

FROM RELATIONAL LOGIC AND RELATIONAL
EPISTEMOLOGY TO RELATIONALISM
TOOLS TO REDUCE CONFUSION IN THE
PUBLIC SQUARE AND TO RESOLVE THE CRISIS
IN MODERN ECONOMIC THEORY¹

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ABSTRACT: Relational Logic establishes relations between the three basic principles of logic: identity, non-contradiction, and equivalence. These three principles were *used* by Cro-Magnon men and women to “name names.” Ever since the Greeks used the principle of equivalence, not to analyze concrete entities such as names, but to determine the truth value of individual words and individual propositions our mind has plunged into a world of abstraction.

Relational Epistemology adds new items to the list of tools of epistemology: to names, ideas, and concepts, Relational Epistemology calls upon theories, “systems of thought,” and “processes” (the analysis of the dynamic of systems). Dialectic ideas and ideals are also tools of epistemology.

The indissoluble union of Relational Logic and Relational Epistemology yields the Relational Method of Analysis (RMA). Faithfully applying RMA to a variety of mental disciplines, one unifies them and obtains the transformation of Rationalism into Relationalism. From the atomism and discord of the modern world we pass to the discovery of systematic and harmonious relationships of everything with everything else. This work is in obeisance to Lukacs, and others, who have stated that we are “At the End of an Age”—and the beginning of another.

The paper is in three parts: Part I, Relational Logic; Part II, Relational Epistemology; Part III, Relationalism. Each part is a schematic presentation of very long and complex developments in human thought. Each Part is designed to give us a better understanding of our confused moment in history. Special emphasis is placed throughout on how the present analysis can be of help in clarifying and solving the crisis in modern economic theory.

KEYWORDS: Relational Logic; Relational Epistemology; Relationism; Dialectics

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PART I: RELATIONAL LOGIC

Synopsis ~ The word “logic” is very misleading because there is not one system of logic. There are many. Eleven of them are analyzed in this paper. Scanty hints are given of the cultural context in which these systems were developed and prospered. Systems of logic are all structurally identical, but the principles of logic that they adopt are different from one another. They all perform the same identical function of providing rules of correct reasoning—but only *from within each system*. Communication across systems of logic requires attentive translation, otherwise it might lead to serious misunderstanding; modern economics is especially prone to logical misunderstandings. Of course, it is to be hoped that some day human beings will all use one, the same, system of logic. Relational Logic, built on principles that have been most constant in history, is offered here as a candidate to perform such a unifying function.

INTRODUCTION

After a summer of intense intellectual struggle with the *General Theory* (1936), I changed one term in Keynes’ model of the economic system and found myself in a totally different intellectual world. Impressed by the enormity of the discovery, I wrote a few pages, locked them in a desk drawer, and went to look for a job. After losing the War on Urban Decay and, in rapid succession, the War on Poverty, eventually I thought I had better find out what was in the intellectual world that I discovered through the revision of Keynes’ model. Gradually, very gradually, I discovered that the new world contains precisely the solution to Urban Decay and Abject Poverty, which, whether with our full knowledge or total ignorance, are the bane of our existence. So far, I have documented many of those discoveries. They are revealed when layers and layers of rationalizations are removed from our thinking processes. The first immediate discovery was that mathematics is **unable to solve problems of economics**:² I was facing two

² Readers should not be cowed by the mathematics of economists; besides, what they use is obsolete linear math.

models of the economic system. They were both “consistent,” the experts I consulted assured me. Thus began my long trek through logic and epistemology. Let us start with logic, Relational Logic.

The *word* "logic" is used in common parlance no less than in formal treatises. And yet that word is one of the most dangerous and misleading tools of communication, because there is not one system of logic. There are many, and there are profound differences among them.

This discovery occurred to me in the 70s while doing research on economic theory, and specifically when my need to understand "economic logic" became imperative. The deeper the search, the clearer became the realization of the existence of that many systems of logic—as well as the need to add one or more systems to the list. But, if logic is supposed to provide the "rules of correct reasoning" and these rules change from system to system, what type of guidance does Logic provide?

The answer is no longer simple. It becomes threefold. First, one must indeed recognize the existence of that many systems of logic. Second, one must recognize differences and similarities among those systems. Third, one must learn not so much to choose among those systems and adopt the one that is best suited to one's needs as, when communicating across systems, to *translate* each and all verbal and written expressions from one system into another.

These operations are less complex than they might appear beforehand, and they are less complex because all systems of logic share basic common characteristics. Each one of them is built on a set of equivalence relations; if properly developed and applied, each system has an internal impregnable consistency; and, in their consistency and sufficiency, those systems are all equivalent to each other. Just like languages: see, Noam Chomsky.

These are the basic issues treated in this paper. Interspersed in the analysis is the attempt to show how systems of logic influence culture—from economics to physics, from religion to mathematics, from art to politics.

The short-range purpose of the paper is to demonstrate that all discussions

across systems of logic are fruitless. The long-range purpose is to foster tolerance of all systems of logic—not only through the demonstration that all systems are indeed equivalent in their consistency and sufficiency, but especially through the presentation of a synthesis that includes the essential elements of all previous systems. This synthesis is the outline of a new system of logic that might be called Relational Logic.

Most of what follows is bound to be well known to expert logicians. It seems to be totally new to most other people. Expert logicians also know the characteristics of equivalence relations. Yet even they might be surprised at how well the principle of equivalence serves to unify the manifold fields of logic.

1. THE VALUE OF THE EQUIVALENCE RELATION

If the equivalence relation has indeed such a far-reaching and fundamental value, it might be useful to inquire about the reasons for this status. The equivalence is a relation among three terms (A, B, C). There are two forms to express the equivalence relation: $A \equiv B \equiv C$; or, alternatively, $A \leftrightarrow B \leftrightarrow C$. The first reason for the extraordinary importance of the equivalence relation is that it gives us the opportunity to triple-check the basis of our reasoning. The second reason undoubtedly can be found in the development of precise rules concerning its application: Each term of the equivalence must be reflexive, symmetric, and transitive, cf. Allen (1970, pp. 435-47, 748-52) or Suppes (1957, pp. 213-20). Thus, we obtain not only three, but nine checks on our reasoning. If any of those conditions is not respected, our reasoning is not valid. To say the least, it requires more or different support.

A term is reflexive when it remains identical to itself all through the discussion—and, ideally at least throughout an entire discipline let alone across disciplines.³ A term is symmetric if each term is a mirror image of the other two

³ An *identity relation* is itself an equivalence relation (cf. Suppes 1957, p. 218). Is Relational Logic simply repetitive? Not at all. The identity relation directs the observation always deeper, and deeper into the event, the haecceity, the "thing" itself. This mental framework analyzes **internal** relations. This analysis is not a concern of this paper. In internal relations one finds the four operators of standard Relational Logic (!): negation, conjunction, disjunction, implication, and equivalence (equivalence!). The *equivalence relation*, instead, directs the observation **outward**, linking the event always closer and closer up with the outside reality.

terms. A term is transitive if it allows us to observe the same reality from three different points of view.

A personal experience will perhaps succinctly relate the importance of the equivalence relation in no uncertain terms. The writer was in the new Philadelphia airport. At landing, he went straight for his car. In the hall, he glanced at one exit (A) and **doubted** that that was the exit to the parking lot. He went to the opposite *symmetric* exit (B). The two exits were so identical that he could have forever gone in circles and never been offered the certainty of where the parking lot was. The solution was to actually step out of any one of the two doors, thus creating a third term of reference (C) and ascertain whether he needed Exit A or Exit B. This case does not establish the equivalence of Exit A to Exit B to Parking Lot; it only verifies the validity of the methodology to ascertain the truth. Technically, if A was the exit, B was *not* the exit needed to reach C, the parking lot. As proof of its extraordinary importance, this method is profoundly used by mathematicians as well as by philosophers.

A third reason why the tool of equivalence is so important, perhaps, is that "the world" itself seems to be built on a set of equivalence relations. The triangle, after all, is an equivalence; and Buckminster Fuller (1975) has provided incisive insights and convincing applications of this tantalizing possibility. But this is not the place to explore such an issue at any depth. When this paper was submitted to Buckminster Fuller (1979) for his examination, he found it "to be extremely interesting." In a similar vein, incidentally, did Moses Abramovitz, then editor of the *Journal of Economic Literature*, react. Equally encouraging were a few other readers to whom this paper has been shown over time (and with few variations was published, with a different title in 2016 in a non-technical venue, *Mother Pelican: A Journal of Subsidiarity and Sustainability*).

In any case, if the above reasoning is correct, we have the basis for carrying the analysis forward. And, going forward, we shall eventually lay the foundation to a new system of logic: Relational Logic.

2. MANY SYSTEMS OF LOGIC

In the following paragraphs, we shall review the essential elements of the

following systems: (1) Primordial Logic; (2) Classical Logic; (3) Rational Logic; and (4) Dialectic Logic. We shall find that Eastern Logic (5) occupies a place of its own in the history of the mind. Thereafter, we shall observe some of the subsets of these major systems, namely, Conventional Logic, Positive Logic, Deductive or Syllogistic Logic, Inductive Logic, Instrumental Logic, and Economic Logic. We shall conclude with the bare outline of Relational Logic.

These forms of logic are rather standard, non-technical modes of thinking. Zenkin (2000) analyzed the *technical* modes contained in **modern logical-mathematical treatises** and concluded: "About thirty years ago, for the sake of 'sports interest' I began to collect various 'logics' used in modern logical-mathematical treatises. When their amount exceeded the second hundred, it has become clear: if the logic can be selected 'on a taste' (or even can be constructed 'on a need'), such notion as 'science' becomes here simply inappropriate."⁴

Two warnings are in order at the outset. First, we shall have to neglect a great many details that actually put flesh and blood on the basic structure of these many systems of logic. Second, the order in which these systems are presented is dictated by ease of exposition. Any inclination to see in this order the possible existence of a temporal succession, or, worse, an order of importance, should be strenuously resisted.

If these two warnings are firmly kept in mind, only a little prompt might occasionally be necessary to make the reader aware that all systems share common characteristics. Provided they are indeed complete systems, they provide sufficient assistance to the conscientious thinker to make him, or her, reach a comprehensive understanding of the surrounding world—the world of ideas, no less than the world of things. But how can an unbiased observer realize that this feat is in fact accomplished, while in the presence of that many systems of logic? The observer simply needs to realize that certain elements in the various systems undergo not always subtle shifts in position. Specifically, the observer needs to realize that while the shifts in position—or modes of usage—lead the adherents to each system to emphasize or de-emphasize certain elements; the shift itself does not make those elements disappear. They are camouflaged.

⁴ This reference is owed to Vladimir I. Rogozhin.

2.1 PRIMORDIAL LOGIC

There is obviously no written record on the system of logic used by our early ancestors, with the Cro-Magnon man of 40,000 years ago as the most famous and best known of our ancestors—and, most likely, much—much—earlier men and women still. But that system must be reconstructed, if we truly want to understand not only the development of thought but especially the function which every system of logic performs. More importantly perhaps, today we have all the tools necessary to reconstruct this fundamental first link in our modes of reasoning. Of course, the reader has to overcome a potential negative bias. The reader has to be open to consider the possibility that, as Herbert L Calhoun (2015) points out, “while the content of thinking may have changed over various epochs, ecologies, and cultures, the process of thinking itself has not.”

To insist on one point, in the following paragraphs we shall be concerned with the broad outline of this system of thought, which might be called Primordial Logic, and neglect the many details of this reconstruction—especially because we shall have to adhere strictly to an intellectual distinction that does not exist in reality, the distinction between logic and epistemology. That continuum has to be broken here. At the appropriate moment, a bit more will be written to catch some of the manifold nuances of our encounter with the past.

The question is: How did it all start? What are the beginnings of knowledge, *our* conscious understanding of the world? Let us try to recapture that miraculous moment in which a Cro-Magnon man is exiting the Lascaux cave—and faces the moon rising and the salmon jumping on the horizon. How did he learn to distinguish between the two flickering signs?

Many years ago, while I was analyzing the structure of economic theory and finding principles of logic to be essential to the task, a friend and editor of much of my work, David S. Wise, brought to my attention a book by Alexander Marshack titled *The Roots of Civilization* (1972). Fairly soon after devouring Marshack’s book, I jotted down a sketch of the use that Cro-Magnon man **must** have made of three basic principles of logic, and I started tracing their development over time. Apart from necessary distinctions, most philosophers, as well as mathematicians, agree, an agreement of extraordinary importance in

itself, that there are three fundamental principles of logic: the principle of identity, the principle of non-contradiction, and the principle of equivalence. Our Cro-Magnon man made use of all three.

Here is that sketch, only slightly altered over the years, which has yet to be validated, or its validity denied, by many scholars in many fields.

2.1.1 THE USE OF THREE PRINCIPLES OF LOGIC BY CRO-MAGNON MAN

Alexander Marshack announced a fantastic hypothesis in his book. He had discovered scratches—i.e., generally points but at times also lines—on bone upon bone and stone upon stone that are preserved in archeological and anthropological museums the world over. He announced the hypothesis that with those scratches our early ancestors were actually inscribing "notations."

One point represented *something!* Scratches were neither idle doodles nor an esthetic arabesque. Their simplicity and repetitiveness implied purposefulness. What was this something? Let us unpack the question. Alexander Marshack has been acclaimed as single-handedly revolutionizing the field of Paleolithic art research. Let us stress, *art research*. In fact, it is fully granted that he allowed scholars to see portable art objects and cave paintings "with fresh eyes, to ask new questions, and to understand their technology and production far more precisely" (Bahn, 2009). However, Marshack himself concentrated his attention on a *deeper penetration* of the meaning of those scratches. He suggested that those notations record the early steps of our knowledge of *astronomy* and *calendar time*. And he has been chided for going too far (Robinson, 1992).

The suggestion here is that neither Marshack nor other scholars have gone far enough in the understanding of those notations. The inspired idea that scratches made by Cro-Magnon man on stones and bones were notations is a discovery of enormous importance indeed. To repeat, the question is: A Cro-Magnon man and woman is exiting the Lascaux cave while facing what we today know as the moon rising and the salmon jumping on the horizon. How did they learn to formulate a complete vision of each image? How did they learn to distinguish between the two images—and the "billions and billions" of other images on the horizon?

Once they stopped relying on memory, the first decision of these human beings was to grab a stone and start recording observations about *any* specific

object at any one time. Let us pause on this incredibly important first step in the history of humanity. In plain words, *with that single act they made use of all three fundamental principles of logic at once*: the principle of equivalence, the principle of identity, and the principle of non-contradiction. Let us see how.

Undoubtedly unaware of all the implications of what he or she was doing, by placing a mark on a stone our ancestor established this set of mental relationships:

This notation \equiv On **this** stone \equiv Specific information about... **this** flicker.

Clearly, our ancestors made full use of what is today known as the relationship of equivalence. There are three “equivalent” terms in that construction: (1) the scratch on the stone (2) the stone itself, and (3) these two entities stood for something else in the mind of the researcher: What was that? Evidently, whatever information was of interest to the researcher at the moment. Let us say, the shape of flicker, length of flicker, duration of flicker. Clearly, all this mental activity was preceded by the development of the number system, which must have started with counting the fingers of the hand. Why else are numbers called digits?

What stood *inside* the above equivalence is a full-fledged application of the Principle (or Axiom) of Identity. This notation represents facts concerning this flicker—and this flicker alone. Geometrically, it is useful to represent the Principle of Identity through a single point. Thus:



Fig. 1

Our ancestors did not need any other mental apparatus to proceed with their discovery of the world. Duplicating the use of the Principle of Identity *over and over again*, our ancestors eventually discovered that they needed another stone to represent facts concerning a different flicker like the moon. Let us see why.

At first, our ancestors might have made notations about *both* flickers at once; needless to say, our attention here is concentrated on the two flickers of our

imagination. Our ancestors were faced with thousands of stimuli all at once. What is suggested here is a “glorious” simplification that will have to be appropriately broken down into more and more finite details in order to be validated or its validity denied. Returning to this terrain from the point of view of gnoseology and epistemology, we shall be able to retrace more of the steps that led our early ancestors from the observation of “flickers” to naming the objects they were observing. The conclusion is this. *Soon after* he put one notation down, and it does not make much difference to assume that, likely, it was *after* eons of trials and errors, one simple fact became apparent. Our ancestor was observing two different things.

Simply by taking a few steps away from the cave, our early ancestor must have experienced that the two flickers on his horizon represented two *different entities*: One was near, the other was far away; the behavior of one event was completely different from the behavior of the other. Soon (?), a careful study of who knows how many objective recordings *intellectually* convincingly confirmed that the two flickers in the sky actually belonged to two different phenomena, two different aspects of reality: Our ancestor was compelled to realize he was observing *two* distinct objects.

Therefore, he needed two stones to record his further observations. Let us call them *Stone A* and *Stone B*. Only when they were satisfied that they had observed each flicker from every possible point of view, they *named* one of them “moon” and the other “salmon.” That was the ultimate inestimable gift by the principle of identity to humans. Our Cro-Magnon man—or woman—was still using the principle of identity, but with a twist.

Let us think this through. If he had not made the distinction between the two Stones and two Events—and respected it religiously—our Cro-Magnon man would have soon become utterly confused. Does this notation belong to the object near me or the one far away? This operation appears simple and obvious today, and it might have occurred in one single spurt. But its importance does not need to be underestimated. Indeed, the full importance of the discovery and application of the Principle of Identity can be better appreciated considering that there are mental disciplines upon mental disciplines, and intellectual discussions upon intellectual discussions, which still do not make scrupulous use of this essential distinction. Economics, above all, still insists on making use—as R.W.

Goldsmith (1955, p. 69n) calculated—of any one of the possible 100,000 definitions of Saving at any one moment in its analysis. For some of the theoretical effects of this practice on economic science, see Gorga (2002, 2009, 2016, esp. pp. 69-137). It is as if our ancestors had had one hundred thousand tablets representing the object far away, which they eventually called the moon, and each person had insisted on inscribing *different* notations—one's own perceptions—on any one of those tablets at random. The disrespect of the dictates of the principle of identity does indeed necessarily lead to incredible misconceptions of the objective reality. If our ancestors had insisted on the prevalence of their personal perceptions, we might have ended up with eventually, *necessarily*, giving 100,000 *different names* to the *one* moon that is in the sky—with consequent 100,000 different descriptions (and analyses) of that *one* phenomenon in the sky. Our early ancestors did not do that.

Our ancestors avoided that confusion. They instinctively (?) respected the dictates of the Principle of Identity. Using modern symbols, they made sure that:

$$(\text{Stone}) A = (\text{Stone}) A; (\text{Stone}) B = (\text{Stone}) B\dots; (\text{Stone}) Z = (\text{Stone}) Z.$$

In fact, as the Greeks were eventually to point out, the Principle of Identity carries implicitly with it, unavoidably, the Principle of Non-Contradiction: A is *not* B. In classical notation,

$$A \neq B$$

Pace Hegel and some Hegelians, Stone A is not Stone B; *the moon is not the salmon*. The moon is always identified by Stone A, and notations belonging to the moon are never placed on Stone B that identifies the salmon.

As Boland (1979, p. 503) points out, "Aristotle was probably the first to systemize the principles of [classical] logic"; but he continues, "most of them were common knowledge at this time." To Aristotle belongs the pride of paternity. With the Greeks, we meet recorded history, and a system of logic that is universally identified as Classical Logic.

To emphasize, our Cro-Magnon men and women used the principle of identity, the principle of non-contradiction, and the principle of equivalence in

their deliberations. They used a system of logic that might be identified as Primordial Logic—or, eventually, Relational Logic.

2.2 CLASSICAL LOGIC

Aristotle enunciated three fundamental principles of Classical Logic. He proceeded in this fashion. He put the Principle of Identity at the foundation of an elaborate construction. The moon must be the moon throughout our entire discussion: $A = A$. We cannot change the definition of our terms in the middle of the discussion—or, abstracting even further, the "truth" remains the truth throughout. But how do we know that the moon is actually the moon, or the truth remains the truth?

The simplest test is that the moon is not the salmon; the truth is not falsity: $A \neq \text{not-}A$. The Principle of Non-Contradiction was formally born.

Geometrically, it can be said that Aristotle (and many other thinkers) began to look *not only at single points, but also at the area surrounding individual points*. In order to make this area visible, we shall draw a circle around the point. Thus:

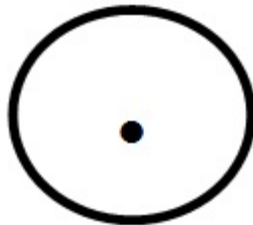


Fig. 2

which can formally be read: "The circle is not the point."

But **what** did the area between the point and the circle represent? Aristotle, with classic Greek clarity, did not tolerate "grey" areas. He formulated the third principle of Classical Logic to take care of this issue, the Principle of Excluded Middle. Nothing can be the moon and the salmon at the same time; or, abstracting the issues even further, a statement cannot be true *and* false at the same time. As Boland (*op. cit.*, p. 504n) puts it, "statements that cannot be true or false, or can be something else, are prohibited." Aristotle simply denied the

existence of "grey" areas. He declared them inadmissible in any conversation or logical formal reasoning.

Appropriately compressing the issues, namely making all grey areas between the point and the circle of Fig. 2 disappear, Classical Logic can be represented through a sphere. In this fashion:



Fig. 3

We thus obtain an immediate image of the "wholeness" of Greek thought. And it is this wholeness that explains not only the great clarity and firmness of that thought, but also its enormous successes especially in philosophy and physics, sculpture and the theater—arts and sciences which must be presented in "tutto tondo." And yet, it was perhaps the self-assurance that existed at the foundation of Greek thought that enabled it to avoid any serious confrontation with economic theory and other topics that require the study of *messy*, "grey" areas.

And yet, the reality of economics could not be avoided altogether. Rather than through hard theory, it was faced with the softer tools of economic policy, which was treated in such a realistic fashion that it endured, basically unaltered, for two thousand years. Aristotle enunciated the *doctrine of economic justice*, a doctrine that, fully accepted by Saint Thomas Aquinas, was silenced by Adam Smith. That system of thought has been revived and completed in the form of the theory of economic justice by Gorga (1999 and 2014).

Before leaving the field, it behooves us to inquire: Have we gathered all that we could from the vast field of Classical Logic? What does the shift from Primordial Logic to Classical Logic imply? Evidently, the shift implies a

momentous stepping stone in the history of mankind. It almost seems as if men and women had no more concrete items—such as the salmon and the moon—to discover, to name, and to analyze. The finite world of physical products of the universe was almost *nearly* all catalogued. By the time we meet the Greeks, human beings had named nearly all objects within their range of observation. What was there left to do?

The world of abstraction, the world created by all our moral and intellectual capabilities was all there to be explored.

2.2.1 CLASSICAL LOGIC AND THE PRINCIPLE OF EQUIVALENCE: DEDUCTIVE OR SYLLOGISTIC LOGIC

What happened to the Principle of Equivalence, which as we have seen played such an important part in Primordial Logic? Logically enough, it had two places to go, and it went there. On the one hand, it went (1) underground—where it can **still be found** today. Strangely enough, it is well known to both (*mirabile dictu*) philosophers and mathematicians. And it is much used by both. But where is it openly located? Where the Greeks left it: (2) in the development of syllogisms, of course! More generally still, *the Greeks used the principle of equivalence to build syllogisms* and led us to the stratosphere of abstraction.

The principle of equivalence became a tool of analysis of such abstract entities as *propositions*. A syllogism is the *equivalence of three propositions*: If the major premise and the minor premise are true, the logical conclusion is also true. All men are mortal. Socrates is a man. Socrates is mortal.

Do not laugh. For two thousand and more years, our culture—what our intellect produced—was **unified** by an *extended, detailed* exploration of the applications of this methodology. All advancements in philosophy, theology, and science were sustained by this methodology. Even the mathematical model of the economic system developed by Keynes (1936, p. 63) is a syllogism:

If, $\text{Income} = \text{Consumption} + \text{Investment}$
And $\text{Saving} = \text{Income} - \text{Consumption}$
Therefore, $\text{Saving} = \text{Investment}$.

From such a simple set of starting propositions, the “figures” of the syllogism,

through a variegated set of permutations and combinations, over the years became more and more complicated (see, *e.g.*, Van Vleck, 2014)—*not unlike econometric techniques today*. All certainties in science *up to the 15th or 16th century* were derived from the validity of the syllogism. The applications of syllogistic logic culminated in the “realism” of Saint Thomas Aquinas and Duns Scotus, and from there it degenerated into the formalistic casuistry of the late Middle Ages and the Renaissance.

Formalistic casuistry of the syllogism led to complicated formulas that at times yielded contradictory results—*just like the results of econometric analysis today* (see, *e.g.*, McCloskey, 1983). Logic, and especially syllogistic logic, could no longer be relied upon as a guide to thought.

Left alone without theoretical guidance, the mind was thrust in a state of unsustainable all-encompassing doubt. Even theology, to remain living and vital, was confined to mysticism, especially the mysticism of Saint Teresa of Avila and Saint John of the Cross. We shall see how philosophy gradually devoured itself from within; for the time being, let us draw an important distinction in the existence of mysticism. Mysticism is mysticism. Yet, apart from such forms of mysticism as Kabbalah and Sufism, there is a fundamental difference between the mysticism of the East and the mysticism of the West. The mysticism of the East is immersed into the sublimity of emptiness; the mysticism of the West is immersed into the sublimity of the fullness of Jesus Christ.

At the end of the Renaissance, everyone was left on his own—*just like we are all, again, left on our own today*. No guidance is accepted or acceptable from logic or philosophy, let alone theology. A mind as acute as that of Lorenzo il Magnifico could issue such degenerate instructions as “He who wants to be happy, be happy. Tomorrow is uncertain.” The mind could not tolerate an abject state of doubt.

René Descartes came to the rescue.

2.3 RATIONAL LOGIC

The Greek civilization collapsed. Was it because the sphere was actually empty? Thereafter, its heirs, the Roman and the Byzantine empires, also collapsed. And the Renaissance gradually became not at all sure of itself; indeed, it became so

unsure of itself that its heirs were led to believe that they could settle theological disputations through religious wars. The certainty of the Greeks had disappeared. The Age of Uncertainty was in the saddle.

All the hard work of the past to create the civilized society, the *polis*, seemed to have been in vain.

Intellectual issues are rarely without practical consequences. Not too much time went by, the Western world was plunged into the religious wars.

What was that changed in the classical system of logic? The Principle of Identity and the Principle of Non-Contradiction were preserved and much strengthened over the centuries. But the soft Principle of Excluded Middle was replaced by the Principle of Indifference. Was the collapse of past civilization which created the need for a change in the ruling system of logic, or was it the other way around, or a combination of the two? Thinking “firmly” and “securely” is the foundation of life and civilization.

No one seems to know when or by whom the Principle of Indifference was formulated. But it was well-known in the Sixteenth and Seventeenth Century. In fact, it was formally incorporated into a new system of logic by Descartes, which is denoted as Rational Logic.

Descartes reached this new synthesis formally, *but not explicitly*. One needs to operate a considerable "translation" and interpretation of his words in order to see how those principles are "clearly and distinctly" (Descartes, 1938 [1637], p. 17) organized to form the system of Rational Logic.

Descartes reduced to three "the great number of precepts of which Logic is composed" (*ibid.*): "The *first* was never to accept anything for true which I did not clearly know to be such; that is to say, carefully to avoid precipitancy and prejudice, and to comprise nothing more in my judgment than what was presented to my mind so clearly and distinctly as to exclude all ground of doubt" (*ibid.*). (Observing Fig. 4 below, it becomes apparent that one single "point" corresponds to this "precept"; and, as seen in Fig. 1, one point is also the simplest representation of the Principle of Identity.)

"The *second*, to divide each of the difficulties under examination into as many parts as possible, and as might be necessary for its adequate solution" (*ibid.*). Observing Fig. 4 below, it becomes apparent that Descartes had simply in mind points B, C, D on any *line*; and the validity of such points—while they undergo

examination—does not need to be determined a priori. One has to be "indifferent" to their validity. Hence this second precept formally incorporates the Principle of Indifference into Rational Logic. For confirmation, it is sufficient to quote the following passage: "If some of the matters... should offend at first sight, because I... seem indifferent about giving proof of them, I request a patient and attentive reading of the whole... for it appears to me that the reasonings are so mutually connected... that, as the last are demonstrated by the first which are their causes, the first are in their turn demonstrated by the last which are their effects" (*op. cit.*, p. 60). For the discourse not to be too cumbersome, not every point needs to be proved at once.

"The *third*, to conduct my thoughts in such order that, by commencing with objects the simplest and easiest to know, I might ascend by little and little, and, as it were, step by step, to the knowledge of the more complex; assigning in thought a certain order even to those objects which in their own nature do not stand in a relation of antecedence and sequence" (*op. cit.*, p. 17). Observing Fig. 4 below, it becomes apparent that with this third precept Descartes was observing an entity that might—for short—be called not-A. This entity can not only be properly defined as "Infinity." It can also be said to incorporate the essence of the Principle of Non-Contradiction; *e.g.* Infinity is the negation of the concreteness of A and Z.

Rational Logic is best represented geometrically by a line; specifically, an infinite line. Thus:

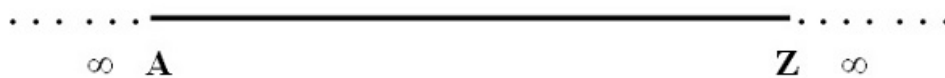


Fig. 4

This representation of Rational Logic is not arbitrary. Descartes himself, in the next breath, stated: "...I thought is best for my purpose to consider these propositions in the most general form possible, without referring them to any objects in particular.... Perceiving further, that in order to understand these

relations I should sometimes have to consider them one by one, and sometimes only in the aggregate, I thought that, in order the better consider them individually, I should view them as subsisting between straight lines... “ (*op. cit.*, p. 18).

This representation of Rational Logic also explains why Descartes further specified that his method called for "enumerations so complete, and reviews so general that I might be assured that nothing was omitted" (*op. cit.*, p. 17). This maxim is not a fourth precept but an *implicit* conjunction of the three principles of logic mentioned above. In his summary, he simply spoke of “the three preceding maxims” (*op. cit.*, p. 24).

Rational Logic is, of course, the dominant mode of thinking in the West. And if there were any doubt as to the direct influence exercised by Rational Logic in our culture, it would suffice to consider its impact on the development of economic thought: One can simply open any economics text and observe how much of its analysis is conducted with the assistance of straight lines.

Yes, our entire Western culture is imbued with Rational Logic.

Indeed, it is upon this system of logic that the entire philosophical structure of Rationalism is built.

Before we do that, we need to ask: Is Rational Logic the only mode of thought today? Far from it. Just under the surface, and prevailing in Communist or Fascist regimes, is another system of logic: Dialectic Logic.

2.4 DIALECTIC LOGIC

Dialectic Logic's fatherhood is credited to Hegel, but it was already known to Aristotle—and indeed was implicit in Primordial Logic. The principles of Dialectic Logic are exactly the same as those of Rational Logic, but they change direction. Instead of the two extreme points of the line proceeding toward infinity, they converge toward the middle, a point which Hegel called "process." Thus:

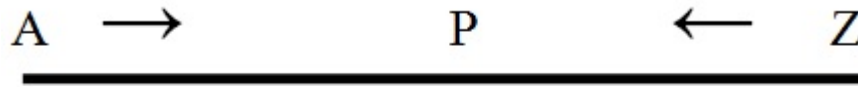


Fig. 5

When Marx acquired this system of logic from Hegel, he saw in the new shape of things the Class Struggle and all that. While some people put their ear to the ground and hear the rumble of the Class Struggle, others cannot even pick up a faint tremor. Who is right? Who is wrong? Are there other positions in between? These are substantive issues that cannot be addressed in this paper. But the methodological question is clear-cut. Once one's thought is guided by Dialectic Logic, the Class Struggle becomes a self-evident phenomenon. The poor fight against the rich.

Those whose thought is guided by other systems of logic are likely to be insensitive to it. Incidentally, notice also that, once the third point—or "infinity" of Rational Logic—was eliminated (or, better, shifted position and turned inward), it was very consistent of Marx to fight against all religions. Allowing the mind to escape toward the infinite, instead of concentrating its attention on the affairs of this earth, with Communism religion became "The opium of the people." And since the extremes always have points in common, some of the fundamental positions are shared by Capitalism as well. Fight, fight, fight is the order of the day. Indeed, competition, competition is for the Alpha man; coordination and cooperation is for the weak.

Dialectic Logic's second major innovation was the destruction of the principle of non-contradiction. We are thus plunged back into the *pre-Socratic tradition* of sophists and rhetoricians that Aristotle had put to rest. After point A and Z have fought with each other and are transformed into P, the distinction of A from Z disappears. They are both transformed into P. The destruction of the principle of non-contradiction has opened the mind to the consideration of infinite possible transformations (*cf.* Brandom, 2014).

Yet, the destruction of the principle of non-contradiction has also done much damage to the clarity of the discourse. Now everything can be contradicted, and the speaker is authorized to become dictatorial. Giovanni Gentile, the friend of Fascists, was explicit about this. He said: “He who possesses the truth has the right to repudiate the affirmation of those who contradict him” (quoted in Holmes, 1937, p. 61). c

Who is the judge of the one “who possesses the truth”? *Lui-même*, he himself, of course. Brute force is then the last resort to resolve disagreements.

Avicenna got it right: "Anyone who denies the law of non-contradiction should be beaten and burned until he admits that to be beaten is not the same as not to be beaten, and to be burned is not the same as not to be burned."

The miasma emanating from the type of discourse engendered by the negation of the validity of the principle of non-contradiction is asphyxial; it leads to suffocation. The only retort must be this. Granted that the principle of non-contradiction is not *necessarily* valid in a dynamic analysis of the long run, its denial at the static moment of the initiation—or ending—of the discourse is utter nonsense and leads only to confusion of mind. A tiny example might suffice: True, over time something ugly can be transformed into something beautiful, to deny this possibility is to deny life; yet, before that final moment the ugly cannot enter the container called beauty, it cannot be called beautiful. At any one moment, anything is either beautiful or ugly. The beautiful is the antagonist of the ugly; it is not the ugly; it cannot be confused with the ugly.

Where is the ultimate flaw in the attempted destruction of the validity of the principle of non-contradiction? The flaw is hidden in the assumption that A and Z necessarily fight with each other in order to reach point P. As we will see, in Eastern Logic the transformation of A and Z into P is generally—very creatively and imaginatively—conceived as an entirely peaceful process.

2.5 EASTERN LOGIC

Generally, no one speaks of Eastern *Logic*. But there could hardly not be one such system of logic. The hint of its existence included in the following paragraphs can hardly be considered satisfactory, especially because this writer does not know of any formal treatment of the issue—whether through a Western or an Eastern source. A glance at Tibetan logic (Brinkman, 2014) suggested by Bob Arnold, an

expert in the field, reveals not a system of logic but an application of syllogistic logic.

In any case, Eastern Logic can be represented geometrically through the well-known Yin-Yang symbol:



Fig. 6

An analysis of this symbol and cursory acquaintance with Eastern literature reveals that Eastern Logic is perhaps *the* available synthesis of all systems of logic observed above. One can recognize in Fig. 6 all symbols belonging to the systems of thought mentioned so far: the point, the circle, and of course the sphere. What is a circle, if not a *flat* mental image of a sphere?

The line is also in Eastern Logic. Snap a circle, and you obtain a line. In reverse, going back one step or two you can build a circle out of a line, by bending the line. Whether you extend the line point by point or you reduce it to a point, and whether or not you blow up the point into a sphere, the line easily leads the mind to infinity. Small transformations help.

Only one point might perhaps be emphasized here. Yin and Yang can actually appear to be revolving around each other and even fighting each other. Is this the major reason why China accepted the Marxist ideology? Are the differences between Dialectic Logic (Fig. 5) and Eastern Logic (Fig. 6) sufficient to explain the differences in the behavior of Stalin and Mao? Are these differences sufficient to provide clues for the different approaches to industrialization and "modernization" between Russia and China?

Generally, however, the transformation of Yin into Yang, like the transformation of night into day, is assumed to be totally peaceful. *Pace* Hegel, if

we had the capacity of Eskimos to distinguish snow from snow, we would not be deceived by our inability to see Dawn as neither Night nor Day. We would call it a “little-less-night-but-still-night” or a “little-more-day-but-not-yet-day” or much more imaginative words. Does Dawn *fight* the Night?

3. PROPOSITIONS AND SYSTEMS OF THOUGHT

Logic cannot be separated from the theory of knowledge. It is the integration of the two fields that eventually will give us a reliable, complete method of analysis. For the time being, faced by the reliance of both Rational Logic *and* Eastern Logic *on individual propositions* it is important to realize that there is no way of determining the validity of individual propositions; only systems of thought can do that. Quick proof. Do parallel lines meet? In Euclidean geometry, they do *not* meet; in modern Imaginary non-Euclidean geometry, *they do meet*.

Generally unaware of this fundamental weakness of syllogistic logic, in the West as well as the East we are still going on basing our beliefs on—and arguing the validity of—single propositions. No wonder we are having such a difficult time clearing our minds and communicating with each other. No wonder the Greeks and the Buddhists (at the same time) have both thrown us into the stratosphere of abstraction and left us there.

Difficulties are compounded by the personal attachment to modes of thought that do not form complete systems of thought. These are more clearly understood if grouped together under the heading of non-systems of logic. We can then **rationalize**, we can argue the validity of *any proposition*, and we like to cow our opposition by maintaining that our position is *logical* (implying the position of our opponents is illogical).

4. NON-SYSTEMS OF LOGIC

As we have seen so far, a system of logic includes all fundamental principles of logic that are necessary to understand reality. The following subsets use the word “logic,” but they are not systems of logic. Let us see some of their particular limitations.

4.1 CONVENTIONAL LOGIC

Believers in Conventional Logic maintain that there is *no such thing* as the truth.

For them, it is all matter of "conventions." If they stopped here, they would not build any "system" of logic. But they shift position and *accept other systems* of logic. It is useless therefore to insist on their non-system—except to notice that they who sincerely believe in their original position give up the struggle for understanding before they enter the ring.

What is Thought supposed to do, if not being constantly engaged in the search for Truth? (The key words are purposely capitalized). Why carry an empty shell in our skull? Why behold a Convention at all? Is it because other people hold it? Is it to feel superior or, at least, more cynical than other people?

As interpreted by Peter J. Barse: "Conventional Logic is not a system of logic, because it accepts illogical statements that make no sense."

4.2 POSITIVE LOGIC

Positive Logic has apparently taken its first steps from Primordial Logic. Geometrically, Positive Logic can be represented in this fashion:



Fig. 7

in which each point represents an individual observation.

Econometrics and the appearance of the computer are two of the latest developments which keep much economics—and many economists—locked in within the realm of Positive Logic. Just like Conventional Logic, however, Positive Logic is not a "system" of logic. There is no relation between points. Just the facts, Ma'am; just the facts.

What are its characteristics? There are two fundamental characteristics. It is enough to observe Fig. 7 to realize that there is not a rule to help its practitioners reach a decision as to when it is possible to stop making observations and start analyzing whatever information has been collected so far.

Positive Logic, *denying the existence of ideas*, is locked in within the realm of "facts." As Boland (*op. cit.*, pp. 507, 511) points out, "Contrary to the hopes of the inductivists, even though one can distinguish between positive and normative statements, there is no inductive logic that will guarantee the sufficiency of any finite set of singular statements. There is no type of argument that will validly proceed from assumptions that are singular to conclusions that are general statements.... one cannot directly solve the problem of induction."

Let us put it this way: In the midst of a serious monetary crisis, much effort is spent analyzing inexhaustible reams of financial data and we are still proceeding without the *definition* of money. Economics textbooks tell us the *functions* of money; they do not tell us what money is.

Perhaps it is not entirely unfair, then, to conclude that *pure* Positivists are still at the level of the *first* observations taken by primordial man. They have a long way to go. Of course, "pure" Positivists (or, as we shall see, pure Deductivists or Inductivists) are stereotypes that—if encountered in reality—would be more akin to caricatures than to truly thinking people.

4.3 DEDUCTIVE OR SYLLOGISTIC LOGIC

Deductive Logic is locked in within the realm of ideas. Ideas are generally expressed through simple propositions; it is not generally realized that single words also contain ideas. The "big" idea, of course, is the idea of Being. Even when combined with the complementary idea of not-Being (especially not-Being of the East), discussion has exhausted the intellectual resources of many a philosopher for 2,500 years, but not too much enlightenment has been gained.

Perhaps all to the good, contemporary thinkers who are imprisoned in this non-system of logic, Deductive or Syllogistic Logic, can be counted on the fingers of a hand in the West.

Do these statements and those concerning the limitations of Positive and Inductive Logic that follow contradict the assertion made at the beginning of the paper that all systems of logic are equivalent to each other in their consistency and sufficiency? Not really. First of all, it is questionable whether all claims of expressing logical propositions are planted indeed in systems of logic. But, more fundamentally, all men are locked in within limitations. Those who prefer to be locked in within the confines of facts and those who prefer to remain locked in

within the confines of ideas, observed from inside their "systems" of thought, hardly suffer from any limitation. After all, both facts and ideas are *infinite*. And the (supposedly) mutually exclusive observation of facts or ideas has its own hidden potential which bursts forth as soon as one considers the work of Leontief (1976) or Boulding (1956) for instance.

What are the limitations of Deductive Logic? Deductive Logic has forgotten how systems of logic ever developed. It was from the observation of factual evidence, and the abstraction from that evidence of successive sets of ideas that eventually helped give names to "things." Progress occurred when common properties (ideas) were found to bind individual facts together. Thus, one operated a synthesis of Inductive and Deductive Logic.

4.4 INDUCTIVE LOGIC

What has been said in relation to Positive Logic and Deductive Logic largely exhausts what needs to be said in relation to Inductive Logic. The *abstraction* of ideas from factual evidence is essential to the construction of our understanding of the world.

And yet, there is no such thing as an absolute "inductive" or experimental *proof* of the truthfulness or validity of any statement.

In brief, the old dichotomy between Inductive and Deductive Logic is a false one. The two approaches are complementary. Only then are they both productive; otherwise, they are both sterile.

Clearest evidence of this deficiency can be found in the **limitations** of enormously important movements of the Middle Ages, both *nominalism* and *realism* as well in their modern revival. See, "Second Crisis" above as well as Pravat (2005).

4.5 INSTRUMENTAL LOGIC

The reader who has read Boland's paper very carefully and who now perhaps has a better acquaintance with Eastern Logic will automatically discover the great similarities between the latter and Instrumental Logic. But one characteristic of Eastern Logic needs to be made explicit: its mysticism.

How does Eastern Logic reach its conclusions? The answer might be put this simply: "The ways to knowledge are many and arcane. One needs to assiduously study (contemplate) the evidence. Do not judge me on how I reach certain conclusions. I do not know. Rather, judge me on the validity/truthfulness of those conclusions." Instrumentalism might thus be called modern Western mysticism. Both Instrumentalism and Eastern Logic aim at communication, predictability, and control (of at least temporary attention from their audience and disciples). Both rely on luck. But their luck is often the result of hard thought.

Essentially, Milton Friedman, who with his *Essays in Positive Economics* (1953) was the major exponent of Instrumentalism, could have used Descartes' words: "For myself, I have never fancied my mind to be in any respect more perfect than those of the generality; on the contrary, I have often wished that I were equal to some others in promptitude of thought, or in clearness and distinctness of imagination, or in fullness and readiness of memory.... I will not hesitate, however, to avow the belief that it has been my singular good fortune to have very early in life fallen in with certain tracks which have conducted me to considerations and maxims, of which I have formed a Method that gives me the means, as I think, of gradually augmenting my knowledge.... My present design, then, is not to teach the Method which each ought to follow for the right conduct of his Reason, but solely to describe the way in which I have endeavored to conduct my own" (*op. cit.*, pp. 5, 6).

There is a very good reason for singling out Milton Friedman in this paper. Milton Friedman is the last of the great economists who so believed in the need for a method that he created his own tools: Instrumentalism. All other economists have succumbed to the numbing dictum of Paul Feyerabend, who declared himself *Against Method: Outline of an Anarchistic Theory of Knowledge* (1975). So today everything goes. The result is that economics, in the famous dictum of Jacob Viner, has become "what economists do." Everyone is free at last. Everyone is for himself. The penalty is that followers are free to follow no one.

4.6 AND THEN THERE IS ECONOMIC LOGIC

...And then there is economic logic. As Keynes specified in the preface to the *General Theory*, "...if orthodox economics is at fault, the error is to be found not in the superstructure, which has been erected with great care for logical

consistency, but in a lack of clearness and of generality in the premisses." If one applies the principles of formal logic to the inner structure of economic analysis, one discovers that not one of its major component terms respects fundamental principles of logic (Gorga, 2002, 2009, 2016, Chs. 4-15). As already noted, this is what R. W. Goldsmith, a professor of economics at Yale, tells us in a footnote in the second of his three volumes titled *A Study of Saving in the United States* (1955, p. 69n). Examining the "specific (operational) definitions of saving," he found that ". . . the number of theoretically possible variant definitions of saving as change in earned net worth is as high as $2^5 \times 5^5$ or 100,000." Which Principle of Identity is respected? Investment is never defined—except as being "equal" to Saving. Consumption, in modern theory, does not mean physical destruction of wealth; it means expenditure of money; yet, not all expenditures of money are counted as consumption; only expenditures to buy consumer goods are arbitrarily counted as consumption. Not one of the fundamental building blocks of economic theory respects the dictates of the principle of identity: A term must clearly mean one thing and one thing only.

If principles of logic are not applied, what is the logic of economics, then?

Analysis demonstrates that the consistency of economics that was claimed by Keynes and, implicitly or explicitly, by most economists is not an external consistency measured against principles of logic, but an internal consistency. History proves that the logic of economics is the logic of **balancing contradictions**. As soon as a contradiction is discovered, great effort is undertaken to repair the flaw; yet, since the effort does not go to the root of meeting the challenges of formal logic, the attempt is destined to fail.

This is the reason why mainstream economics has been in a state of crisis since the publication of Keynes' *General Theory*. This is commonly recognized. What is not generally admitted is that the crisis is older still. It goes all the way back to Adam Smith. Economics has regularly been subjected to such major upheavals ever since 1776 as recorded in the books of the history of economics. From classical economics we were led to neo-classical economics to the marginalist revolution to the economics of Keynes to Keynesian economics to post-Keynesian economics to monetarism to real business cycle theory to behaviorism—let alone Marxist economics or Austrian economics or Georgist

economics or Kelsonian economics; indeed, let alone such (major) splinter programs of research within each major school of economic thought as labor economics, industrial economics, feminists economics, and so on and so forth.

5. THE ISSUE OF CONSISTENCY

It should be apparent now that discussions across systems of logic are destined to be fruitless. The external manifestations of these systems are so many and so varied (even neglecting the myriad of details) that one can hardly become thoroughly familiar with any of them through a lifetime of study. And without complete familiarity that is available only to insider cognoscenti, action and reactions based on external criticism can be irritating but are certainly pointless.

Dialogue begins to become possible only when any two interlocutors are within the same system of logic. Otherwise, an optimistic assumption relies on three conditions: First, that the interlocutors are aware of the existence of different systems of logic—thus avoiding the pitfall of believing that there is such a thing as only one system and using the word "logic" indiscriminately; second, that each interlocutor reasons exclusively from within one system of logic; third, that an attempt is made to “translate” meanings from one to the other system.

The situation begins to appear a little less despairing as soon as one observes the *internal structure* of those systems. Then it is possible to agree, first of all, that all systems of logic are consistent. The simplest proof of the validity of this position is not so much to suggest the tautology that if they are not consistent, they are not systems of logic, but especially to advance the proposition that *all fully constructed systems of logic are built upon at least one or a set of equivalence relations*. They contain at least three basic propositions, and these propositions are equivalent to each other.

Let us observe this all-important phenomenon, at least in relation to those systems of logic in which it is most evident.

6. THE EQUIVALENCE IN ALL SYSTEMS OF LOGIC

Quite apart from possible conclusions from deep future philosophical and/or neurological studies, the equivalence is a mysterious invention of our mind that gloriously gives us a triple-check on our conclusions. Thus, our early ancestors and classical logicians reasoned as follows: How do I know that the moon (or the truth) is the moon? The first evidence I have is that I am consistently observing

something that I have chosen to call the moon. The second piece of evidence is that I do not see anything which contradicts the evidence I have assembled. Therefore, until contrary evidence is brought forward, I can rest assured that I am actually observing some individual event that I have chosen to call the moon—and I am not observing a salmon. That gave certainty to Greek thinkers—no less than to our earlier ancestors.

Primordial Logic, as we have seen, is based on a very basic equivalence relation that automatically includes the principle of identity and respects the principle of non-contradiction.

The syllogistic structure of Classical Logic forms sets of equivalence relations. There is more. Greek thinkers began to use the equivalence relation in many fields, and its applications have unmistakably multiplied ever since: A syllogism is an equivalence; a system of equations is an equivalence; trigonometry is based on an equivalence; regression analysis is based on an equivalence; many religions are based on an equivalence (The Father \equiv The Son \equiv The Holy Spirit); all systems of logic are based on an equivalence: Rational Logic (see Fig. 4) is based on the equivalence of A to Z to Infinity; Dialectic Logic is based on the equivalence of A to Z to P; Eastern Logic is based on the equivalence of Yin to Yang to ... the night, the day, the universe, etc.

Perhaps the point that regression analysis is based on equivalence relations deserves to be elucidated somewhat through the use of geometry, in the following fashion:

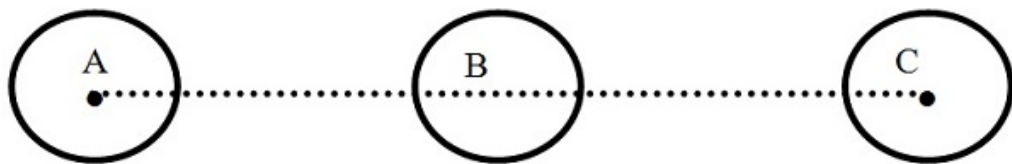


Fig. 8

Given point A and point B, regression analysis is able to estimate point C, by projecting segment AB and making (alternative) estimated guesses as to where point C might lie on the horizon. These three points themselves form an

equivalence; but the equivalence, as suggested by the circles drawn around each point, is much more complex than that. The equivalence is actually assumed to exist among the "situations" around those points—and indeed determining each point. The greater the knowledge of conditions determining points A and B, the better the chances of estimating C correctly.

7. THE TRANSITION TOWARD RELATIONAL LOGIC

The transition toward Relational Logic that has taken place within the work of this writer perhaps will remain forever enshrouded in the mysteries concerning the inner movement of thought. The spark that illuminated and indeed established the circuit between "moral" and "physical" sciences so barely outlined above occurred while reading that physicists—with Newton at the head of the parade—proceed *without* a definition of gravity.

The spark can be simply put in this fashion. There are three “terms” in what physicists observe: Action and Reaction are the first two; the third term is the *Relation* between the two. The apple falls to the ground because the earth has a tremendously more powerful force of attraction within itself than the apple; but, though miniscule, the apple also has a force of attraction within itself. It is the play of these two forces that determines the direction of the action. Let us put it a little more technically: If the apple had no power of attraction within itself, it would fall to the ground at a minimally faster rate of speed—at the limit, instantaneously.

The spark was ignited by the knowledge of Dialectic Logic. That knowledge sparked the following definition of gravity: Gravity is the *process* of action and reaction; namely

$$\text{Action} \leftrightarrow \text{Reaction} \equiv \text{Gravity}$$

Action and Reaction are the first two terms; the notation \leftrightarrow is the *invisible* link that fuses the first two terms together, in a fashion that we synthetically call “gravity.”

At the distance of a few months from this discovery, the breakthrough occurred. The foundation of Relational Logic had been laid out.

8. THE FOUNDATION OF RELATIONAL LOGIC

The foundation of Relational Logic is composed of the following axioms, which are presented in a literary and geometric fashion. These axioms read as follows:

I Axiom: A point is equivalent to a line, and both are equivalent to infinity.

II Axiom: A point is equivalent to a circle, and both are equivalent to a sphere.

III Axiom: A point is equivalent to a sphere, and both are equivalent to infinity.

The whole of Relational Logic can be enclosed in the following geometric representation:

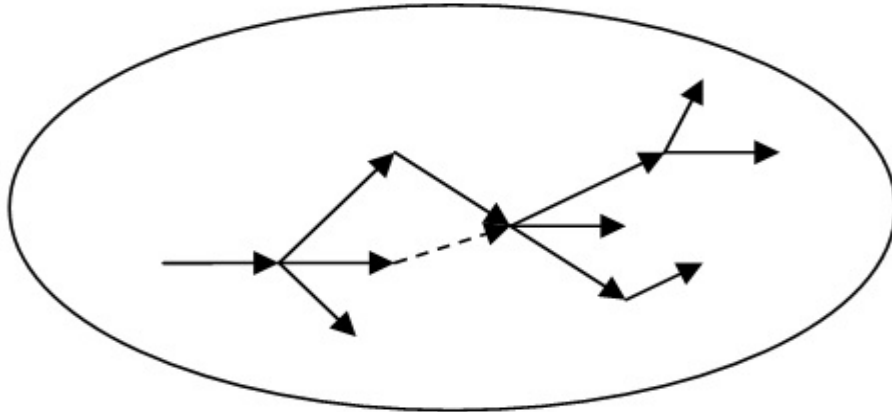


Fig. 9

Only three observations concerning Fig. 9 are permitted here. First, this figure encloses within itself all the essential elements of each system of logic observed above. Second, these elements are indeed enclosed here in an "organic" fashion. Third, Fig. 9 can be progressively interpreted as representing a single cell, many things in between, or the entire universe.

Mathematically, in fact, Relational Logic can be synthetically expressed with the following equivalence (Gorga, 2010):

o i

or, alternatively,

o i

Zero is equivalent to one, and both are equivalent to infinity. All three elements are complete systems in themselves; and yet, they can be fully understood only when observed in relation to each other—as in this expression: the infinitely small is equivalent to a blade of grass and both are equivalent to Infinity.

8.1 THE PRINCIPLES OF RELATIONAL LOGIC

As can be seen from the above paragraphs, there has never been any disagreement about the validity of the Principle of Identity. The Principle of Non-Contradiction has also been implicitly or explicitly accepted as valid by all systems of logic, except (dynamic, long-term) Dialectic Logic. Indeed, both principles have been subjected to much refinement. They are accepted as given by Relational Logic.

The struggle has always occurred on the validity of the third principle which must link the former two together. Explicitly, the Principle of Excluded Middle was replaced by the Principle of Indifference and both (for short) by the Principle of Process.

Relational Logic suggests that any such principle be replaced with the Principle of Equivalence. Relational Logic is thus formed by the interrelation of the Principle of Identity, the Principle of Non-contradiction, and the Principle of Equivalence.

8.1.1 SOME APPLICATIONS OF RELATIONAL LOGIC

Mathematics respects religiously the dictates of the principle of identity and the principle of non-contradiction; mathematics is especially all built on equivalence relations (Gorga, 2010). Physics still benefits enormously from the application of this methodology (Gorga, 2007). Through the “remorseless” application of this methodology, for many consilient reasons economics morphs from mainstream economics into Concordian economics (Gorga, 2009b); sociology escapes the

doldrums of the individualism vs. collectivism paradigm and falls into the embrace of Somism, the theory and practice of the social man, the civilized person (Gorga, 2014); so does political science escape the doldrums of Capitalism and Socialism and falls into the embrace of Concordianism (Gorga, 2021a); theology is affirmed (Gorga, 2009d); and philosophy is rejuvenated (Gorga, 2009c; 2021b).

9. A READER'S GUIDE

The issues treated in this paper are so numerous and cover so wide a field that it might be useful to reduce the paper to a synopsis of two or three topics that might especially be of more direct and immediate interest to the reader who specializes in economics.

9.1 ON FRIEDMAN'S INSTRUMENTALISM

Friedman's Instrumentalism is a valid system of logic that might be reduced to the following equivalence:

$$\text{Economic Reasoning} \leftrightarrow \text{Useful Conclusions} \equiv \text{Economic Theory.}$$

Friedman's Economic Reasoning is not abstract. It is reasoning spurred by the continuous study of observable facts, but the facts are not observed through the lenses of a rigid system of economic theory. Theory for Friedman is a conclusion; it is a derivative. Rather, he uses all available theories to help him study economic facts *in order to reach Useful Conclusions*. And he wants to be judged not on the Economic Reasoning that precedes his conclusions, nor on the "Theory" that results from his efforts, but simply on the validity of his Conclusions.

This methodology might not—and indeed it does not—satisfy everybody. But, as Boland makes clear, Friedman does not want to be judged on this issue. He wants to be judged on the validity of his conclusions. Besides, since he does not suggest that his methodology should be imposed upon others, others should not want to impose their methodology on him.

This paper reinforces the appropriateness of choosing one's own methodology. With so many systems of logic available, one indeed has the duty to choose the methodology that best fits one's own temperament and purposes in life, as well as one's own intellectual, spiritual, and aesthetic capacities. The issue of the choice among systems of logic is more complex than can be indicated in this context. It of course starts with the knowledge of the existence of that many systems of logic. Indeed, this paper tries to establish an even more important point. It tries to foster tolerance of all systems of logic by pointing out that, provided they are consistently and thoroughly developed and applied, all systems of logic are all equivalent to each other.

9.2 ON THE EQUIVALENCE OF SYSTEMS OF LOGIC

From the most simple to the most complex, all systems of logic perform the same function. They all provide rules of correct, disciplined reasoning.

But rules pertaining to one system can be entirely contradictory when compared to rules of other systems. That is predictable and immaterial. What is important is only that rules should not be contradictory when compared to other rules belonging to the *same* system of thought.

Hence methodological discussions *across* systems of logic are totally pointless. Consequently, this issue leads to the thorniest questions of all: What is the relationship between systems of logic and economic theory? Finally, how to judge the value of each economic theory?

9.3 ON SYSTEMS OF LOGIC AND ECONOMIC THEORY

Each system of logic leads to a peculiar vision of the world. This vision affects all of man's activities, from practices to theories—and hence, unavoidably, economic theory.

Even though the issues require much elaboration, we have briefly seen how Classical Logic led to a de-emphasis of economic theory, or how Rational Logic led to what might be called Rational Economics, or how Dialectic Logic led to Marxist Economics. These correspondences might of course be a result of

happenstance. But they are too strong to lead to any other conclusion.⁵

Relational Logic has led to Concordian economics. This is an entirely new paradigm, which, though presented in a number of readily available books and papers published in peer-reviewed journals, is still in its infancy. The field is wide open; everyone is welcome.

So far, so good. The question, however, remains: How can we compare economic theories? This is the thorniest question of all.

9.4 ON THE COMPARISON OF ECONOMIC THEORIES

The question of how to compare theories is thorny. Indeed, it is insurmountable. Peace of mind is acquired only when one accepts the reality: Namely, do recognize the existence of many theories; accept their validity, if they are internally consistent; and then *refuse to compare them*.

9.5 THE REAL ISSUE

The real issue is a different one. The real issue concerns the fruits of each theory—hence the intrinsic validity, again, of Instrumentalism. While it is invalid to compare a pear tree to an apple tree (a tree is a tree), it is entirely appropriate, valid, and indeed necessary to compare a pear to an apple. Then the discourse flows. Then the discourse is profitable. This writer's standard is to compare economic theories in relation to the solutions they propose for the problem of poverty. Other people might prefer a variety of other standards: efficiency, creation of wealth, preservation of the ecosystem are possibilities that easily come to mind.

PRELIMINARY CONCLUSION

This is a schematic presentation of various systems of logic, from Primordial Logic to Relational Logic. The implications—for economics, no less than for other mental disciplines—are vast and can only be explored through subsequent

⁵ Systems of logic provide basic structure to thought, and economic theory is automatically influenced by that structure.

efforts. Two observations should suffice.

First, this work proves that men and women of—at least—40,000 years ago were reasoning the same way as we have been reasoning ever since. Clearly, there has been an astonishingly constant use of identical principles of logic all throughout “recorded” history. The questions this observation raises are innumerable. They have to be left out of this presentation.

Second, all complete systems of logic are equivalent to each other. And what does this rather cryptic expression mean? It means that each system of logic, if it is consistently developed and applied, enables the practitioner to reach an understanding of the world—or portions thereof—which is valid and true. That understanding can withstand all tests of validity. That understanding is true because the truth simply is: it was, it is, and it will be. What changes is the "amount" of truth that is grasped at each time. Certainly, the more "complex" the system of logic used to reach that understanding, the "greater" the amount of truth can be expected to be grasped. But each amount is equivalent to all others. The truth is the truth. A "larger" truth is not truer, even though it may be more useful than a "smaller" truth. Knowledge necessary for celestial navigation is not truer than knowledge for terrestrial navigation. Therefore, mastery of the knowledge of systems of logic leads not only to understanding. It also leads to tolerance.

PART II: RELATIONAL EPISTEMOLOGY

Not Categories but Synthesizers of Knowledge

Ideas, Concepts, Theories, Systems, Processes, Dialectic Ideas, Ideals

Synopsis -Categories, long helpful tools of epistemology, have become part of the many problems we face. *After dismissing the categories as **organizers** of information, we will focus our attention on **synthesizers** of knowledge. Synthesizers of knowledge are indeed *synthesizers of knowledge*. If we peek into the word/name “tree,” actually the *idea* denoted by the word tree, we find all the components of the idea: roots, trunk, branches, leaves—as well as all conceivable trees, all objects that we have named, or we will ever name “tree.”* Next levels of abstraction and synthesis are expressed by concepts, which are associated with other concepts into theories and theories into systems of thought; systems are static, they become dynamic when transformed into processes. Complex ideas assume the form of dialectic ideas, which are resolved into ideals.

10. A RECURRING PATTERN OF CRISIS AND SOLUTIONS

In pursuit of knowledge and understanding, for long periods of time during the course of the millennia we have coped with the same crisis we are facing at present: a crisis of information—a crisis that in the end always turns out to be a crisis of knowledge; a crisis concerning the validity of what we know, what we do not know, and what we ought to know. The crisis is spurred by too much data and too many ideas to be contained in our mental britches.

Hope for a solution to the current crisis is in many quarters placed in computers and computer models. But computers are not of help for this purpose. They voraciously ask for more data. They multiply the data and throw it back at us. Computer models and computer simulations divide or multiply the data; they

put it in relation with other data; but they do not synthesize the information. They do not make knowledge accessible to our limited mental britches.

The thrust of this paper is that the solution of today's crisis lies elsewhere. It lies in the understanding of the recurring pattern of essentially identical crises faced in the past and similar solutions so ingeniously devised by our ancestors.

When faced with too much information, our ancestors synthesized it. They invented a set of appropriate intellectual tools: containers whose function was to include all relevant information. From then on, one would carry in one's head only the container, and not the detailed mass of data which had been poured into and formed the container itself. At the same time, the original data was not destroyed. If one needed it, one simply had to look into the very composition and formation of the container.

The list of such containers—or synthesizers—is not long. Through further refinements, the list might be made longer; but we shall pay only scant attention to such refinements. At this stage of the discussion, we are better served if we focus our attention on bare essentials. *After dismissing the categories as **organizers*** (not synthesizers) of information, we will be primarily concerned with the following synthesizers of information: ideas, concepts, theories, systems, and processes. Complex dialectic ideas are sublimated into ideals.

Of course, these synthesizers of knowledge are individually known in great detail. But they do not seem to be commonly known in their relations to each other.

10.1 THE FACTS

Just the facts. Just the facts, it is thoughtlessly repeated: This is a very misleading maxim. The problem is that “facts” are deceitful. One of the most egregious case in history is the “fact” of phlogiston. Everyone knew it was everywhere, until it was ascertained it is nowhere: it did not exist. Above all, facts are infinite. They have always been infinite. Therefore, we need mental tools that prevent our consciousness from being submerged in the sea of facts. Indeed, looked at the other way around, it can properly be said that the whole purpose and function of “knowledge” is to understand facts.

10.2 TWO GENERAL QUESTIONS

What is information? Information is all that enters—and goes out of—our consciousness. The expression "all"—especially when encompassing as it must, all those "entities" that enter our life without our awareness of them, those that enter our life above or below or sideways in relation to our awareness—clearly suggests an infinity of such entities as impressions, visions, imaginings, emotions, words, thoughts, numerical digits, virtual digits, and facts: facts relating to trees; facts relating to the economic value of trees; facts relating to the intellectual value of trees; theories that, when laid out, become "facts," deeds, acts, that one can see and touch.

If information is *anything* that enters our consciousness, what is consciousness? Beyond subtle distinctions and much deep thought spent on these issues, this is the place for enormous simplifications. Except for flickering data from neuroscience, we know virtually nothing about consciousness in particular. Do trees have consciousness? They might, and we might be able to find objective evidence of this capacity one day; yet, since trees (and animals) do not seem to have an apparatus capable of responding—consistently and unambiguously—to our queries, the issue can be tabled. Our concern can reasonably be restricted to an inquiry about human consciousness. (To ultrasensitive souls who feel the pain suffered by animals I joyfully say: "I am with you; I feel the pain felt by a sheath of wheat cut by the scythe").⁶

The shortest shortcut we are going to adopt is to believe that human consciousness is a synonym for human life.⁷

The complexity of the issues becomes clearer when we realize that we are thick in the flow of the *fourth* major crisis of information. The first climaxed perhaps 30,000 years ago; the second climaxed 2,500 years ago; the third

⁶ These disquisitions can be settled only in the context of the equivalence of matter to energy and to spirit, whereby it can be agreed that it is the spirit of wheat, the spirit of the dog (whose eyes and tail are clear tools of communication), and the spirit of human beings that are capable of communicating with each other. For this original equivalence, see Gorga 2007.

⁷ Once the equivalence of matter to energy and to spirit is accepted, one can pass to this equivalence: Spirit \equiv Consciousness \equiv Being (alive). This equivalence solves two of Heidegger's problems: What is the essence of being; what is the relation between Being and beings.

climaxed 500 years ago; we are now in the throes of a fourth such crisis.

11. WHAT HAPPENED 30,000 YEARS AGO?

How did our early ancestors identify those flickers in front of their eyes; how did they distinguish a gazelle from a salmon or the moon?

To repeat, Alexander Marshack in his *The Roots of Civilization* (1991) revealed that Cro-Magnon men and women, if not much earlier people, accumulated *notations* upon notations by placing them on stones and bones that he found in archeological museums of the world. That must have been the first crisis of information faced by human beings. *How could any one person keep all those notations in mind?* What were those notations signifying?

Part I of this paper has attempted to reconstruct the mental process through which our ancestors distinguished a gazelle from a salmon and the moon. They used a system of primordial logic—a system that has remained constant ever since, a system that gradually came to be identified as being composed of the principles of identity, non-contradiction, and equivalence. With the help of this—instinctive (?)—system of logic, they used those notations *to record* information concerning nearly all the objects composing the reality of the natural world, all objects that enveloped their lives. At the same time, they were enormously inventive in creating distinctive *names* for the objects in front of their eyes.

11.1 THE SOLUTION

To gain a fuller understanding of the solution to the first crisis of information we have to realize that the creation and use of “names” had a deep significance. Any such name was an “idea,” a *concrete* idea. To simplify things, rather than roots, and trunks, and branches, and leaves, thinking people—who came much before the Greeks—created one word, tree. Passing from linguistics to epistemology, we realize that this was not just a name; it was an *idea*, the idea of “tree,” a *synthesizer of information* that contained all trees, and all component parts of a tree—as well as all conceivable trees, all objects that we have ever named tree; all past and future trees we have discovered, might discover, or might create by craft and graft, all imaginary trees, such as the “tree of life” that was ever, or will ever, be conceived, depicted, or described are also included in the idea of tree.

Through an intellectual process that still needs to be investigated in depth, Cro-Magnon men and women named all concrete objects around them: trees, salmon, gazelle, moon.⁸ In the process, as pointed out above, they synthesized much information: rather than trunks and branches and roots and leaves... they decided that they could name and remember just one word: tree.

Mirabile dictu, once a name was selected the “entire world” seemed to coalesce toward its acceptance within each language system.

12. WHAT HAPPENED 2,500 YEARS AGO?

What were the minds of the Greeks supposed to do when the task of naming concrete things was (nearly?) complete, when all *real* entities around them—and between them—had already been given specific names? Remain in idle adoration of the accomplishments of their ancestors, “the legislators of words”? Just relish the memory of spectacular accomplishments of the past? Accomplishments were not only *naming* most everything, but having such names so widely accepted, world-wide, in any language, that there has not been much discussion ever since about the distinction between a tree and a bush—or such relations as quantity or quality.

What were the Greeks supposed to do, when there were no more concrete objects and relations to name?

12.1 THE SECOND CRISIS

The real problem the Greeks faced concerned the past more than the future. What to do with the immense number of names of objects and relations that had been created? *The sum total of those names was, most likely, beyond the capacity of any single human being to retain.* That was the second formal crisis of information—this is a crisis in which we are, *in part*, still fully enveloped.

⁸ Did they also establish *relations* between them? Such a thing as “darkness” appears in the sky *before* light returns again; this salmon is *longer* than that salmon. How could Cro-Magnon men and women have avoided the whole slew of what might be called *concrete* relations and qualities such as time, and space, and quantity—and, of course, colors, and numbers (numbers!).

12.2 THREE (TEMPORARY) SOLUTIONS TO THE SECOND CRISIS OF INFORMATION

The Greeks did not remain passive; rather, they were enormously inventive; their work resulted in three extraordinary accomplishments: 1. The creation of the categories; 2. The creation of *abstract* ideas; and 3. The Syllogistic Method of Analysis to understand and define abstract ideas.

1. *Categories*

No one knows who created the first abstract idea or the first syllogism; but we know who created the categories. Through a feat of the intellect that is still fully engaging philosophers today, Aristotle⁹ *organized the names of the whole physical and intellectual reality known to man into 10 groupings* (later extended to 12 by Kant and to 4 [times x] by Whitehead and to...). Aristotle called such groupings “categories.” All words that responded to such an attribute as “how much” were included in the category that he called quantity; all words that responded to the attribute “when” were grouped in the category time. And so on. These groupings included such entities as time, space, quantity, quality, and six more whose meaning is still much debated. (We temporarily assumes that any one of the categories was ever defined unequivocally).¹⁰

2. *Abstract Ideas*

Rather than resting on the laurels of the past, the richness of definitions of concrete “entities” to which their direct ancestors immensely contributed,¹¹ the Greeks began to explore the field of abstract ideas. *Abstract ideas cover fields that arise, not from the objective reality of the world, but from regions of the heart and mind and spirit that are still mostly obscure today.* The relevance of the Greeks is evidenced by the fact

⁹Aristotle was perhaps helped by many precursors whose work has not come to light yet. Also, works like Plato’s *Sophist* seem to be still in need of full integration into our understanding of the categories. And certainly [Plato](#), in his [Statesman](#) dialogue, introduced the idea of grouping objects based on their similar [properties](#).

¹⁰ For Kant, categories were “pure concepts of the understanding;” not simply descriptive concepts; more abstractly still, for him concepts were “the condition of the [possibility](#) of objects in general.” For the moderns, categories are “metaconcepts.”

¹¹ For nearly any scientific advancement that needs a particular name, we *still* use roots of Greek words to identify them.

that we are still exploring the meaning of such basic abstract ideas as *what* is beauty and truth and goodness and justice. More importantly, these are ideas that raise such perennial questions as *how* can we have **more** beauty and truth and goodness and justice in society? Were these accomplishments not sufficient to establish the incredible importance of the Greeks in our lives, a few questions should suffice. Who invented comprehensive mythology? Or philosophy? Or theology? Or logic? Or epistemology? Or rhetoric? Or psychology? Or history? Or political theory? Or geography? Or archeology? Or physics? Or medicine? Or drama? Or Theater? Or the mathematical distinction of melody from noise (Pythagoras)—and locking music into the “Western” canon? The list is far from exhausted. In addition, in the course of centuries we have lost some of the distinctions that were dear and clear to the Greeks: the distinction between *agape*, *eros*, and *philia* readily comes to mind.

The essential characteristic of abstract ideas is that they require more than a single word to become clear. One cannot simply “point” to this or that entity for an abstract idea to become clear. To communicate abstract ideas to others, we need one or more propositions.

The need then arose to determine the validity of propositions.

3. *The Syllogistic Method of Analysis*

The Greeks basically established not only *what* to analyze, a kind of territory beyond which the mind—likely—could not and should not extend itself; they also established *how* we must proceed in our reasoning if we want to be understood and accepted by others. *To establish the validity of propositions, the Greeks invented the Syllogistic Method of Analysis.*

THEY APPLIED THE PRINCIPLE OF EQUIVALENCE TO PROPOSITIONS.

Thanks to these three accomplishments, the Greeks have forever dominated the world of the intellect. Socrates, Plato, and Aristotle—let alone Democritus, Parmenides, and Heraclitus—are as alive with us today as they were 2,500 years ago. When in doubt about *anything*, we still consult them.

Yet, all three solutions were partially faulty.

12.3 THE KEY PROBLEM

The problem with using the Greek system of thought is that, belonging to the stratosphere of *abstraction*, answers to our questions have never been very clear, never been definitive. There has always been something to add to or subtract from Greek solutions. Aristotle was fully aware of this limitation: He concluded his work on *The Categories* by saying, “Other senses of the word might perhaps be found, but the most ordinary ones have all been enumerated.”

It is this lack of certainty that gradually led to the *third* great crisis of information and knowledge: a cultural crisis, a crisis of the spirit.

13. WHAT HAPPENED 500 YEARS AGO?

Using the Syllogistic Method of Analysis, the Greeks and their followers all through the Middle Ages, working within the framework of knowledge established by the categories, explored all nuances of such abstract ideas as beauty, goodness, and truth—and justice. The concentration of philosophers, of course, was on such ideas as Being and especially “universals” and “particulars.” And then there were subtle disquisitions about the meaning of each one of the categories themselves that needed to be clarified.

Conversations were fascinating, but the more these ideas were explored in depth, the less knowledge were they yielding. Two “schools,” at least two major schools, arose. No matter what *Realists* were proposing, *Nominalists* would demolish each and every one of their propositions—and vice versa. There is nothing beyond “names,” the Nominalists maintained. And the Realists retorted: “Reality” *is* all that there is; reality is the thing in itself, the *noumenon*.¹²

Here is a fundamental distinction that Realists of the Middle Ages, for a great variety of reasons, were not able to consider. They did not realize that only God **is**; all the rest *exists* in relation to God. See, Gorga 2009.

(These issues have so many facets that one can change subject and predicate and obtain identical—or completely different—conclusions. And then there are many combinations and permutations of subject and predicate.)

People made fun of the subtle disquisitions of the “doctors”: the Doctors of

¹² This fundamental distinction still lingered three, four, five centuries after the overall crisis of the Renaissance was resolved. Kant eventually attempted to settle the issue, by saying that the *noumenon* is unknowable—thus precipitating the modern crisis in which we are directly involved.

Philosophy and Theology. Even some of them asked, “How many angels can dance on the head of a pin?”

Gradually, as the Syllogistic Method of Analysis itself became more refined, it became more complex, and *less manageable, less useful*. Interested readers might want to Google *Argument Forms* to be convinced of this reality. The answers this method yielded became **problematic**. *We came to doubt everything*.

All work of the past seemed to have been in vain.

Eventually, the majority of the people rejected the syllogistics method itself; they refused to accept its dominance.¹³

13.1 DESCARTES APPEARED

The intellectual crisis became deeper and deeper,¹⁴ until, about 400 years ago, Descartes suggested a way out—in two parts. Without saying a negative word about it, he destroyed the foundations of the Syllogistic Method of Analysis¹⁵—and the very value of abstract ideas.¹⁶ Thus, two of the major innovations of the Greeks were gone; what was left were the categories.

Descartes convinced us that all doubts would gradually vanish if only we concentrated the mind on the understanding of “clear and distinct” ideas—which in the long-run turned out to be observations about objective measurable matters.

Rationalism was born. Descartes intoxicated us with the injection of a good dose of math and geometry in his analysis (geometry generally makes

¹³ The disappearance of the Syllogistic Method is questionable. It mostly remains hidden in many a system of equations. Keynes’ model of the economic system most assuredly is a syllogism (Keynes 1936: 63).

¹⁴ Let us never underestimate the practical value of “abstract” discussions. Let us rather remember that the brain rules the hand; words determine actions. Let us remember that in those years religious wars in Europe were in full bloom.

¹⁵ With the method proposed by Descartes, we thought we had shed the Syllogistic Method of Analysis. What we did shed is its overuse—its abuse and the exclusive reliance on it. Suffice it to say that Keynes’ model of the economic system is a syllogism. (And the mathematical model on which the General Theory is built, as Michael E. Brady has demonstrated, has not been discovered yet.)

¹⁶ Descartes implicitly forbade us from analyzing abstract ideas. But the mind cannot be so constrained; he simply made room for the faulty ideals of the Enlightenment. Equality displaced justice; liberty—which gradually became freedom of the “masters of mankind,” as Adam Smith labelled them—displaced freedom; and happiness displaced virtue; see, a paper titled “Wake up America. Wake up from Your 250-Year Old Slumber” (Gorga 2016).

mathematics visible). With math in the saddle, we have been riding to higher and higher levels of Abstraction—and Uncertainty.¹⁷

13.11 THE CRISIS ABOUT THE CATEGORIES

Eventually, the categories were **also** found faulty. Modern physics has been at the forefront of the struggle to demolish them; let us recall the treatment of space and time. These are entities in which our life *appears* to be enmeshed; our very life seems to be constructed out of space *and* time. Yet, they survive in modern physics only as a joint unit, space-time.¹⁸

Separate from the things they hold together, the categories themselves are found to be inventions of our mind that encompass no reality. The word "quantity" by itself is only a word; it contains nothing real. And the same is true for all other categories. When the entities they gather together are real, the categories remain useful *organizers* of information, nothing more, nothing less.

The last vestige of the Greek tradition has been destroyed.

Even though these are obvious conclusions, we must pause and think of the confusion that these realizations entail. When the content of the categories proves to be unreal, it is as if the intellectual ground were pulled from under our feet. Where is life, if not in time and space?¹⁹

During the last four to five hundred years, we have witnessed a cascade of errors, one worse than the other, one attempting to correct the other but, never going to the root of it, just falling into greater and greater abstraction. Phil Pilkington (2014), limiting his observation to economics, put it right: "Mainstream economics moves forward not through logical development and integration, but

¹⁷ One extension is the contemporary interest in the much-disputed String Theory.

¹⁸ At 12am in Gloucester, MA, USA, it is 6:00pm in Rome, and 12:00 night in Manila. The least that can be said is that mechanical time is something that is relative to this earth. If time existed as an independent category of thought all of its own, would it not be the same time at least all around the earth? As for space, one observation might suffice. The Copernican revolution seems to have displaced the earth from the center of the universe. This conclusion is premature. If the universe is infinite, every point is at its center. And, if not infinite, the universe is certainly so big that we can assuredly say that any point is at its center.

¹⁹ And yet, this separation has to occur in order to have the same conception in physics as in religion. Once we go beyond time as ordered by the mechanical clock, we realize that yesterday has gone, and tomorrow is yet to come. "Real" is only the sacred present. The wondrous reality of the non-existence of time; the confluence of past and future into the present, is the eternal present.

through forgetting.”

So can be said of Rationalism; see, Gorga 2017a.

How did we reach this stage?

14. THE CURRENT CRISIS

Just as in the late Renaissance, we are again certain of nothing; human relationships are at a very low level of mutual trust; and communities are disaggregating under our very eyes. Truth is nowhere in sight.

We have especially lost faith in the “method” we inherited from Descartes. This method encouraged us to place our trust in “clear and distinct” ideas—and clear and distinct propositions, we must add. All reinforced by the use of mathematics and geometry.

What happened to this method? What happened to the common understanding that to do science is to follow an agreed-upon method of analysis—so people can repeat our experiment?

If this lack of trust is found to exist in the “hard” sciences, how much more deeply does it apply to the “soft” sciences? To top it all, we are now of the conviction that our life is enveloped in “two cultures.” Not even a faint hope of healing the breach in our head, the breach in our lives.

14.1 THE KUHN/FEYERABEND ATTACK

Descartes’s method of analysis has been subjected to severe criticism for quite some time.²⁰ Most reasons are well known and do not need to be repeated. Here it suffices to point out, not only that mainly as a result of Thomas Kuhn’s *The Structure of Scientific Revolutions* (1962) and Paul Feyerabend’s *Against Method: Outline of an Anarchist Theory of Knowledge* (1975) we are left *without* a method, but especially that we are left with a cultural bias *against* method, against *any* method of

²⁰ One of the most effective battles has taken place in economics through the revelation that conclusions reached with the help of econometrics are not definitive; see McCloskey (1983). Economics is a field of study which for a variety of reasons, as widely acknowledged, has been in a state of crisis for quite some time, at least since the publication of Adam Smith’s *The Wealth of Nations* (1776).

analysis.²¹

“Anything goes.” There is no agreement about anything anymore. Indeed, there is no agreement on how to proceed in order to escape the current crisis.

In confirmation, we shall stress two veins that run deep through any such analysis: the crisis regarding individual words and the crisis regarding individual propositions.

14.2 THE CRISIS REGARDING INDIVIDUAL WORDS: THE NEED FOR THREE CONCEPTS

Why are we still arguing about the meaning of specific words? In a previous paper titled “The Abuse of Words” (Gorga 2017b) we found that the meaning of individual, abstract words will always be equivocal, the more abstract the content, the wider the room for lack of precision. The broad issue is text without context.

Specifically, in search of a solution we found out that we need to put trust only in *triads*: Not one, but three words (more specifically, as we shall see in a moment, **three concepts**) that, *respecting the rules of equivalence* give us the logical context in which specific words live—most assuredly, the context is observed from three points of view.

The validity of this approach can be justified in many ways. The shortest is this: Two observations lead to circularity of reasoning. Science takes over only when a third point on the graph is identified.

Among many consequences, this is worth stressing: This is why the world of “dichotomies” crashes.

14.3 THE CRISIS REGARDING INDIVIDUAL PROPOSITIONS

A proposition by itself has no meaning. Just as for individual words, the wider the context to which the proposition refers, the wider the room for misunderstanding. The *locus classicus* is such a stark proposition as “**Do parallel lines meet**”? As we shall see, *it is theories that define propositions*. Thus, while parallel lines do not meet in Euclidean geometry, they do meet in non-Euclidean geometry.

²¹ The only condition Feyerabend posited is the idealist situation in which the speaker welcomes criticism. For realism, see Gentile above.

14.4 THE DEPTH OF THE CURRENT CRISIS

With Rationalism, human thought—largely unawares—gradually became involved in a **narcissistic adoration of itself**. Thought was expressed in a crescendo of abstract ideas and concepts, *ideas and concepts of itself!* Rationalism went its own merry way into an apotheosis of narcissism that is Kantian and Hegelian Idealism and Conceptualism: **Abstract thought contemplating itself**.²² And can Thought ever find fault with itself? Yes, of course, continuously. But the result is a never ending succession of errors, followed by the justification of errors into a more abstruse composition of words—individual words. Those thinkers who are lucky enough to go back over their works, revise them, and revise them again.²³

American and European philosophy of the last century mostly refused to follow those abstractions. However, their escape routes, Pragmatism and Analytical Philosophy, did not yield satisfactory results. What else to expect since we have lately rejected “method” itself? It is as if **unbridled** reason could ever be trusted to produce anything that is not self-serving.

14.5 A TURNING POINT

Instead of extricating itself from these meanders, the trend is currently to go back to Kant and Hegel to see whether anything useful can be extracted from their systems of thought that had not been discovered before. As Gare (2002) points out, “Schelling’s arguments against Hegel and his call for a positive philosophy brought about a philosophical revolution. Nietzsche and Heidegger were products of this revolution. The poststructuralists, Lacan, Derrida, Foucault, Lyotard, Deleuze and Guattari, have continued to develop the arguments of these philosophers and sought to free civilization of the defective forms of thinking

²² A Copernican revolution: Knowledge for Kant does not revolve around what the world is like, but what “we are like.” The answer to Hume skepticism should have been, not that we build, but we discover,

²³ In 1831, the year he died, Hegel signed a contract to revise his fundamental book, *Phenomenology of Spirit*, he had published in 1807. The revision of other authors’ philosophy is an entirely different matter.

which have engendered an oppressive and domineering social order. Hegel is the thinker whose ideas have to be overcome.”

Yes, there is a fundamental problem with Hegelian idealism and Marxist materialism: The dialectic process of *thesis, antithesis and synthesis* **does not work; it cannot be made amenable to mathematical analysis**; this type of thought cannot be made clear enough and precise enough to pass intense in-depth scrutiny. How to measure a “not-apple”?

WE NEED A NEW METHOD OF ANALYSIS.

14.6 THE GRAND DIVERGENCE

Totally unaware at first, this writer has been pursuing a different line of thought. He has been observing the **objective content** of ideas and concepts and has found them as means to acquire knowledge of the **external** world, rather than a self-referential observation of thought itself. Hence, the Grand Divergence.

It is the *tripartite analysis* of **equivalence relations** that overcomes the inability of Hegelian idealism and Marxist materialism to be subjected to mathematical analysis.

The divergence, in brief, is this: Building on the stronghold of Relational Logic, the effort is to build a Relational Epistemology. The ultimate purpose is to build, from their conjunction, a new method of analysis, the Relational Method of Analysis. On the basis of past experience, we can assuredly state that the current crisis will be resolved only with agreement about a new method of analysis. If useful, the method will by itself gather the allegiance of many people.

15. RELATIONAL EPISTEMOLOGY

Apart from the firmness of names and/or concrete ideas mostly ascertained more than 2,500 years ago, we are still in a sea of doubt about any other entity; notwithstanding spectacular technical progress, we are in an ocean of ignorance and confusion regarding our intellectual, social, economic, political, and cultural life. There is no truth to which we can give our allegiance. *There is no truth that, once lived, can give value to our life.*

In brief, rather than being guided by the categories any longer we are going to entrust our efforts to an organic series of synthesizers of knowledge that

constitute Relational Epistemology. Relational Epistemology is represented by this sequence: 1. pure ideas—homogeneous ideas that contain no contradictions; 2. concepts: pure concepts—homogeneous concepts that contain no contradictions; 3. concepts are developed into theories; 4. theories into systems of thought; 5. systems of thought are developed into dynamic processes that try to understand life—they try to understand life as it goes by; they try to understand the *panta rei*; they try to understand the *noumenon*, the thing-in-itself. Select abstract ideas are then recognized as dialectic ideas, ideas that are sublimated into ideals.

Let us look at these tools in rather rapid succession.

15.1 NEW/OLD SYNTHESIZERS OF KNOWLEDGE

Relational Epistemology is composed of *scientific* synthesizers of knowledge; what happens in literature and the arts, as well as in technology, falls outside the scope of this paper. These elements are individually known in great detail, but they do not seem to be known in their relation to each other. Let us observe them in this context.

15.2 IDEAS—AND THE CRISIS OF ABSTRACT IDEAS

Many ideas are just like flowers, brilliant in the morning wilting by the evening. Yet, ideas have a tremendous power as tools to acquire, retain, and transmit knowledge, because they synthesize information relating to homogenous facts. The "idea" of the tree does—indeed, must—not only be capable of incorporating all conceivable trees; it must also be capable of incorporating all the detailed information concerning each particular tree. In short, an idea is a first level of abstraction of concrete, factual information. This is the first intellectual container to include exclusively homogeneous items: trunk, bark, branches form trees and all trees are trees. (Biology and chemistry confirm that the same “elements” stream through all component parts of the tree: roots, trunk, branches, leaves, and lymph; thus, making the idea of “tree” a homogeneous entity). An idea can be as broad as possible, but it remains subject to the rules of the principle of identity: an idea has to put homogeneous “things” together. At a higher level of

abstraction than tree, the idea of *wood*, can include trees, bushes, and brush; but it cannot include nails. An idea can be as broad as possible, but it cannot include non-homogeneous, contradictory information.

These requirements are easy to identify when dealing with concrete ideas. The danger with abstract ideas is that unbeknownst to the writer and the reader, they might contain non-homogeneous facts, contradictory observations and information. A detailed dissection of the content of the idea of Saving in economics, for instance, yielded the conclusion that this word embraces a long series of basic contradictions: To remain at an elementary level of analysis, the word Saving includes bark, and leaves, *and nails*. We are out of the realm of words and concrete ideas such as tree and wood. In what world are we? We are in the world of *abstract* ideas. In economics, we are in the world of Saving.²⁴ Wood and nails are included in the word Saving—what is more evident that one can “save” nails?

Yet, the inclusion of this—hidden—tiniest of all contradictions, the inclusion of wood *and* nails in the word Saving, explodes into a series of contradictions that result in the crisis in which the structure of economics is inveigled today. Both Aristotle and Thomas Aquinas were aware of the crushing importance of small fractures at the basis of an intellectual construction. (Examples of contradictions multiply the closer one looks at the idea of Saving: Can a banana be saved? Is a savings bank account that yields interest a saving—or is it an investment?) Abstract ideas can arbitrarily cover *non-homogeneous* entities and thus lead to unresolved and unresolvable conflicts of understanding.

To enlarge a bit our focus, let us remember that since Saving is “equal” to Investment in mainstream economics, Investment automatically assumes 100,000 meanings. This is the root of interminable controversies about the meaning of “capital.” For confirmation, see evaluations of Thomas Piketty’s *Capital in the Twenty-First Century* (2014).

²⁴ A professor of economics at Yale, R. W. Goldsmith, calculated that Saving can assume 100,000 possible meanings. Saving in mainstream economics is not restricted to one and only one definition, but it indeed assumes 1 + 99,999 meanings. Any wonder that mainstream economics is in a state of crisis today? Individually, they are all logically tenable meanings. In fact, one can include in this container all the shades of *opinion* from hoarding to non-consumption. Yes, not consuming can be a form of saving—provided the item saved is not perishable. Notice the shift from “things” to opinions. Yet, even in the field of opinion one must respect the principle of identity: One cannot introduce contradictory ideas in the same conversation.

How can we resolve this crisis of abstract ideas? Learning from the past, we can assuredly state that we can resolve the problem of hidden contradictory information contained in abstract ideas only by splitting the information and creating new containers, which, being synthesizer of homogeneous ideas, do not contain contradictory information. This type of container is the concept.

15.3 CONCEPTS

More technically, our effort at solving the crisis of abstract ideas involves the transformation of ideas into concepts, a next level of abstraction, a more selective tool that allows us to synthesize an enormous amount of detailed information, all the while eliminating the possibility of being confronted with hidden contradictory information.

Thus rather than fixating on Saving, I enlarged my focus to observe “wealth.” Wealth then yielded a clear-cut difference between being productive or non-productive. I defined Investment as an entity representing all productive wealth. Outside of finance, what is the purpose of an investment if not to produce further wealth? I defined Saving as an entity representing all non-productive wealth. (Later, to avoid confusion I defined Saving as Hoarding.²⁵)

Totally unawares, I changed a vague Idea into a Concept.

A concept is a synthesizer of knowledge that contains homogeneous ideas. Indeed, a concept can be formally defined as a relationship among homogenous ideas. Kant provided the rules that help us identify concepts:

In every cognition of an object there is unity of concept, which may be called qualitative unity, so far as we think by it only the unity in the comprehension of the manifold material of our knowledge . . . Secondly, there is truth, in respect to the deductions from it. The more true deductions can be made from a given concept, the more criteria are there of its objective

²⁵ This solution was a drastic one. The solution forced this writer to discard the word Saving, to expunge it from the world of economics, and relegate it to the practice of financial accounts. As pointed out earlier, Saving is a word that, as Professor R. W. Goldsmith calculated, assumes 100,000 logical meanings. Saving is not a tenable scientific word; it is not a useful tool of knowledge.

reality. . . Thirdly, there is completeness, which consists in this, that the plurality together leads back to the unity of the concept, according completely with this and with no other concept.

What allows us to put wood and nails into the same container is the idea of wealth. This broad idea, then, allows us to **distinguish productive from non-productive wealth**. It is on the basis of this distinction that we can logically analyze the content of the word Saving. The word Saving can definitely include wood and nails *that are in a non-productive state*.

Automatically, wood and nails *that are in a productive state* can then be included in Investment. Investment is the concept in economics that—by an unspoken agreement—includes all productive wealth. Thus, these two concepts, Hoarding and Investment, allow for the study of elements that perform homogeneous functions (wealth that is either in a non-productive or a productive state).

15.4 THEORIES

Just as one swallow does not spring make, so one or even a few separate concepts are not harbingers of anything spectacular. In fact, individual concepts, just like individual propositions, might lead to much confusion. A concept, in fact, reduced to semantic or linguistic terms is only one thought or one statement. As we have seen, individual statements or propositions by themselves have no meaning. The classic example, to repeat, is the question: *Do parallel lines meet?* Without inserting the questions in a larger context—*i.e.*, a theory—it is impossible to give any definite answer.

To insist on this important point, it is only theories that provide the larger context or intellectual world in which individual statements—or concepts—have a definite meaning. Theories then are relationships among homogeneous concepts. (That concepts have to belong to a homogeneous world in order to form a theory is self-evident. No sense would be made by mixing the concept of gravity in physics with the concept of investment in economics).

Relating Hoarding to Investment is an exercise in theory that this writer has lately come to define as *A Theory of the Cause of Poverty*. Let us see how. With Saving defined as Hoarding, through painstaking logico-mathematical reasoning one passes from the *equality* of Saving to Investment (treated as ideas) to the *complementarity* of Hoarding and Investment (treated as concepts). This relation—and its effects—are better analyzed when placed in a Lorenz diagram, as follows:

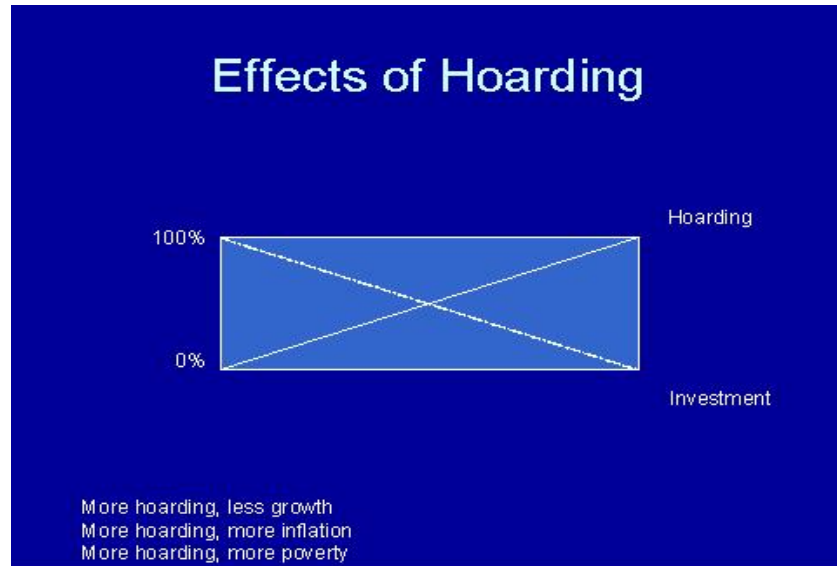


Fig. 10 – Effects of Hoarding

More hoarding, less investment, results in less growth. More money spent on hoarded goods, more money in circulation—with less growth—results in more inflation. More hoarding, less investment—and more inflation—results in more poverty.

These hypotheses can be proved valid or disproved only when numbers are collected in accordance with the categories suggested by Concordian economics.

15.5 SYSTEMS

The assurance that the analysis of the discipline of economics was complete, at least as far as modern economics is concerned, was given by the inclusion of Hoarding into Keynes' model of the economic system. Meeting this requirement yielded surprising results. Thus:

INCOME = CONSUMPTION + HOARDING

INVESTMENT = INCOME - HOARDING

This system resulted in the equality of Investment to Consumption ($I=C$).

“ $I=C$, I love it!” wrote a reader who desires to remain anonymous. “In fact, I think Keynes’s General Theory is incoherent without it... Someday, $I=C$ will shift from radically ridiculous to patently obvious.”

The $I=C$ construction is scaffolding that comes down and becomes obvious as soon as Investment is transformed into Production—what is an investment if not for production of real wealth? As an entity capable of effectuating an exchange, Consumption is understood to mean expenditure of all monetary wealth to purchase real goods and services (not simply as expenditure on consumer goods as in mainstream economics). Not all wealth that is produced is physically consumed; some of it is exchanged for the money created by the Monetary Authority (some steps are more complex than this, but this is the essence of the process of exchange of wealth).

The new result was $P = C$. This conclusion yielded the automatic *separation* of the real economy from the monetary economy—thus bringing much clarity to the economic discourse. (Economists see only money; only the monetary economy.)

Then, since an equality has to be an equivalence in order for the relationship to be logically valid (see, *e.g.*, Suppes 1957), a third term was searched for and found out of the need to apportion the ownership of wealth to someone as soon as it is created. This term is Distribution (D) of ownership rights. This logical need yielded the additional benefit that the two parts of the economy—real wealth and monetary wealth—were not left hanging separately but were ultimately joined together through the concept of Distribution of the value of ownership rights over real and monetary wealth.

The fundamental proposition of economics thus became: Production \equiv Distribution \equiv Consumption. The following figure resulted:

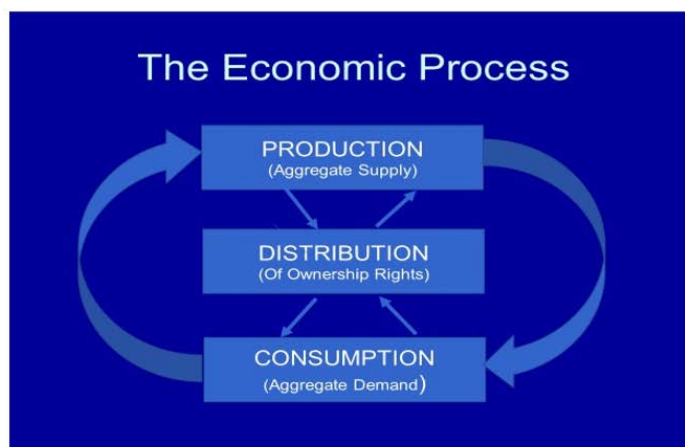


Fig. 11 – The Economic System

The easiest way to explicate this Figure is to relate it to the purchase of a chocolate bar. The real wealth of the chocolate bar (1) is exchanged for money; the third invisible item is the exchange of property rights; (3) property rights over money are being exchanged for property rights over real wealth. This invisible element of the economic process is made visible in the graph, and it is made tangible by the sales slip. To exit a store without the sales slip, one is exposed to the risk and peril of going to jail.

Some characteristics of Concordian economics are these: The diagram allows us to see all relationships at once; it allows us to constantly see each item within its appropriate context (ever been struck by the vacuity of positions trying to establish the priority or preeminence of specific items in a system of thought?); it also gives us the basic dynamics of the interrelationships among the various elements of the presentation.

More explicitly. One of the implicit merits of the Relational Method of Analysis is to transform reductionism and linear thinking of mainstream theory into relational patterns of thought. Annotating—for the second time—my

fundamental book titled [The Economic Process](#)²⁶ (2002, 2009, 2016), the *Journal of Economic Literature* in its December 2017 issue (p. 1642) states: "Expanded third edition presents the transformation of economic theory into Concordian economics, shifting the understanding of the economic system from a mechanical, Newtonian entity to a more dynamic, relational process."

All the pieces of the economic puzzle are ready to spring into action. Until they remain static, they manifest all the key elements of the economic system. Indeed, this writer can only repeat with Galileo, these three elements I have not put in the economic system; rather, I have found them there: 1. Real wealth; 2. Monetary wealth; 3. Rights of ownership.

Once the economic process is reconstructed, one is granted the privilege of *completing* the Aristotelian/Aquinian project of **economic** justice. Thus:

²⁶ Apart from rather glowing reviews, two negative reviews, published in influential journals, were based, one ([Paul Davidson, 2003](#)) on statements that do not exist either in the *General Theory* (I=S) or in the *Economic Process* (I=H), the other ([Mark Broski, 2003](#)) on a displeasure with the title of EP. According to this reviewer, EP should have been titled "The Costs of Hoarding;" and then, since he did not find hoarding in the (2003) daily reality, he dismissed the importance of the book. All reviews of *The Economic Process* obtained so far are posted at <https://www.new-economic-atlas.com>.



Fig. 12 – The Theory of Economic Justice

Clearly, Figure 12 is the mirror image of Figure 11.²⁷ This body of knowledge disappeared from our consciousness, once Locke shifted our attention from it and made us focus on the *justice* of property rights.

To which Socialists and Marx retorted: Let us rather focus on the *injustice* of property rights.

And there the political discourse stands today.

15.6 PROCESSES

The economic system described by Concordian economics is eminently

²⁷ Since they both justified slavery, Aristotle as well as Aquinas were condemned not to see the need for “participative” justice for all; their construction was arrested at the development of Distributive Justice and Commutative Justice.

dynamic.²⁸ This characteristic is more clearly observed by reducing the rectangles of Figure 11 to three points (0,0,0). And then extending each point into a line. Over time, these lines are expected to create the following patterns:

E

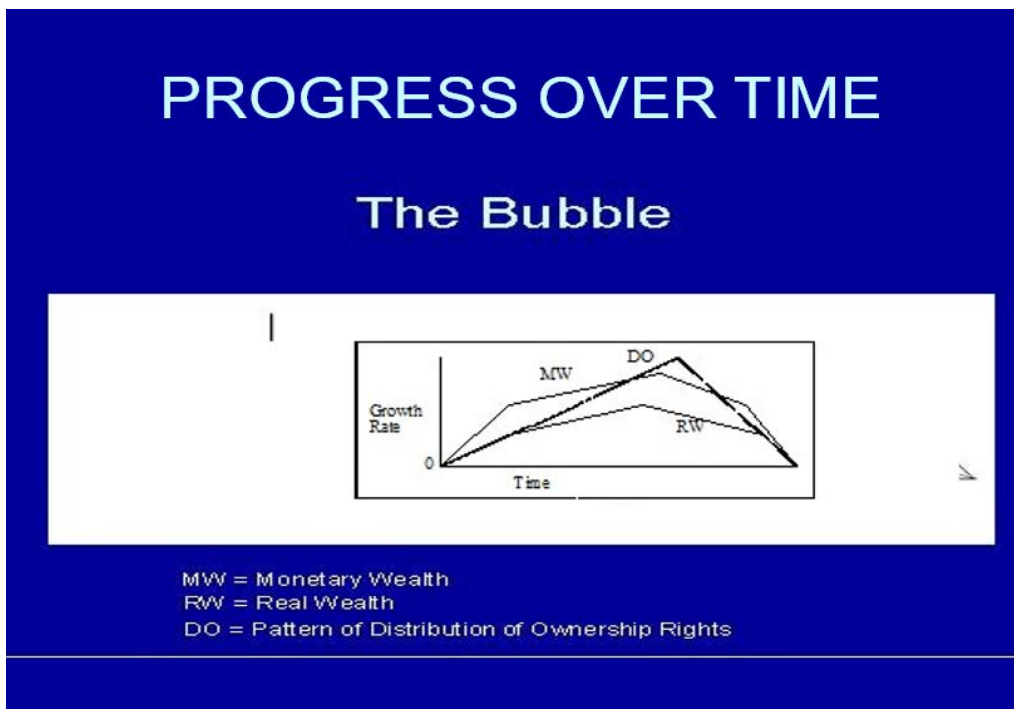


Fig. 13 – The Dynamics of the Economic System

For its ease of production, Monetary Wealth (MW) can be expected to grow at a faster rate than Real Wealth (RW). At a first level of analysis, the rate of change in the Distribution of Ownership rights (DO) can be assumed to be shooting through the sky and then collapsing. As pointed out elsewhere, the area between MW and RW can be described as the “economic bubble.” This is an

²⁸ Process thinking is the most needed and the most demanding form of modern thinking. Most modern thinkers manifest in one form or another this type of reasoning as well as a variegated response to the needs of modernity (Gare 2002).

area that can be precisely measured with the help of the following values: p-values, d-values, and c-values (Production-Values, Distribution-Values, and Consumption Values) all measured with the same yardstick, the legal currency of the country.²⁹ Modern mathematics seems to be fitted to a “t” to Concordian economics. Indeed, this new system requires, not the stale horse of linear math, but the systems analysis pursued by non-linear math and chaos theory.

The geometry of this construction yields a figure such as this:

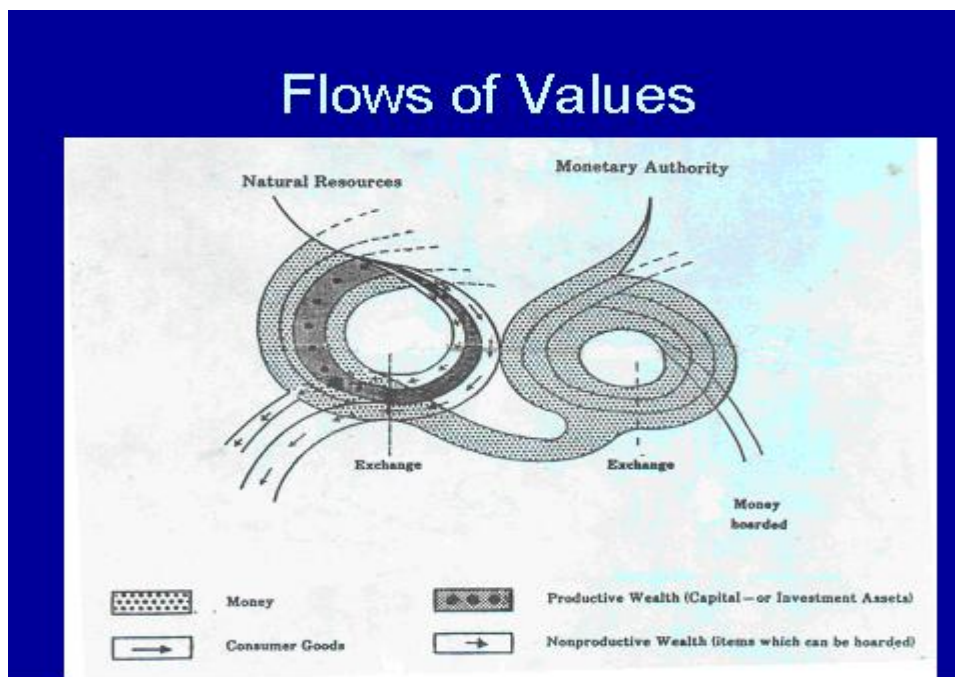


Fig. 14 – Flow of Economic Values

This figure reproduces the cumulative cycles of production and exchange that one obtains combining natural resources with monetary wealth over time. This

²⁹ The issue of measuring real wealth has been one of the most difficult problems to solve in economic. I was distinguishing these values by color, when my wife suggested they can be distinguished by calling them p-values, d-values, and c values. Brilliant.

figure records all the cycles that have occurred since the beginning of civilization (with some civilizations dying over time). Closing the two halves together, one obtains the image of a cyclotron.

This is a figure that is well known to contemporary scientists. It is called a Strange Attractor. Time will tell whether these conclusions are validated or disproved for economics.

15.7 FROM DIALECTIC IDEAS TO IDEALS

The work from concrete ideas to concept, theories, systems, and processes is not carried out in a vacuum. All throughout this road there is such a thing as the culture of the age. Culture is related to agriculture. Culture is always alive and new: Dead culture is the culture of the past, some of which is preserved in museums and libraries. Culture, does not proceed in the dark. The passage of culture is assisted by four guideposts: the ideas of truth, goodness, beauty, and justice.

These are complex ideas, actually they are most enervating, exasperating ideas. They are not “pure,” but extremely twisted entities. Each one of them is a dialectic idea: they contain in them their ineradicable *opposite*.³⁰ Truth/falsity; beauty/ugliness; good/evil; justice/injustice. And not just a little bit of one and a little bit of the other; but, guided by the laws of probability they cover a continuum from 0 to 1. For example, a blank canvas has the value of a little more than zero; the resulting Mona Lisa has the value of one.

Dialectic ideas lead to the ineradicable urge to reach ideals, to make ideals concrete.

Pace Hegel and a large group of intellectuals, the task of each generation is *not to distinguish beauty from not-beauty*, a nonsensical idea; the task of each person is to identify the falsity, the ugliness, the evil, and the injustices of life; the task is to conquer the negative, and let the positive prevail. This is the task of living. This is a task that will end with the end of life. The task is to reach for the *ideals* of truth, beauty, goodness, and justice. Tools to reach those ideals are continuously evolving *theories* of truth, beauty, goodness, and justice. The goal is not to reach

³⁰ Dialectic is a Greek form of logic and discussion that during the last centuries has been elevated to the status of philosophy; in two forms, Dialectic Idealism and Dialectic Materialism.

absolute truth, beauty, goodness, and justice; that is for god-like creatures. The goal for common mortals is to defeat concrete expressions of falsity, ugliness, evil, and injustice that diminish the quality of the life that we all should be able to live.

PART III: A BRIEF NOTE ON RATIONALISM, RELATIONISM, AND RELATIONALISM

Synopsis³¹ – At present, our culture offers three major modes of thinking and expression: Rationalism, Relationism, and Relationalism. Their distinguishing features are these: Rationalism commands (and is commanded by) the great variety of *manifestations of Reason*. Relationism reduces all knowledge to knowledge of *relations*: overlooked are the objects, the organisms, the ideas, the worlds which relations are presumably holding together; the substance, the essence to which relations refer, disappears from sight. Thus, reality becomes evanescent. Relationalism keeps *three elements* constantly in mind: the two (or more) entities, objects, organisms, ideas, concepts, worlds that are connected through relations and the relation(s) themselves. With the help of all principles of logic and all appropriate tools of epistemology, Relationalism studies as many *entities as necessary as they exist in relation with each other*. Relationalism is a relatively new method of analysis that is being applied to a great variety of mental disciplines. By systematically discovering how everything exists harmoniously in relation to everything else, Relationalism clarifies and increases our knowledge of reality.

16. ON RATIONALISM

Five hundred years ago, Western culture was in deep crisis. The world acquired some calm when Descartes announced his Method of Analysis (1637). Rationalism was born. Rationalism has sustained us for most of the last four hundred years.

And now Rationalism is in deep crisis.

³¹ In 2016, the writer posted on his website an essay titled “Relationalism vs. Relationism.” He would now like to take this opportunity to add a few clarifying notes to that post and to his ongoing work on Relationalism. This Part was written at the suggestion of [Professor John Opuda-Asibo \(2021\)](#).

16.1 THE PRESENT STATUS OF RATIONALISM

Cartesian Rationalism has granted us many gifts; science and technology have benefited most: We plumb the depth of the ocean; we can *see* the neurons; we can see the atom; we can see beyond distant galaxies. We have sent men to the moon and brought them back safely. What remains to be said about some medicines and most computers?³²

But Rationalism, guided by free, unbridled Reason, has not been an unadulterated blessing. As Goya knew well, “Dreams of Reason Produce Monsters.” To get an inkling of the grave problems in which we are inveigled at present, we can note that we have the hardest time reaching the downtown of nearly every city in the world. With its touchstone ability to analyze *one thing at a time*, Rationalism has given rise to reductionism and atomism; thus, the tendency to separate one human being from another. Racists have exploited this tendency of Rationalism. What is not generally realized, however, is that racism is skin-deep; and yet racism is one of the major obstacles that prevents us from tackling—and even recognizing—thick problems of cultural and economic exploitation. At the core of things, Rationalism has split our minds, our lives really, in two: the hard physical sciences v. the soft social sciences.

Even the *culture* of the hard sciences is currently in turmoil. Rationalism is in crisis.

The crisis is Societal. On the rock bottom of *I think, therefore I am*, René Descartes did not only build Rationalism; he reinforced our rational thinking processes with the explicit, uninterrupted help of mathematics and geometry. The exalted union of Reason with mathematics and geometry yielded a total surprise. It gave birth to an unexpected child: **materialism**. The reason is clear. Only material things can be *easily* counted, can be measured, and can be represented geometrically.

³² These accomplishments might be directly attributed, not so much to Rationalism, as to its “junior sister” Empiricism, a philosophical guide that was supposed to have been destroyed by Kant. Technically, Kant was also supposed to have replaced Rationalism with Idealism. Rationalism persists.

And then materialism became absolutist. It did not tolerate the existence of anything that cannot be measured. Absolute scientism is older and deeper than the scientism identified by Hayek (1955). It denies the existence of anything spiritual. As a consequence of this encroachment of scientism, intellectually and rationally—as distinguished from the practical perception of billions of human beings—first, the soul went, and with the soul also went religion. Indeed, among the Illuminati and the cognoscenti, any conception of God was also excluded from Nature first and from the nature of men and women thereafter.

To balance things up, they opened their minds to experience billions and billions of miracles, like a flower blooming.

The Crisis Is Personal. The strangest phenomenon of all is the ongoing battle to reduce the mind to a set of material—chemical and electric—nodes and switch operations. Off has gone the unity of body, mind, and soul. The human reality has been reduced to a set of **stick figures** that only think: no feelings, no spirit. *Martians*, really.

Thus Rationalism has given rise to extreme forms of Individualism—“I” think, therefore “I” am. This is an individualism that degenerates in solipsism, whose forerunner was a lovable narcissism.

The Crisis Is Intellectual. The enormous influence of the current intellectual crisis can be pinpointed only by singling out that without an intimate knowledge of prevailing philosophical discussions (of any age), one cannot really understand the (spirit of the) age from which they arise. The least that can be said about them is that they uniquely contribute to sharpening the mind of readers of that age as well as subsequent ages. The intellectual crisis of five hundred years ago was characterized by the expression, “How many angels can dance on the head of a pin?” The current intellectual crisis might be characterized by the expression, “How many angels can dance on the head of a *non-existent* pin?”

The argument is hard to follow. And in the end, there is no there there. Reality becomes evanescent.

The examination of fundamental questions is throwing us back into the world of Uncertainty. Much uncertainty is in the saddle.

Rationalism cannot endure. We are living in the throes of its demise. Our current crisis has been specified in many ways. Through a comprehensive analysis offered by John Lukacs, among others, we have mostly concluded that we are *At the End of an Age* (2003), the Age of Rationalism.

Through an uncanny characterization offered by Oscar Wilde and endorsed by a great many people, we nearly all nod our assent to the proposition that we know “the price of everything and the value of nothing.”

The specifics vary, but the general rule applies: Leave well enough alone. Do not interfere with advancements in science and technology—even though we have to give proper attention to *applications* of science and technology. We must only tackle an area of broad concern. Rationalism has brought most social sciences to a dead end. If we want to liberate them, we have to dismantle the habit of absolute freedom in which human beings are held by Rationalism. The apparent freedom for everyone is actually enslaving each one of us to everyone else. Rationalism stands in need of a radical reform.

A vignette might cover the result of efforts in the social sciences and social practices during the last five hundred years: The glitterati have spent their time dreaming of the windmills; engineers have devoted their minds to building the windmills; and the oligopolists have concentrated their efforts on acquiring control over the windmills.

Another vignette? Our social sciences and social practices have reduced our communities to worlds of beggars: The poor beg for an entitlement; the middle classes beg for a job; the affluent beg for tax reductions and subsidies.

These are not minor expressions of the overall need to reform Rationalism.

Insurrections and wars are again (still?) our preferred methods to settle disputes.

16.2 THE ABSTRACT THEORIZING OF RATIONALISM

We must reform Rationalism because its essential characteristic, abstract unbridled theorizing, is distracting us from searching for solutions to our most pressing, practical needs of daily existence—and mutual understanding. With Rationalism, human thought—largely unawares—has been expressed in a

crescendo of abstract ideas and concepts, often without even distinguishing one from the other (!). Abstract thought is now engaged in *contemplating itself*. More. Much more. The human mind is now engaged in **creating** itself and the outside world.³³ A complete revolution. The world is upside down.

We are more or less back where we were in the late Renaissance. The disaggregating tools of reason need to be fused with integrative and synthesizing tools of analysis. If we want to reform Rationalism, we now have the technical tools of Relational Logic and Relational Epistemology. If we bridle Reason with Logic and Epistemology, we are going to create a new world, the world of Relationalism, the world in which everything is in harmonious relation with everything else.

First, let us give a look at an intermediate type of escape that is being carried out under the banner of Relationism. Let us give a look at this form of thinking and expression. Acquaintance with Relationism offers us the implicit benefit of unearthing some of the most hidden characteristics of Rationalism.

17. ON RELATIONISM

Including its major precursors,³⁴ Relationism is a field of study still in relative

³³ For Kant, categories were “the condition of the [possibility](#) of objects in general.”

³⁴ Three writers have generally been acknowledged as founders of “Relationalism”: Karl Mannheim, Rudolf Eisner, and Alfred North Whitehead. Each one of these writers offers complex systems of thought which cannot be explicated here. Our present concern is to ascertain that, rather than Relationalism, these systems of thought are exponents of various forms of Relationism.

Karl Mannheim, in his *Ideology and Utopia* [(1929) 2015], advocated for a theory of knowledge that is more akin to sociology than philosophy. He asserted that the truth value of knowledge is determined by social class, location, and generation rather than by any objective standard. To separate his system of thought from the danger of relativism, he himself called it “relationism.”

Rudolf Eisner, in his *Dictionary of Philosophical Terms and Expressions* (1899, 1927, 1930), advocated for a theory of knowledge as knowledge of relationships—rather than a theory of knowledge in itself. Relationships, to perform any function, necessarily require the presence of two or more objects, organisms, ideas, worlds. In the world of “knowledge of relationships,” all these entities, all this reality disappears from sight. The study of relationships can properly be classified as relationism.

Alfred North Whitehead, in his *Process and Reality* (1929), advocated for a theory of knowledge as knowledge (or philosophy) of organism—rather than knowledge as theory of knowledge. Organisms, essential as they are to the understanding of (biological) reality, are irreducible complex entities closed-in in themselves. In fact, Whitehead argued that reality consists of processes rather than material objects, and that processes are best defined by their relations with other processes. Whitehead’s work can be properly classified as relationism.

infancy; with its already vast literature, it is covering many fields. Relationism is an esoteric disembodied enterprise. It focuses on relations, which are necessarily without body or substance, and neglects the entities that are in relation with each other.

Overlooked are the objects, the organisms, the ideas, the worlds which relations are presumably holding together; the substance, the essence to which relations refer, disappears from sight. Sandwiches are intensely relational entities. If one focuses on relations alone, one neglects the meat as well as the slices of bread, namely the *things* that “sandwiches” are supposed to hold together and of which they are composed. Reality becomes evanescent.

Culture plays tricks on us; it controls our minds even when we are not aware of its influence. Rationalism is not relinquishing its control over our mind without much resistance. In their death throes, certain aspects of Rationalism control Relationism.

The propensity of Relationism to focus on relations alone is mostly due to the fact that our mind is not extricating itself from the strictures of Rationalism. If we become open to its historical roots, through a huge simplification we can reduce the spirit of Rationalism to its power to analyze “one thing at a time”—relations alone in our case. This is the window that lets us understand the rear-guard stratagem of Rationalism of controlling us through Relationism.

Indeed, in the practice of Relationism, two or three of the worst characteristics of Rationalism rare their ugly heads: solipsism, an extreme form of individualism, and narcissism. In the end, Relationism manifests itself as an extreme form of Individualism (the hidden soul of Rationalism: I think; I am): solipsism, really. To single out a prominent case, aesthetics, in *A Relational Aesthetic* (1994) by Harold W. McSwain, Jr, is defined as “aesthetic experiencing”: Gone is the art, gone is the artist; what remains is the lonely spectator, “me,” the Universal Me, reduced to a “relation” for that matter, an abstract entity that is “experiencing” ...aesthetics.

Relationism, transmogrified into solipsism, is the tail end manifestation of a major “problem” of Cartesian Rationalism. Solipsism is a very important problem, the focus of Goethe’s *Faust*. Professor Stephen Thornton, in a personal

communication (email February 4, 2016), assured me that solipsism is indirectly related to the ancient problem of narcissism. Really, not the whole “self,” but only the image of the self. One may be a solipsist, truly a “lone wolf” and other more esoteric expressions of individual “mental states”—like self-reliance—without being a narcissist, and vice-versa. Clearly, some of those who like to call themselves solipsists can hate themselves. Narcissists are in love with themselves.

Do we not often note an excess of pride in the performance of the Rational mind?

This sketch does not exhaust what needs to be said about Rationalism or Relationism; it only helps us to demarcate the ground: What come next, Relationalism, immunizes us against narcissism and individualism. Imbued with the spirit of Relationalism, one cannot possibly be either a narcissist or an individualist. What a sigh of relief one hears from people who wish to be part of the *polis*.

18. ON RELATIONALISM

There are many reasons why we have to get away from Rationalism—as well as Relationism—and have a conversion toward Relationalism. Not the least of which is the need to close the gap between the “two cultures.” This abyss at the center of our modern life is due to the lack of a proper method of analysis, a common method of analysis. As Feyerabend liked it, we are even *Against Method* (1975).

Relationalism has the power to bring us to a safe harbor, precisely because it offers a new method, the Relational Method of Analysis. This method results from the indivisible union of the twins, Relational Logic and Relational Epistemology. Using *all* three fundamental Principles of Logic and *all* appropriate Tools of Epistemology, Relationalism brings our unruly Reason under the control of reasonable human beings and synthesizes a bewildering amount of information into reliable knowledge. Ultimately, Relationalism, a work in progress, is a new mode of thinking and expression that is gradually placing everything in harmonious relation to everything else (see Gorga 2021a).

Relationalism does not abrogate Rationalism; it simply avoids its most dreadful mistakes, mistakes that are covered under a chain of rationalizations—basically faulty justifications of past errors. To use Benjamin Franklin’s beloved

expression, Relationalism is a form of “improved and corrected” Rationalism. Relationalism proceeds only when the requirements of all fundamental principles of logic and the requirements of all appropriate tools of epistemology are satisfied.

This writer’s work has been concentrating on economics, with sideway runs into a few ancillary fields. In his publications, one can find the following equivalence relations:

✓	Zero ≡ One ≡ Infinity	...Gorga
(2010)		
✓	Matter ≡ Energy ≡ Spirit ³⁵	...Gorga
(2007)		
✓	Body ≡ Mind ≡ Soul	...already in, e. g., Plato, Aristotle, Aquinas
✓	Thought ≡ Behavior ≡ Feeling	...Gorga
(2018:12-13)		
✓	Production ≡ Distribution ≡ Consumption	...Gorga (2002, 2009, 2016:161-234)
✓	Participative ≡ Distributive ≡ Commutative (Justice)	...Gorga
(2017c)		
✓	Individualism ≡ Somism ≡ Collectivism	...Gorga
(2014)		
✓	Capitalism ≡ Concordianism ≡ Socialism/Communism	...Gorga (2021b)
✓	Being/not-Being ≡ Becoming ≡ Existence	...Gorga
(2009c)		
✓	Western Philosophy ≡ Relationalism ≡ Eastern Philosophy	...(To Be Written)

The writer has briefly analyzed these major triads in published papers, two of them in peer-reviewed journals; one of them in three books, one of which is in its third edition.

³⁵ How can Spirit be measured? The same way physicists measure Matter and Energy.

These triads are better analyzed if placed in a simple diagram like Figure 11 above.

As can be seen more clearly from the following Figure, the last set of equivalence relations is an application, an extension of the first set.

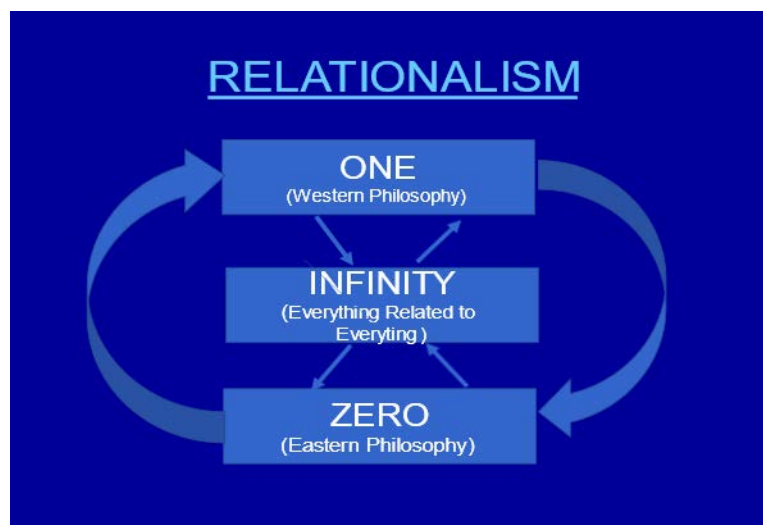


Fig. 15 – Relationalism as a Philosophy

Put very briefly in ontological terms, Western philosophy has consistently concentrated its attention on Being (or One, the Full Set) and Eastern philosophy has consistently concentrated its attention on not-Being (or Zero, the Empty Set). Relationalism has within it the potential of integrating these two fundamental aspects of our human minds. Many efforts have been devoted and are being devoted to reach this goal. When that is done, our minds will certainly acquire much more equilibrium than they have exhibited in the past and are exhibiting in the present.

19. FROM LASCAUX TO MOSCOW/KYIV/WASHINGTON, RELATIONALISM IS REAL AND INDEED RELATIONAL

Unlike a Plato Person, our Lascaux men and women did not look at their shadow on the wall of the cave; they looked outside, they saw and described a real wondrous reality. There it is. Our wondrous reality is all in our written books. Reality is indeed real and

fully relational. We now have a chance to write a book about Ukraine. A horrible reality. Can Relationalism come to the rescue? Yes, it can. Let us start from a real request from President Putin: He wants an end to the US Dollar Hegemony. Should President Biden give it to him? Yes, if President Putin stops the war in Ukraine.

What would the USA get from ending the Dollar Hegemony? Well, the benefit is in plain sight, see Gorga (2022). The Dollar Hegemony is transferring, in exchange for real goods, an inordinate amount of US dollars abroad. These resources are not paper tigers: Gradually, foreign nations are acquiring control of our real resources. Even Italy controls Chrysler these days.

This would be a Grand Bargain: End the war in Ukraine for an end to the Dollar Hegemony. This is a true Brandeis compromise. Louis D. Brandeis said: "I don't believe in compromises — but I do believe in the full play of forces and in giving my opponent what he wants if not inconsistent with what I want, and particularly if what he wants is something I want to get rid of."

20. THE KEY TO TRUTH

What is true? What is false? This is the most urgent question we face today. With the use of tools of information and misinformation spreading at breakneck pace, society needs to develop an ability and literacy for each person to distinguish one from the other. Relationalism comes to the rescue: Does the proposition respect principles of identity, noncontradiction and equivalence? Is it the result of the use of all the tools of epistemology? In brief, does the proposition foster Relationalism? If it does, the information can be welcomed; if it does not, the spreading of that information must be resisted.

CONCLUSION

Rising above ideology and even shooting wars, Relationalism—systematically using all fundamental principles of logic and all appropriate tools of epistemology—can gradually help us overcome the degradation erupting from some of the most strident social, economic, and cultural wars that beset the world at present. We can enter the field of Relationalism at any point; and from there we can reconstruct the sphere of Relationalism whole. The traditional point of

entry is God the Father Becoming Son or Being/not Being Becoming Existence. Existence is clearly composed of Matter Energy and Spirit. We human beings are clearly composed of Matter Energy and Spirit. Using wisely superabundant Matter and Energy, we can—we must—create a better world of the Spirit. Clearly, we can create a better world for ourselves only if *we all*, or nearly all, work together to create a better world than the one we found at birth. The purpose of life? The purpose is to enjoy the inexhaustible wondrous existence of our world of Matter Energy and Spirit.

With clarity of understanding everything is possible.³⁶ Relationalism does not abrogate Rationalism. On the contrary, it perfects its rational *modus operandi* and brings Rationalism to its full bloom. Starting from the atomism of Rationalism, Relationalism moves thought toward universality, a system of thought in which everything is logically and organically related to everything else.

Relationalism enriches us all, in all our lives. Two most beguiling expressions result from a close encounter with Relationalism: Women are not irrational; they are relational. God is not rational, he/she/it is relational.

The hope is that liberated from abstract considerations, we have a better chance of inquiring how can we get organized to produce a world that is truer to itself, more beautiful, contains more goodness—and is more just—than the world we inhabit today.

Relationalism is a work in exploration of reality. It systematically recognizes how everything is in mutual relation with everything else. Is this closeness that will eventually allow us to live harmoniously with everyone else? Relationalism, as per Gare's goal, allows us "to understand the immanent dynamics, intrinsic significance and the diversity of processes participating in the creative becoming of the world, including ourselves. This is the condition not only for an effective opposition to the destructive imperatives of modernity. It is the condition for overcoming it" (Gare 2002).

There certainly are many more aspects of Relationalism that need to be brought forward. But these are most dear to this writer at the moment.

Let us get to work.

³⁶ In response to the desiderata of Whitehead, with Relationalism we are provided with a goal "not only to advance understanding but to create a society based on a better understanding of the world and ourselves than has been possible with either scientific materialism or idealism" (Quoted in Gare 2002).

Ora et labora, preached in c. 530 St. Benedict of Nursia, a place not too distant from Roccadaspide, where I was born. Yes, let us get to work, says I. Let our work be a prayer to the wondrous goodness and mystery of God and Humanity. Let us make both God and Humanity real in our lives.

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