place<sup>24</sup>. And, of course, the

---

<sup>24</sup>Plato. Republic, in Plato in Twelve Volumes, Vols. 5 & 6 translated by Paul Shorey, Cambridge, MA, Harvard University Press; London, William Heinemann Ltd. 1969, 619c; an individual who has no

idea of alternative always appears in relation to *one* action or to certain actions, not to the totality of that individual's actions. The logic of individual action is based on *choice*, this itself being a bifurcated position between several possible courses of action for the individual. But what does choice mean from a logical point of view? It means *comparing* the possible action variants to the best model: considered by the individual or, of course, by the judging subject or subjects. And although this "the best" is clearly subjective, in fact it is a *bar* (*i.e.* an ideal) or a milestone for *evaluating* action models from highly recommended to permitted and not permitted, according to a characteristic or an advantage / disadvantage in relation to the individual making the choice<sup>25</sup>. Basically, to choose means to be aware of the bar and to call "worse the life that leads the soul to more injustice, and better the one that leads it to more justice. . . not to be charmed by wealth, and other such evils and not to commit numerous and insurmountable evils" as a tyrant or something similar<sup>26</sup>. The alternative occurs when an action that took place / did not take place is attributable to the individual, namely the alternative appears as *mandatory*: precisely because the individual could have (from a logical point of view) easily replaced his choice with this alternative if he wanted to<sup>27</sup>.

Talking about the alternative on a collective level adds a necessary condition, time. The alternative to an individual's action seems rather for the past tense and, by translation, for the present tense and for the future, for it concerns the choice by the individual, *i.e.* the sole responsibility of the individual, regardless of other actions and events. The alternatives to collective actions no longer have the individual choice as a starting point, although this choice or this criterion is not missing. But the specificity of the choice in collective actions is the dependence on a large number of facts, events, actions. Therefore, the alternative (in fact, always in the plural) is not for the past, but for the present and the future. When the historical research investigates past events, it asks the question "what would be (would have been) if" only as a joke in connection to the reaction of some characters. In fact, it seeks to explain the succession and intertwining of different kinds of causes, and the result is a picture that fits into the broader picture of a wider period and trends.

If the logic of the alternative confronts choice or decision *and* the result, that requires analysis with the help of "should have", it is clear that the problem of the alternative is not for the *past* when it is *not* an individual decision but the *intertwining and corroboration of n facts and events*. But for the *present* and for the *future* the problem of the alternative arises because even if it is about collective facts and actions, the role of the individual decision is *constitutive, i.e. present and future facts can change depending on the individual decisions at present. The introduction of the possibility of the alternative no longer takes place with the past conditional tense but with the present conditional tense:*

---

the will to choose what he knows it is good from a human standpoint, has no ability to judge himself: "For he did not blame himself for his woes, but fortune and the gods and anything except himself". See also Plato, *Phaedo* in *Plato in Twelve Volumes*, Vol. 1 translated by Harold North Fowler; Introduction by W.R.M. Lamb. Cambridge, MA, Harvard University Press; London, William Heinemann Ltd. 1966, 99a and b: "If anyone were to say that I could not have done what I thought proper if I had not bones and sinews and other things that I have, he would be right. But to say that those things are the cause of my doing what I do, and that I act with intelligence but not from the choice of what is best, would be an extremely careless way of talking. Whoever talks in that way is unable to make a distinction and to see that in reality a cause is one thing, and the thing without which the cause could never be a cause is quite another thing".

<sup>25</sup>For some phenomenological aspects of choice, see Ana Bazac, "Sartre and the responsibility of choice", *Revue roumaine de philosophie*, 1-2, 2008, pp. 173-185.

<sup>26</sup>Plato, *Republic*, 618e ("naming the worse life that which will tend to make it more unjust and the better that which will make it more just"), 619a, ("but may know how always to choose in such things the life that is seated in the mean and shun the excess in either direction").

<sup>27</sup>Charlie Dunbar Broad, "Determinism, Indeterminism, and Libertarianism" (1934), in Charlie Dunbar Broad, *Ethics and the History of Philosophy*, London, Routledge & Kegan Paul, 1952, pp. 195-217.

“should”. *The logic is fine precisely because it notices the differences in the conditions of facts and actions.*

*Perhaps a proof of the finesse of logic<sup>28</sup> is the joke about logic, ending with the conclusion that only compliance with the form of inferences leads not only to an absurd certainty that has nothing to do with reality, but also to unfortunate consequences<sup>29</sup>. We could speculate that a subtext of the joke was the opening of logic to the integration of form and content and, thus, to the investigation of situations that can, of course, be captured in logical formulas but that show precisely the compelling nature of these formulas and the need to overcome them by developing logic, including in the unconventional manner of proposing alternatives.*

## The logic of the alternative

### The known and the new

Knowledge does not occur on *tabula rasabut* on an already complex basis, with  $n$  items of information and, therefore, perspectives about the world. As a result, the new is the result of an intertwining of causal chains (*the new is not the result of a single causal chain*), it involves  $n$  reverse (positive and negative) feedback, *i.e.* it appears only pursuant to such feedback that contributes to the creation of the new response and strengthens it; the new always involves the matter-information complex and the objective-subjective complex, and as a result of such a situation it is always linked to the whole of existence.

The scientific way – focused on the structures of relationships and elements, so on systems and functions – is not at all reductionist, simplifying. As mentioned above, especially through science the new is not the result of a single causal chain, it involves trans-/ inter- and multi- disciplinary perspectives plus complex teams. We do not start from the simple to reach the complex: the premises or hypotheses already have behind them a structural complexity of the studied system, and also a methodological complexity. The only reason of the metaphor “from simple to complex” is that, on the one hand, the theses from which they start are somewhat known and, on the other hand, the system resulting *pursuant* to knowing is clearer, its complexity is now clear and, inherently, greater than the complexity of the starting point. Today’s disciplinary perspective is always in relation – in fact, interdependent – with the multi-, inter-, trans- disciplinary perspective. And the objective of science to reach laws / regularities does not simplify, but only gives a *criterion* for knowing complex phenomena. This knowledge is the goal of science. Thus, *science is not a myth; it does not seek to draw a static picture that would be confused with the world.*

In the common knowledge the same understanding occurs: for things are complicated, apart from information, from a “theory” about the object of interest, there is something else. Thus, *on the one hand*, people still put this much more richer reality in parentheses beyond the object of interest, because this is the practical attitude; and *on the other hand*, they either go further around the object of interest to see other information and other theories about it, or they are stopping from going further from the dominant educational messages and constraints external to their need for knowledge and their human nature.

<sup>28</sup>But doesn’t this precisely mean the finesse of human reason?

<sup>29</sup>Ambrose Bierce, *The Devil’s Dictionary*, 1911: “LOGIC, n. The art of thought and reasoning in strict compliance with the limitations and inabilities of human misunderstanding. The basis of logic is the syllogism consisting of a major, a minor premise and a conclusion – as such: Major premise: sixty men can perform a work sixty times faster than a single man / Minor premise: a man can dig a hole in sixty seconds / therefore – Conclusion: sixty men can dig a hole in one second. This can be called arithmetic syllogism, by which combining logic and mathematics we obtain a double certainty and are doubly blessed”.

Of course, barriers are put in place in many ways, including by channelling thought in the directions necessary for the authors of the constraints.

From an epistemological point of view, knowledge advances in the direction of understanding complexity only if it always checks again the already existing theories. This means *concern for real falsification* (Popper), assuming the confrontation of existing theories with new or “unpleasant” data, and *the freedom of spontaneity* in choosing alternatives. Only after undergoing this process, do the new perspectives, through which we can see better the complexity of things, appear, thus the *new problems*, the new objectives of knowledge.

The alternatives respond to paradoxes, to the knowledge vacuum about an object of interest. At this level, we already see the difference between knowledge “from experience” – that does not open many alternatives – and scientific knowledge. What about that “experience”? Every man sees through the prism of his experience, therefore of his own particular. The difference is between:

- the scientific perspective or the *scientific level* – which, based on particular knowledge, with their inferences, comes to have a knowledge of what can be generalised / of the universal and, when analysing something (again, a particular) it confronts this one with the universals, i.e. it develops a theory of causality that goes beyond the particular causes of particular experiences – and
- the *particular empirical level* that does not go beyond the inference or causality related to the particular which it considers as a model or as the universal, the Truth.

The particular empirical level considers as a criterion of truth only its own “practice”, its experience. But in science, practice itself, experience, are *examined*, beyond the particular, with inferences in which the causality of different causalities is confronted, so with inferences involving the universal perspective; practice and experience are not considered unquestionable axioms. The alternatives appear in this examination space<sup>30</sup>.

*What would be (would have been) if?* Some cannot conceive that their example is not cannot be generalised or that it does not necessarily lead to the universal, to the valid universal conclusion. For this reason, they do not wonder what would have been; this is the mechanistic perspective: *starting from* particular examples *to* the rule that becomes the universal / the criterion/ the fixed *datum* / the reality. So, they do not imagine new hypotheses and “guess” the best theory after a small number of examples or by not even questioning the examples<sup>31</sup>.

Others, the contemplatives, believe that inferences exclusively from universal concepts and theories lead them to new / over / else knowledge; they do not question the universals, that is, they do not corroborate them with practical examples and, of course, with practical examples that are as different as possible; their logic is *monotonic*, meaning they are not looking for new knowledge or new examples to add something and possibly to invalidate.

---

<sup>30</sup>See the extremely clarifying Jeremy Shearmur, *Abusing Popper*, May 2021, pp. 7-12, <https://www.hpsst.com/uploads/6/2/9/3/62931075/2021may.pdf>, where Popper’s theory of falsification is explained as well as the philosophical context of the falsification of scientific theories.

<sup>31</sup>Immanuel Kant, *Critique of Pure Reason* (1781). Gruyer, P. A. W. Wood (Trans., Ed.). Cambridge University Press, 1998, pp. 268-69 “A physician therefore, a judge, or a statesman, can have many fine pathological, juridical, or political rules in his head, of which he can even be a thorough teacher, and yet can easily stumble in their application, either because he is lacking in natural power of judgment (though not in understanding), and to be sure understands the universal in abstracto but” cannot distinguish whether a case in concreto belongs under it, or also because he has not received adequate training for this judgment through examples and actual business. This is also the sole and great utility of examples: that they sharpen the power of judgment”.

On the contrary, from a scientific perspective, every detail generates a question and therefore, one or more hypotheses, anyway, new problems<sup>32</sup>. A way of seeing things *differently*, *i.e.* of outlining a problem, is also the critique of opposite theories and, paradoxically, the assumption of both opposites in a theory that does not necessarily refer to the subject of opposite theories but benefits from elements of both. For example, from the two opposing theories on infections – germ theory and terrain theory – a new theory<sup>33</sup> can assemble the problem of germ targeting *but also* the problem of strengthening the immune system of organisms. Just as, the correlation of perspectives studied for a long time separately – *e.g.* biology, chemistry, the theory of knowledge – leads to the emergence of a new perspective that, in its turn, is the basis of new theories which better explain phenomena (interdependencies and actions and reactions)<sup>34</sup>. Likewise, theories are overcome by highlighting, in the scientific research, situations different from those that formed (on) the basis of a theory; and the result is, again, a theory that shows the coexistence of situations in the first theory and in the second theory, as a result of complex conditions of evolution of these situations<sup>35</sup>. And, of course, the result of the research is, above all, the verification of old theories and the highlighting of some problems that only now must be investigated<sup>36</sup>.

In all these manners, the subtext is “what would be if?”.

## A moment on truth and alternative

Since the first reaction to the idea of alternative is that the existing theory is not true / the known is not (or no longer) true, let us quickly show that the relationship between truth and alternative is not so simple. And, of course, it is all the more complicated as it actually takes place through dialogue, where essentially opposite arguments take place. The logic of argumentation implies an over-approach of our problem, but which we do

<sup>32</sup>See à propos the current centre of interest (the pandemic, the virus etc.), rediscussing the problem of the origin of viruses (not in the political and geopolitical meaning): Robert O Young, *Dismantling The Viral Theory*, Jun 20, 2020, and references, evidencing the internal/from within the organism origin, from cells in the process of extinction; also see J. A. Steiner, E. Angot, P. Brundin, “A Deadly Spread: Cellular Mechanisms of  $\alpha$ -Synuclein Transfer”, *Cell Death and Differentiation* 18, 2011, pp. 1425-1433; R. Kakarla et al., “Apoptotic Cell-derived Exosomes: Messages from Dying Cells”, *Experimental & Molecular Medicine* 52, 2020, 16; D. Lucchetti et al., “Detection and Characterization of Extracellular Vesicles in Exhaled Breath Condensate and Sputum of COPD and Severe Asthma Patients”, *European Respiratory Journal*, Apr 1, 2021; 2003024; or László G. Puskás, “Nanobionts and the Size Limit of Life”, Anna-Teresa Tymieniecka, Attila Grandpierre (Eds.), *Astronomy and Civilization in the New Enlightenment*, Springer, 2011, pp. 225-228, indicating the extra-terrestrial origin.

<sup>33</sup>Let us not forget, all theories are historical: they reflect the level of knowledge at a certain moment.

<sup>34</sup>The communication of chemical structures – [proved by cognitive biology, Ladislav Kováč, “Life, chemistry and cognition: Conceiving life as knowledge embodied in sentient chemical systems might provide new insights into the nature of cognition”, *Embo Reports*, 2006, June, 7 (6), pp. 562-566; and see the studies concerning molecular recognition and adaptive chemistry], also manifesting in the entities between un-alive and alive states (viruses) and in living organisms, including bacteria – is the transmission and reception of chemical signals, of chemical relations noticed as signals. See Ewen Callaway, “Do you speak virus? Phages caught sending chemical messages”, *Nature*, 18 January 2017; Zohar Erez et al., “Communication between viruses guides lysis-lysogeny decisions”, *Nature*, 2017 January 26; 541(7638), pp. 488–493. And the use of bacteriophages in treating bacterial infections, Alan R. Hauser, Joan Mecsas, Donald T. Moir, “Beyond Antibiotics: New Therapeutic Approaches for Bacterial Infections”, *Clinical Infectious Diseases*, 63(1), 2016, pp. 89–95.

<sup>35</sup>Eric C. Keen, “Paradigms of pathogenesis: targeting the mobile genetic elements of disease”, *Frontiers in Cellular and Infection Microbiology*, 14 December 2012.

<sup>36</sup>Marcin F Osuchowski et al., “The COVID-19 puzzle: deciphering pathophysiology and phenotypes of a new disease entity”, *The Lancet*, May 6, 2021, pp. 1-20; Stephanie Seneff and Greg Nigh, “Worse than the Disease? Reviewing Some Possible Unintended Consequences of the mRNA Vaccines Against COVID-19”, *International Journal of Vaccine Theory, Practice, and Research*, 2(1), May 10, 2021, pp. 402-443.

not deal with here<sup>37</sup>.

First of all, the very truth of the existing theory is not – and is not considered by researchers to be – absolute and definitive. A theory is true if it answers to as many questions and counterexamples as possible for falsifying the theory, if it is empirically appropriate, and if its model is fruitful (translatable; that is, it allows predictions, as was long been said in the philosophy of science). But a theory is considered by researchers to be only a tool for tackling problems. This attitude towards the truth does not dissolve judgement milestones, the theories being such milestones. And obviously, it does not lead to relativism when valorising theories<sup>38</sup>. *Researchers do not confuse* the determined and contextual historical nature *of theories with* their truth value. No researcher / technician consider that the truth of the theories he works with would not matter<sup>39</sup>.

On the contrary,

- both the research and the practical application can be done only on the basis of the theory / theories assumed to be true,
- only these theories represent the basis / premise for criticism / analysis and denial / falsification,
- but, also, on this basis we get new information, which also require new processing, and that leads to new theories,
- theories that are denied / exceeded do not coexist within the same specialised time frame (e.g. molecular biology research of problem X is based on *the latest* theories of molecular biology about problem X),
- only in the *history* of science and technology do theories coexist, including from different time frames; they are not (necessarily) alternative theories, which means that alternative / competing theories take place in science (and technology) *only within the same framework*.

Historically, theories increasingly reflecting objective reality are increasingly objective. But their evolution is based on their acquisitions which are true, i.e. they have a high degree of *internal coherence and pragmatic correspondence*<sup>40</sup>.

In the same temporal frame and in the same field, the alternative can, therefore, be a hypothesis that does not change the paradigm – nor *Weltbild*, the representation of the world<sup>41</sup> – or it can even do so. It can be stated that the paradigmatic theories were the result – based on the examination of contradictions and problems highlighted by existing paradigms – of a construction with the subtext “what would be if?”.

<sup>37</sup>Constantin Sălăvăstru is an accredited specialist in this field. See only “Tendances actuelles dans la théorie de l’argumentation - Essai critique et systématique”, Noesis (Travaux du Comité Roumain d’Histoire et de Philosophie des Sciences), XXVII, 2002, pp. 13-45; Logique, argumentation, interprétation, Collection «Epistémologie et philosophie des sciences», Paris, Editions L’Harmattan, 2007.

<sup>38</sup>Here we are not discussing about value relativism in ethics.

<sup>39</sup>Just as no normal man believes that he can understand things, that is, to infer some things from others without the former being certain – within the temporal framework of his direct and indirect experience –. Prediction, that is considered an essential criterion of science and around which many theories about the validity of the scientific approach have been created – is integrated into the human thinking, and this integration takes place, at the level of logic, through inference. The inference involves interest for the conclusion, and the conclusion is an undetermined (future). The interest in somewhat determining the conclusion, by inference, is an interest in prediction.

<sup>40</sup>For clarifications on truth and content, see Ana Bazac, „Structuri de conținut în dezvoltarea comprehensiunii” [“Content structures in the development of comprehension”], Studii de epistemologie și teoria valorilor [Studies of epistemology and value theory], Volume VI, Coordinators: Alexandru Surdu, Marius Augustin Drăghici, Gabriel Nagâț, Bucharest, Editura Academiei Române, 2020, pp. 127-154.

<sup>41</sup>Boris Kožnjak, “Can there be a ‘scientific worldview’? A Critical Note”, *Filozofija i Društvo*, XXIV (4), 2013, pp. 19-29.



Finally, it would be interesting to note that the truth of some reasoning / “theories” – with and without quotation marks – is, logically, the result of the *logical construction* of the proof. Construction is the inference or connections from and between proofs – that is, from premises to the conclusion. Ultimately, the internal coherence of a reasoning or knowledge consists precisely in the form, in the structure of connections in relation to the proofs. This structure must not be deprived of any step of inference, precisely so that its result be clear: easier to reject, easier to confirm.

Simply, if we consider knowledge as a relationship, we retain the *information* (data, experience) – mental and practical *processing* – the *conclusion* (that is always a *model*); the *truth* that is dynamic / plural / historical)].

### **An *avant la lettre* questioning of the possible truth of the new, and of the alternative as well**

In the *Menon* dialogue, Plato confronted theories or arguments related to the possibility of knowing (that is always that of the new). Menon said it is impossible to know what we do not know, because we cannot see if we found it<sup>42</sup>. The argument is challenging for the logic of alternatives. There is no sense in asking “what if (there would be / would have been)?” because we cannot know if after thinking we also found that future. More technically, Menon referred to the fact that in inferences, *the conclusion* – if it is not known, that is, it is not clearly expressed – *can already be glimpsed*, because it is included in one of the premises (“all people are mortal / Socrates. . .”). Socrates answered with the famous thesis of knowledge as a recollection of the immortal soul. Of course, it is not the concrete content of the thesis that is important here, but the idea that human beings can know: and based on the logical patterns of thinking<sup>43</sup> and unfolding them spontaneously and creatively, unravelling the truth of things (Plato-Heidegger perspective) and creating it (Kant’s perspective).

### **The question as an opening to the truth**

Since the alternative arises from a question, we can remember – if we allow ourselves to take the Socrates-Plato perspective as a joke – that the entire knowledge is the result of questions. The description made by propositional logic (*We know that*) is, introduced with the ontological question *what is*, is developed and corroborated with the investigation of the description itself: *how is* and *why is*. Modal logic emphasises more rigorously the logical conditions of knowledge: that ontology can be possible / impossible, necessary / contingent, hypothetical or implacable (deontic), mandatory or optional, and of course that the picture is fuller when introducing temporal conditions (temporal logic is modal logic).

All variants of logical introduction of ontology<sup>44</sup> involve questions adequate to the conditions of *existence, property, relationship, negation, causes*. And among these latter, Aristotle’s famous question about telos (for what? / what is the purpose / finality / aim?; more freely, what is the *reason for being*?) is more edifying even for the other conditions and questions. The question concerning telos restricts the conditions for which questions are asked (in this sense, it is the most economical of the questions) and, at the same time, it is decisive in the bifurcation of the trajectories given by questions. Also, if all

<sup>42</sup>Plato, Meno, in Plato in Twelve Volumes, Vol. 3 translated by W.R.M. Lamb. Cambridge, MA, Harvard University Press; London, William Heinemann Ltd. 1967, 80d: “Meno: Why, on what lines will you look, Socrates, for a thing of whose nature you know nothing at all? ... Or even supposing, at the best, that you hit upon it, how will you know it is the thing you did not know?”.

<sup>43</sup>Referring in a way to the immortal soul, if the joke is permitted.

<sup>44</sup>And also, of epistemology, i.e. of relating the speaking subject to the above-mentioned modes.

the questions are triggering (answer options), the *telos* allows also the *meta* perspective on all the questions.

The question about *telos* also brings us closer to the idea of alternative, because the alternative is a variant of existence. In this regard, the other questions have a limited framework (affirmation, negation, non-answer / undetermined answer), while the *telos* opens. *There is not only one alternative.*

### What does “what if (there would be / would have been)” mean, from a logical point of view?

Since it is *clear that, when people want to know, they are interested in the causality behind visible things, and since causality also involves*

- *the principle in the subtext of all searches of meaning according to which there are no things without causes,*
- *and the principle of the difficulty to find them,*

people are getting closer to causes by way of *conditioned assumptions*. “If ... then”. This model of reasoning, characterised as *counterfactual*, may have as unknown elements – thus possibly untrue – both the antecedent (if ...) and the consequent (then ...). The model determines the creation of several *hypotheses* and, necessarily, their demonstration and verification. The result is the confirmation or invalidation of both antecedent and consequent hypotheses<sup>45</sup>: thus, the formidable enrichment of new theories / ideas. In this process, the coexistence of different and even opposite situations, highlighting the plurality of causes and their probabilistic manifestation<sup>46</sup>, more adequately describes the phenomena<sup>47</sup>.

More specifically, the reasoning model involves *abduction*, too, *i.e.* the *choice* of the most *plausible* hypothesis, from several *probable* hypotheses, based on the assumption that both the conclusion (real situation or taken as an object of interest) and the rule of inference are known. So, in the subtext, researchers know that it is a *hypothesis* about the cause / conditioning of the conclusion, but during the processing, they consider it in the indicative mode and in the present tense and continue with demonstrations. This is where we must pay attention: researchers know that this is a *hypothesis*, while some outside commentators consider it a theory, already assumed by the community of researchers.

At the same time, abduction must be seen as a hypothetical type of reasoning but the most economical one and similar to induction, *i.e.* it starts from a case, but does not overlap with it. Because: with induction the rule of inference is true (minor premise)<sup>48</sup>, while in abduction, that starts from the case, *the rule must also be demonstrated*. And as a result, it is possible that the entire result (including the perspective in which the conclusion / consequent has been described) is invalidated. Only in this way is the result of abduction a new theory. On this line, the abductive reasoning is *heuristic*. (Of course,

---

<sup>45</sup>Matthew Tontono, In a Twist, Scientists Find Cancer Drivers Hiding in RNA, Not DNA, Monday, August 27, 2018, <https://www.mskcc.org/news/scientists-find-cancer-drivers-hiding-rna-not-dna>.

<sup>46</sup>But the probabilistic manifestation is not a-deterministic.

<sup>47</sup>Also see Mark Parascandola, “Causation in Epidemiology”, *Journal of Epidemiology & Community Health*, 55, 2001, pp. 905–912.

<sup>48</sup>The induction model: the major premise (starting from a case) – “Socrates is human” –, the minor premise providing the rule (“all humans are mortal”), the conclusion “Socrates is a mortal”. (Unlike deduction, where the major premise provides the rule (“all humans are mortal”), the minor premise provides the case (“Socrates is human”), therefore the conclusion is, after all, included in the major premise (“Socrates is mortal”).)

the abductive reasoning is heuristic also because the chosen hypothesis is outside the scope of “normal” theory).

However, the abductive reasoning has also a more distinctive feature: it seeks to support the hypothesis through the data that support it. In this regard, abduction is economical, *i.e.* it starts looking for hypotheses for new particular facts / data and seeks to demonstrate the most *obviously plausible* hypothesis. But again, we should pay attention: *the scientific research*, namely evaluating data, theories, the manner in which they are linked, *never uses a single type of logical reasoning*. That is, not only does the research start from the case and from the data that allowed the case / hypothesis, but it also falsifies them through questions and data that are opposite to the former. The Popperian falsification has also its say with respect to abductive reasoning.

And, moreover, *all modes of reasoning intertwine* and find their place in the knowledge of a problem; abduction is accompanied by induction that highlights the facts to test the hypothesis. Finally, the hypothesis itself can be a variant of assumption, from a fanciful one – considered as such even by its initiator – to one with a lower or higher degree of probability. But regardless its plausibility, the hypothesis is tested by facts – themselves posited into mini-theories, from the point of view of their position in the abductive reasoning regarding the hypothesis – and the result is that of *effects* and *hypothesis* (considered a premise) and *reasoning*. The result is a set of new meanings caught in a new theory. Even the logical rules are forged by the result, as we see them after practicing abduction.

In a common assertoric reasoning, the premise (either the case, or the initial condition, or the rule) is asserted as truth, aiming the understanding through an amplification of the idea of the initial *datum*. The question goes beyond this assertion, and: 1) judges and selects the assumption / hypothesis from the existing ones, so as not to waste time with unsuccessful / untrue reasoning; in this sense, abduction is *inference towards the best explanation*; and 2) determines the innovation of another hypothesis.

### ***Ex contradictione – quodlibet***

According to the logical principle that anything can follow from contradiction or any proposition can be demonstrated, we must pay attention here only to the *generative capacity of contradictions*. If we know that a logic based on contradictions is *explosive*, or that the consequences are explosive, then we should be afraid of contradictions. But people, over time, have become accustomed to judging the given, and therefore the contradictions. These ones could not have only explosive consequences, because in this way the security of thinking would not have much basis. Well, common sense determined them to consider that only *necessary* conclusions can follow from contradictions, not any conclusions. And that meant that contradictions also imply a certain coherence and a certain consistency. The necessary conclusions were called *paraconsistent* conclusions, giving the sign of the entire paraconsistent logic, of *conclusions from coherent contradictions*.

In traditional formal logic, there must be consistency (*i.e.* non-contradiction) between premises and conclusion (only in this way is the conclusion a solid, justifiable, reasonable, viable, convincing theory); so, at the level of *form*, a theory is solid if it is not contradictory, therefore it does not contain contradictory propositions, because this already vitiates the inference, consequently the solid conclusion.

At the level of *content*, it is about truth (dialetheism); but at the *formal* level there is no question of truth. However, if the truth is important, then, formally, the logic must be *paraconsistent*. Such logic delimits the contradiction so that the conclusive result is not explosive but consistent (non-contradictory), therefore, it makes the contradiction

coherent (all of its parts fit anyway). Nevertheless, the objective of paraconsistent logic is not to obtain coherent contradictions, but the non-explosive nature of conclusions.

A theory can have consistent parts, but in its entirety, it is inconsistent, namely it is contradictory<sup>49</sup>. In the real world, the complexity of the content accepts or supports non-triviality, *i.e.* the fact that not all propositions are parts of the theory as such, so they can be true because they refer to different aspects, although related. This is what happens in terms of content. At the level of form, that is of the logical schemes of thinking, such contradictory propositions should not be introduced in the premises of the theory, because from a contradictory situation any conclusion can result (and not only the necessary one, related to the theory itself); consequently, logic explodes. The paraconsistent principle is that the *contradiction is retained*, but “any conclusion is possible” is invalidated, so the explosion of logic is also invalidated.

More clearly: the inferences cannot be trivial, *i.e.* the *presence of contradiction does not mean that any conclusion, both true and false, would be acceptable*. So, *the classical formal logic must be followed as much as possible*. Its paraconsistent amendment does not mean by all means its annulment. Because, after all, logic – that is, inference and demonstration – appears or deviates only when there is a contradiction: that is why the *essential* principle of classical formal logic is non-contradiction. (Not the principle of identity and not that of the excluded third, because they derive; the need for non-contradiction appeared in the dialogue, identity is only a precondition of dialogue, it only named<sup>50</sup>).

Logically, including as the paraconsistent principle is emphasised, the conclusion must be related to the premises, to be relevant to them, therefore, to refer to them, the problem not being so much the contradiction of the premises, but the relevance of the conclusion. (Logically, the relevance occurs when the conclusion and the premises share at least one variable. In more colloquial terms, the conclusion and the premises must have something in common<sup>51</sup>). In this sense, paraconsistent logic is *non-trivial*, *i.e.* it does not consider that all contradictions are true and that anything that is true in a conclusion can be inferred from anything.

### The critical spirit and the alternative

In colloquial understanding, the critical spirit is a negation or a series of negations. The critical spirit is, of course, negation, but since we know that there is no negation without affirmation, let us see what it does mean. Let us remember, in this quick manner, that precisely the relating of negation to affirmation is the criterion that separates the real critical spirit (or constructive and, as we will see, this synonym is not wrong) from the false one. From a logical point of view, the critical spirit is a two-sided attitude.

One concerns the perception of *contradictions* (or inconsistencies in man-made deeds and in the very process of their creation). We do not go into the detail that distinguishes between opposites and contradictions, neither into the theory about the excluded third and the included third. What suffices is that the perception of inconsistencies in the realities that are objects of interest can be acute or, conversely, opaque. We immediately think about education, but logically the perception of inconsistencies is related to

---

<sup>49</sup>This idea is extremely important. And it is known. The credible lie is the one that also contains true parts. Still: a false theory is not necessarily false in every aspect of it. Logic uses the terms trivial / triviality describing the impossible ontic and epistemic situation in which all propositions / parts are true, and, at the same time, all contradictions are true. The excessively gullible persons assume such an impossible situation. Impossibility is given by the logical law of non-contradiction.

<sup>50</sup>Aristotle systematised logic starting from the simple, from the name. (But it is worth mentioning that the simple can appear precisely from its complex, developed form (idea demonstrated by Marx).

<sup>51</sup>An equally challenging example: whether or not the virus first appeared in China has nothing to do with the West's struggle against China. That fact is not an argument for such struggle.

the ability of analysis, *i.e.* of discerning and relating things and, of course, of making inferences between them. Of course, this capacity of analysis is related to the existence of things themselves – expressed in more modern terms, to the existence of information – that is, to the ontological picture as such given or revealed to people. But, looking at the same ontological picture and the same information, some make a finer analysis, but others a less detailed one. As a result, at these people the representation of things does not reveal or raise the issue of inconsistencies. Nothing is denied, but the picture becomes true. The result is that, of course, such a representation does not involve the creation of alternatives.

The other side is somehow a continuation of the former, but here occurs a differentiation between types of negation. Inadvertencies are noticed on this side, and their noticing itself is a negation. This is from where the critical spirit emerges. As it is well known, it is elegant for people today to show “critical spirit”. It is “elegant” to deny but without a serious argument of denial: and this means that n denials crowd together *without any purpose*. Or, it is elegant to seem that you are excessively fault-finding, somehow analogous to Caragiale’s formula, “and go on, and fight”. But such a struggle is based on a *superficial* refutation that, in fact, does not deny but on the contrary, strengthens the reality against which the struggle is claimed. The above illustrations refer to *the false critical spirit that has no as real purpose the critique all the way to the end*.

*The finality of criticism is always the alternative to the criticised aspect.* And if this is missing, it is also because logic is lacking in anticipation. Simple naysayers do not express – and logic refers to formal thought structures as they are *expressed*, and not to ideas intuited and beliefs left in the mind – their entire reasoning of denial, *i.e.* the substantiation of the conclusion of denial on its prediction from theses (denials). As a result, the conclusion of denial is not even accompanied by anticipation; that is, it is a denial not only without completion, but that nullifies completion.

### “*Ignoratio elenchi*”

The quotation marks in the above formula indicate that ignorance in arguing a problem – for or against – can be hidden by ignoring information related to the problem.

When problem A is answered by discussing problem B, an ugly tactic is used that is meant to determine the co-participant in the dialogue to resign from participating: because he should answer, and prove, that the discussion concerning problem B – when the topic was problem A – has nothing to do with the topic, and only then to possibly continue to give arguments for the topic A. So, he would waste his time and it is not certain that a discussion in such mystifying terms would be of any use.

This is the classic meaning of the formula. As the tactic is transparent, those who participate in dialogues from *positions of power* – so from positions from where *they can disregard the methodological rules of dialogue*: of respect for the topic, respect for the equal position of all participants in the dialogue, respect for the logical laws known and assumed by all participants – change the topic by *keeping quiet* about some information. Such information exists and, at least some of it is known to the other participants in the dialogue. But this information is avoided in public discourse, the only one in which knowledge is expressed: precisely because it is of data that contradict the positions of power. And then, in the absence of debate of essential information<sup>52</sup>, the dialogue is

---

<sup>52</sup>Essential information can be the type of quantitative data, *i.e.* of some characteristics, and can be the methodological type. For example, the official discussion about vaccination omits information about serious adverse effects of anti-Covid vaccines (these adverse effects being limited only to immediate and, basically, only to immediate potential unpleasant consequences), just as information about the increase in the number of infections after vaccination is omitted (see Dr. Gérard Delépine, L’hécatombe post vaccinale s’étend dans le monde, 25 May 2021, <https://www.mondialisation.ca/lhecatombe-post->

transformed into a system of *parallel* and, inevitably, asymmetrical monologues: and which are not fruitful for the collective clarification of the problem<sup>53</sup>.

### There is no alternative without anticipation

If we think to the cause of the reserve of many towards the idea of alternative, we can understand that, *epistemologically*, they were not used to drawing conclusions *all the way to the end*, that is, they were not used to practicing *anticipation of things resulting from their judgements* (which commonly envisage, basically, inferences in the present indicative mode). The conclusion of this limited type of inference is, of course, immediate, or short-term, immediately predictable.

Mihai Nadin highlighted the importance of differentiating between *foresight* and *anticipation*<sup>54</sup>. The first is related precisely to the immediate inference, *i.e.* to highlighting the consequence of the indicative premises. “If we don’t tighten the screws well, the spare part will wobble (and the work will be compromised and we will have to start over)” ; “If we shoot wild animals, they will no longer wreak havoc in people’s farms” ; “the rain makes rich harvests” / “rain makes corn, and corn makes whiskey” , if we want to joke reminiscing a song from 2010. So, *logically*, the course of thinking is from the present to the future, that is, to an immediately predictable future.

Anticipation is, however, an opposite movement: from the future to the present. It involves, from the point of view of mental operations – or, if it does not sound too pretentious, of mental faculties (powers), as Kant pointed out – *imagining* the future with the help of premises of continuity / development of some characteristics of the present. “If people do not change their attitude towards nature, all systems of this nature will collapse.” Leaving aside the abbreviated form, the example bases its conclusion (“all systems of nature will collapse”<sup>55</sup>) on imagining the situation in which the continuation of the current treatment of nature will generate a system that can no longer self-regulate.

vaccinale-setend-dans-le-monde/5656922).

<sup>53</sup>See also the system of overcrowding information with details which do not lead to elucidation – in fact, tiring the receiver, screening it –. Concentration of irrelevant information is an everyday tactic of mass communication and of official reports that cannot show the phenomena in their actual functioning. See the criticism of this tactic in Paul Ryder, The Pentagon Papers at 50: What’s Left Out is Crucial, May 25, 2021, <https://www.counterpunch.org/2021/05/25/the-pentagon-papers-at-50-whats-left-out-is-crucial/>: with the aim of showing how peace was achieved in the Vietnam War, in fact following it, official documents concentrated hundreds of pages with dialogues of political figures; but they did not recall at all the fact that the war responded to the need of the power system to continue it, nor that peace would not have taken place without the social movements alternative to the power system: the resistance movement in Vietnam and the peace movement of the students, soldiers and a good part of the US population. (As regards this second movement, it showed its power a little late, after the initiative of students – who were “surrounded /excluded” – was joined by popular groups which, however, did not protest at the beginning of the aggression against Vietnam).

<sup>54</sup>Mihai Nadin, Anticipation: The end is where we start from, Computer Science Colloquium, University of Bremen, 11 June 2003, PDF.

<sup>55</sup>Indeed, the last UN Intergovernmental Panel on Climate Change (IPCC) Report 2021 is a model of anticipation methodology. It demonstrates unequivocally the consequences of the procrastinated policies after 2013 (the last IPCC Report): the aggravated parameters (some ones attaining and even surpassing the tipping points) in all the aspects of a system of imbalances of the entire physical sphere of the Earth were also modelised extrapolating them in different future time scale versions. The analysis of dozens of models of a future that is already visible – thus, from the future to the present – showed the imperiousness of the present radical decisions of transforming all policies worldwide.

And the above-mentioned imbalances are intertwining with biodiversity loss, *i.e.* with the imbalances in the organic and living sphere of Earth. Both types of imbalances are the result of policies, and thus these policies must change. There is no more room for prevarication. The scientific research drew attention on false “green” policies, namely, on their contradictions and inefficiency, see Nathalie Sedon et al., “Getting the message right on nature-based solutions to climate change”, Global Change Biology, Volume 27, Issue 8, Feb, 2021, First published, 01 February 2021; H. O. Pörtner et al., IPBES-IPCC co-sponsored workshop report synopsis on biodiversity and climate change; IPBES and IPCC, 2021.

This imagination is the argument for the conclusion of the entire example, or more precisely, for the hypothetical thesis / condition in which people do not change their attitude towards nature.

But this means that *anticipation has already suggested or even outlined an alternative*, it has been proven to be a premise of the alternative. Anticipation proves to be fruitful: it does not remain a sterile mental exercise but generates new constructions of reality.

## The alternative – a very serious matter

Firstly, the abductive reasoning can be better understood if we keep in mind what *hermeneutics* – interpretation – put forward: people have *rational anticipations* about one thing or another, therefore already on the basis of previous valid reasoning, and then attempt to explain them, considering the explanation itself a demonstration of the truth / plausibility of those anticipations and reaching the conclusion that those anticipations were quick understandings (intuitions). We are not interested in intuitions here, but in the fact that the explanation / demonstration / interpretation represent knowledge that validate pre-knowledge (anticipations) and reveal a higher level of knowledge. *On the one hand*, the way of inferring from the explanation is based on the structure of evidence from anticipations, considered as variables. Interpretation / explanation is a tree of derivations, of inferences, because every fact in the hypothesis is recursively explained. From a perspective of intuitive mathematics but without using its symbolic language, the explanation / *construction* is both the logical movement of inference with respect to these facts and its result, *i.e.* the idea / theory at the beginning only as pre-knowledge, hypothesis. Construction is movement (from hypothesis – the facts / evidence, *i.e.* their logic in the hypothesis – to the result that is the set of facts demonstrated); the result is a confirmation of the manner of construction, hence the reinstatement of the constructed facts. Objectivity in logic is given by the structure of formal inferential relations and, of course, by the formal (syntactic and semantic) qualities of the objects placed in relations. But this means that, *on the other hand*, the evidence / object / fact itself is (defined) according to the manner of inference<sup>56</sup>.

The material truth – that appears to us in the everyday natural language – cannot be a proof or a fact if it is not true in a formal linguistic and logical structure. Simply put, the material truth is part of *another level of existence*. The reasoning of the alternatives is no exception. For the alternative to be valid, each of the elements of the hypothesis must be valid, and then the connections between them as they appear in the hypothesis must be valid. So, the reasoning model is a tree in which the analysis (calculation) of the elements is continued with an analysis of their relations, and this analysis confirms the initial plausibility of the hypothesis, the fairness of the choice of that hypothesis.

*Then*, more than the other manners of reasoning, the abductive one requires the development of reasoning and presupposes the awareness of this requirement and of the abductive specificity. Neither “*if . . . then*” nor “*what if?*” do allow truncated syllogisms, in logical language *enthymemes* or *sorites*<sup>57</sup>; the reasoning must be very clear precisely

---

<sup>56</sup>See Jean-Michel Salanskis, *Y a-t-il une Kehre de la logique?*, 2004, *Kehrlog.pdf*, pp. 1-20.

<sup>57</sup>Leaving aside its logical form, sorites is argumentation – either syllogistic, or polysyllogistic – from which the intermediary moment is missing, either in the position of one of the premises or even in the position of the conclusion. Sorites is a form of polysyllogism. It is characterised by the suppression of the intermediate conclusion between the two syllogisms, so the suppression of the conclusion of the first syllogism. But in this way – and this is all the clearer in a syllogism – even the formal system of implication or relationship is vitiated. This vitiation is given by the fact that the variable that is, in fact, common to both syllogisms is missing: in the absence of the variable, the implication is less clear and can give rise to paradoxes. Abbreviation is not the sign of the acuity of reason, but “the brevity of possible reflections. . . the limitation to a mediocre expressiveness”, Maryse Laurence Lewis, *Le langage*

because it started from a hypothesis; just as abduction does not allow rhetorical tactics that evade the problem or a concrete question and refer to another problem or an unasked question. The cause of this tactic is, of course, the inability to answer the asked question or the raised problem<sup>58</sup>, and then the discussion is diverted to another, as if this other problem had been initially raised.

Precisely because the abductive reasoning must be clearly developed, there is a fear of alternatives in discourses and of social alternatives as objects of investigation. If most people no longer believe that “everything that is real is also rational”, they are still educated to prefer the existence of the unknown and, under no circumstance, probing the way people penetrating the unknown.

And although the hypothetical nature of the starting point could characterise the whole reasoning process as adventurous, in reality the reasoning and theories related to alternatives are extremely alert to each element and reasoning related thereto; reasoning and theories related to alternatives warn that one *cannot skip* stages of thinking and judgement.

Finally, choosing alternatives is not so much guess work, as a *test* of the new. And the way to solve it is, as we have known for a long time, both from common thinking and from technology, more broadly – from practice, *trial and error*. That is, trial – error – partial fix – trial – error – another partial fix. . . ; or even total fix etc. Everything is like: one should not treat this cycle with indifference, neither to fail in resignation faced with its difficulty. And trial and error do not refer only to the steps taken in the realisation of a theory or a product, but also to the *meta* judgement of this theory or this product in terms of their negative consequences, beyond the flawless logic of their realisation as such. The logical pattern of *trial and error* is creative beyond the realisation of a particular creation, in the very process of generating new creations, by criticising some from the perspective of new facts.

Even because it involves the logic of trial and error, the reasoning positing alternatives are *constructive*: steps towards the renewal of thinking and even towards changing the paradigms on which so much is said about.

## On the difference between descriptive logic and the logic of alternatives

We must not forget that formal logic – the most everyday logic – refers to the description of facts with their relationships. As we have seen, a simple succession is not equivalent to the generation of a fact by the previous one: *post hoc ergo propter hoc* is not a valid way to deduce the causation<sup>59</sup>. Of course, in everyday life description is amended by the precaution of the possible or the probable, in different forms (“neutral” / objective: “it is possible” / “not possible . . .”; or the involvement of the subject – in doxastic logic –: “I think that. . .”). As well as, during common judgements we come to prescriptions (“must” / “it is necessary”). This whole amendment is caught up in *modal* logic, as already mentioned. But there is a big difference between the *possible* and *prescriptions*. The latter already involve *the values* behind the description, and for this reason prescriptive judgements are farther from the logic of description than cautious judgements or judgements advancing doubt.

But the classic distinction between the natural sciences as sciences *about facts* and, on the other hand, the social sciences *about values and norms* is not real, *i.e.* the

---

et les droits humains: futilités et débats incohérents, 25 May 2021, <https://www.mondialisation.ca/le-langage-et-les-droits-humains-futilites-et-debats-incoherents/5656897>.

<sup>58</sup>That is why this tactic is also called *ignoratio elenchi*, ignorance in rejecting (arguments related to a problem or question).

<sup>59</sup>“The rooster crows. . .”.



somewhat absolute distinction between objective description and normative prescription is (of course, historical, but) useful only didactically. Sciences about facts use models – which involve norms – and the social sciences / humanities use meticulous descriptions. So, Hume’s<sup>60</sup> old observation about the difference between “is” and “must be” is valid for research in both types of science.

The above modal logic operators (“must” etc.) are already part of the logic of alternatives or, more precisely, of step 0 of this logic. The real is not so banal, that is, the theory that renders it is not so certain, so true that it does not require modal amendments: “yes, it is possible, but ...” / “and yet it is (seems) impossible to...”; “is it really implacable?” / “but it is not really necessary to ...”. This is not the place to discuss more closely which operator is closer to the logic of alternatives. But it is clear that – always by confronting facts / situations which, at first, seem to deny the theory – they open the door to: *doubt* and *alternative*. “What if we also examined the hypothesis or hypotheses ...?”. These hypotheses are required by the new situation in which the *confrontation* between theory / product and, on the other hand, consequences, new theories, maybe even new products, leads to modal amendments.

The logic of alternatives does not appear, therefore, at any time in the process of judging things. And it is not synonymous with the false alternative that would result from highlighting a characteristic or behaviour of the *object of interest* from a different point of view than the one to which the theory refers: the macro characteristics of substances or animals do not have as alternatives the molecular characteristics or organ and cell function. It is clear that this is not about alternatives but about parallel theories, about different aspects (even if these aspects are ontologically related). At the same time, this logic can refer only to the precise object of interest exactly – *e.g.* the cellular functioning – or to the *integration* of the exact object of interest into a larger whole / system according to new data (for example, about changes in the cellular function as a result of substances participating in this functioning).

Of course, the new facts / data / perspectives do not necessarily represent invalidations of the old theory, just as they do not lead only to *one* alternative<sup>61</sup>. As a result, we must be careful *not to stop looking for alternatives* after we reach one that is interesting *now*.

## The examples and the alternative

What we call examples are the manifestation of the inductive, experimental character of thinking, but also of the unity of this inductive character with that of the general already existing following *n* experiments in which the mind processed everything given to it in these experiments. It can be said, in passing, that the elements known from these experiments, already kept in the form of more or less clear ideas about things in experiments, can always be brought back to the layers of memory in the form of mental experiments. These are no longer imaginaries of situations still non-existent in cognitive memory, so only then outlined – regardless of the fact that imagined situations include *n* aspects / cognitive elements already known – but reproductions, reminders: of course, ordered according to their intention or, more precisely, to the connection between them and the reason for recall as such; or, in other words, the ultimate goal of thinking.

The examples are forms of mental experiments. But, depending on their purpose – or their use – they are of several kinds. There are examples as simple *illustrations*

<sup>60</sup>David Hume, *A Treatise of Human Nature*, Oxford, Clarendon, 1965, p. 469.

<sup>61</sup>Thus, we may advance the methodological principle: as there is no one single cause of real, inherently complex phenomena, so there is never one single alternative that is possible. But obviously, the two parts of the principle do not overlap, rather their relation is an analogy.

of already clear / essentially clear assertions. These types of examples invigorate the discourse – and can bring an extra understanding because they beat the already existing understanding of assertions, i.e. they bring an extra concrete (which may possibly be the specific element or model of assertions that is most easily remembered). This addition of concrete does not mean the new, nor does it invite a deeper judgment of the assertions, so to think of possible alternatives.

There are illustrative examples in scientific knowledge and even in the scientific knowledge of the most abstract things. Assertions that link abstractions can be extremely "concrete" examples and welcome in all that is mathematical formalization. The whole development of graphs, diagrams, tables, figures in the modern science, which increased not only the intelligibility of theories and demonstrations but also included different degrees of concrete exemplification, is related to the intertwining of the abstract and the concrete in the scientific knowledge of things. But an extremely important variant of illustrative examples – or examples with the function of illustration – is that related to memorizing the steps, order and concrete content of human movements or actions in order to achieve concrete objectives. Here, imitation and repetition of steps, etc. play a key role in quickly understanding the order in which actions are taken. After mastering the movements and actions related to concrete<sup>62</sup> tasks much easier, people can better understand, i.e. translate into coherent articulated language the logical explanation of the action as a whole: that is, they can make theory easier. Actions and, in general, concrete theoretical systems are assumed by researchers or people involved in the acquisition of knowledge related to actions and systems. Their truth or the necessity of those actions is not in doubt: the goal now is to understand them and make them autonomous. *Illustrative* examples do not raise problems.

The illustrative examples are thus extremely important in the learning process and are, as we have seen, extremely necessary.

On the other hand, there are examples that are given the function of *proving* the truth of theories / opinions / points of view. But, as we know, examples can always be given for contrary theories. Moreover: if there is even one example that refutes the theory, then it is not the example that is to blame, not it must be erased, but the theory as such must be revised.

Indeed, what is at stake now is not learning the theory / action, but the truth or meaning of the action or theory. The examples no longer have the function of making it easier to approach the subject to the object (theory / action), but the object as such. Regardless of the number of subjects who prove or assume a theory, its truth takes into account only its coherence and consistency. As a result, if there is even one example that reveals inconsistencies and incoherence in that theory, then – precisely because only a true theory is a *theory*, that is, it is retained, it is a basis for knowledge, learning and development – the theory must be revised. And the example becomes an invitation to take into account theories opposed to that theory.

If we take the current example of the approach of the pandemic<sup>63</sup>, it is quite clear that the demonstrative example – which is, at the same time, a demonstrative argument – is the one that raises problems. Thus, in the dominant theory – a kind of *statistical* theory – the only solution to defeat the disease is vaccination. In principle, vaccination is an easy and quick solution<sup>64</sup>. It substantially reduces the number of patients hospitalized and

---

<sup>62</sup>Or, expressed pompously (i.e. in scientific language), these concrete tasks or objectives are finite systems with their own objectives, their own means of accomplishment, their own criteria, their own evaluation of the phases and results.

<sup>63</sup>The current global official approach of the pandemic is part and parcel of the current worldwide dominant approach of health care, and emphasises its logically contradictory, and practically, malign aspects.

<sup>64</sup>And – especially when it is bought by governments, as they buy the armament production, as state

those who have reached the ICU, as well as deaths. But, an objection is advanced from the viewpoint of the *subject*, current American and European new types vaccines can cause extremely serious side effects, including deaths. These reactions are, however, very rare, the dominant theory continues, so there is no need to discuss them. Nevertheless, the objection does not stop, “I do not want to be among those rare cases”.

This objection, which excludes any reference to external issues (conspiracies, etc.), is absolutely ignored by the official theory. This ignorance reflects the inability to always consider different / even adverse theories: here, starting from “adverse” examples.

The dominant theory and the different theory that start from the subject are not, so far, opposite: they are simply *parallel*. So, both have the same right to be taken into account.

But the ignorance of the theory of the subject by the official theory is determined by the fact that, if the theory of the subject is taken into account, then the whole dominant theory should be revised. That is: if everyone – including each subject – is interested in reducing the number of those hospitalized, etc., then prophylactic<sup>65</sup> and incipient treatment must be performed and strengthened. It exists – even if not in the form of one specific pill but, in any case, without side effects – and is effective<sup>66</sup>: so, reducing treatment, in the dominant theory, to vaccine and hospitalization medication is opposed to even the alleged official goal of reducing the number of hospitalized patients, etc. As, if the subject’s theory is taken into account, then time is freed up for the improvement of vaccines, etc. Moreover, the supreme argument that the vaccine would allow milder symptoms if the vaccinated are re-infected<sup>67</sup> is more than shaky. Even until December 2020, when the vaccination campaign began, *most* of those infected and sick<sup>68</sup> had healed and / or had mild or anyway manageable symptoms; because the mortality caused by the virus is low. Why would we assume that if before the vaccination campaign most of them recovered and did not need a hospital, after the vaccination the mild symptoms would be the result of the vaccine, and not of the type of infection as such?

So, in the case of examples intended to be *confirmations*, counter-examples can always appear. And only the confirmatory examples are not enough for the truth of the theory: this one must always have the power to refute the counter-examples if it wants to be

---

contracts, and offer it for free to the population – it “homogenises” both the health state of the different social layers and their different health-care conditions. At any rate, the vaccine covers the difficulty of both many layers to support the eventually necessary long enough while of non-vaccine treatment, and the health-care systems’ funds to offer this treatment, especially in hospitals.

<sup>65</sup>Prophylaxis involves a much wider approach than that of medication to directly avoid an illness.

<sup>66</sup>Michael Welch, Dr. Stephen Malthouse, and Dr. Peter McCullough, Doctors vs Health Authorities. Clinically Proven Drugs vs the Jab. Who will Prevail?, June 05, 2021, <https://www.globalresearch.ca/doctors-vs-health-authorities-clinically-proven-drugs-vs-the-jab-who-will-prevail/5746999>; here Transcript – Interview with Peter McCullough, June 1, 2021, also for general methodological frameworks of multi-drug regimens, of logic of the present type of vaccine conception and distribution, and insights of the epidemic control.

<sup>67</sup>However, as we know, one of the main aspects here is the prevention of infection by vaccines. This capacity of vaccines was refuted by studies on real life. See Alarmist reporting hides Covid vaccine success, August 20, 2021, <https://rmc.bfmtv.com/emission/covid-19-les-vaccins-de-pfizer-et-modernettement-moins-efficaces-contre-le-variant-delta-2047271.html>; Dr. Peter McCullough, Study: Fully Vaccinated Healthcare Workers Carry 251 Times Viral Load, Pose Threat to Unvaccinated Patients, Co-Workers, 24 August 2021, <https://www.globalresearch.ca/study-fully-vaccinated-healthcare-workers-carry-251-times-viral-load-pose-threat-unvaccinated-patients-co-workers/5753908>, referring to Timothy Farinholt et al., “Transmission event of SARS-CoV-2 Delta variant reveals multiple vaccine breakthrough”, medRxiv preprint; Nguyen Van Vinh Chau et al., “Transmission of SARS-CoV-2 Delta Variant Among Vaccinated Healthcare Workers, Vietnam”, preprint with The Lancet, Available at SSRN: <https://ssrn.com/abstract=3897733> or <http://dx.doi.org/10.2139/ssrn.3897733>; Fully vaccinated people who get a Covid-19 breakthrough infection can transmit the virus, CDC chief says, August 6, 2021, <https://edition.cnn.com/2021/08/05/health/us-coronavirus-thursday/index.html>.

<sup>68</sup>We are not discussing here the validity of the tests, we are only taking the official data corroborated worldwide by the corona worldometer.

true.

## Epistemic corruption instead of alternatives

Although logical models of reasoning appeared above, where possible deviations, though suggested, have occupied only a very modest place in the analysis, we are all convinced that, actually, the entire effort related to “how people should think”<sup>69</sup> is the reaction to the violations of logic. At the level of the presentation of the *content* by logic / by the logical forms and structures, even Heraclitus pointed out<sup>70</sup> that, in order to present the desired content, some people use logic in a distorted way; in other words, that there is a tendency to subordinate the universal rigor of logical inferences to the subjective intentions always linked to the particular and the accidental.

The importance of content is always related to the subjects who assume it. And from this point of view, from the perspective of the subjects, one can also describe the formal aspects supported or violated by them.

Thus, the violation is seen as *corruption*, in the etymological meaning of this word. More clearly, when people – and, specifically, researchers – do not comply with *epistemic standards* (equality of persons in a dialogue, namely the critical examination of arguments regardless of their issuer, coherence and logical consistency of reasoning, critical examination of evidence), the process of obtaining the truth is vitiated and is covered by *epistemic corruption*<sup>71</sup>.

This corruption is at the same time also a corruption of logic:

- *informal* logical fallacies (which involve the truth of arguments): *post hoc ergo propter hoc* / afterwards, therefore for this reason (the first phenomenon is considered a cause, although it is not); *cum hoc ergo propter hoc* / with this one, therefore for this reason; *ad hominem* / personal attack, with the variant *tu quoque* / revealing the hypocrisy of the previous speaker; *argumentum ad verecundiam* / out of respect towards authority; *argumentum ad misericordiam* / appeal to feelings; *counter-arguing a theory not supported by the partner but that is weaker and easier to refute*; the *false dilemma*; *the improbable conclusion of its own theory as an argument for itself*; *petitio principii* / the circular argument; the *hasty generalisation*; *argumentum ad ignorantia* / one’s own ignorance as argument; *ignoratio elenchi* / distracting attention to an aspect because the theory cannot be refuted; *non causa pro causa* / the argument of the false cause; *ambiguity*; *argumentum ad populum* / the argument of the popularity of the supported point of view; *consensus gentium* / consensus as argument;
- *formal* logical fallacies (which involve the validity of arguments): *non sequitur* / arguments without connection or the conclusion does not follow from premises; *quaternio terminorum* / the fallacy of the four terms of the syllogism (instead of three); *non distributio medii* / the fallacy of the undistributed medium term neither

---

<sup>69</sup>We are not discussing here the validity of the tests, we are only taking the official data corroborated worldwide by the corona worldometer.

<sup>70</sup>Heraclitus, *The Complete Fragments, Translation and Commentary and The Greek text* – William Harris, Prof. Emeritus, Middlebury College: “2. We should let ourselves be guided by what is common to all. Yet, although the Logos is common to all, most men live as if each of them had a private intelligence of his own”

<sup>71</sup>Epistemic corruption does not consist only in casting doubt on a theory that is opposed to one’s own image; it is not a question of methodical doubt about all theories, including one’s own, but of selective doubt that ignores the rigorous development of pro and against arguments.

The concept of epistemic corruption and this meaning about it were proposed by Stephen Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change*, New York: Oxford University Press, 2011, p. 462, as another facet of moral corruption.

in the major, nor in the minor premise; the fallacy of *illicit processing* either of the major, or of the minor term; the fallacy of the *affirmative conclusion in one or both the negative premises*; the fallacy of the *negative conclusion from affirmative premises*; the fallacy of *mutually excluding premises*.

There are two main causes of epistemic corruption: one is *psychological* in nature; because some cannot stand that new data about a fact contradicts their image of that fact, they “adjust” epistemic standards (ignore new data, select only information that matches their theory of fact), and do not think of rebuilding their theory. Psychologically, it can be considered that the distortion of epistemic standards is the way to avoid *cognitive dissonance* between new information and their old theory<sup>72</sup>. The other cause is social, more precisely, *political*: epistemic standards are distorted by those who have decision-making power and thus allow the distortion of standards in their relationships with other people.

As we have seen, epistemic corruption is the process by which a theory is supported regardless of the informal and formal costs of this support. In other words, epistemic corruption is the absolute opposite of creation of alternatives.

## Abductive reasoning (with probabilities) about society

Now there is room only to outline a few ideas.

After people are shown that they judge with the help of hypothetical reasoning, these ones become familiar and, in principle, are not rejected. They can even play by always proposing – so, consciously – “what if?”. Their professional approaches allow this type of reasoning<sup>73</sup>. At the same time, they are educated to confine themselves to “their area of expertise”. In this area they can – with socially-historically determined limits – develop hypothetical reasoning; but not outside this area. And this bifurcation between the use and non-use of reasoning related to alternatives has become their habit, a pattern of thinking.

In their own area, they *can* even manifest themselves boldly; and at the same time, outside of it, “they don’t have to bother”. For the *past*, they may eventually accept even the question about Cleopatra’s nose, as a slightly cynical joke that signals the *accidental* as a matrix for historical causality. For the *present*, they prove their spiritual height either by “realistically” criticising situations and obstacles and stopping in this moment or by escaping into metaphysical esotericism and mysterious matters where they list abundantly only abductions. For the *future*, they hide behind the infamous label of “utopia!” put on any abduction of alternatives.

This position could be perceived as a weak ability to understand *the aggregate of systems in a unitary manner and based on the same logic*: of course, as a result of their education. This education stopped the *integrative* treatment and unitary understanding of systems and causality; and the reasoning of the alternatives was limited only to strict professional preoccupations (if).

The above words may seem too harsh: especially since the common patterns of thinking are not just given but imposed. And yet, in the face of *absurd* social phenomena – destructive of individuals and of the human species, of nature – there are dominant voices in the public scientific space that insist that the development of technology is the causative factor either of evil (AB, as if the use of technology was not an option of

---

<sup>72</sup>Axel Gelfert, “Climate Scepticism, Epistemic Dissonance, and the Ethics of Uncertainty”, *Philosophy and Public Issues* (New Series), Vol. 3, No. 1, 2013, pp. 167-208.

<sup>73</sup>We are not discussing here about the real social conditioning that gives the limits of the use of abductive reasoning.

social actors) or of the progress that will solve everything. And since prevention policies are weak in the face of this factor – that is, there is no globally integrated, coherent management of science, technology and their applications, and there are also “diverse motivations” due to the large number of actors and their particular social interests – there would be virtually no solution other than increasing surveillance and isolation of wrongdoers<sup>74</sup>.

In such theories, there is no abduction, there are no alternatives: the future is the absolute structural continuation of the present, even if it is already in a state of collapse and the continuation does not improve it at all, science and technology being further transformed into competing private means for private interests.

Knowledge devoid of sensitivity to alternatives is manifesting in an extremely contradictory manner: even in *science* that generates new knowledge, knowledge deprived of the idea of alternative is determined by economic and political constraints external to science; at public level, it appears as a *false science* that offers explanations for a phenomenon based on the opinions of “experts” and does not accept alternative theories; false science uses specialised journals that do not accept to demystify scientific fraud<sup>75</sup>, just as it uses specialised control and ethical control institutions which are subordinated to it<sup>76</sup>.

### *Parrhesia*

We could conclude on a philosophical note this excursion into the thinking of alternatives. If everything was explained with the help of the rational power of man, let us make a comparison<sup>77</sup> between the ancient and modern thinking, concerning the *current*<sup>78</sup> knowledge and the possibility and, especially, the need for alternatives. The comparison generates only models, inherently simplifying, and excludes the continuity of some characteristics in the two models.

In the ancient Greek thought, the truth of cognisance seems to be one of their objective features that people must *dis-cover*, as if they were copying reality, so the ultimate criterion of truth would be outside them (in Platonic ideas or in reality itself). If people know, it means that they know what is – and what is needed – so there is no longer room for any doubt about knowledge, and therefore neither for alternatives.

(Such a model was specific also to the medieval thinking. In the religious thought, the criterion of truth and the generator of indubitable evidence was the supreme extramundane being. The knowing individual could only affirm what appeared to be absolutely external to him and, obviously, absolutely certain. The responsibility of thinking somehow fell outside the knowing subject).

In the modern thinking – Bacon-Descartes – the proof of truth, certainty, are achieved: 1) by man’s participation, by his examination of data, and 2) by understanding that this acquisition of truth is based on awareness of participation in obtaining truth and knowledge. On this line, in which knowledge is no longer a copy (Kant, as a continuation of the mentioned thinkers), the modern thinking is the field where Einstein’s perspective of the known depending on the subject, appeared, and precisely as such conditioned certain.

---

<sup>74</sup>Nick Bostrom, “The Vulnerable World Hypothesis”, *Global Policy*, Volume 10, Issue 4, November 2019, pp. 455-476 (here, pp. 458-459).

<sup>75</sup>Richard Smith, *Journals, fraud, science, and misaligned incentives*, July 25, 2016.

<sup>76</sup>Lisa Loikith, Robert Bauchwitz, “The Essential Need for Research Misconduct Allegation Audits”, *Science and Engineering Ethics*, 22, 2016, pp. 1027–1049.

<sup>77</sup>The comparison is, unfortunately, Eurocentrically limited.

<sup>78</sup>In the sense of contemporaneous to the discussion, to the analysis.

There is another aspect common to ancient and medieval thought: the dependence of truth on the moral qualities of the knowing subject. The obtained certainty is the result of its positive moral qualities. In the modern thinking, knowledge and the dissection of the process of knowledge show that they depend exclusively on cognitive abilities, not moral ones.

But a return to origins which are not devoid of wisdom is always beneficial. Even Rabelais, at the dawn that barely announced modernity, warned: science without conscience is the ruin of the soul. Leaving the soul aside, knowledge has proven to produce, as modernity progresses to a cognitive triumph, also absolutely inadvertent results for the purpose of the process of knowledge itself. It is very difficult to decide whether the formidable acquisitions of scientific theories plus today's impressive technological applications counterbalance the phenomena of barbaric and irreparable, final destruction of human beings and of the human environment, and we rather doubt that these phenomena would be the inevitable price of the progress of science and technology. Of course, we know that this figure of Janus is determined by historical and social causes. But regardless these causes, *knowledge itself seems to require ethical conditioning*.

An ancient idea sensitive to the ethical causes was given by the concept of *parrhesia*<sup>79</sup>: free expressing of people with obvious moral qualities. Expressing is free even if what is said *triggers risks* to those persons. They know they must tell the truth – as their entire cognitive experience certifies – precisely to help the audience understand things. From the point of view of knowledge, there is an obvious relationship of asymmetry between the audience that does not know, but must know, and the speaker who knows and, at the same time, knows that he must share what it is known. Of course, if in antiquity the speaker / exhibitor was convinced that there was a perfect overlap between his opinions and the truth, we know that we must look circumspectly both at the opinions and the truth. If he believed that a critique made against some institutions was the truth (and the only truth), we know that not every kind of criticism is good “because it is critical”. But if we assume these precautions, they should not silence us, that is, they should not make us only mimic the freedom of thought and expressing.

In the ancient thinking, truth was not conceived as manifesting itself in private mental experience; but only in *dialogue*, that is, in *free expression in a human collectivity*. But the late modernity – and the post-realistic euphoria of seclusion, including because of the danger of pathological natural contagion – enthusiastically glossed over the individual probing of the depths. Nowadays, *parrhesia*, free speech, seems like a retro naivety.

The ancient thinking of *parrhesia*, however, was not so refractory to the role of the subject as in the simplistic model above, mirroring the modern one. Because the bearer of *parrhesia* was a certain person: who had moral qualities not only to reach the truth with certainty but, above all, to *expose it freely*. And regarding the moral qualities, the ancient thinking was different from that of the Middle Ages: the greatest ancient “sin” of the exhibitor was *not pride / conceit*, but *insincerity*: with oneself (since the exhibitor is the one who chooses evidence, reasoning, data, because, although the truth is only transmitted, the exhibitor, himself, participates in it) and with the others, with the dialogue as such. Today, even more so as we know that the truth is not external to the subjects, sincerity should be a cardinal virtue of discussing the truth. But sincerity is categorised as naivety.

However, because in ancient thought the truth of sincere opinion was certain, the exposition did not highlight hypotheses, but theses. They intersected with the opposing theses possibly stated by the interlocutors: but this only led rather to the effort and the result of presenting them better.

---

<sup>79</sup>Michel Foucault, *Discourse & Truth: The Problematization of Parrhesia* - Six lectures given by Michel Foucault at the University of California at Berkeley, Oct-Nov. 1983.

Socrates was a special *parrhesiates*. He told the truth even at the risk of losing his life. At the same time, he presented the theses as hypotheses: which had to be confirmed or invalidated by collective controversy. In this controversy, the thesis-hypotheses of the opponents were *withdrawn*. That is, the examination of the arguments led to the highlighting of the truth of Socrates' hypotheses. Opponents apologised, meaning they understood that their own theses were inconsistent and that is why they were the ones who withdrew them. In his turn, Socrates shaped his hypotheses according to the ideas that appeared in the dialogue. And, although cardinal problems were raised in the middle of the discussion, if they were too radical, they were avoided or reduced to details. Inherently, Socrates' theories were completed without serious integration.

But Socrates has shown that the rhetoric by which you retell the thesis without questioning it is not enough, and that the truth always involves the confrontation of hypotheses. In subtext, any assumption of the hypothesis means the possibility to withdraw it (and to apologise for the inconsistencies that have confused the audience to no avail). And that none of this takes place outside the possibility of free expression.

*Theoretically*, today – especially in science and technology – these are already commonplace. *In practice*, the set of knowledge of methodology of knowledge is not as common. The space for expressing alternatives is rather exceptional, through the dominance of unique thinking over free communication. What will happen to the “field of the possible”<sup>80</sup>, remains to be seen: although the expression of some anticipations and some alternatives raises concerns about its limitation.

## In lieu of a conclusion: let us not be afraid of alternatives!

The thinking of alternatives is natural, because, both in the logic of reasoning that determine them and in their own logic, the *continuity* of the picture previous to them is shown as necessary, constitutive. Alternatives can, of course, be more radical or less radical, *i.e.* the ontic and ontological picture they present may be different from the previous one to various degrees of changes of structural representations / relations and, therefore, of some elements or characteristics of the elements participating in structures. But regardless of these degrees, the alternatives – even if they are outlined only as precise systems of structures – contain in themselves the ontic and ontological continuity that gives the *basis*, the *foundation* of change and of the alternative.

This is the first meaning of Hegel's famous term, *Aufhebung*, an overcoming that *preserves* (something of) the old state<sup>81</sup>. But with Hegel, things are more nuanced.

<sup>80</sup>The expression is from Pindar, Pythian Odes, 3, used as a motto by Albert Camus in *The Myth of Sisyphus*, 1942: in the French translation, the soul must exhaust “the field of the possible”. The English translation is more prosaic: “Do not crave immortal life, my soul, but use to the full the resources of what is possible”, Odes. Pindar. Transl. Diane Arnson Svarlien, 1990, [60], or “Do not yearn, O my soul, for immortal life! Use to the utmost/ the skill that is yours”, Pindar's Victory Odes, Translation by Frank J. Nisetich, Baltimore and London: Johns Hopkins UP, 1980, pp. 169-173, <http://www.miscellanies.org/mythology/deities/demeter/pindar.html>. Anyway, it is about the ontological possibilities created by the human being.

<sup>81</sup>Georg Wilhelm Friedrich Hegel, *The Science of Logic* (1812/1831, 1813, 1816), Edited and translated by George di Giovanni, Cambridge, Cambridge University Press, 2010, p. 33: “that what is self-contradictory does not resolve itself into a nullity, into abstract nothingness, but essentially only into the negation of its particular content”; or “such a negation is not just negation, but is the negation of the determined fact which is resolved, and is therefore determinate negation; that in the result there is therefore contained in essence that from which the result derives – a tautology indeed, since the result would otherwise be something immediate and not a result. Because the result, the negation, is a determinate negation, it has a content. It is a new concept but one higher and richer than the preceding – richer because it negates or opposes the preceding and therefore contains it, and it contains even more



Overcoming or transcending occurs when in the old state there are elements which, themselves, are negations / inferior forms of necessity: these elements or aspects are and must be overcome, precisely for the state to correspond to the universal concept that determines it. It is a question of suppressing a contradiction, not of the absolute suppression of the whole in which that contradiction exists.

But it depends on how we conceive of continuity and how we treat it. The seemingly cautious but a-historical perspective equates *the present* as we conceive it with its *continuity* (and its preservation). So, it is clear that this very conception of the present can no longer be equated with the simple copy, the simple confirmation of an existing that is legitimated at an absolutely extra-human level. Obviously, the current level of understanding of knowledge excludes such a perspective of equating the present with continuity<sup>82</sup>. As a result, the treatment of continuity must be critical, *i.e.* to discern between its aspects, to select them and to transform them according to their adjustment to the discontinuity already appeared in the system. However, such a critical treatment of continuity is not a loss of this continuity, but, on the contrary, an enriching and a revelation of it<sup>83</sup>.

The second meaning of the term *Aufhebung* is that of overcoming as *suppression / abolition in essence*, in which the very preservation of the old is subordinated thereto. The contradictions of the old appear so significantly that they cannot be overcome “here and there”, partially: precisely because such a partial, non-structural overcoming is contradictory exactly to continuity<sup>84</sup>.

Continuity is not, therefore, legitimate unless it is processed and shaped as discontinuity, or simply put, unless it is transformed. But why?

The second argument against the fear of alternatives is the *purpose* of the alternative. After all, what has always been the purpose of human reason, of logic, of the *logos* as it was understood by the ancients as the ongoing mental ordering of the world<sup>85</sup>? The purpose of the human logic was and is to *solve the problems* that arise in the human existence and in the contemplation of existence<sup>86</sup> by man. And if the problems have not

---

than that, for it is the unity of itself and its opposite”.

<sup>82</sup>Ionuț Tudor, „Concept și subiect de drept. Reflecții hegeliene” [“Legal concept and subject. Hegelian reflections”], pp. 15-25, in Emanuel Copilaș (coord.), *Aventurile posibilului: două secole de filosofie politică hegeliană* [Adventures of the possible: two centuries of Hegelian political philosophy], Iași, Editura Universității „Alexandru Ioan Cuza”, 2021: “Present must not deceive us, it was not there from the beginning, it became as such at certain historical moments and due to specific historical coordinates” (p. 24).

<sup>83</sup>Karl Marx, *Economic and Philosophical Manuscripts of 1844*, “Communism as the positive transcendence of private property as human self-estrangement, and therefore as the real appropriation of the human essence by and for man; communism therefore as the complete return of man to himself as a social (i.e., human) being – a return accomplished consciously and embracing the entire wealth of previous development (*Aufhebung*)”.

<sup>84</sup>Tony Andréani, *Misère du réformisme. A propos de L’esprit de la révolution. Aufhebung*, Marx, Hegel et l’abolition, de Patrick Theuret, <http://denis-collin.viabloga.com/news/misere-du-reformisme>.

<sup>85</sup>As it is known, the human *logos* was conceived by the ancients as a pendant of the *logos* of the world, that is, of the ability and, at the same time, of the world’s characteristic of order. This correspondence of the human *logos* with that of the universe or the given existence precisely signalled the ability of reason to capture the order of the world, therefore, to put in order the disordered appearance of things.

<sup>86</sup>Problem solving is not synonymous with the theoretical teleological perspective in which the final goal and form would already be caught in the starting forms and moments. Such a perspective appears in a simplistic image of linear dialectical logic in which the existence of negation already implies the contradiction which, in its turn, automatically gives rise to the new thesis that denies negation.

Actually, in dialectical logic, the result is only a (possible) consequence of the contradiction; and its characteristic of “reason to be” of the entire reasoning (and process) – in which after the accumulation of the determinations highlighted by theses, contradictions (antitheses) appear and they logically require their overcoming (synthesis) – does not imply at all that overcoming (the famous denial of negation) be an absolute negation of the antithesis and take place only in the individual affirmative form. More clearly: if Hegel gave us the logic in which “the contradiction of statements made by the consciousness

been solved by the logical ordering of human existence as it is given or is considered as given, then the only solution is to question the datum itself and, inherently, to think alternatives. The alternatives are not meant to destroy the constructive peace necessary for human balance. On the contrary, they make a decisive contribution to this peace: when it becomes rarer and when it is necessary to re-stimulate it. The concern for continuity is, thus, congruent with the concern to conceive alternatives: always on time.

## Bibliography

- [1] *Alarmist reporting hides Covid vaccine success*, August 20, 2021, <https://rnc.bfmtv.com/emission/covid-19-les-vaccins-de-pfizer-et-moderna-nettement-moins-efficaces-contre-le-variant-delta-2047271.html>.
- [2] Andréani, Tony. *Misère du réformisme. A propos de L'esprit de la révolution. Aufhebung, Marx, Hegel et l'abolition, de Patrick Theuret*, <http://denis-collin.viabloga.com/news/misere-du-reformisme>.
- [3] Bazac, Ana. Sartre and the responsibility of choice, *Revue roumaine de philosophie*, **52**(1-2):173-185, 2008.
- [4] Bazac, Ana. Lucian Blaga and Thomas Kuhn: The Dogmatic Aeon and the Essential Tension, *Noesis*, **37**:23-36, 2012.
- [5] Bazac, Ana. From the Objective Information to the Information Created and Received by the Human Beings: And What Does Informatonosis Mean?, *Noema*, **17**:15-47, 2018.
- [6] Bazac, Ana. *Logica și interesele de clasă*, 20 aprilie 2020, [http://www.criticatac.ro/logica-si-interesele-de-clasa/\[Logicandclassinterests\]](http://www.criticatac.ro/logica-si-interesele-de-clasa/[Logicandclassinterests]).
- [7] Bazac, Ana. Structuri de conținut în dezvoltarea comprehensiunii [Content structures in the development of comprehension], *Studii de epistemologie și teoria valorilor*, București, Editura Academiei Române, **6**:127-154, 2020.
- [8] Bierce, Ambrose. *The Devil's Dictionary*, 1911, [https://www.gutenberg.org/files/972/972-h/972-h.htm#link2H\\_4\\_0014](https://www.gutenberg.org/files/972/972-h/972-h.htm#link2H_4_0014).
- [9] Bostrom, Nick. The Vulnerable World Hypothesis, *Global Policy*, **10**(4):455-476, 2019.

---

on different levels of its development" appears (Dragoș Popescu, *Logică naturală și știința logicii în filosofia lui Hegel* [Natural logic and the science of logic in Hegel's philosophy], Giurgiu, Pelican, 2009, p. 241), Marx's dialectical logic involves the realistic evolution of thought in which modal situations and the pluralism of theses regarding determinations also exist. So, speaking of Marx's dialectical logic we do not reduce it to the application of logical schemes to real life, but we remain at the level of the formal science of thought structures; although in Marx such a science appears rather indirectly, from its applications in real life or as a result of observing the ways of thinking in real life.

Speaking about the teleological perspective: the telos as ab initio triggering cause appears in Aristotle. In Hegel, telos is not an ab initio cause, but appears in connection with thinking and resolving contradictions. In Marx, telos is, on the one hand, only thought and, on the other hand, only possible. In other words, even for the same reasoning / argument, there is not a single telos. And no, objective logic and subjective logic do not remain indifferent to each other (as Dragoș Popescu considers, *ibidem*, p. 233). If thinking – by which several teloi are confronted – fails to see better the type and extent of the determinations as theses and the type and extent of the contradictions they support, then the result, the synthesis, does not contain at all the telos that was initially considered as a premise of the entire reasoning. Or, of course, the result supports a different telos. The result is a possible consequence and, possibly, not even the best/most logical.

- [10] Broad, Charlie Dunbar. Determinism, Indeterminism, and Libertarianism (1934), in Charlie Dunbar Broad, *Ethics and the History of Philosophy*, London, Routledge & Kegan Paul, pp. 195-217, 1952.
- [11] Chau, Nguyen Van Vinh et al. *Transmission of SARS-CoV-2 Delta Variant Among Vaccinated Healthcare Workers, Vietnam*, preprint with The Lancet, <https://ssrn.com/abstract=3897733> or <http://dx.doi.org/10.2139/ssrn.3897733>.
- [12] Callaway, Ewen. Do you speak virus? Phages caught sending chemical messages, *Nature*, 18 January 2017. <https://doi.org/10.1038/nature.2017.21313>
- [13] Delépine, Dr. Gérard. *L'hécatombe post vaccinale s'étend dans le monde*, 25 mai 2021. <https://www.mondialisation.ca/lhecatombe-post-vaccinale-setend-dans-le-monde/5656922>
- [14] Farinholt, Timothy et al. Transmission event of SARS-CoV-2 Delta variant reveals multiple vaccine breakthrough, *medRxiv* preprint, 2021.
- [15] Foucault, Michel. *Discourse & Truth: The Problematization of Parrhesia - Six lectures given by Michel Foucault at the University of California at Berkeley*, Oct-Nov. 1983.
- [16] Gardiner, Stephen. *A Perfect Moral Storm: The Ethical Tragedy of Climate Change*, New York: Oxford University Press, 2011.
- [17] Gelfert, Axel. "Climate Scepticism, Epistemic Dissonance, and the Ethics of Uncertainty", *Philosophy and Public Issues (New Series)*, Vol. 3, No. 1 (2013), pp. 167-208.
- [18] Giuculescu, Alexandru. Order Versus Chaos or the Ghost of Indeterminacy, *Twentieth World Congress of Philosophy, in Boston, Massachusetts*, August 10-15, 1998, <https://www.bu.edu/wcp/Papers/Scie/ScieGiuc.htm>.
- [19] Giuliodori, Lucio, Valentina Uliumdzhieva, Elena Notina, Irina Bykova, Thinking Beyond, *Living Beyond: Futurism, Wisdom*, 2(15):176-187, 2020.
- [20] Hauser, Alan R., Joan Mecsas, Donald T. Moir. Beyond Antibiotics: New Therapeutic Approaches for Bacterial Infections, *Clinical Infectious Diseases*, 63(1):89-95, 2016.
- [21] Hegel, Georg Wilhelm Friedrich. Wer denkt abstrakt? (1807), in G. W. F. Hegel, *Werke in zwanzig Bänden*, Frankfurt am Main, Suhrkamp Verlag, 1970, 2 Band (Jenaer Schriften – 1801-1807), pp. 575-580.
- [22] Hegel, Georg Wilhelm Friedrich. *The Science of Logic* (1812/1831, 1813, 1816), Edited and translated by George di Giovanni, Cambridge, Cambridge University Press, 2010.
- [23] Heraclitus. *The Complete Fragments*, Translation and Commentary and The Greek text – William Harris, Middlebury College, <http://wayback.archive-it.org/6670/20161201175137/http://community.middlebury.edu/~harris/Philosophy/heraclitus.pdf>.
- [24] Holcombe, Madeline, and Christina Maxouris. *Fully vaccinated people who get a Covid-19 breakthrough infection can transmit the virus, CDC chief says*, August 6, 2021, <https://edition.cnn.com/2021/08/05/health/us-coronavirus-thursday/index.html>.

- [25] Hume, David. *A Treatise of Human Nature*, Oxford, Clarendon, 1965.
- [26] Ioannidis, John. Why Most Published Research Findings Are False, *PLOS Medicine*, **2**(8), 2005, e124.
- [27] Kakarla, R. et al. Apoptotic Cell-derived Exosomes: Messages from Dying Cells, *Experimental & Molecular Medicine*, **52**:1-6, 2020.
- [28] Kant, Immanuel. *Critique of Pure Reason* (1781). Gruyer, P. A. W. Wood (Trans., Ed.). Cambridge University Press, 1998.
- [29] Keen, Eric C. Paradigms of pathogenesis: targeting the mobile genetic elements of disease, *Frontiers in Cellular and Infection Microbiology*, 14 December 2012.
- [30] Kováč, Ladislav. Life, chemistry and cognition: Conceiving life as knowledge embodied in sentient chemical systems might provide new insights into the nature of cognition, *Embo Reports*, **7**(6):562-566, 2006.
- [31] Kožnjak, Boris. Can there be a ‘scientific worldview’? A Critical Note, *Filozofija i Društvo*, **24**(4):19-29, 2013.
- [32] Lewis, Maryse Laurence. *Le langage et les droits humains : futilités et débats incohérents*, 25 mai 2021, <https://www.mondialisation.ca/le-langage-et-les-droits-humains-futilites-et-debats-incoherents/5656897>.
- [33] Loikith, Lisa, Robert Bauchwitz. The Essential Need for Research Misconduct Allegation Audits, *Science and Engineering Ethics*, **22**:1027–1049, 2016.
- [34] Lucchetti, D. et al. Detection and Characterization of Extracellular Vesicles in Exhaled Breath Condensate and Sputum of COPD and Severe Asthma Patients, *European Respiratory Journal*, **58**(2), 2021.
- [35] Marx, Karl. Economic and Philosophical Manuscripts of 1844, <http://www.marxists.org/archive/marx/works/1844/manuscripts/comm.htm>
- [36] McCullough, Peter. *Study: Fully Vaccinated Healthcare Workers Carry 251 Times Viral Load, Pose Threat to Unvaccinated Patients, Co-Workers*, 24 August 2021, <https://www.globalresearch.ca/study-fully-vaccinated-healthcare-workers-carry-251-times-viral-load-pose-threat-unvaccinated-patients-co-workers/5753908>.
- [37] Michael Welch, Stephen Malthouse, Peter McCullough. *Doctors vs Health Authorities. Clinically Proven Drugs vs the Jab. Who will Prevail?*, June 05, 2021, <https://www.globalresearch.ca/doctors-vs-health-authorities-clinically-proven-drugs-vs-the-jab-who-will-prevail/5746999>.
- [38] Moisil, Grigore. *Lecții despre logica raționamentului nuanțat* [Lessons on the logic of nuanced reasoning], București, Editura Științifică și Enciclopedică, 1975.
- [39] Nadin, Mihai. *Anticipation: The end is where we start from*, Computer Science Colloquium, University of Bremen, 11 June 2003.
- [40] Osuchowski, Marcin F. et al. The COVID-19 puzzle: deciphering pathophysiology and phenotypes of a new disease entity, *The Lancet*, **9**(6):622-642, 2021.
- [41] Parascandola, Mark. Causation in Epidemiology, *Journal of Epidemiology & Community Health*, **55**:905–912, 2001.

- [42] Pascal, Blaise. *Pensées* (1670), Léon Brunschvicg éditeur, 1897, Ebook Samizdat, 2010.
- [43] Plato. *Phaedo*, in *Plato in Twelve Volumes*, Vol. 1 translated by Harold North Fowler; Introduction by W.R.M. Lamb. Cambridge, MA, Harvard University Press; London, William Heinemann Ltd. 1966
- [44] Plato. *Meno*, in *Plato in Twelve Volumes*, Vol. 3 translated by W.R.M. Lamb. Cambridge, MA, Harvard University Press; London, William Heinemann Ltd. 1967.
- [45] Plato. *Republic*, in *Plato in Twelve Volumes*, Vols. 5 & 6 translated by Paul Shorey. Cambridge, MA, Harvard University Press; London, William Heinemann Ltd. 1969
- [46] Popescu, Dragoș. *Logică naturală și știința logicii în filosofia lui Hegel* [Natural logic and science of logic in Hegel's philosophy], Giurgiu, Pelican, 2009.
- [47] Popescu, Dragoș. Demonstrația matematică și demonstrația speculativă. Linii de orientare, *Probleme de logică* [Mathematical and speculative demonstration. Guidelines], **20**:127-137, 2017.
- [48] Pörtner, H. O. et al. *IPBES-IPCC co-sponsored workshop report synopsis on biodiversity and climate change*, IPBES and IPCC, 2021, DOI:10.5281/zenodo.4782538.
- [49] Puskás, László G. Nanobionts and the Size Limit of Life, in Anna-Teresa Tymieniecka, Attila Grandpierre (Eds.), *Astronomy and Civilization in the New Enlightenment*, Springer, pp. 225-228, 2011.
- [50] Ryder, Paul. The Pentagon Papers at 50: What's Left Out is Crucial, *CounterPunch*, May 25, 2021. <https://www.counterpunch.org/2021/05/25/the-pentagon-papers-at-50-whats-left-out-is-crucial/>.
- [51] Salanskis, Jean-Michel. *Y a-t-il une Kehre de la logique?*, 2004, <http://jmsalanskis.free.fr/IMG/pdf/Kehrlog.pdf>
- [52] Sălăvăstru, Constantin. Tendances actuelles dans la théorie de l'argumentation - Essai critique et systématique, *Noesis* **27**:13-45, 2002.
- [53] Sălăvăstru, Constantin. *Logique, argumentation, interprétation*, Collection «Epistémologie et philosophie des sciences», Paris, Editions L'Harmattan, 2007.
- [54] Sedon, Nathalie et al. Getting the message right on nature-based solutions to climate change, *Global Change Biology*, **27**(8):1518-1546, 2021.
- [55] Seneff, Stephanie Greg Nigh. Worse Than the Disease? Reviewing Some Possible Unintended Consequences of the mRNA Vaccines Against COVID-19, *International Journal of Vaccine Theory, Practice, and Research*, **2**(1):402-443, 2021.
- [56] Shearmur, Jeremy. *Abusing Popper*, pp. 7-12, May 2021. <https://www.hpsst.com/uploads/6/2/9/3/62931075/2021may.pdf>.
- [57] Smith, Richard. *Journals, fraud, science, and misaligned incentives*, July 25, 2016. <https://blogs.bmj.com/bmj/2016/07/25/richard-smith-journals-fraud-science-and-misaligned-incentives/>
- [58] Steiner, J. A., E. Angot, P. Brundin. A Deadly Spread: Cellular Mechanisms of  $\alpha$ -Synuclein Transfer, *Cell Death and Differentiation* **18**:1425-1433, 2011.

- [59] Tontono, Matthew. In a Twist, Scientists Find Cancer Drivers Hiding in RNA, Not DNA, Monday, August 27, 2018, <https://www.mskcc.org/news/scientists-find-cancer-drivers-hiding-rna-not-dna>.
- [60] Tudor, Ionuț. Concept și subiect de drept. Reflecții hegeliene [Concept of law and subject of law. Hegelian remarks], in Emanuel Copilaș (Ed.), *Aventurile posibilului: două secole de filosofie politică hegeliană*, Iași, Editura Universității „Alexandru Ioan Cuza”, pp. 15-25, 2021.
- [61] Young, Robert O. *Dismantling The Viral Theory*, Jun 20, 2020. <https://www.drrobertyoung.com/post/dismantling-the-viral-theory>
- [62] Zadeh, L. A. Quantitative Fuzzy Semantics, *Information Sciences*, **3**:159-176, 1971.
- [63] Erez, Zohar et al. Communication between viruses guides lysis-lysogeny decisions, *Nature*, **541**(7638):488–493, January 26, 2017.