# *Philosophy, Information, Intelligence, Society; A Complex Cognitive Ontolon*

***Abstract***

To discuss the philosophy of information (PI) in relation to the intelligent society, appropriate concepts of philosophy, information, intelligence and society are required. Here, I first apply the non-propositional logic of Stéphane Lupasco to the PI of Wu Kun. PI is then related to a new concept of a science of intelligence, recently introduced in China by Zhong Yixin, Shi Zhongzhi and Zhao Chuan, giving a basis for deciding if a society is 'intelligent'. The complex, evolving set of processes operating in human society can be considered a new type of dynamic systems 'unit'. Abir Igamberdiev and I have adopted the term ontolon for such ontological units. Wu previously defined the informosome as the integral of the life experiences of an individual in informational terms. The ontolon is a similar heuristic tool, embodying ethics and offering a holistic view of knowledge for the common good.

## 1. BACKGROUND AND INTRODUCTION

Almost exactly ten years ago, the 4th International Conference on the Foundations of Information Science – FIS - took place in Beijing, under the leadership of Pedro Marijuan and Wolfgang Hofkirchner. With the involvement of Wu Kun, two of the main currents of thought in the field of information converged: the Information Science of Marijuan and Hofkirchner and the Philosophy of Information, a field pioneered by Wu. Other leading Chinese figures in information, logic and Artificial Intelligence, including He Huacan, Zhong Yixin and Yan Xueshan contributed to this field.

At this Conference, Wu made available a manuscript in English, *Basic Theory of the Philosophy of Information* (Wu, 2010), which summarized his work of the prior quarter-Century. I also presented a paper at this Conference in which, for the first time in connection with information, I discussed the non-standard, non-propositional logic of the Franco-Romanian philosopher and logician Stéphane Lupasco. Since 2000, I had been working with Professor Basarab Nicolescu, a founder with Lupasco of the International Center for Transdisciplinary Research (CIRET). My task was to make Lupasco's work available in English. As I have shown elsewhere, this logical-philosophical system, which I have referred to as Logic in Reality (LIR) (Brenner, 2008), can be used to amplify and extend standard notions of information based on the original concepts of Shannon and others.

Also in the last 10 years, the expanding field of Information Science and has been explored by many scientists and philosophers including Terrence Deacon and Gordana Dodic-Crnkovic, Marcin Schroeder, Mark Burgin and Rafael Capurro. Luciano Floridi has pioneered in the field of the Philosophy of Information in the West (Floridi, 2010), as has Wu in China, but Floridi has had only a tangential relationship to the work of Wu and his associates.

The Beijing Conference also led to the formation of the International Society for the Study of Information, in which the workers mentioned have had a leading role. Wolfgang Hofkirchner and others also pioneered the development of the concept of a Unified Theory of Information and, most recently, of a Global Sustainable Information Society (GSIS) (Hofkirchner, 2013, 2015). A new Institute for a GSIS started last year. A fourth current of thought, also present in the original work of Lupasco, has been that of systems theory. New concepts of systems, such as those of Hofkirchner and those being developed by Gianfranco Minati in Milan (Minati, 2018), are central to my paper.

Since 2018, I have focussed on Natural Philosophy and the synergy which I saw between it, the logic of Lupasco and the Information Science and Philosophy of, in particular, Wu, Capurro and Hofkirchner. These studies led to my collaboration with the biologist and

philosopher Abir (Andrei) Igamberdiev, culminating in the recent joint publication of two papers (Brenner, Igamberdiev, 2019) and a new book in press, *Philosophy in Reality.*

## 2. THE FORUM THEME

Whatever we may have thought or written about the subjects of society, intelligence, information or philosophy, or perhaps about two of them, we are being asked at this Forum to present a coherent discussion – synthetic rather than analytic – of all four together. There are many difficulties to be overcome: for example, 'society' is not considered, at least by the authoritative *Stanford Encyclopedia of Philosophy*, as a category separate from the various perspectives that have been used to study "it".

The nature of change, Change in Reality, is central to all these subjects. Inspired by the ancient Chinese *Book of Changes,* the *I (Yi) Ching* (Legge, 1899), the sub-title of my new book is *A New Book of Changes*. Change is ubiquitous in existence and experience. Since the Bergamo Conference on Change in 2009 (Brenner, 2009), little progress has been made either in the understanding of change in general, nor in the reasons for that lack of understanding. Western theories of change, however, have focused on making it mathematically, computationally and logically tractable, within the framework of standard logic. In fact, change is contradictory: it is regular *and* irregular; consistent *and* inconsistent; continuous *and* discontinuous. Since the only logics available have been propositional bivalent logics, incapable of accepting real contradictions, they have been incapable of describing change.

The importance of the *I Ching* in this context is as an attempt (or series of attempts) to find the underlying features common to the experience and knowledge of change and consequently of human life and the universe in their entirety. The *I Ching* can be understood on many levels, and it contains many forms of truth; one need not believe oneself in divination to know that it satisfies a human need, but this particular use will not concern us here.

## 3. OUTLINE OF PAPER

In this paper, as outlined below, I will discuss the basic principles of Logic in Reality, aspects of Intelligence and the Intelligent Society, and a new concept for discussing existence.

### 3.1 Basic Principles of Logic in Reality

- Logic in Reality (LIR). Grounding in physics
- Logic in Reality as a Formal Logic; Implication
- Categorial Non-Separability
- Philosophy in Reality: the Recuperation of Dialectics and Semiosis
- Information in Reality: Logic and Philosophy

### 3.2 Intelligence and the Intelligent Society

- Intelligence and Intelligence Science.
- Agency
- The Common Good

### 3.3 Existence and the Units of Existence

- Ontolons
- The Society as a Complex Cognitive Ontolon
- Incompleteness

## 4. LOGIC IN REALITY (LIR)

As it was fifteen years ago, in the absence of discussion in the literature, the Lupasco system has to be re-presented *ab origine*. The simplest formulation is that Logic in Reality is a scientific-philosophical perspective that yields a process view of nature and change. There are two kinds of thermodynamic change, linear and interactive. In interactive change, opposing elements are related such that the actualization of one implies the potentialization of the other, alternately and reciprocally, without either ever going to the ideal limits of 0 or 1 except in trivially simple cases. Values resemble non-Kolmogorovian probabilities. Opposing process elements move as from predominantly actuality to predominantly potentiality and *vice versa*, and from identity (unity, homogeneity) to diversity (multiplicity, heterogeneity) and *vice versa.* New entities emerge from the mid-point where the degree of actuality and potentiality is the same. These rules operate at all thermodynamic levels of reality and define a non-truth-functional *logic* - Logic in Reality (LIR). LIR allows inferences about the further evolution of the processes under consideration (Brenner, 2008).

### 4.1 Opposing Elements

Familiar elements of processes that are opposing in the sense of LIR, but also not separate or separable, are the following:

| | |
|---|---|
| • Knowledge (Knowing) | Ignorance (not-Knowing) |
| • Knowledge_as_Such | Intuition |
| • Philosophy (Philosophization) | Science (Scientification) |
| • Information_as_Energy | Information_as_Meaning |
| • Memory | Forgetting |
| • Presence | Absence |
| • Distinct | Fuzzy |
| • Figure | Ground |

As one example of the operation of these principles, I note that sets and the members of sets are not totally disjoint. The LIR concept of non-semantic logical consequence, real material implication, applies to part-whole relations: the parts and the whole of complex processes are not separate or separable. It has been said many times that a relation exists between figure and ground, but these are usually thought of a distinct, requiring a full cognitive 'switch' from one to the other, for which simplistic pictures are given. This is what I called the optical equivalent of the logical principle of absolute non-contradiction.

### 4.2 The Fundamental Postulate of LIR

The fundamental postulate of LIR is that any arbitrary element e is always associated with its opposite, non-e, such that the actualization of one entails the potentialization of the other and *vice versa*, alternatively, without either ever disappearing completely (Principle of Dynamic Opposition).

The mid-point of semi-actualization and semi-potentialization of both is a point of maximum contradiction or better non-linguistic interaction or "countervalence". Emergence of an intermediate "*T*-state" resolves the contradiction (or "counter-action") at a higher level of complexity or reality. Logical operations (*e.g.*, implication) are *also* viewed as processes. The basic implication, in this theory, is that e actual *implies* non-e potential.

### 4.3 The Axioms of LIR

What I consider the definitive formulation (Brenner, 2008) of the Axioms of LIR is the following:

**LIR1:** *(Physical) Non-Identity*: No A at a given time is identical to A at another time.

**LIR2:** *Conditional Contradiction*: A and non-A both exist at the same time, but only in the sense that when A is actual, non-A is potential, reciprocally and alternatively.

**LIR3:** *Included (Emergent) Middle*: An included or additional third element or T-state emerges from the point of maximum contradiction at which A and non-A are equally actualized and potentialized, but at a higher level of reality or complexity, at which the contradiction is resolved.

**LIR4:** *Logical Elements*: The elements of the logic are all representations of real physical and non-physical entities.

**LIR5:** *Functional Association*: Every real logical element e – objects, processes, events – is always associated, structurally and functionally, with its anti-element or contradiction, non-e, in physics terms, they are conjugate variables. This Axiom applies to the classical pairs of dualities, *e.g.*, identity and diversity.

**LIR6:** *Asymptoticity*: No process of actualization or potentialization of any element goes to 100% completeness.

### 4.4 A Logic of Change

The key characterization of LIR is that it is *a* logic, perhaps *the* logic of change. At the different levels of reality, change is defined as developments:

| **Level** | **Development Toward** |
|---|---|
| **Quantum** | **◊ Contradiction; T-state (superposition)** |
| **Physical (inorganic)** | **◊ Non-contradiction of Identity** |
| **Biological** | **◊ Non-contradiction of Diversity** |
| **Cognitive** | **◊ Contradiction; T-state (emergence)** |

As discussed in detail in (Brenner, 2008), and as originally stated by Nicolescu (2002), the quantum level resembles the human cognitive level: it is isomorphic to it, but quantum properties are not to be found as such at the mental level due to decoherence.

### 4.5 The Categories of Logic in Reality

For purposes of discussion, I have defined the following as the non-standard, ontological categories of LIR:

**Material**

Energy/Quantum Field

**Formal**

**Process**

- Emergence, Closure and Downward Causation

**Dynamic Opposition**

- Separability and Non-Separability

**Subject, Object and Subject-Object**

**T-state (**emergent included middle**)**

I call attention in particular to that of Non-separability and the T-state or Included Middle which are at the heart of LIR as a *philosophy* in and of reality.

### 4.6 Systems Theory

Lupasco, in what he called systemology, (1962), provided the basis for the application of LIR to systems, starting from the three basic principles necessary for the formation and persistence of a system.

- A Relation of Antagonism
  - without repulsion = agglomeration
  - without attraction = scattering

- A Relation of Contradiction
  - all elements identical = total homogeneity
  - all elements different = total heterogeneity

- A Principle of Antagonism applicable to Energy
  - without passage from actuality to potentiality ◊ no change possible (and *vice versa*, alternatively)
  - energy: a contradictory duality of extensity and intensity

In my new book, *Philosophy in Reality* (in press), there is an extensive discussion of the application of these principles to a philosophy of c*omplex* systems, a field that has received essentially no attention since 2011 and the authoritative work of Hooker (2011).

## 5. PHILOSOPHY IN REALITY. NATURAL PHILOSOPHY

All of the subjects in this paper deal with philosophy, information, intelligence and society as part of Natural Philosophy. Wu Kun has explained why the Philosophy of Information should in fact be considered a Metaphilosophy: it contains or implies all individual philosophies such as the Philosophy of Science, the Philosophy of History, and so on. The (Meta)-philosophy of Information is similar if not identical to Natural Philosophy

Natural Philosophy is a non-technical domain of knowledge that tells us something real about the world consistent with our best science, physical, biological and cognitive. Speculative philosophy can always re-illuminate 'eternal' questions such as what it means to be a thinking being in a non-thinking environment, but it cannot in itself be other than part of philosophy *tout court*. Natural Philosophy is receiving a current detailed study by Gordana Dodig-Crnkovic in a series of Special Issues of the journal *Philosophies*, under the direction of Marcin Schroeder (2018).

In the conception of Rafael Capurro, Natural Philosophy deals with the question about nature as a whole stated by beings (ourselves) who find themselves in nature without having the possibility of a holistic view of being, since we are ourselves in nature and not beyond it. My basic working hypothesis is that the dynamic principles of Logic in Reality offer a way of distinguishing between Philosophy in Reality and Philosophy *tout court* and its non-or anti-realist stances.

### 5.1 Natural Philosophy and LIR

The state in which I found the field in 2017 prompted a paper which I called "The Naturalization of Natural Philosophy" (Brenner, 2017). By this somewhat provocative title, I wanted to call attention to what I saw as the overdependence of natural philosophy on *analytic* statements that are true by virtue of the meaning of their constituent terms alone. In contrast, the statements of Logic in Reality look like what are termed *synthetic* statements, that is, ones whose truth depends on matters - in particular, contingent facts about the world - to which a

dialectic *structure* can be ascribed. LIR thus provides support to a naturalistic, causal-role theory of mental content and a naturalistic means of drawing the analytic/synthetic distinction. This can be part of Natural Philosophy, even if a 'pure' analytic theory cannot be. LIR *always* defines a real relation between the intensional notions or aspects of a phenomenon and the extensional ones. Kaye (1995) claims that his causal role theory of content identifies the meanings of representations in the brain with the causal relations of representations that are determined by their structure and by the structure of cognition. Despite the incomplete knowledge of the details of such causal relations within our mind/brains, LIR defines the operation in them of dynamic opposition as a structural or better structuring principle. It is possible to say, now, that an analytic statement is true in virtue of *both* the causal relations resulting from its syntactic structure and, as well, the causal relations that it stands in by virtue of the structure of the cognitive system that contains it. The consequence is that an absolute distinction between analytic and synthetic statements does not need to be fully maintained. Analytic claims can provide insight into external reality, but only if coupled with a non-semantic theory that provides some basis for explanation of the coincidence between our concepts and the properties or real phenomena of the world. By starting from the side of the phenomena, LIR permits progress toward a new 'synthetic' philosophy that if not entirely is more within the domain of Natural Philosophy. For a further compatible perspective on Natural Philosophy, see Igamberdiev (2018).

### 5.2 Human Consciousness and Natural Philosophy

In contrast to theories of the mind that tend to idealize the operation of consciousness, I place questions about the phenomenon of human and animal consciousness squarely in the domain of Natural Philosophy. Representations and beliefs are natural *qua* the mental processes from which they develop; they are only pure philosophy with regard to content, even if they refer to real objects (I believe the door is open) and can be verified *a posteriori*. As in the case of organism evolution, it is only by examining the dynamics of lower-level emergent processes that one can adequately explain the sentience, representation, perspective, and agency that are the hallmarks of mental experience.

By reframing the problem in logical-dynamical terms, I believe we will discover that rather than being the ultimate "hard problem" of philosophy and neuroscience, the subjective features of neural dynamics are the expected consequences of this emergent hierarchy, as discussed by Deacon (2011). The so-called mystery of consciousness may thus turn out to be a false dilemma, created by our failure to understand the causal efficacy of emergent constraints.

## 6. INFORMATION AND INFORMATION PHILOSOPHY

Information is best described as a complex emergent phenomenon at the intersection of technology, science and philosophy. The relevance of the first two disciplines have been accepted for some time, but as noted, only in the last twenty years has the pioneering work of Wu Kun and Luciano Floridi in the philosophy of information begun to receive proper attention.

### 6.1 Theories of Information

Many of the properties of information correspond rather closely to the contradictory aspects of change listed above, and the importance of the nature and role of information in science and philosophy cannot be overestimated. Here, I will simply agree with Ladyman and Ross (2007) that one need not worry about the apparent insubstantial nature of information because there is no absolute dichotomy between the abstract and the concrete or between the

substantial and the structural in the first place. One does not need and should not say that the world is 'made' of information, which is bad, old dualistic ontology, but that information is a fundamental concept for understanding the objective modality of the world – its laws, cause and effect and kinds. Citing Zeilinger, L&R repeat that "it is impossible to distinguish operationally in any way reality and information – the notion of the two being distinct should be abandoned." Our logic and dialectics enable this statement to be rationally applied, that is, to cases and situations whose complexity requires my approach. Attempts to counter it by reference to two types of limiting, idealized cases should be rejected, here as elsewhere. Examples are simple binary events at one end of the spectrum, and constructed catastrophic counterfactual 'examples', with zero probability of actualization, at the other. It is part of reality that two human beings are physically, and immunologically separate, but their minds are or can be in a joint state of communicational 'overlap'. Information may not be energy in the standard sense of Wheeler, but it cannot be defined without reference to energy, which is required for its transmission. In Lupascian terms, information is and is not energy.

Without going to the excessive concept of Wheeler that all things physical are information-theoretic *in origin*, I can state clearly that my metaphysics is a metaphysical dynamicism. We thus recover, in a more modern context, the frequent use by Lupasco of *dynamism* to refer to processes. Both are ontic notions involving real process properties in contrast to the epistemic notion of dynamicity of Johanna Seibt (2015).

**6.2 General Theory of Information or Theory of General Information**

In a recent book (2010), Mark Burgin has presented an extremely complete approach to a General Theory of Information (GTI) based on a thorough analysis of information processes in nature, technology and society. In particular, Burgin gives an extensive treatment of how information is modeled by mathematical structures. As Burgin and Brenner have shown elsewhere (2017), Logic in Reality supports many of the conceptions of the properties of information in the GTI. Brenner has offered a "non-representational" logical (in the LIR extended sense of logic) theory of information that complements the semiotic, "representational" theory. With Burgin, we claim that it is necessary to see information, better the information generation process, not as the output of a symbolic operator but of a natural and social operator.

In the GTI, information is characterized by a system of principles which are both mathematical and philosophical. The GTI, in Burgin's terms, treats information at a very high methodological and mathematical level. It provides tools for specifying the characteristics of all existing information theories which, together, constitute information science, and of types of information, ethical and semantic, for which semantic meaning is the essential feature.

From another standpoint, Burgin's theory is not so much a General Theory of Information as a Theory of General Information. For me, what are ontologically primary are the phenomena themselves, which have meaning embodied as the information necessary for the survival and reproduction of living beings. These phenomena follow rules that are a combination of principles that are digital and analogue, mathematical and non-mathematical, Boolean and non-Boolean.

Burgin further states that his General Theory of Information "encompasses all existing information theories only potentially". Accordingly one must have both it and "a variety of special information theories". If we accept this most interesting point as a basis for discussion, a further modification of Burgin's conception suggests itself: the GTI he has defined is in fact *Meta-Theory* of Information, a theory of *Theories* of Information. As I have frequently pointed out, however, there is not and does not have to be an absolute separation between a theory and its associated meta-theory, which coexist dialectically. There is a clear, intriguing

parallel here with the approach of Wu Kun and his definition of the Philosophy of Information as a *Meta-Philosophy*.

I conclude that, as noted, what Burgin has proposed should be called a *Theory of General Information.* It extracts, or abstracts, the general characteristics of information processes independently of their substratum of physical (energetic) properties, that is, their reality. All of the mathematical aspects of his GTI then apply to that abstraction, and a 'meaning' of those aspects exists, but it is tautological. It is a closed, epistemological system, which, like classical logic, is topic-neutral. It cannot found or impact on an ethics. It is a part, but only a part, of the Foundations of Information Science and of an eventual Unified Theory of Information in the sense of Hofkirchner.

### 6.3 *Incomplete Nature*

In his *Incomplete Nature* (2011), the biologist Terrence Deacon extends a concept of energy derived from statistical mechanics to yield a description of complex processes in which *absence* plays a critical role in the emergence of living systems, mind and information. He shows how an *interactive* operation of Shannon, Boltzmann and Darwinian entropy must be taken into account in information. The approaches of Deacon and LIR are complementary: both refer to a phenomenon that is not, or not yet fully *there.* LIR shows that presence (actuality) and absence (potentiality) in such processes must be related dynamically.

### 6.4 Toward a Unified Science-Philosophy of Information (USPI)

In recent papers in English, some of them with me (Wu, 2016)(Wu, Brenner, 2017), Wu has demonstrated the relevance of a philosophical perspective based on considerations of the unique and ubiquitous properties of information, better information processes, and the convergence of philosophy and science in general as a consequence. The philosophical view of process elements as information or informational complements a scientific view of these elements as energetic processes. The concept of a dynamic 'unit' of the informational process experience of individual or collective agents can be found in Wu's concept of an 'informosome'. In this philosophical classification, any complex material structure contains in itself its 'condensed' history, its current properties and the information of its possible or potential future development. This concept grounds the convergence Wu proposes of Information Science and Philosophy toward a Unified Science-Philosophy of Information (USPI). The principles of Logic in Reality apply again here: in such a USPI, the individual components do not lose their identity, but remain in an active dialectic relation to one another. One's mind alternates between a predominantly philosophical and predominantly scientific perspective.

### 6.5 The Informational Attitude (Stance)

Wu Kun has defined an Informational Attitude (IA) as a philosophical position most appropriate for, and not separated nor isolated from, the emerging science and philosophy of information itself. IA requires attention to the informational aspects of complex processes as a methodological necessity. Wu has defined the Informational Attitude or Stance (IS) as a philosophical position most appropriate for, and not separated nor isolated from, the emerging science and philosophy of information itself (Brenner, 2011). IS requires attention to the informational aspects of complex processes as a methodological necessity (Wu, Brenner, 2017).

Application of an Informational Stance would involve defining, for each concept in information research, in all of science and in fact of all knowledge not only its scientific and philosophical aspects but also their interaction and co-modification. The major consideration of such a stance associated with a Unified Science-Philosophy of

Information is thus that of giving proper value to its qualitative, non-measurable and non-computable components. It should never be said that qualitative relations and inequalities that follow the rules of Logic in Reality are more important or necessary than the quantitative equalities, only that they are no less fundamental.

We consider that a Revolutionary Attitude is now a necessary part of the intellectual world, embodying several functions. It would be revolutionary for people to change the dynamics of their acceptance of the published literature, exercising the principle of tolerance but also rigor that Nicolescu has insisted are the main attributes of the Transdisciplinary Attitude.

## 7. INTELLIGENCE AND INTELLIGENCE SCIENCE

Intelligence is a common term which, like information, is capable of being used in a wide variety of senses, more or less adequate. The quite recent development of the concept of Intelligence Science is directly relevant to the theme of this paper. It was developed primarily if not exclusively by a group of Chinese scholars (Zhong Yixin, Shi Zhongzhi and Zhao Chuan). They were dissatisfied by the overemphasis on Artificial Intelligence, not because AI is not a major new and important field of knowledge, but because it was not accompanied by equivalent emphasis on human (and other animal) intelligence. Human intelligence has tended to be studied by statistical and reductionist methods of which the epitome is the so-called Intelligence Quotient (IQ) which has dominated thought about intelligence for the last 100 years or more. In the process other, more scientific modes of description have been neglected.

Intelligence is perhaps best described as a capacity for moral as well as material survival. Intelligence Science is a developing body of knowledge that has a unique philosophical dimension, since intelligence is above all a human phenomenon. In previous work, I have discussed the relation of Information Science and Philosophy. As noted by Wu Kun, the *convergence* of Information Science and Information Philosophy is becoming more and more apparent, toward a unified Science-Philosophy of Information. Perhaps even more than the latter, Intelligence Science challenges the relative role of metaphysics and phenomenology in their implications for the society and the emergence of an Intelligence Philosophy. We thus can already, in its earliest stages, see Intelligence Science in its most theoretical as well as practical aspects as a ‘Science-Philosophy’ resulting from the convergence of the scientific and philosophical characteristics of intelligence, where intelligence is the conjunction of pragmatic and social capability defined above. Intelligence Science has thus a unique philosophical dimension, since intelligence is above all a human phenomenon. One can see Intelligence Science in its theoretical and practical aspects as a ‘Science-Philosophy’ resulting from the convergence of the scientific and philosophical characteristics of intelligence as well as information. As a formal field, however, it requires further differentiation from that of cognitive science.

From my perspective, a more scientific and logical mode, in my extended sense of logic, of talking about intelligence is in terms of capacity for tasks, at the lowest level, and life, at the highest. Intelligence is perhaps best described as a capacity for moral as well as material survival.

## 8. THE INTELLIGENT SOCIETY

The conceptual nexus of this paper, in any case, is the non-separability of the notions of ‘society’ and ‘ethics’. It is perfectly possible to imagine a society, composed of intelligent people, which operates in an unethical manner, individually or collectively. The other two of the four subjects present no conceptual or theoretical difficulties: we are ‘talking’ about philosophy and information constitutes the basis of discourse or interaction between the agents.

We are thus in front of two possible philosophical discourses: the first about ethics and society on the one hand and the role of the intelligence of its members. This is not intelligence in the abstract but that involved in the operations and exchanges taking place between them. The second discourse, more philosophical if you like, is about the nature and structure of the information that is both the medium and the messages of those operations and exchanges,

These discourses are by no means the same, but also not totally different. In fact, the dynamic relation between them, dynamic in the sense of constant change, is described by a non-standard, non-propositional or truth-functional logic that I have referred to extensively as Logic in Reality. Some of the key principles for a satisfactory theory of our current society and of the way in which it should develop were laid out by the sociologist Christian Fuchs. In his paper "The Dialectics of the Nature-Society System" (2006), Fuchs conceives the relationship of nature and society as dialectical, both identical and non-identical at the same time. This establishes the clear link to Logic in Reality.

**8.1 The Locus of Agency**

The first question with which we are confronted is that of agency; is it acceptable to say that a society *is* intelligent or possesses intelligence? To do so is of course a commitment to a systems theory that accepts the reality of collective action. But studies of collective action have tended to focus on systems of entities with levels of consciousness that are low or absent such as flocks of birds or swarms of insects. Part of their patterns of behavior may be found in movements of large numbers of human beings, but they are not good models for or examples of the intelligent social behavior we are studying here. *A posteriori*, it is always possible to say that a 'society' of three or more individuals behaved in an intelligent manner that was most likely the consequence of prior communication among these individuals, resulting in mutual agreement, at least for the purposes of some specific action. The locus of agency, in this approach is not static; it is first in specific individuals and then extends to the collective configuration in which they find themselves. Information is indissolubly present in this situation as the medium of exchange in the communication and subsequent actions undertaken by the society. There is so far nothing startlingly new in what we have said.

We can then ask: has our society been intelligent and/or displayed some form of intelligence in arriving at this 'point of interaction'? Our preliminary answer, for purposes of discussion, is that our society was intelligent if its behavior, or, on a longer time scale, patterns of behavior contributed to the survival and well-being of the individuals composing it. If these were further supported by the existence of the group, this is a secondary albeit just as real advantage of the deployment of intelligence. However, it obviously differs ontologically since a group or society is not a sentient entity. As Smiley put it (2008), "collectives do not have full-blown mental lives".

But no group or collective, any more than any individual, exists in a vacuum. The interaction between groups, in any real world, without unlimited sources of energy as heat and food, should allow *both* to survive under any system of distribution of wealth and resources. Information is involved passively in the society as knowledge of the nature and scope of available resources, and actively in the nature and extent of the knowledge exchanged between groups to further one or the other form of objectives – ultimately, selfish or altruistic.

It is not my intention to reduce the most complex structure in the universe – that of a dynamic group of human beings – to a set of simplistic relations. It is thus not possible, in a paper like this one, to say whether any form of behavior, selfish or altruistic, is more profitable to an individual or group in the long term if not in the short term or *vice versa.* Perhaps some readings of history will show that selfish behavior is *always* counterproductive globally if not locally, or else our species would have ceased to exist.

Ethics enables us to establish the overall justification and imperative for any of this kind of study, namely the common good. The claim can perhaps be made that some aspects of science merit the use of social resources to increase knowledge in the absence of immediate practical applications. The increase in knowledge of the world will, in my view, inevitably broaden the horizons of thought, and this is *ipso facto* a contribution, an 'intelligent' one, to the society as a whole.

As Hofkirchner has discussed in the Forum, the concept of conviviality, first proposed by Ivan Illich (1973), greatly merits rediscovery and application as a tool for implementing a just and intelligent society (Hofkirchner, 2020). As he describes it, conviviality points toward a convivial existence at both the individual and collective level as a basis for a *reasoned optimism* that, for example, ethical, rational judgments have a reasonable probability of emergence.

## 9. THE SOCIOTYPE

For the discussion of society, the philosophy of sociology is the most general applicable discipline since it spans the domain of social knowledge from theories of society to the closely related fields of anthropology, economics, political theory to military strategy and history. The classic Chinese *Art of War* (Minford, 2002) mentions or implies all of these subjects.

For the understanding of social processes, I would like to mention the concept of the sociotype introduced recently by Pedro Marijuán and others (2019, 2020). Briefly, a social system is constituted by reflexive, *i.e.*, communicating, interacting individuals; in the social 'organism', the phenotype and genotype correspond to the biological realm, while the sociotype appears as the constituent imposed by the social structure. The sociotype is, in other words, the kind of complex system resulting from the simultaneous operation of different logics, at different levels of complexity, with different modes of evolution as envisaged by Minati.

## 10. THE ENTITIES OR UNITS OF EXISTENCE. ONTOLON

I think that we all, as have our predecessors since antiquity, felt the need of breaking up reality into some sort of units, at least, for thought and discussion. I have listed some of these, but many others could be added.

- Atom
- *Ding-an-Sich*
- Holon and Parton
- Ontolon
- Epistemon
- Phaneron
- Holomovement
- Informosome

One unit that will be new to the reader is the ontolon. Basically, it was invented in 2019 by Igamberdiev and myself (Brenner, Igamberdiev, 2019) as the ontological counterpart to the epistemon of Barham (1990). It makes an ontological commitment to the reality of processes, and hence is our proposed alternative to the phaneron of Peirce which avoids such commitment. An 'ontolon' is an identifiable but dynamic 'individual' in the sense of Krause that refers to or implies a portion, recognized as such, of the ontological process. As such, an

ontolon is a quasi-individual, individual and non-individual, and is an analogue of a quantum system, but only an analogue, quantum-*like*. The ascription of *essential* quantum properties to macroscopic processes in humans or societies leads only to anti-scientific views, in which decoherence is conveniently ignored.

## 11. SOCIETY AS AN ONTOLON. INCOMPLETENESS

The image to which I hope a further more rigorous framework may be given, is that of an intelligent society as a complex ontolon, a dynamic unit of existence, changing and not changing. A society, in the phrase of the sociologist Manuel Castells (2004) is a "space of flows". This is the picture that emerges also from the new systems theory of Minati: in our complex social reality, processes start and stop, randomly *and* non-randomly, in a configuration space of many, but not infinitely many dimensions. Human society from this standpoint is the most complex object in existence, and to begin to comprehend it, I suggest that the meaning of 'object' has to be drastically expanded to include bundles of processes, some more or less linear, others definitely non-linear. As Minati states, a Good Old-fashioned Systems Theory of society is not so much incorrect as it is inadequate. Thus for the 17th Century English philosopher Thomas Hobbes, the citizen transferred his allegiance to an entity which represented the abstract notion of the state, the "Leviathan", after the biblical whale which swallowed Jonah. In contrast, in my notion of the state, or society, the entity is not abstract, only difficult to grasp.

As we design our realist approach to the logic and dynamics of social systems, we should not forget that such approaches have been and probably always will be subject to anti-realist attacks. These say something like "the processes that we see operative in the society are purely mental constructions that have no proper existence". The concept of the reality of a social operator, outlined in the paper of Burgin and Brenner (2017) would be contested, despite the reasonable argument for it (to us). Let us reproduce this argument briefly.

The contemporary American philosopher John Searle is perhaps best known for his so-called 'Chinese Room' thought experiment which attempts to offer a way of distinguishing a response to a question by a person as opposed to a machine. His book, *The Construction of Social Reality* (Searle, 1995) is useful in countering the above anti-realist argument. First of all, he is interested in a class of institutional facts which are those deriving from simple but real social interactions, those which he considers has a "huge invisible ontology" that constitutes social reality. The origin of this ontology is the capacity of the human brain to operate with characteristics that are both 'mental' and 'physical'. Searle supports a complex view of human rationality that goes beyond sharply delineated, and in our terminology binary, intentional content. The resulting picture is that of a reality independent of human representations – "external realism" (ER). This is the position that we have taken earlier in the discussion of "representation in information theory" in Chapter 11. Searle goes further toward a concept of realism that is compatible with the LIR dialectics: "Realism does not say how things are, but only that there is a way that they are". 'Things' includes processes as well as objects in a universe without an absolute independent space-time to worry about. These considerations are directly relevant to a social reality and its dynamisms. Giving the human brain the capacity to construct, as some anti-realists such as Maturana do in order to support their concept of autopoiesis, is a self-referential monster. Searle: "It is just a *non sequitur*, a genetic fallacy to infer from the collective neuro-physiological causal explanation of our knowledge of the external world to the non-existence of the external world." In standard philosophy, it is possible to counter arguments based on perception, but they require what Brenner has referred to as "catastrophic counterfactual" arguments whose probability is zero.

Again, it does not follow from the fact that all cognition is within a cognitive system that *no* cognition is ever of a reality that exists independently of cognition.

Searle suggests that realism is attacked by people who would like truth, an epistemic principle, to coincide with reality, an ontological principle. Our thesis does not discredit naïve notions of truth and reality but redefines their relationship, following Lupasco, who stated that "truth is the truth of reality". External realism, again, says that there is a way that things are that is independent of representations of how things are. Reality is thus not constructed either by individuals or groups of individuals – society. Public reality also exists independently of representations or statements about that reality. According to Searle, *this* statement is not a truth condition but a condition of the *form* of intelligibility that such statements have as properties. Searle's thesis applied to money rather to facts about money illustrates our dualistic approach: facts about money can be both epistemically objective – money is a social construct – and ontologically subjective (internal reality). Searle considers that a socially constructed reality presupposes a non-socially constructed reality is a "transcendental" argument, but we find it a logical consequence of the coexistence of individual minds and society, immanent to them. Culture is thus a 'large' ontolon that describes collective intentionality, functions of phenomena that go beyond the content of the underlying physical reality. This work of Searle is most congenial to our study as well as important because he equates the rejection of realism and the denial of ontological objectivity with attacks in general on "epistemic objectivity, rationality, truth and intelligence in contemporary intellectual life". We unfortunately have to emend this to "all contemporary social and political life". Arguments against external realism go hand in hand with irrational extremism. Let us now look at some ways of combating it.

### 11.1 The Social Implications of Incompleteness

My position, confronted with the clearly mathematically unmanageable complexity of social change is to invoke the Lupasco Principle of Dynamic Opposition: restated here, it is that any sub-unit process evolves from states that are more or less actual toward states that are correspondingly more or less potential. I must add to this how difficult I have found convincing some philosophers that my – the Lupasco concept of potential – is not just as idealistic as those I decry. Is the potential for growth of a tree, or for understanding this paper localized and 'measurable', with measurability being the only adequately rigorous 'philosopher's stone'? I conclude that to even begin to achieve the social objectives of our various philosophies, we must emphasize and reemphasize the value of incompleteness. To work with, we have Gödel at the foundations of mathematics, Deacon's "Incomplete Nature" and François Jullien's definitive statement of the core of Chinese philosophy "The Great Image has no Form," (2003) plus the foundational incompleteness identity or diversity and other pairs of properties in LIR (see also Minati, 2016).

I have thus attempted to draw clear lines of correspondence between the philosophical logic of Stéphane Lupasco, central ideas of Chinese philosophy and the intelligent society. While Lupasco and some Chinese workers accept the transcendental nature of questions posed by existence, both doctrines are realist, philosophies focussed on immanence and real change. The essence of Chinese and Japanese thought in this sense are their 'down-to-earth' realism and practicality, to be developed in the interest of the common good.

## 12. HERACLITUS

Here and in my new book, I have argued in favor of some novel concepts, but my intention has not been to persuade or convince, let alone prove. Rather, I have to tried open up new areas and ways of discussion and debate. In this, I have been guided by a Fragment of

Heraclitus, N° 93, which makes a statement that Chuang Tzü could readily endorse: "The Master, whose oracle is at Delphi, neither affirms, nor denies, but suggests. . ."

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