AN EPISTEMOLOGICAL BACKGROUND OF THE PRESENT DEBATE CONCERNING THE NATURAL AND SOCIAL SCIENCES[1]

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ABSTRACT

The paper highlights some *common* features in the natural and social sciences, and intends to remind economists their scientific responsibility to treat economics as a science, and not as a collection of opinions. Indeed, the goal is here just to justify – through the epistemological analysis of similarity of scientific requirements in both natural and social sciences – the scientific standards necessary to be realized by economics as a social science, and thus to warn against the *logic of fragments* the mainstream economics promotes despite all the denials of the real world.

KEYWORDS: social sciences, opinion, truth, experience, fragmentation, transdisciplinarity.

Introduction

The problem of *background* is philosophical. It consists in the questioning of principles, concepts and reasons which, all of them constitute the *paradigm* (as main tenets/ general view/ research program) of a set of scientific theories in a certain historical period. The result of this inquiring is the emphasis of characteristics of thinking within that set of theories, but also beyond them, such as: continuity and discontinuity, unity and difference, rhythm of change and the conditions and consequences of both tenets and change.

[1] Paper prepared for the Conference- debate concerning the philosophy of natural and social sciences and the place of economics in the frame of sciences: Bucharest, Romanian-American University, March 14, 2014. This conference is a part of a series concerning the specific of economics.

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On the other hand, the common presumption is, in the traditional view of *differentiating* between *natural* sciences (astronomy, physics, chemistry, biology and the earth sciences) and *humanities*[3] (linguistics, anthropology, literary science, visual and performing arts), that there would be rather dissimilarity than resemblance between them, concretely between the natural and *social* sciences (sociology, economics, political science, psychology, law, history)[4].

In order to challenge this presumption, in the following I draw attention on some aspects which would be helpful for the understanding of the attitude towards economics.

The common assumption of the cognitive mediation of scientific cognizance

The first is the criticism of the traditional naïve axiom, pertaining to both natural and social sciences, that there is one world and we, humans aiming at knowing, would position ourselves outside it and know it from outside. This belief arose from both the empirical proves of an objective world and the goal to grasp its functioning, origins and regularities. At the same time, this belief was especially assumed by the modern natural sciences developing from the 17th century on and searching for the laws of the material world. Indeed, this naïve pattern was concomitant with the strong positivist development of sciences in the 19th century and, though it was countered by the idealistic philosophical reaction of the time (therefore, outside sciences), in fact it was not shaken until science itself did not undermine it.

At the beginning of the 20th century, physics has *demonstrated* that "the world exists according to the observer", i.e. not "the world as it presents itself to us", so outside us, but the world *as we do know it*, the world as connections and movements of things transposable into a logical, measurable, reproducible and falsifiable representation of the world.

As we know, the Socratic turn in philosophy was that which early jolted the naïve axiom of the first philosophers searching for the first

[3] The German tradition calls them sciences of the spirit (*Geisteswissenschaften*).

[4] As we know, the classification of these sciences is not very precise. For example: anthropology, history, law, linguistics are considered either parts of humanities (which include philosophy and theology) or of social sciences. At the same time, humanities themselves are regarded in fact as social sciences. Or: these ones as humanities. Also – and even though the natural sciences study *physical* systems, while the *formal* sciences (mathematics, logic, statistics, theoretical computer science, information theory, system theory) occupy with *formal/ sign systems* – the latter are sometimes equate with the natural sciences from the standpoint of precision, quantifiable data and experiments.

principles of Being. This is the reason of a long period of "oblivion of the *ontological*" (Heidegger), thinkers focusing rather on the discursive mediations of the bottoms of things, while the modern scientists have continued the endeavor to grasp the laws of nature. But, only when the Einstein's change of paradigm occurred – preceded, at the level of science, that is, of and within social sciences, by Marx –, the naïve axiom began to enter within the history of the human thinking.

The conclusion of this new, and present, paradigm is that: sure the world is objective, but we do not regard it from outside; we are parts of the world. More: we watch it from the standpoint of our places within it, then from the standpoint of our (direct and indirect) cognitive experiences. The (false or true) ideas we share give the "world"/the representation of the world as we consider it. And this conclusion *is assumed by both the natural*[5] *and social sciences*. Both relate, more or less consciously, the "cold" ontological approach with the ironic epistemological one[6] (which many times includes the hot social/psychological/ethical preoccupation). (But, obviously, the emphasis of this relation, its interpretations and significances are made by epistemology, a philosophical discipline which, within the corpus of philosophy, considers "that it has an irreplaceable task, that to say the Truth about all the truths, practices and human ideas"[7]).

Hence a question arising from the core of this new paradigm of "translation" of the world by ideas: therefore, would everything in the field of knowledge be relative? Would the relativity of positions of the observers lead to the relativity of knowledge?

The common view on truth

Science – in fact, philosophy, since at the beginning of the history of expressions of rationality man knew so little about theoretical[8] and practical questions, as well and regarding the whole *kosmos* (κόσμος –

[5] See Andrew Pickering, *Constructing Quarks: A Sociological History of Particle Physics*, Chicago, The University Of Chicago Press, 1984.

[6] In fact, the epistemological standpoint considers – or brackets – the world as it appears within the human discourse: the philosophical concept of discourse referring to the entire human cognizance, transmitted in any forms. The ideas cannot be known but because they were grasped within discourses. See Michel Foucault, *L'archéologie du savoir*, Paris, Gallimard, 1967.

[7] Louis Althusser, « La transformation de la philosophie » (1976), in Louis Althusser, *Sur la philosophie*, Paris, Gallimard, 1994, pp. 147, 148.

[8] It is worth to remind that *theory* means to understand the existence/the reasons of things (since *to see* is tantamount with *to understand*): the origin of θεωρία is θεῶμαι = I see.

order), that knowledge was integrated – took place when the thinking man became aware of the *logos*: not only of the reason of things – that there is always a causal connection between them – and that this reason emphasize the order of the world, but also that there is a superposition of the cosmic *logos* and that of the humans. This meant that man can understand the logic of things and act in accordance.

However, the problem is that "Although the Law of Reason is common, the majority of people live as though they had an understanding *of their own*"[9]. What does this mean?

Plato has answered: there is a huge difference between the reasonable conduct according to the *individual* needs, then to the "things with which they daily meet"[10] and fit to and answer in order to tune with, and on the other hand the yearning to fathom *the reasons* of the intertwining and order of things. To the first the *opinion* – δόξα – corresponds: it stands, obviously, under the sign of *logos*, since it is expressed in an articulated manner, in accordance with the commonly shared meanings of words and it is "a way of getting into fruitful relations with reality"[11]. But it is subordinated just to this aim and thus it excludes all that contrast to the expectations[12], in fact desires people have[13]: consequently, it is rather the statement of the standpoint people assume, their opinion.

What is much more than opinion is *knowledge* (ἐπιστήμη): related to the *truth*. Indeed, the second chronological moment of the birth of

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[9] Heraclitus of Efessus, *Fragments*, The G.W.T. Patrick translation, 92, http://www.classicpersuasion.org/pw/heraclitus/herpate.html (my emphasis, AB). And (95): "To those who are awake, there is one world in common, but of those who are asleep, each is withdrawn to a private world of his own".

[10] *Ibidem*, 5.

[11] William James, "Humanism and Truth" (1904), in W. James, *The Meaning of Truth: A Sequel To 'Pragmatism'*, London, Longmans, Green and Co., 1909, pp. 51-101 (p. 80).

[12] As common belief, δόξα originates from δοκέω, to expect, hence (see Henry George Liddell, Robert Scott. *A Greek-English Lexicon*. Revised and augmented throughout by Sir Henry Stuart Jones, with the assistance of Roderick McKenzie. Oxford. Clarendon Press. 1940, http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.04.0057%3Aentry%3Ddoke%2Fw) to think, to suppose, to imagine; even to pretend, to seem to oneself that.

[13] See Raymond Boudon, "A 'Satisfying' Theory of Social Knowledge", *Knowledge and Politics*, Editor Riccardo Viale, Heidelberg, Physica-Verlag HD, 2001, pp. 63-87: following Herbert Simon who has created a "satisfying" theory of decision (that of "bounded rationality"), Boudon has proposed the same satisfying principle of the ordinary knowledge. It consists in the fact that people stop further deliberation and inquiry as soon as they found a satisfying decision/"theory", even though it is doubtful that this "theory" is the best.

I add to this underlying of psychological causes (the minimal effort to reach a standpoint), the sociological ones: that to adequate to the individual interests and to the ideas previously received and which became the ideological frame of the individual's thinking.

science (philosophy) – which is, actually, the first, just developing the intuitions of the one *logos* (that ought to be understood by humans through the exercise of their logic[14]) – was when man has discovered that the means of understanding the things *beyond* the circle of their near usefulness is knowledge: founded, valid, because it is verified both through logical deduction and empirical confrontation, in our experience[15]. Indeed, if Plato was the founding father of the paradigm that the truth would lay outside the humans (as a matter of fact, in the perfect world of Forms) and accordingly they have to discover it from-the state-of-concealment (truth as ἀλήθεια), his conception on truth was, however, more complicated. Plato was, at the same time, the supporter of the possibility of human education, development, through the medium of experience (learning, listening and debating). Therefore, if truth has pertained to the objective world – so not depending on man – knowledge was exclusively the result of human effort: to exceed the relativity and probability of opinions.

[14] Heraclitus of Efessus, *Fragments*, 91: "The Law of Understanding is common to all. Those who speak with intelligence must hold fast to that which is common to all".

[15] Therefore, science – see also the Latin translation of ἐπιστήμη, where man's *conscience* itself became something originated in the common *science*, thus beyond *doxai*, in the reproducible knowledge, thus expressed and fructified for one's own understanding of things and their place, as well as the subject's place, in the world: *con-scientia* – is beyond the opinions. Because: these ones, however reasonable, are circumscribed to the particular interests and "world" of persons, while knowledge/science always analyzes the *reasons*/the *basis* of a phenomenon. [In Greek, ἐπιστήμη is composed of ἐπι – on, over, concerning, and ϊστημί, to lift in a standing position, to stand still, to push forward/up, whence to fix, to stay; thus, ἐπιστήμη means *knowledge acquired through study, by learning*; and if ιστέος means that which one must know, would it be a to venturesome speculation to relate it to έστιάω, to give a feast, from where to charm the ears or eyes?; anyway, from a form of ϊστημί, the verb ιστορέω derives: to seek to know, to find out, ιστορία being just research, exploration, information. Therefore, the meaning of ἐπιστήμη is that of *detachment from the apparent information*, of *critique*].

The idea of *science*, beyond opinion, is linked to the search for the *causes* of phenomena (*aitia*) (Aristotle), thus beyond what would seem, however reasonable, or would appear to one or the other. Just from the understanding of causes and their repeatability have scientists later arrived to the *laws* of nature.

As we know, knowledge/science was at the beginning *philosophy*. But what does philosophy mean? It means love of *wisdom*. And what does wisdom mean? It compulsorily means *knowledge beyond opinions*. Why that? Because opinions might be dangerous for the human life: they would lead to the reign of *relativism* (thus to the rule of those able to impose their opinions) and in this way to some perilous facts in the everyday practice. This is the reason the archaic Greeks have considered *wisdom as the alternative to opinion*.

Finally, in the concepts of wisdom or knowledge focusing on the *reasons* of things a component of these reasons is integrated: the *consequences*. Though the ancient Greeks were not preoccupied with them at the level of physics/*ontos*, but only at that of ethics and politics, the problem of consequences has become important with the development of modern sciences.

Later on, the adventure of the concept of truth has emphasized that there is any contradiction between the assertion of the objective character of the world and, on the other hand, the origin of truth in the human experience: the objective character of existence is certified in and by experience, and truth – the result of the judgment about the *correspondence* and *consistence* of ideas, *both on short and long term*, and *both at a fragmented and holistic level* – is a *process* depending on the objective character of the existence. Therefore, a transition from the *essentialist* paradigm (that the essence of the human cognizance would lie outside the relations between man and the world) to the *existentialist* paradigm (that the essential aspects known by the human beings are the result of their cognitive experiences, and just this standpoint became the paradigm of the modern science and philosophy) took place.

Consequently, truth is no longer an objective characteristic of the world (as in Plato), but a *verified* – and thus and only thus objective – feature of *ideas*[16] people construct/arrive at in the process of experience. "The truth of an idea is not a stagnant property inherent in it…it *becomes* true, is *made* true by events. Its verity *is* in fact an event"[17]. A cognizance is thus a "true judgment with an account"[18], more than an opinion or conviction, a set of verifiable *reasons* – that is, transcending individual experiences –, *reproducible, verifiable and verified* and *dynamic*.

Therefore, however important is the epistemic subject who forges truth, just these features make truth to be objective towards one or another individual view, so not relative to the standpoints people have[19]. And these features are developed *by both natural and social sciences*, since their goal is just to understand the objective characteristics of the world. Even the fact that the ideas about the world are according to people's experience, social place, culture and influence over them is objective should be analyzed and decomposed scientifically.

There are infinite sides of the objective world and of the viewpoints people have about, as well as of the viewpoints sciences assume and transpose into specific studies. But all of them share the same concept

[16] William James, "Humanism and Truth" (1904), in W. James, *The Meaning of Truth: A Sequel To 'Pragmatism'*, p. vi: "true ideas are those that we can assimilate, validate, corroborate and verify. False ideas are those that we cannot".

[17] *Ibidem*.

[18] Plato, *Theaethetus*, Translated by John McDowell, Oxford, 1973, 201c.

[19] A manifestation of this objective character of truth is its normative function; just by the inclusion of the logical and practical criteria of reasoning, truth has a pragmatic role: that to encourage people to construct arguments, validated in their lives. See Huw Price, *Facts and the Function of Truth*, Blackwell, Oxford, 1988.

of truth: irrespective of the manners they realize it. For this reason, although every science assume the paradigm of evolution and change – this entailing the principle of criticism of presumptions, demonstrations, experiments, and results – then although the first image of sciences (with their theories, criticisms and alternative theories) is that of a puzzle, in fact there is a certain order in every field of research, a high level of *rationality* in every acknowledged theory: therefore, the conclusive remark of the spectators of sciences is rather that of the "absolute", or of the *certitude* arising from the emphasizing of truths, than that of relativity and rarefaction of fulcrums.

But, of course, neither the scientists do think the authority of their studies would be unlimited, nor the truths they arrive at would be the Truth, but only *events* in the historical process of knowledge: which have both epistemological and social/political causes and reasons[20].

Falsifiability of scientific ideas – as common assumption of natural and social sciences

Therefore, in the modern existentialist view of sciences and theory of knowledge, truth is a characteristic of *ideas*, while in the essentialist view it is a characteristic of the *objects*[21]. It follows that for both natural and social sciences the first principle guaranteeing the operability/"workableness" of scientific ideas is the explicit *assuming of the paradigms* within which they develop their research. The entire logic and truthfulness of theories constructed in various scientific studies depends on both the paradigms within which they develop and their explicit assumptions.

Accordingly, there are at least two problems which demonstrate rather the analogy of natural and social sciences, than their opposition. The first is that in both *the critique of theories pushes to the critique of paradigms* as well: thus, critique itself turns out to be the inner scientific means of development of the scientific knowledge. The second arises from a question related to the *procedure of criticism*: if the theories are constructed[22] in the framework of different paradigms, may a dialogue

[20] See Isabelle Stengers, *The Invention of Modern Science* (1993), Translated by Daniel W. Smith, University of Minnesota Press, 2000.

[21] William James, "Humanism and Truth" (1904), in W. James, *The Meaning of Truth: A Sequel To 'Pragmatism'*, p. viii.

[22] All theories are constructed according to the same *empirical* method, consisting in: a) observation, b) first explanation/intuition/comparing/hypothesis, c) empirical or logical/mathematical experimentation, i.e. transposing of the phenomenon into mental experiences (this is called "reflection upon") = d) explicit construction of hypothesis, e)

between theories – i.e. the critique of a theory from the standpoint of another theory – be possible at all? Or, in other words: are the theories *mutually translatable*, since they belong to different, even opposite sometimes, paradigms? And certainly, in this very general approach, I exclude the historical perspective: i.e. I do not consider the state of "normal science" when a scientific field develops based only on a single paradigm which, however, *will be* surpassed by a new paradigm through a "scientific revolution"[23]. I consider only parallel and synchronic theories working in the same or different realms related nevertheless to the same field of reality.

As we know, there are standpoints that consider theories to be mutually untranslatable: every one of them would have its truth value within the confines of its paradigm, and they simply would not dispose of concepts connecting them and being acceptable by all parts. But in this case: 1) the tool of scientific criticism would be significantly thinned, 2) the danger of dogmatism would not be little, since the evolution of theories would be fuelled only by the acquisition of novel data – within the existing paradigm – which eventually would falsify the theories, and 3) the freedom of falsification process[24] would be severely limited: because this freedom concerns both the paradigms and theories, or if the falsifying process would attain only the theories, and not also the paradigms, this process would shrink.

My viewpoint aligns to the epistemological principle of the – at least relative – possibility of reciprocal translation of theories: *at a higher level* than both theories, with higher scientific and philosophical tools. Actually, this principle – proved by experience, even empirically – is based on the fact that there always is an *external* environment and scientific (and philosophical) domain to a certain scientific theory, and that the focus on the truth process from within the theory, focus from an external standpoint existing everywhere in the scientific analysis, is only but fruitful.

In fact, this is Gödel's demonstration: that, in a lay expression, the truth of a system is always outside the system as such[25]. Or, differently put: the limits of the structure/rules of a system constitute a brake for the

conceptualization, generalization/ generalization, conceptualization, f) verification, g) validation, h) conclusion as final explanation = g) assertion of laws/tendencies.

23 Thomas S. Kuhn, 1996, *The Structure of Scientific Revolutions*, Chicago and London, University of Chicago Press, 1962; Ana Bazac, "Lucian Blaga and Thomas Kuhn: The Dogmatic Aeon and the Essential Tension", *Noesis*, XXXVII, 2012, pp. 23-36.

24 Karl Popper, *The Logic of Scientific Discovery* (1935), London and New York: Routledge / Taylor & Francis, e-Library, 2005, pp. 18-19.

25 See Ana Bazac, "Explicația ultimă în studiul societății", *Noema*, nr. VII, 2008, pp. 100-119. ["The last explanation within the study of society"].

truth process in that system. (And this aspect is very important for the economic research. Actually, this aspect urges toward the understanding of the historicity of the concepts: for example, the original economics as management of the household (*oikos*) can no longer remain within the boundaries of fragmented spaces).

Therefore, the limitless freedom of falsifying the theories is an axiom of *all sciences, natural and social as well.* And the process of *falsification* of scientific theories (Karl Popper) is akin to Hegel's *progress through the resolution of contradictions*, thus to the ancient *dialectical* perspective about the world[26], as well as to Kuhn's theory of *scientific revolutions*. Finally, if this method of falsification involves the prediction of new "inputs" of a theory, it opens the way to the prediction of its "outputs", or shows that the *truth of a theory means the predictability of the world according to that theory*.

The fragmented character of the scientific research and trans-disciplinarity

Sciences as coherent pursuit of scientific goals – to discover by experience, demonstration and calculus the laws of things/regularities in the movement of things, hence to predict their future behavior – have developed with the advent of modernity. It was thus normal that the first character of the new born sciences – the first were natural sciences, as we know – to be circumscribed to precise areas and problems. The development of new and new studies has followed this pattern, because it was the most efficient: to *focus* on certain precise phenomena, to "bracket" the rest of the world in order to better grasp the specific of the phenomena whose structure and movement represent the interest of that science, was not only successful, but also dependent on the level of scientific tools and instruments.

Just the boundaries instituted by scientists between areas of phenomena have allowed the scientific progress. The more circumscribed the chosen phenomena were, the better the results of studies.

In those times, only philosophy has "compensated" this fragmentary development of sciences, sending – since this was its *reason d'être* – to the connectivity of things and the whole beyond the ordered systems cut up in this whole. And only philosophy has criticized the excessive confidence into a scientific progress realized step by step through

[26] Heraclitus of Efessus, *Fragments*, 56: "The harmony of the world is a harmony of oppositions…".

acquisitions of knowledge about slices of reality[27]. Actually, the excessive positivist view did not belong so much to scientists (who always were conscious about their bracketing the exterior of their analyses), than to the common representation criticized by philosophers (who have equated positivism, as prudent but consistent scientific optimism, with the excessive view; whether this excessive view has pertained rather to the common expectations concerning science and progress, or to the media transposed liberal functionalizing of science, it's an open problem; at any rate, the prudent positivism arising from the logic of science should not be caricatured as a simplistic solution of the knowledge of the world).

With the spring of scientific research generated by the logic of scientific discovery and the institutionalization of private and state funding of science (the subordination of science to economic and political commands), the fragmentation, even atomization, and overspecialization of intellectual activities *have increased*, as it was obvious at least in the second half of the 20th century[28]. This process has brought not only notable information and new theories trying to *dis-cover* new territories within the fields circumscribed by the assumed paradigms related to these fields, but also a certain discredit of the philosophical examination of the truths accredited by the cohort of "special studies of". To this level of science rather an epistemology of *propositional coherence* has corresponded, thus openly diverting the attention of theorists from the "naïve" holistic conditions of this coherence. On the contrary, new studies have developed

[27] Ana Bazac, „Provocarea filosofiei pentru ştiinţele sociale", în *Tendinţe în filosofia ştiinţelor socio-umane*, coord. Angela Botez şi Gabriel Nagâţ, Bucureşti, Editura Academiei Române, 2008, pp. 79-99 ["Philosophy's challenge for social sciences", in *Trends in the philosophy of social-human scieces*]; Ana Bazac, „Fragmentarea ştiinţelor sociale, filosofia socială şi societatea cunoaşterii", în *Unitatea ştiinţei între noutate şi tradiţie*, coord. Dan Gabriel Sîmbotin, Bucureşti, Editura Academiei Române, 2011, pp. 193-226. ["The fragmentation of social sciences, the social philosophy and the knowledge society" in *Unity of science between novelty and tradition*].

[28] See here Popper's devastating critique (Karl R. Popper, *The Myth of the Framework: In Defence of Science and Rationality*, Edited by M.A. Notturno, London, Routledge, 1994, Author's Note (1993), pp. ix-x.): "Today it has become fashionable in the sciences to appeal to the specialized knowledge and authority of experts, and fashionable in philosophy to denigrate science and rationality. Oftentimes, this denigration of science and rationality is due to a mistaken *theory* of science and rationality – a theory which speaks of science and rationality in terms of specializations, experts, and authority. But science and rationality have really very little to do with specialization and the appeal to expert authority. On the contrary, these intellectual fashions are actually an obstacle to both. For just as the fashionable thinker is a prisoner of his fashion, the expert is a prisoner of his specialization. And it is the freedom from intellectual fashions and specializations that makes science and rationality possible".

by focusing on *forms* from different realms and subordinating them inside a common pattern (behavioral economics, for example). Therefore, philosophy has not questioned this focus on forms by more and more fragmented researches.

But, from both the science that has arrived to its boundaries stopping it/ from science that has confronted the brakes of the given paradigms, and from the philosophy that felt it needed to transcend the postmodern justification of relativity of truths, two new *tendencies* have constituted (in fact, they are rather *in statu nascendi*): the *first* is that of *trans-disciplinary* treatment and construction of problems (thus, the birth of new, trans-disciplinary studies) and that of an epistemology critically approaching the truths, theories and paradigms, beyond both the quantitative euphoria and the metaphysical consideration of quality. This new tendency regards *both the natural and social sciences*.

The *second*, weaker than the first, is the *science-philosophy "integration"*: traditionally, philosophy was necessary to the human beings searching for truth *before* the constitution of scientific theories (that is, demonstrated with scientific tools) and also *after* the development of these theories and the proofs of the correctness of the paradigms they based on. Nowadays – as quantum physics has already demonstrated – philosophy is necessary from both standpoints, and this means the *integration of epistemological questioning somehow in the corpus of scientific discipline*, because philosophy is more able to approach the internal contradictions of scientific theories and their contradictions with the external, scientific and real, environment, and thus to put the standpoint of *totality* in front of science. This standpoint is specific only to philosophy and it leads to a more responsible attitude of sciences towards the world.

Falsification and the scientific *laws* and *tendencies*

All sciences use, au fond, the method of falsification. If and when they do not behave in such a manner, they renounce to the specific that made them to be science, knowledge, and not opinion.

When the method of falsification concerns natural sciences, everything seems to function without problems: not the possibility of new facts denying the existing theory or even paradigm is which is considered unpleasant – at least, not by responsible scientists – but only the technical means, the time horizon, the funds and the human resource bother the scientists. And, after all, they want only to research, the decisions concerning the results of their effort would not be their business, would it?

The method of falsification – which annuls a theory even when only a single fact contradicts the tenets of that theory – has an ordered logic: to repeat the experiences, to repeat them with variants of inputs (including methods), thus to change some data and add other ones. If the results do not contradict the theory, although they may emphasize some new aspects or correlated problems, the theory is valid: it synthesizes permanent correlations between facts within nature, therefore it arrives at *laws*.

The natural laws constitute the background of natural processes studied by sciences: they are the keystones on which these processes develop and, for sciences, the landmarks of certainty. That's why falsification – even though a difficult historical process – is assumed by natural sciences: the more so as it legitimizes the *predictability* of things together with these natural sciences. (From this standpoint, sciences are *directly* related to the human problems: they solve the interest of *foresight* – since in an unpredictable environment people cannot live and progress –, while philosophy is only *indirectly* related to the human problems, by promoting first of all the *astonishment* and the *doubt*, as well as the *holistic* approach and the *logic of principles*).But, and here I finally stop on the *difference*[29] between natural and social sciences, because, first of all, the

[29] Let remind how the problem of demarcation between the natural and the social/human sciences has developed. To the second half of the 19th century, after the spring of the natural sciences and the constitution of the social ones, the epistemological reflection has focused on the community and difference between them. As we know, the demarcation between *physical* and *moral* sciences was put by John Stuart Mill in his *System of Logic* (1843).

(Adam Christopher Konopka, *An Introduction to Husserl's Phenomenology of Umwelt: Reconsidering the Natur/Geist Distinction Toward an Environmental Philosophy*, Ann Arbor, ProQuest, 2009): Later on, the neo-Kantians and Dilthey (and later on Husserl) aimed at emphasizing the specific of the human sciences: they did not want to take over the methods of the natural sciences (p. 41). But Dilthey has differentiated between *physical* sciences, researching physical processes, and *mental* sciences, the former being that about the *outer* experience explained by causal laws and the latter – about the *inner* experience, intelligible only through understanding (p. 43) (this understanding itself preserving the whole but concretely working with hypotheses allowing the study of isolated phenomena) – and relating in *der Aufbau* in 1910 the *explanation* only to the physical sciences, the other being only *hermeneutical*.

While Windelband in 1894 calling the first, *nomological* (emphasizing the constant form and invariable laws of nature) and the historical sciences/*idiographic*, as sciences of processes and unique events, a historically significant *Angst* concerning the eruption of irrationalism (Bennett Gilbert, *On Wilhelm Windelband's History and Natural Science*, 2013, http://philpapers.org/archive/giloww-2) has developed. In Rickert, the problem of demarcation is determined according to different *values* (individualizing or generalizing) that animate "theoretical interest". Therefore, if for the neo-Kantians the contingent and anomic empirical reality becomes intelligible only "when it is brought under concepts" (Konopka, p. 47), it does this because the object of the historical sciences is the "life-nexus".

logic of relations in the social world takes place through the conscious attitudes of the human beings having *reason and free-will* – while the logic of natural relations connects unconscious elements (so predictable) – so, this logic cannot be grasped in the form of unchangeable and eternal laws, but only as *tendencies*. Secondly, because the reason and free-will of the humans are depending on their *interests* and *social positions* and *ideas* about society, once more the logic of human relations manifests only as *tendencies*. Concretely, the attitude of the humans towards society is contradictory: since its reasonableness passes through the ideas they receive and since these ideas might be absolutely opposite to the real interests of the humans, on long or short term (but people follow these ideas and not their sound reason which would push them at least to doubt upon the ideas and paths they go on according to these ideas), it results that, on the one hand, there are many, changing and even contradictory interests (even of a single person) and, on the other hand, because the conduct of people does not even follow only their interests, social sciences may but *sketch* the lines of human conduct. These lines are regular in the form of *tendencies*.

Withal, since there are many lines of conduct, many interests and ideas intersecting and giving new compositions and so on and so forth, it results once more that the social sciences cannot discover laws similar to the natural laws[30], but only *tendencies*.

But this supposes that *every* scientific analysis is historical, concretely, it supposes a historical *a priori*: all and every cognizance exists in dependence of the conditions of possibility of knowledge in general: language, relations, traditions, motivations, that is, the human "life world" (Husserl). The invariants given by the experience of the natural world (natural sciences) must be analyzed and grasped from the level of consciousness of the historical intentions of research, and sure these intentions are linked to the content of natural cognizance too (Edmund Husserl, *L'origine de la géométrie* (1938-39), Translated by Jacques Derrida, Paris, PUF, 1962).

The problem of demarcation was also central in the Congress of German Association of Sociology in 1961, with some new aspects. Actually, it was not about the distinction between natural and social sciences, but between social sciences and philosophy. Popper was a protagonist, by taking over from the natural sciences the criterion of testability/falsification and considering that the social sciences must be testable in the same manner if they want to be sciences: this criterion, considered Popper, is absolutely necessary in a epoch that has proved to be "post-critical" and "post-rationalist" (see Ana Bazac, *Critica politicii. (I). Elemente de epistemologie a politicii*, Bucureşti, Editura Tempus, 1994, pp. 43-45 [*Critique of politics. Elements of epistemology*].

[30] Actually, what does *natural law* mean, especially towards the *tendencies* discovered by social sciences? The first emphasizes that in given conditions – which, generally, are unchangeable or change only infrequently – there are some correlations: their repeatability allows their predictability. The second emphasize au fond the same: in given conditions there are some correlations, but all of these only in the register of *probability*.

Does this fact lead to the dominion of relativity in the social sciences? Not at all, or at least not in the common understanding of relativity, which has as stake only the "absolute" natural laws and everything that departs from this stake would be not only unscientific but also worthless.

- *First and foremost*, in the social sciences there are *concepts*[31] which consist in *ideal models* (remember Max Weber's *ideal types*) of phenomena and with which one constructs the whole logic of the complex social processes: the concepts are the first stakes of the social sciences. (In fact, there are *preliminary concepts*, describing the idea intended and having the function of landmarks for the next developments of demonstrations, and *result-concepts*, constructed on the basis of these developments).
- *Secondly*, the social sciences construct *models* of phenomena, just the natural sciences do. But, because the standpoints and concepts considered even for a single social phenomenon, as well as their relations, are many (since they are selective), it results that there is not a single model for a phenomenon. (And, consequently, that in order to better understand the phenomenon we have to consider as well the exterior (formal and empirical) not taken into consideration by the model).
- *Thirdly*, just the precise understanding of *conditions*, *environment*, *causes*, including fuelling *ideas*, as well as the precise understanding of the evolution and change of phenomena, allows the social scientists to have valuable knowledge about society.
- *Fourthly*, social sciences use the *explanation* as submission to tendencies/hypotheses, as the natural sciences do. Every explanation derives from enunciations about initial conditions (of the phenomenon studied) and

[31] See Ana Bazac, „Trei concepte în filosofia ştiinţelor sociale: 'întâlnirea', 'ciclicitatea' şi 'criza'", *Categorii şi concepte în filosofia ştiinţei*, coord. Angela Botez, Henrieta Anişoara Şerban, Gabriel Nagâţ, Marius Augustin Drăghici, Bucureşti, Editura Academiei Române, 2011, pp. 127-148. ["Three concepts in the philosophy of social sciences: the 'meeting', the 'cycle', and the 'crisis'", in *Categories and concepts in the philosophy of science*].

from enunciations about the social tendencies and about the general hypotheses.

- *Fifthly*, the subjective phenomena – as motifs, intentions, will, actions – which explain the social phenomena are not only scientifically understandable, but also objective *causes*, since once they exist they are parts of reality and they are objective for the scientist.

There are, obviously, social sciences which are more precise than other, but *in no way* can we assume that they would be only subjective interpretations – thus, being covered by relativity – or that they would be precise only inasmuch as they use mathematically transposed data and calculus[32], or that they would be non-mature from the standpoint of the criteria of validation.

On the contrary, because, on the one hand, the criteria of the scientific truth – obviousness, consensus, verification – are not tantamount with the truth itself, and because truth, as characteristic of our knowledge (and not of the objects we focus on), is a complex structure whose multidimensionality generates types of truth (formal, factual, logical and mathematical, analytic and synthetic), and, on the other hand, the scientific method is *the same* (setting of norms and criteria – verification, falsification –) in both natural and social sciences, *there is not a logical-methodological difference between the natural and social sciences*, but only a *practical* difference/difference *of degree*. Consequently, on the basis of explanations, the social sciences could *predict*: obviously, only at the level of *probability*, of tendencies. At the same time, while the social sciences operate too, as we saw before, with causes, thus with not only logical, but also *causal inferences* regarding the social *conditions*, the natural sciences in turn should use interpretation, as necessary means in the process of debating scientific alternative theories (see only the wave particle debate leading to

[32] As more than a century ago Henri Poincaré has observed, in social sciences there are quantities or sizes which are *non measurable*, but this aspect does not annul their scientific necessity since they are *detectable*, "Lettre de M. H. Poincaré à M. Léon Walras" (1901), in Léon Walras, "Économique et Mécanique", *Bulletin de la Société Vaudoise de Sciences Naturelles*, Vol. 45, 1909, pp. 313-325, reprinted in 1960, *Metroeconomica*, Vol. 12, No. 1, pp. 3-13 (http://homepage.newschool.edu/het//texts/walras/walrasmech.pdf).

Or see the observation of the Romanian mathematician Grigore C. Moisil, *Lecţii despre logica raţionamentului nuanţat*, Bucureşti, Editura Ştiinţifică şi Enciclopedică, 1975 [*Lectures about the logic of the shaded reasoning*] concerning the theoretical difficulties faced by those who used statistics in the research on non-quantitative phenomena.

Accordingly, the measurability of results is a consequence of the chosen theory and set of experiments.

the wave particle duality). As well as, the natural sciences also use the "impressionism" of the understanding when they deal with internal causes in the deep down of matter: see only the description of quantum behavior.

Falsification itself (thus, not confirmation, but denial) is linked to the general reasons of social theories. Because the criteria of validation are:
1) the 'material" criterion/practice,
2) the "formal" criterion/logical formalism/theoretical demonstration,
3) the "immediate" criterion/experiment and demonstration,
4) the general criterion/practice in its wholeness/the social-historical practice,
although a general and at the same time immediate validation is impossible, and just because a judgment is verified by the whole system/theory it belongs to, as well as the theoretical system is verified through the series of its judgments – all of these meaning that the process of validation is always open[33] – the social sciences use falsification as *rational criticism of ideas* (which may include at some extent the logical formalism) that may lead to the abandoning of theories.

The inferences used in the explanation of social phenomena are *practical, conceptual*: the conclusions could be deduced from premises empirically or logically, but only in the framework of *tendencies*, thus, of probabilities.

Likewise, the excessive positivist exclusion of social sciences from the corpus of sciences as such because they would be lacked of controlled experiences has no reason: because these experiences exist in such social sciences as experimental psychology and linguistics, but rather miss from natural sciences as astronomy or geology.

Accordingly, the only difference between the natural and social sciences is that between the *natural laws* and the *social tendencies* as scientific acquisitions and tools. Because: neither the possibility of experiments, nor of measurement and mathematization, nor of the favorite interest for the individual or for the general, nor the marked theoretical or descriptive characters do constitute qualitative distinctions. All of these aspects belong to both natural and social sciences.

Scientific consistency

The remaindering of Gödel's theory has put into evidence that in both natural and social sciences the external environment to the scientific theory is the *ultimate* proof of this one: ultimate proof of its truth.

[33] Gh. Enescu, *Logică şi adevăr*, Bucureşti, Editura Politică, 1967, pp. 168-169. [*Logic and truth*]

Therefore, the internal consistency of a theory – be it realized through experiences, measurement and correlations with natural laws, or through logical analysis of language, conditions and tendencies and possibilities – does not consist only in the correctness of its parts (experiments, demonstrations, steps…) transposed into propositions, but is validated when all is told by the external environment: thus, by all kinds of *practical relations of man with the world*. These relations are structured in the truth-false pattern and thus, even the internal coherence and propositional consistency are validated by the external world. And here the "external world" is taken in its *systemic* view, as the *whole* world, and not only slices from it.

This is a *common feature of natural and social sciences*. However, as we experience it, the social sciences are more tempted to separate the internal coherence of their theories from the validation of reality. The reason is not pertaining to the internal "essence" of these sciences, but to their *social* environment/to their social/political conditions of existence and development. And because this means class conditions, it follows that these sciences are, consciously or not, *ideological*. At the same time, since these sciences are directly related to the social and political relations, forces and interests, they are compelled by the *power relations* to align their theories to the standpoints of these power relations. As a result, some theories are prevented to not being validated by practice, i.e. by the *whole* social system, and not only by isolated fragments. An example is the theory of *marketing*, serving to sell everything, no matter how harmful and irrational (at least from the standpoint of ecology and waste). So, why would Gödel's conclusion be so important? It is because it challenges the rigid interpretation of coherence theory of truth, i.e. of the propositional consistency of a theoretical construction *inside the doctrine* it assumes and which it belongs to[34].

Gödel's warning serves us to understand that if the social sciences want to be knowledge, and not opinion, they obligatorily must confront their theories with the *whole* of the social system, including with *opposite* fragments of the social reality. The problem of consistency is thus sending to the *epistemological responsibility*: actually, to choose the concepts/the content of the concepts and their relations within a theory[35].

[34] Akin to the coherence theory is that of consensus theory.

[35] See, for example, the concept of *economic equilibrium*. An interesting analysis is Karl Polanyi, "The Mechanism of the World Economic Crisis"**,** *Der Osterreichische Volkswirt*, 1933, Translated in 1998 by Kari Polanyi Levitt, http://www.karipolanyilevitt.com/wp-content/uploads/2012/07/Mechanism-of-the-World-Crisis.pdf.

Four examples in the economic theory may well illustrate these requisites. The first three, – the fashion of:

1) *econometrics*, dividing the economic sphere into isolated slices, treating them mathematically and separating it from society, and of "post-econometrics" trying to interpret economy in a "sociological" view

2) by measuring the inequality of incomes from labor and by promoting a new *welfare state* with its progressive tax for the 21st century [36], or

3) by promoting concurrently a financial reform and the reversal of austerity policies[37]

– as if it would be possible, since the first means "financial discipline", i.e. stint of budgetary expenditure and reducing the budget deficit, thus less money borrowed and spent in budgetary expenditure, while the second demands more coinage –

share the same paradigm of fragmentation and thus ineffectiveness. The other, 4) has criticized them from the standpoint of an *ecological economics*, integrating the whole social system with its energy and resources, entropy and waste, and adding to the mathematical modeling of isolated correlations a dialectical science. The mathematical formalization is not the sufficient justification of economical theories (The promoter of tthis holistic paradigm is Nicholas Georgescu-Roegen).

Instead of conclusions

Finally, if the tendencies emphasized by the social sciences are as objective as the natural laws – but only in the register of probabilities –, but because these tendencies take place through the medium of human beings as subjects, it is once more necessary to specify "the place" of the observer, namely the *ideology* from which the focus on occurs. The specification of the ideology – the worldview/social paradigm – of scientists is part and parcel of the *conditions of the research*. If some parts of these conditions are not specified but simply ignored, an external standpoint to the scientific spirit substitute science. This is the *interest*, which is in fact *opinion*, fragmented reason[38]. Or, science is self-awareness and *self-criticism*, aiming

[36] Thomas Piketty, *Le Capital au XXIe siècle*, Paris, Le Seuil, 2013.

[37] Joseph E. Stiglitz, *Europe's Lapse of Reason*, January 8, 2015, http://www.project-syndicate.org/commentary/european-union-austerity-backlash-by-joseph-e--stiglitz-2015-01.

[38] See John Rawls, "Legal Obligation and the Duty of Fair Play", in Joe P. White, editor, *Assent/Dissent*, Dubuque, Kendal/Hunt, 1984, pp. 45-56: because justice is fairness, the disobedience to the law is unfair and unjust. And because – John Rawls, *Political Liberalism* (1993), New York, Columbia University Press, 1996, p. 1v; also John Rawls, "The idea of public reason revisited", *The University of Chicago Law Review*, vol. 64, no 3, 1997, pp. 767

at the knowledge of the whole. [This last word not in a philosophical sense, but in a scientific one: as the whole system studied by a science. For example, and even letting aside the social environment external to the realm of economy (but without which this realm is not legitimated), the coherence of this realm – and of economics – cannot be established by reducing it to the fragments of separate succeeded pursuits of profit. Because the general result of this separation and reduction is, as we see, the crisis of the whole economic domain[39]]. If so, if social sciences have accurate methods in order to know the logic of the social world, if they gather formal and empirical means and they are aware of the unity of parts and the whole, one cannot say that they would be relativistic – because of their empirically searched validity –: just the logical criticism *all the way*, by excluding the opinions from their corpus, is which is watching for the danger of relativism.

This danger occurs when the process of falsification does not take place. The criterion of *falsification* is a very constraining one: it requires that *no part of the formal and empirical reality the theory considers be excluded from the process of inquiry and countering the theory*. The criterion of falsification implies thus *holism*. Any beautiful theory about an aspect or another of the social reality should not ignore the possible refutation by the whole: and this whole means also the understanding of *historicity*.

But the historical character of social facts is not tantamount with relativism: on the contrary, it protects us from it, just by emphasizing the

and 771 – only the *public officials*, as the competent political representatives, are those who discuss the public problems, reaching the public consensus in the recourse to the public reason (acceptance of the minimal liberal values), it results that, on the one hand, only the "well-ordered" countries/peoples (or "reasonable liberal (and decent) societies" John Rawls, *The Law of Peoples*, Cambridge, Harvard University Press, 1999, pp. 38, 6-7, 34-35, 58, 63, 64-67), with some general well-being, might be suggested to accept this formal manner of democracy and, on the other hand, this understanding of democracy and liberal spirit "is *non-emancipatory*... the existing principles, values and institutions of modern society are *not* agreed, and are *dynamic* not static, being normally subject to challenge. *Ethical reason* is then the *direct opposite* of public reason", Andy Blunden, *Rawls' Political Liberalism*, 2003, http://home.mira.net/~andy/blackwood/rawls.htm.

[39] John McMurtry, "Behind Global System Collapse: The Life-Blind Structure of Economic Rationality", *Journal of Business Ethics*, Vol. 108, No.1, 2012, pp. 49-60; *The "Cancer Stage of Capitalism": The Ten-Point Global Paradigm Revolution*, January 02, 2015, http://www.globalresearch.ca/the-cancer-stage-of-capitalism-the-ten-point-global-paradigm-revolution/5422537; Jacques Sapir, *L'hiver vient...*, 28 décembre 2014, http://www.comite-valmy.org/spip.php?article5429.

values[40] which framed and frame people and which are objective landmarks of the scientific knowledge. In this respect, a "well-ordered science" has as criteria: 1) Independent Testability of Auxiliary Hypotheses, 2) Unification, 3) Fecundity: in the context of a deliberative democracy forging the values according to which the research-agenda[41] and the external conditions of fecundity are chosen. These criteria allow the epistemic values "(explanatory problems deemed to be important) held by scientists as the actors of science"[42], as earlier Max Weber has observed[43], and challenge the horizons and knowledge values of the *lay public* too. But the *enlargement of the horizons of this public* by leaving behind the traditional distance between the experts and the laymen, and the use of these ones as an external necessary stake of science[44] is, especially in the social sciences, an epistemic condition: something like the "appreciative" knowledge[45] of the general social environment.

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[40] For the theory of scientists' relationships to values (that the choice of problems is always value-relevant, that the research as such must be value-free, that the research as such should not contain practical advices), see Max Weber, *On the Methodology of Social Sciences* (1903-1917), Translated and Edited by Edward A. Shills and Henry A. Finch, Glencoe, Ill., The Free Press, 1949.

Recently, in the same line emphasizing the value-relevance in the constitution of research-agenda, see Philip Kitcher, *Science, Truth, and Democracy*, Oxford University Press, 2001, p. 129: if "the research agenda . . . systematically neglects the interests of the members of [a] group in favor of other members of society, there is the problem of Inadequate Representation".

[41] Philip Kitcher, *Science, Truth, and Democracy*, Oxford University Press, 2001.

[42] Ingo Brigandt, „The Dynamics of Scientific Concepts: The Relevance of Epistemic Aims and Values", în Uljana Feest, Friedrich Steinle (eds.), *Scientific Concepts and Investigative Practice*, Berlin/Boston, Walter de Gruyter Gmb., 2012, p. 75.

[43] See also Max Weber, *The Vocation Lectures*, "Science as a Vocation", "Politics as a Vocation" (1918, 1919), Edited and with an Introduction by David Owen and Tracy B. Strong, Translation by Rodney Livingstone, Indianapolis, Hackett Publishing Company, 2004, pp. 1-31.

[44] Isabelle Peschard, "Participation of the Public in Science: Towards a New Kind of Scientific Practice", *Human Affairs*, Special Issue 'Action and Practice Theory', edited by Theodore R. Schatzski, vol. 17, no. 2, Dec. 2007, pp. 138-153.

[45] See Tojo Thatchenkery and Carol Metzker, *Appreciative Intelligence: Seeing the Mighty Oak in the Acorn*, San Francisco, Berrett-Koehler Publishers, 2006.

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