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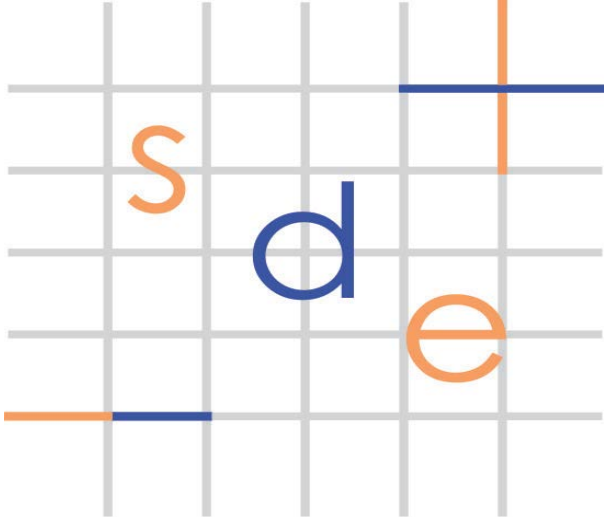

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Social Complexity: Operational definition

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Social Complexity: Operational definition

Bojan Radej

Abstract: *Society is complex 'mesocosm' (Plato). Concept of social complexity is developed from a cross comparison between simple, systemic, chaotic and evolutionary thinking. The most rudimentary category of social complexity is incommensurability of social issues because of their incompatible valuations in vertical and horizontal direction. These two orthogonally organised axes obtain us with Cartesian frame which is further reworked into Leontief's input-output matrix as each axis is internally differentiated on (at least) three integral domains. These provide a middle ground or meso level where domains are correlated which is fundamental for studying them. To apply mesoscopic logic on social processes one needs first to develop specific set of hybrid or bi-modal categories with dual horizon which are capable of bridging oppositions between pairs of incommensurable comparisons. Hybrid categories radically reinterpret society as a complex and deantagonised. Three practical examples are addressed to illustrate the mesoscopic transcendence of idea of totality as well as of fragmentation. Their conclusions suggest that our common destiny increasingly depends on individual and collective capacity to take a broad insight and constitute as globally responsible, self-restraining but also rigorously autonomous agents.*

Key words: *Social complexity, Incommensurability of values, Mesoscopic rationality, Hybrid categories, Mutuality.*

Threats of Complexity

Profound transformation from postmodern to complex societies is underway since early 90's (Wallerstein, 1996). The transformation is driven by divergent forces. On one side interdependence between effective causes of collective action is immensely enhanced on a global scale. On the other, autonomy of independent agents increased to the extent where they become capable of organising their lives around their own specific centres of local or narrow concerns. Squeezed between contradictory demands for uniformity and diversity, collective processes are decreasingly manageable in a standard way, top down or bottom up, and this fundamentally destabilises social systems (Bar-Yam, 1997). Complex situations instigate complex coordination problems (Elsner, 2006) which entail 'complexity risk' (Zolli, 2012) and lead to strategic uncertainty about appropriate response. We are like traveller, searching unknown terrain with the assistance of old maps (Benhabib, 2010) – hanging around short sighted in the face of far reaching changes with no safety guarantees offered for favourable outcomes (Wallerstein, 1996) and happy ending for all. We have entered a dangerous zone with no return available, without alternative choices offered and with no default option at hand.

There are numerous yet recent examples and empirical evidence of high-level failures of complex social systems. Very intriguing one, despite relatively small damage involved, took place on New York stock exchange with momentarily crush shortly after 2:30 p.m. on 6th May 2010. Local reporter saw it as one of the most terrifying moments in Wall Street history with a brief 1,000-point plunge in Dow Jones Index, the largest intraday decline on record, which some

later and equally abruptly mostly entirely rebounded. The chaos lasted just 16 minutes but left Wall Street experts struggling to come to grips with what had happened. The source of the turmoil remained unknown to the reporter, but it had apparently set off algorithmic trading strategies, which in turn rippled across everything, pushing trading out of whack and feeding on itself — until it somehow homeostatically started to reverse (Bowley, 2010). This event nevertheless triggered observable change in exchange rates between $ and € on global financial markets, it also affected global price of oil and *inter alia* resulted in emergency meeting of the council for national security.

Stock exchange has been often blamed as a potent source of systemic chaos due to its unregulatedness. However, increasing social complexity is certainly not limited only to unregulated, decentralised and dispersed processes. Just the opposite, regulation itself is a strong source of complexity. See a catastrophic failure of one of the world's 25 largest nuclear power stations on 11th March 2011 in Fukushima, Japan, which resulted in a meltdown of three of the plant's six nuclear reactors. The series of ruinous events was triggered by the earthquake, the most powerful ever recorded in Japan, which led at the plant to disconnection in electric power. Then the tsunami water flooded the emergency generators, so that active cooling systems were cut from electric power and stopped, and the nuclear reactors began to heat up. The power failure also meant that many of the reactor control instruments failed. Failing to supply power to the reactors' coolant systems and control rooms, multiple hydrogen-air chemical explosions occurred from 12th to 15th March. Although no short term radiation exposure fatalities were reported at that time, some 300,000 people evacuated the area, a part of them for a prolonged period of time. The plant is afterwards leaking radioactive water into the Pacific Ocean and radiation was detected on the other side of the ocean near Canada's West Coast in 2013.

The disaster in Fukushima may have been triggered by earthquake but it was human error that made it into one of the worst-ever nuclear accidents in history. This is conclusion achieved in the Executive summary of the Fukushima Nuclear Accident Independent Investigation Commission Report prepared by independent body.[1] The investigation found the nuclear disaster was 'manmade' and that its direct causes were all foreseeable. The report found that the plant was incapable of withstanding the earthquake and tsunami of such catastrophic proportions. It is found that bureaucrats put organizational interests ahead of duty to protect public safety. The government body promoting the nuclear power industry, failed to meet the most basic safety requirements, such as assessing the probability of damage, preparing for containing collateral damage from such a disaster, and developing evacuation plans. Report attributed much of the

[1] http://www.slideshare.net/jikocho/naiic-report-hires, March 2014.

blame directly to collusion between the plant's owner-operator, government regulators, and a dysfunctional governance and management bureaucracy. The blame should be put, according to the report, on systemic faults that supported flawed rationales for decisions and actions, rather then issues relating to the competency of any specific individual. Fundamental causes for disaster are to be found in the ingrained conventions of Japanese culture: reflective obedience; reluctance to question authority, devotion to 'sticking with the program'.

These harsh conclusions should be probably read in the traditional Japanese context of fatalistic self-criticism, which is rather odd for many non-Asiatic cultural conventions. Also there might be some veiled agenda behind the investigation that needed to contribute to impression that it is not nuclear technology per se that is uncontrollable in catastrophic condition but only professionals' deviation from the standards in the management, governance and business procedures. The alleged cause for the catastrophe is not supposed to be complexity of the situation per se but deviation from simple rules of practice and profession. In this way Report fails to outline that risky interdependencies with potentially catastrophic outcome may be reasonably expected as entirely possible outcomes in an inherently dangerous overlap between brainless large-scale technology, unpredictable nature and purposeful managers beings locked in their structural and cultural framings.

Complexity of social life is of course not limited only on high technology but can be seen also in every day operations, such as collective coordination aimed at achieving democratic and rational consensus about public goods. Social complexity proves to be counter-productive for any collective problem-solving (Elsner, 2006) in the sense that the single causes basically cannot predict the outcomes at the outset of actions due to 'strategic' unpredictability of other, unpredicted causes. Results of social processes can not be controlled since they emerge independently of specific purposeful actions or judgments of those involved.

Social institutions found themselves caught between their old habits and new demands. Politically dominant agents nevertheless still retain their privilege to pay no attention to these demands and continue to impose on society their uniform will from above or behind our backs like with the invisible hand. The intricacy is that the outcomes of narrowed enforcements are perverse in complex setting and decreasingly manageable even by those who imposed them. The outcomes of one sided impositions do not automatically reproduce structures of social domination any more. In this way coordination capacity of eminent institutions become weak and is further fading in light of emergence of wicked problems such as perpetuating systemic inequality and structural injustice. Social life can not be shaped any more by assumingly benevolent visions of power holders whose legitimacy has almost vanished. Several independent

global studies consistently reveal that a strong majority of world population, between 60% - 80% and even more, does not feel represented by their governments any more (United Nations, 2000 in Kreisler, 2001; Halpin, Summer, 2008; Eurobarometer, 2005; Henning, 2007).

A recent study authored by Motesharrei et al. (2012 in Nafeez, 2014), has highlighted the prospect that global industrial civilisation could crumble due to convergence of independent processes which breach system thresholds in all social domains. Following recent study prepared by Oxfam the 85 richest people on the planet own the same wealth as half the world's population— the 3.5 billion poorest people — while just 90 corporations have been responsible for a full two-thirds of the carbon emissions generated since the onset of industrialism (Oxfam, 2014; Chomsky, 2014). Combination of resource pressure and structural inflexibility can lead to collapse when factors converge to generate two crucial social features – the overstretching of resources due to the strain placed on the ecological carrying capacity and the economic stratification of society into rich and poor. These trends have played a central role in the process of the collapse of civilisations 'in all such cases over the last five thousand years' (Motesharrei et al., 2012 in Nafeez, 2014).

This is a miserable picture of situation without a decent exit. There is widespread impression of over increased complexity in markets, technologies and societies resulting in system tensions and poor integration (Abrahamson in Ritzer, Smart, 2003). They are reciprocally incommensurable and this involves a tragedy (Hsieh, 2008): no matter which aspect is emphasised, it always imposes involuntary and illegitimate trade-offs.

The search for coherent rational bases for dealing with collective problems is bound to fail, because of changed nature of these problems. They are enigmatically complicated or wicked (Rittel, Webber, 1973). Ordinary problems in the natural sciences are definable and may have solutions that are findable in a prescribed way. The wicked problems in social context have no definitive formulation, they occur in any domain involving stakeholders with differing legitimate perspectives. They are uncertain due to the hardly reducible structural uncertainty, difficult to manage with a variety of actors with diverse interests involved and hard to grasp in the sense that they are ill-structured and difficult to interpret relying upon elusive political judgment for their resolution. Wicked problems invalidate any simple unitary concept, such as the public interest or market mechanism, and make its practical application infeasible (Rittel and Webber, 1973).

Social complexity, when observed through only recent vast system failures and catastrophic developments, is perceived as a source of chaos and so as an obstacle and even a threat to the modern way of life which is presumed on predictability and stability. There is therefore an overwhelming support among mainstream social scientists for an idea that complexity is

dangerous. A noble task which is worth of every effort has fallen on their shoulders on the battle ground divided between simplicity on one side and chaos on the other, aspired with a goal to build resilient social systems with killing the complexity (Zolli, 2012) as its necessary and sufficient precondition. This might be therefore jet another example in history of social science which is abounding with intriguing reports exposing that the first intellectual steps undertaken in dealing with radical novelty are not so rarely displayed as coordinated efforts for silencing, discrediting, subverting or at least to ridiculing it.

Caught Between Simplicity and Chaos

The monetarist Milton Friedman as one of very influential economists (Nobel laureate in 1976) was convinced that complexity in social issues is just impression until we find a simple explanation with better theory (in Hollis, 2002). Complexity should be wiped out and can be if we remain rational and aspire to this goal hard enough. Whenever you look at very complicated systems in physics or in biology, you generally find that the basic components and the basic laws are quite simple (Wolfram in Bousquet, Curtis, 2011). So it is assumed with the analogy that precondition for regaining ability to control socially complex processes is to translate them first into a set of simple issues.

There is a widespread philosophical presumption that simplicity is either fundamental characteristic of reality or at least the highest theoretical virtue (Baker, 2013). Historically, the dominant view about why we should prefer simpler theories to more complex ones has been based on a general metaphysical thesis that nature itself is essentially simple. Clarity, beauty and simplicity, which emerged with the discoveries of the first mathematical, logical and natural proofs and laws, overwhelmed their inventors so much that it convinced them they must have discovered eternal truths (James, 2002). For early Naturalists from Ionia (VI century BCE), Thales, Heraclitus and Democritus, the true nature of reality is hidden but simple because it can be explained on the level of simple units called ‘atoms’. The Pythagoreans developed a theory of geometrical proportions in V century BCE. It aims to explain the universe as based on rational proportions such as $^{1}/_{2}$, $^{2}/_{3}$, $^{3}/_{4}$, $^{4}/_{5}$… Simplicity was ascribed to the deep knowledge of gods and its harmonious character could have been best experienced listening musical harmony which is itself an outcome of rhythmical correlation of rational proportions. Leibniz, a German philosopher in XVII century, also claimed that world rests in pre-established harmony. In order for something to count as a real being it must be 'truly one', or an entity endowed with genuine unity, a 'monad'. And in order for something to be a genuine unity, it must be a simple, indivisible entity. Hume, a Scottish philosopher from XVIII century suggested that a tacit

assumption of the uniformity of nature is ingrained directly into our psychology. A compatible attitude—and rhetoric—is shared by scientists through the modern period, including Copernicus, Galileo, Kepler, Newton, and Maxwell (Baker, 2013). Einstein (in Baker, 2013) was also convinced that the history of physics justifies us in believing that nature is the realization of the simplest conceivable mathematical ideas, such as $E=m•c^2$. The social sciences in XX century in particular continue to be dominated by the same paradigm that our world is essentially simple (Wallerstein 1991).

Despite the historical importance and influence of this view, there is scant empirical evidence that the world is really simple (Oreskes et al, 1994). Our commitment to simplicity is largely an inheritance of XVII century theology (Oreskes et al, 1994) and more recent philosophers and scientists have been resistant to the idea. It seems difficult, says Fitzpatrick (2013), to formulate the thesis that nature is simple so that it is not either obviously false, or too vague to be of any use. There would seem to be many counter-examples to the claim that we live in a simple universe. Consider, for instance, the picture of the atomic nucleus: it was assumed that matter was made only of protons and electrons; there were no such things as neutrons or neutrinos and no weak or strong nuclear forces and no Higgs boson to be explained, only electromagnetism. Subsequent discoveries have arguably led to a much more complex atomic picture of nature (Fitzpatrick, 2013) which still resists our full understanding.

Simplicity is then relevant at least as a theoretical virtue. Many philosophers believe that, other things being equal, simpler theory is better (Baker, 2013), since it is more efficient, because its empirical content is greater; and because it is better testable (Popper 1992). In Leibniz's view best theory contains a maximum of individual variety falling under a minimum of general laws (in Craig, 1998). Einstein (in Baker, 2013) said that the grand aim of all science is to cover the greatest possible number of empirical facts by logical deductions from the smallest possible number of hypotheses or axioms. Kant puts forward the maxim that rudiments or principles must not be unnecessarily multiplied (in Baker, 2013).

So our standard science is focused on small and easy issues (Prigogine,[2] Stengers, 1982). Scientists still today largely subject to a medieval rule which has come to be known as Occam's razor: explanatory entities which are needed to formulate a truth statement must not be multiplied beyond necessity, since simplicity is preferred explanatory approach. The rule states that one should apply simpler theories until simplicity can be traded for greater explanatory power of more difficult elaborations. Thomas Aquinas (1945), Italian scholastic from XIII century made

[2] Nobel laureat for chemistry in 1977, Wikipedia, #Ilya Prigogine, May 2014.

the similar argument writing, 'If a thing can be done adequately by means of one, it is superfluous to do it by means of several; for we observe that nature does not employ two instruments if one suffices.' Newton affirmed a conclusion that, 'We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances' (in Hawking, 2003). Finally, for some the most daring authors starting with Pythagoras, simplicity is an ultimate and a priori epistemic principle which must be taken as a direct evidence for truth (Swinburne, 1997).

The ideal of simplicity has been first systematically materialised in the Newtonian scientific paradigm. Isaac Newton, English physicist and mathematician in XVII century described reality as an organized simplicity – eternally ordered and stable realm, with little disagreement among scholars about how to comprehend it. In simple world we deal with 'known knowns', where there is a high degree of agreement about what is research problem. Simple systems are linear – where an increase in the size of an input to the system gives a proportional increase in the size of output – so the cause-effect relationships are transparent and the arrow of causality can be at least in principle easily discerned for classical objects of concern. Only one credible description of the concerned issue is valid with no competitive and substitute explanations (unilineality). Furthermore classical science is positivistic because it aims translating observational results into general theoretical laws following some strict confirmation rules of scientific method. For French philosopher Auguste Comte, founder of positivist doctrine in social sciences[3] from early XIX century, a positive science is based upon empirical observations that is used to generate and test abstract laws of human organization (in Turner, 2003).

The paradigm justifies a view that an objects can be treated like independent mechanical systems which are deterministic i.e., a future state can be precisely predicted from a previous state. Real things are ordered and follow strict rules. Relevant data for their inquiry both exists and can be measured, analysed and are wholly testable and replicable in analogous situations. Theories can either be built up from analysing observations or, if developed top down, can be tested against observations. In either way, this view is reductionist, since it reduces the parts from the whole, or understood the whole without relation to the parts. A simple system is either indivisible atomistic or invariant under division because its quality is intrinsic.[4] The constituent parts of such a system are commensurable meaning that parts within one subsystem or class are regarded as identical. Despite its unification purpose, principle of simplicity does not rule out diversity. There is diversity between parts which is below their surface appearance nevertheless connected with the same intrinsic content or value which is applied as a common denominator for unifying all

[3] Wikipedia, #Auguste Comte, May 2014.
[4] Wikipedia, #Atomism, Feb. 2010.

diverse appearances. When diverse issues share a common unit of measurement they are said by Pythagoreans to be '*arithmos*'[5] or commensurable. Commensurability as a term comes from Euclid's Elements, in which two line segments *a* and *b* are called commensurable if there is some third segment *c* that is a common unit of length in terms of which *a* and *b* can both be measured. Otherwise *a* and *b* are not '*arithmos*' but '*alogos'* or incommensurable, and so accepted as delinquent cases against the common rule. These subjective and less tangible or even irrational aspects of evaluation must be by Newtonian scientist properly recognised and discounted.

Classical science is manifestly progressive, insofar as over time its theories tend to increase in depth, range and predictive power. Any new models or theories, once shown to fit, will be compatible with old knowledge and expectantly will accumulate vertically into a grand synthesis. At least in the long run, classical model of science tends to produce consent regarding which theories are valid (Gorton, 2010). A unified theory of everything is an ideal of ultimate, all-encompassing and perfectly organised knowledge as idealised by Plato, Leibniz (Monadology, 1714) or French philosopher Descartes (dualism, the first half of XVII century), as a model of the world that encompasses different aspects of physical dimensions (such as classical physics together with the quantum model). Another, even more far-reaching examples are evolutionary synthesis (Huxley, 1940), economic synthesis (micro – macro, by Hicks, 1937, and Samuelson, 1955; Nobel laureate in 1970), or even broader models which may include into the general theory also spiritual dimensions (Wilber, 2000; see Skinner, 1997; Capra, 1982).

Newtonian paradigm sets framework for classical scientific program which is since then held as 'normal' (Kuhn, 1962) and declared as obligatory model for scientists to become established as their general reference frame. The main purpose of normal science is to convey the idea that like someone doing a crossword puzzle or a chess problem or a jigsaw, the puzzle-solver expects to have a reasonable chance of solving the puzzle and reveal the great picture. One of the foremost risks of 'normal' framework is that there is no challenge of received wisdom, the effort for truth is not reflective, it feels no need to evaluate own positions, it is not questioning paradigmatic issues, so it is not deep. With his theory of relativity Einstein has issued guidance for very cautious application of scientific conclusions and for humble aspirations of scientists for generalisation of their conclusions beyond their limited observation potentials and narrow research frames. He knew perfectly that relative movement of bodies can be appropriately described only on dissimilar ways (Hollis, 2002). So our understanding can be only relatively valid within the borders of concrete experience (James, 2002), partial and contextual. On the

[5] Wikipedia, #Pythagoreans, Nov. 2011.

other side relativity theory says that primary qualities (such as space and time) are not directly accessible to senses but emerge as hypothetical constructions of the mind (Schrödinger, 1996).

Epistemology, conceived in Newtonian and Kantian terms as the study of what can be known with certainty, begins to seem impossibility in the face of emerging epistemological relativisms (Skinner, 1997). Relativity means that classical science produces valid results only in very narrow frame in which these results are obtained (Bourdieu in Couldry, 2005). Narrowness of scientific conclusions has been proven by the classical science itself. Take for instance theorems of indeterminacy, incompleteness and impossibility. For German physicist Heisenberg and Bohr, as leading authors of quantum mechanics, indeterminacy places fundamental limits on the applicability of the deterministic classical concepts (in Hilgevoord, Uffink, 2012). He pointed out (1927) that the act of measurement cannot simultaneously measure with precision all characteristics of the object which leads to uncertainty and we can do nothing about it (Hilgevoord, Uffink et al, 2012). The uncertainty principle asserts a fundamental (physical) limit to the precision and objectivity of observer's insight. He specifically stated that the more precisely the position of some particle is determined, the less precisely its momentum can be known, and vice versa. Another, closely related difficulty is that measurement is never accomplished in isolation from the observer, which causes ‘the observer effect’. It is noted that measurements cannot be made without observer's affecting the observed systems. So we have both, indeterminacy of the system which brings about uncertainty as a fundamental principle of reality, and observer's subjective interference into objectification process. The implication of indeterminacy is that classical science is constrained from both sides in its capacity to reveal truth with uniform means (measurement, objectivity, rationality) because its objects exist (or are constructed) as dual structures in which only one aspect of the whole (particle or momentum) can be objectivised at a time, while the other is held passive in its assumed condition – or in social systems even actively antagonised to the dominant counterpart. The postmodernists similarly claim about essential indeterminacy in social analysis for an accurate or useful apprehension of reality (Portis, 2008). Objects with dyadic structure can be recognised in the face of absolute categories of truth only in indeterminate way because dyadic and monistic methods do not operate on the same plain of reasoning. There is no rational approach that might enable a given dyadic structure to get rid of its duality and somehow achieve direct access to absolute truth which would be needed for it to earn monistic status of absolute validity.

At approximately the same time (1930), it has been proved by Kurt Friedrich Gödel, Austrian mathematician, that incompleteness is a general characteristic of any ideally uniform Newtonian mathematical construct. Incompleteness establishes inherent limitations of all but the most trivial

axiomatic statements that are set in monistic frame. Formal system may be incomplete simply because not all the necessary axioms have been discovered and cannot be discovered because the world itself is incomplete entity in permanent transformation. As a result of incompleteness, truth may be approached only with categories formulated on relative claims which are not composed in monistic nor in dualist but in plural setting.

The Gödel's theorem showed that truth cannot be contained within the formal limits of strict logic. Any formal theory which contains the theory of the natural numbers cannot be proved self-consistent by means of principles which can possibly be expressed within the theory in question (Menger, 1937). For non-mathematicians his theorem is interpreted as essentially stating that no formally consistent system of axioms is capable of proving truth integrally. Any effectively generated theory able to express elementary arithmetic cannot be both consistent and complete. Any consistent formal theory that proves certain basic arithmetic truths, involves an arithmetical statement that is true, but not provable in the same theory (Kleene, 1967).[6] A formal truth cannot be self-sufficient in its own context of reasoning, because it cannot be formulated without the unexplained residual value; a residual can usually be spotted and resolved, but only with hybridisation of explanatory frames with different formal systems of claims. So there neither is any way of completing all the relevant theories. They are 'essentially incomplete' (Raatikainen, 2014). If the theory is consistent with initial demands of the model, then it is incomplete. Conversely, if the theory is complete, then it must be inconsistent. Gödel showed that only if we allow paradox or some irrational content can truth completely reveal itself in form, concluding that the truth is beyond purely rational comprehension.

Russell's self-referential paradox (1901) helps as an example signifying that the theory of truth is far more subtle then assumed by classics, in particular by monists. Russell notes that, if one claims that a collection of propositions contains a proposition stating that 'all propositions are either true or false', such as classical logic, such a statement could not be legitimate unless 'all propositions' referred to some already definite collection which is not possible, since a statement about 'all propositions' is itself a new proposition, which can also be false (Russell, in Fioretti, 1996). Incompleteness can be thought through in terms of an illustrative experiment to compose a list of all lists: if such a list does not write itself on the list the property is incomplete, as there will be one missing, it is no longer a list that contains all list, so it cannot become what is supposed to be (Badiou, 2005). List of all lists is not completed until it lists all lists, and when it does, in that very moment it is completed without being complete, without further capacity to list itself as a newly emerged list. If list of all lists eventually imposes itself on itself, in this way it

[6] Wikipedia, # Theory_(mathematical_logic), Jan. 2013.

transforms from a formally logical structure into self-referenced and over-determined redundancy with unstoppable passion for presenting its validity as general. But the incompleteness in Badiou's view is not epistemic situation, it does not refuse a possibility for classical approach to truth, but entirely logical situation that arises on the frontier where pure and so necessarily incompatible logical forms interact. In our understanding, this means that monistic statements cannot be fully justified logically because they logically do not exist as complete and consistent entities, suggesting that monistic claims necessarily involve some non-rational content. Postclassical theory of truth in that case does not fall in category of simplicity but involves a sort of impureness which better connects it to complex system, which integrates rational and irrational component.

Next limitation of simplistic paradigm has been elaborated through an effort of social sciences to understand collective processes and consistently organise collective meaning, such as with the attempt to construct 'the social welfare function' (Bergson, Samuelson) which ranks all pairs of social alternatives with which decision-maker is faced as less desirable, more desirable, or indifferent. For this purpose Arrow formalised his impossibility theorem (1951, Nobel Prize in 1972, with Hicks). He proved that it is not possible to provide simultaneously for entirely democratic and maximally rational choice where initially everybody has the same voice and at the end of the selection process only one and precisely the most rational alternative for all is picked. One of the formal reasons why all diverse individual's preferred choices on the micro level cannot be neatly translated into a uniform social welfare function on the macro level is the difficulty of non-transitivity of individual preferences (the Condorcet's paradox). Transitivity requires the pair-wise rankings of preferences. For instance, if a voter prefers X to Y and Y to Z, then the voter must logically consistently prefer X to Z. A voter with transitive preferences is called rational; a voter with non-transitive preferences is called irrational (Munda, 2011). Non-transitivity in Arrow again reminds that public choice issues shall also be treated in relation to their irrational component and so addressed in a complex frame.

Arrow's results again probably should not be entirely unanticipated. Theorem proves something which seems ontologically straightforward: that assumed monist rational principle of the individual's preference, when applied in a public choice algorithm based on a dualist ordering procedure (pair wise comparison of alternatives), cannot consistently resolve problem in a plural, democratic way.

Another radical setback for the classical scientific paradigm came by a plural scientific revolution in seventies of the XX century, triggered by Kuhn and later by Feyerabend that effectively suspended Newtonian unilineality of science. The revolution had developed a ground

to elucidate idea of science as multiple and multilineal process that produces knowledge from different aspects which may even not be compatible.

Kuhn attacked classical positivism from a different direction than mainstream scientists. He assessed the history of science and noted that periodically whole areas of science are overturned by new theories, e.g. the Ptolemaic conception of the earth centred cosmos (II century) was replaced by a Copernican model in which the Earth revolved around the Sun (XVI century). Revolutionary overturning of prior theories demonstrated a far greater relativity to the status of scientific claims than previously thought. What the positivists saw as an immutable logical truths suddenly became contingent and historical (Mendel-Gleason, O'Brien, 2013), even culturally dependent and contextual. The Newtonian view was that science is neutral arbiter between competing theories. His thesis denied this, holding that the nature of scientific observation is influenced by prior beliefs and experiences. In general the factors that determine our choices of theory are not fixed and neutral but vary and are dependent in particular on the 'disciplinary matrix' within which the scientist is working (Bird, 2013). There are no facts independent of our theories about them, and in consequence, no one way of scientific viewing, classifying and explaining the world that all rational persons should be obliged to accept (Skinner, 1997). Formally speaking, an endless number of theories can be constructed with a particular body of data, just as an endless number of curves can be geometrically constructed to pass through a finite number of points (Barnes, 1997). Different theories weigh the appearances of the same world differently. Say economist and ecologist integrate information in different ways, so they rarely find common ground in shared scientific challenges and usually support different judgments. When confronted with multidisciplinary issues even the most competent, honest and disinterested scientists may arrive at different problem framings and conclusions because of systematic differences in the way they collect and interpret data, which hypothesis they apply and how they summarize findings (Mumpower et al., 1996). So it cannot be expected that two scientists when observing the same scene will make the same theory-neutral observations (Bird, 2013).

Since the paradigm and apparatus of different theories may essentially differ, the terms employed by one theory may fail to be definable in the context of another theory (Feyerabend, 1981 in Sankey, 2007). That is, it is not possible to understand one paradigm through the conceptual framework and terminology of a rival paradigm. Given the inability to define even less directly translate their constitutive terms, such theories may not share statements in common (Sankey, 1997), and may not overlap. Kuhn introduces term incommensurability, to account for differences which impede communication between the advocates of rival paradigms. As a

concept it describes specific form of negation that is logically different from true-false dichotomy since it allows for several true statements about the same issue which are equally valid but produce opposite conclusions. Rival theories can of course be compared and legitimised, but not against an objective scale (Skinner, 1997), they are rational in incompatible frameworks and so they appear to each other as irrational. Such a situation would push communication between classical scientists to a permanent confrontation and so to a dead end. This implies that incommensurably related disagreements need to be treated separately from their assumptions, dispositions and attitudes as irresolvable sources of disagreement. As a consequence, a question naturally arises here on available alternatives. We will not address it immediately - at least not before the first paying a due appreciation to the protagonist of our story, who enters the stage together with introduction of incommensurability thesis.

The first one who dared to question a simplistic concept of truth from the aspect of irrationality, paid dearly for his outrageous assertions. It was Pythagorean fellow, Hippasus of Metapontum, who disproved general validity of commensurability concept and so refuted Pythagorean enthusiastic conception of universal harmony. The discovery of incommensurability is recognised today as one of the most far reaching accomplishments of early Greek mathematics, which is entirely confirmed in philosophy of science in XX century (Bird, 2013) but which also triggered the first grand crisis in history of mathematics (Chaitin, 2000). The Pythagoreans have initially come to believe that 'Number is the first principle,'[7] arranged in strange symmetries and unearthly harmonies (Morris, 2011). Consider the sides (a, b) and the diagonal of a square (c) in Pythagoras's theorem: $a^2+b^2 =c^2$. This beautifully simple rule led them to an idea. If rules of geometry really represent universal laws, and if these laws are as simple as the theorem of Pythagoras and as mutually consistent as geometrically obtained rules obviously are, then this implies that world and the truth about it is in principle simple and harmonious. For Pythagoreans, musical harmony was, much the same as geometry, an undeniable proof, both aesthetic and logical, that simple truth is essentially a form in which language spoken by gods is developed. However, Pythagoreans did not know for irrational numbers.

Legend says that during one of their not so rare escapades, taking brotherhood across the Aegean see from mainland Greece to Sicily, a tragedy happened. It started with the Eureka moment, when Hippasus came to a discovery that the dimensions of certain mathematical objects lack a common unit of measurement, such as the side (in length of 1) to diagonal of a square or the hypotenuse of an isosceles right triangle are incommensurable in virtue of there being no unit that can be used to measure both (sides and diagonal or hypotenuse) exactly (Bird, 2013). The

[7] Wikipedia, #Pythagoreans, Nov. 2011.

same holds for π, the circumference of a circle with its radius, for Euler's number *e,* the base of the natural logarithm and for golden number φ (=[(1+√5)/2]). So one can for instance split an apple in 2, 3, 4 of whatever equal parts he wishes, but he cannot split it in √2, π, *e* or φ equal parts, simply because these cannot be defined precisely in relational and in relative terms, so they are said to be irrational numbers, behaving quite inharmoniously when observed in a conventional way.

With recognition of the presence of incommensurability in the heart of sacred geometry, the universe cannot be assumed as harmonious in Pythagorean way anymore. Since Hippasus we shall comply with the conclusion that harmonic proportions are only part of the law of the universe; the other part is obviously irrational. Now you can predict how the legend concludes. Betrayal is a mortal sin and shall not be ever tolerated. He who brings disharmony to the community of decent and good thinking people by his irrational claims must be severely punished. So Hippasus was thrown across the board by the priests of harmony to feed the fish and to keep instead the idea of simplicity alive and intact.

Kuhn has been for his philosophy also portrayed as anti-realist; he constituted view on a scientific project as irrational. However this is not meant that Kuhnian theory does not refer to the world. Reality is only one but nobody can perceive it integrally on all levels and in all coexisting domains. What is rejected in his philosophy is a monistic theory of classical method (Nola, Sankey, 2000). Narrow perceptions of reality may be nevertheless internally consistent conceptions, only that they mostly progress independently, rarely intersecting and only marginally overlapping. Think for example of economic, social and environmental arguments in discussion about social equity and sustainable welfare. The irrational anti-realist explains reality so that she multiplies views of a given issue. Foucault called this process causal multiplication or pluralisation of causes which asks a researcher to analyse a given event from the aspect of multiple causes that enabled it (Foucault in Burchell et al, 1991).

Historically observed, transformation from a simple to a complex paradigm of science has not been proceeding straightforwardly, just the opposite. On the one side, incommensurable nature of knowledge has been formulated in the absence of genuine theory of plural reasoning. On the other side, classical concept of science proved resilient to the criticism from the irrationality camp. Advocates of standard view were at first able to defend their holistic aspirations and responded to the argument of multiplicity of knowledge without essentially modifying their core simplistic logic.

Very successful theory which aimed to decomplexify scientific objects is the system theory. The system theory (von Bertalanffy, 1968) is studying relations between sometimes loosely connected components in incompatible natural, social, and scientific systems that are related in a complicated ways. System is transdisciplinary, interdisciplinary and multiperspectival concept which aims at developing foundations that are applicable in a variety of unrelated areas. Its two the most important characteristics are equifinality – that there are alternative ways of attaining the same objectives (convergence) and multilinearity – that alternative objectives can be achieved from the same inputs (divergence; Cicchetti, Rogosch, 1996). In this way the system theory aims to serve as a bridge for interdisciplinary dialogue between autonomous areas of study.

Laszlo (1972)[8] noted that the systems theory went one step beyond the Newtonian view of 'organized simplicity' which reduced the parts from the whole, or understood the whole without relation to the parts. In systems, it is argued, the only way to fully understand why a problem or element occurs and persists is to understand the parts in relation to the whole (Capra, 1996). System theory is concerned not with separated multiple sub-entities because they have objectively incompatible substantial contents but with the main structural relations between them in this way also replacing dogmatic formal logic of reasoning with some different logic which is intermediary formed through relations between these sub-entities as holders of substantive content. Relational issues are certainly not independent from real ones but aim at explaining the system from nature of manifold transactions between objects instead of from their constituting but incommensurable substances (Emirbayer, 1997). Guided by the system theory one is now able to explain multiple meanings (Checkland, 1993) in systemic way without interfering into incommensurable differences between them.

System theory with its distinctive intermediating logic of reasoning decidedly pushes classical science into the direction of paradigm of complexity, but not far more than only a small part of the distance that spans between them. A system is commonly understood as more that the sum of its internal structure of relations. However, this only guarantees that the higher level of the system is different, higher quality and this is not (necessarily) creative and transformative achievement for the system as a whole. Systems can produce improved control over its constituents for their more efficient exploitation, which is qualitative improvement on the level of the system but is may simultaneously be perceived as totalitarian result and deterioration from the aspect of parts its constituent members. Systemic change can become creative under less restrictive conditions. Without their explanation it is not possible to comprehend complex

[8] Wikipedia, # Systems theory, note 6, April 2012

systems yet. A complex system is inherently systemic without being also resilient on its internal structure (Byrne, 1998) and on narrowed potential for qualitative change. Creativity in this sense is addressed with theory of evolution, another sister discipline of complexity, to which we arrive some later.

Another step in dismantling Newtonian paradigm is abolishment of linearity between variables of the simplistic model and instead implying non-linear relations. This is a determining characteristic of chaotic systems. The theory of truth (James, 2002) offers different options for constructing scientific claims. Simplicity, disorder, complicatedness, complexity and chaos are the main. They are neatly schematised in extended 'Cynefin framework' in Picture 1 so we can compare them in their foundational understandings. The framework has been originally developed in the context of knowledge management by Welsh scholar Snowden (2000). Later it was reworked by Stacey (2002) into Agreement and Certainty Matrix – where certainty axis refers to the quality of the knowledge, while the agreement axis refers to a conflict about what is considered the truth. We propose to add to this scheme also area of disorder to outline important connections and distinctions between compared theoretical options.

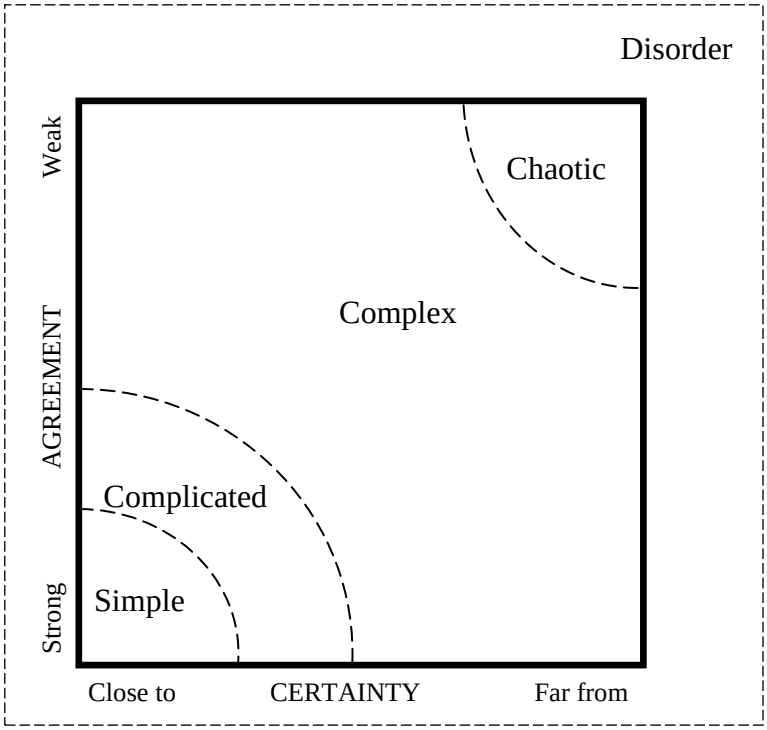
In the reworked and extended Cynefin framework the core of the system theory is located in the zone of complicatedness which is situated between simple and complex. A researched issue becomes complicated as a result of overlap between multifaceted and confusing interactions. Complicated system has a large number of lowest level entities, but simple organization (Ahl, Allen, 1996). It refers to a system of 'known unknowns' having many parts, there may be multiple right answers but they are partial, making it hard to understand analytically in its entirety. What is complicated is not necessarily complex, like watch on your wrist. And what is complex needs not be complicated, like friendship. Complex refers to the realm of 'unknown unknowns' which is not fully predictable (Foster, 2004).

Another category in the Cynefin diagram is chaos. Theory of chaos triggers Kuhnian type of break with classical paradigm (Gleick, 1991) and may be understood as exact opposite of concept of simplicity. Chaos is a world in which nothing is certain; things are not just unknown but unknowable. Chaotic systems are characterised with relationships between its small and large variables, small incident can trigger system change, rather than simple additive relationships which habitually cumulates from small to large (Nicolis in Byrne, 1998). Theory was developed from the work of meteorologist and mathematician Edward Lorenz (in Gleick, 1991) for systems that develops in self replicating manner which are very sensitive to even the slightest differences in initial conditions. This is often called the butterfly effect according to which 'a butterfly that

flaps its wings can cause a hurricane on the other side of the world'.[9] As small influences can result in large effects, the cause-effect relationships can not be evident. Rules of chaotic process are changing with every new self replicating iteration in which they unfold (Gleick, 1991).

Despite involving paradigmatic break with classical paradigm, chaos is not non-simple concept, since the inner logic of chaos is actually quite simple. Stewart (1997) explains chaos as apparently random behaviour with purely deterministic source involved in its simple replication of is rudimentary form, called fractal. Despite the apparent messiness of a chaotic system, the set of rules that it adopts in its associated processes can be quite simple to represent analytically (Foster, 2004) in iterative equations which starts with an initial value for x, inserts it into the equation and then using the result of x in the next calculation step *ad infinitum*. Chaos can be graphically presented with fractal geometry. A fractal is a geometric shape, which repeats itself in a self-similar pattern beyond all levels of observation so it is said to be *scale invariant*, well known examples are the fractals proposed by Polish mathematician Wacław Sierpiński with his triangles (1915, see Picture 2, later) or French mathematician Benoît Mandelbrot with his sets (Mandelbrot, 1983, in Gleick, 1991).

Picture 1: Distinction between simple, complicated, complex and chaotic



Source: Adapted from Stacey, 2002.

[9] Wikipedia, #Chaos, June 2013.

Social systems are usually orderly complex rather than chaotic or stable (Manuel-Navarrete, 2001). System founds itself in a complex condition when it is performing far away from its static equilibrium so it needs to maintain high structural flexibility and creativity (Prigogine, Stengers, 1982) to remain distinctive and autonomous in its character. But it is not that far yet from equilibrium to fall completely into chaotic state. Distinction between the chaotic and the complex systems was worked out by Prigogine and Stengers (1982). Complexity relates to *chaos déterministe*, it is ordered and self-organizing area of creativity spanning 'on the edge of the chaos'. Waldrop states (1992) that 'the edge of chaos is the constantly shifting battle zone between stagnation and anarchy, the one place where a complex system can be spontaneous, adaptive, and alive'. The actors or components of such system are not permanently locked in to a particular position or role within the system, but they neither fall completely out of control.[10]

Simon (1962, Nobel laureate in economics in 1978) defines a complex system as a system that is subject to the number of conflicting constraints. These are partly independent and partly dependent (Easterling, Kok, 2002). We can never hope to describe completely the complex zone, but we can learn to adapt to its constraints from intermediate location which gives rise to a complex collective behaviour (Bar-Yam, 1997). The core feature of complexity is linked to its middle location in the Cynefin framework, situated between the ordered regularity of the simple zone and the opaque randomness of the chaotic zone.[11] Mesoscopic perspective enables an observer to see not only the laws of chaos, but simultaneously also those of order (Manuel-Navarrete, 2001). Middle ground is crucial here as it facilitates possibility for observing correlation between coherent and random behaviour, so that a compromise between simplicity and chaos as well as between structure and surprise in this way becomes feasible (Kauffman, 1996).

The only remaining category to be introduced with the Cynefin framework is disorder. Disorder is absence of order. Disorder is nevertheless not far from order. It may be conceptualised as that sphere of the real on which our intelligibility has not descended yet to inhabit it with rational mind to organise it according to needs into orderly pattern. Despite permanent extension of knowledge which is colonising new spaces previously belonging to the disorder, kingdom of order always exist only as a small island surrounded with a vast ocean of disorder. A motive for incorporating disorder into a concept of knowledge management and truth building is then straightforward. It is indispensable because it keeps one away from Pythagorean bigotry. Area of disorder is like a shield which protects seeker of truth against illusions, because it conceptualises

[10] http://lostgarden.com/2006/04/managing-game-design-risk-part-i.html, Oct. 2012.
[11] http://lostgarden.com/2006/04/managing-game-design-risk-part-i.html, Oct. 2012.

inability to directly communicate with eternity and gain direct insight into infinity of absolute knowledge; a concept of disorder in this way protects rationalisation of the social world from superficial generalisations beyond construct validity of applied models of reality.

So the most polar opposite of ordered simplicity is disorder, not chaos, far less complexity. Complexity is not the exact opposite of simplicity just the contrary it is more generally valid version of it, instituted on far less restraining and excluding core assumptions. Concepts of simplicity, chaos and complexity are in a way similar because they all belong in the broad family of ordered systems. This means that different orders of order are involved in different theories of truth.

Further, disorder and order seem to be connected as subsequent phases of social system evolution. If Cynefin frame is taken evolutionary, then distinctions put forward in its schematics are seen only as steps in circularly reordering system's life from more to less ordered and back again. Many systems in their life span and social systems in particular historically undergo all types of order from complete disorder to simple order, which sooner or later becomes too constrained and as a sort of provocation leads to systemic and further on to complex structures. With even further complexification, order of a system may be dissolved and broken. Before it 'bifurcates' and changes into entirely different order a system may become for some period of time chaotic or indecisive about its preferred state or tendency in the future. This circularity of ordered forms finally suggests that all theories of truth may be co-present in every society through its subsystems which are ordered at different stages of their life-cycle even though they do not impact social dynamics at given point in time in a balanced way.

Despite there are several radical alternative theories available to pure Newtonian system, the simplicity as its essence, proved indestructible in all of them. Individual characteristics of simplicity, such as linearity or unilineality can be diminished in alternative theories, but characteristics of simplicity cannot be eliminated integrally from any theory to obtain a sort of strictly non-simple theory. We shall remain more than satisfied with this inability, because elimination of simplicity in the first place eliminates our ability to understand anything in a systematic, ordered way. Prigogine and Stengers (1982) claimed that simplicity belongs to our macroscopic observation of reality when we are searching for general truths (Prigogine, Stengers, 1982). They seek support in citing Bergson who explained that one and the same object can be seen as simple from one aspect and as complex form another. But these two are not equally genuine. Simplicity belongs to the object and symbols we apply to describe it, complexity belongs to our observations, when we move around the object, applying incommensurable explanatory approaches when attempting to simulate its mechanism or rationale. The complexity

emerges not from denial of simplicity but from the organisation of multiple simpler meanings (Bousquet, Curtis, 2011).

A system theory and a theory of chaos both remain silent on how to strike a balance between order and disorder or between rational and irrational counterpart of truth, as they both develop only one aspect of duality which always remains ignorant to the other. System theory and a theory of chaos neither are capable of invoking qualitative novelty. Linear reasoning cannot surpass its puzzle-solving mentality so it cannot generate deep understanding. Analogously, non-linear chaotic system only replicates its fractals in all directions. They can not emerge their results beyond own form so they are not capable of gaining insight into transformative processes – how they bring about creative systemic change. More comprehensive approach is needed for gaining insight into creative and transformative mechanism of complexity. The fundamental mechanism of emergence was explained in biology by Darwin (1859) and his theory of evolution. However, it turned out that extrapolation of newly obtained understandings and insights from biology to social processes can be very deceptive and constraining.

Conformism on Evolutionary Main Road

A theory of evolution is another older sister discipline of complexity approach (Dopfer, 2011). It developed much deeper understanding of processes under qualitative transformation than preceding theories. Evolution as a process it follows three phases: variation, selection and retention. Evolutionary algorithm advances by an iterative, chaotic like, but nevertheless systematic process of progression from lower to higher forms. The first phase, variation is usually considered to be blind or random, and happens typically by mutation as a small change in the genetic pattern. In the opposite to physical atomism, in evolution it is not repetition but a deviation from underlying uniformity as ascribed in (genes of) a parental DNA, assumingly a basic atomistic structure of life, which leads to growth of the system, and this sometimes progresses into qualitative novelty – if the variation is beneficial for organism (Boodin, 1918). The second and intermediate phase of evolution is selection of the fittest variants of novelty that is best suited to survive and reproduce in a given environment, while the unfit novelties are abandoned. The creative act of evolution is accomplished on this intermediate level of selection among variable alternatives. The features of the fit variants are in the third phase retained and passed on in offspring which may gradually develop their specifics into identifying characteristic of a new specie which can be then uniformly classified as a new form on the three of life. Observe how evolutionary theory formulates its conclusions when it combines non-linearity in

emergence of novelty and linearity in uniform classification of emerged life forms. After those fit variants are retained, they can again undergo variation, starting a new round or iteration.

A theory of evolution is connected with two of its main fields of application – biology and social sciences – even though their mechanisms are importantly dissimilar. Darwin was more than familiar with Adam Smith's concept of invisible hand by which, in present terms, market stability evolves spontaneously between independent forces of demand and supply just like eco-systemic stability emerges spontaneously between contradicting aspirations of predators and prey. Darwin also studied Robert Malthus and his demographic principles that justified survival competition for limited natural resources. Social sciences in response proved wide open to accept evolutionary logic from biology as one of its building blocks.

Application of biological theory of evolution for interpretation of social processes has always raised theoretical controversies in social sciences which continue to be dominated by the Newtonian paradigm by the present day (Wallerstein, 1991). Natural and social systems are both systems in evolution but characteristics of this process are specific. Social systems are evolving around alternative scopes – political visions, environmental conditions, and cultures – while evolution in nature has no aim and final goal (Heylighen, 1989). Nature evolves outwards when creating new forms of life, while social evolution at the same time also evolves inward, trying to become more inclusive and capable of cohering communal diversity in meaningful participation.

Cultural ecologist Julian Steward (1955) has characterised the contributions of classical sociology as unilineal because it interprets evolutionary process of social change as a uniform along one main idea, and specifically from less to more developed forms in the same way universally. Steward rejected mainstream view, pointing out that social evolution is differentiated and so it must be observed as multilineal between its incompatible constituents which are related to each other as parallel or only occasionally intersecting. Societies evolve according to their constructed scopes and specific external requirements, which vary between them so widely that their internal selection mechanisms are not directly comparable neither culturally transferable among them. For instance, in one culture time is conceptualised in circular dynamics which repeats itself to return social practices to their foundations with rituals and ceremonies, following the same repetitive logic as chaotic systems – in this case evolutionary progress is impossible. Other culture understands time as arrow in linear perspective flowing from past to future, which is then ideal for concepts like progressive evaluation (Gell, 1992). Their evolutionary mechanisms are accordingly divergent.

Also the nature of selection itself is completely different. In a democratic society under normal conditions social selection is not leading to the extinction of the unfit individuals. By sociologist

and economist of Norwegian origin Torsten Veblen (1899), object of evolutionary selection, are not individuals but institutions and social formations which are formed precisely to protect members from harsh selection process. But institutions are inert structures so they gradually become obstacle to change and become the first target of selection (Hodgson, 2008).

Schumpeter (1942) in his theory of economic evolution, unlike Veblen, did not build on Darwinian concept of natural selection, except metaphorically. With the evolution he refers no longer to the selection between institutions, even less between individuals, but to the general dynamics of the accumulative transformation with irreversible consequences to the economic system as a whole (François, 1997) due to technological, structural and institutional reasons. Evolution is in Schumpeter synonym for qualitative transformation of the characteristics of social system. The social theory of evolution is with him primarily concerned with explanation of transformation mechanism of social change and specifically with transition of system between two qualitatively different macro states (Dopfer et al., 2004) – such as before and after introduction of a technological innovation (Easterling, Kok, 2002; Geels, Kemp, 2000).

There are some further reasons for the claim that biological version of evolutionary theory remains too restricted in elaboration of social processes in their complexity. Standard understanding of evolution process is a vertical progression from less to more successful forms. Evolutionary economists also understand competition as a mechanism where losers are relegated to subordinate status and winners emerge as superior (Krossa, 2006). System scientists such as Simon (1962) analogously define theory of complex system only as a multi level hierarchical architecture in a vertical direction – a complex system is composed of subsystems, partial wholes that, in turn, have their own subsystems, and so on – in this way saying that system is complex when it is hierarchically modular and organised on vertically incommensurable levels.

Not only has that evolution in nature emerged its achievements in vertical direction. Selection as its main mechanism is itself also explained as a vertical process. Newer contributions to evolutionary theory (Okasha, 2006) emphasise that selection mechanism operates on different levels from lower to higher. Its starts on the micro level as a selection between individuals forming a narrow group or cluster in its local context with the aim to crystallise prevailing group characteristic, that is the most representative for all included. On the next higher level selection continues between groups. The fittest group is not the one with the largest number of fittest members but a group which the most successfully utilised inherited group advantages – such as with higher reproduction rate or with better control of limited resources in the environment or higher internal cohesion which enables more cooperative efforts than in competitive groups.

Analogously, selection in society may take place on different levels of social reality and their mechanisms are not necessarily comparable.

Hence, there is a deeper vertical process embedded in general verticality of evolution. This more contemporary concept of evolution unfolds as a narrower evolution which is embedded in a broader evolution. Evolution is thus not vertical in a classic linear commensurable way; neither is it scale invariant and so hierarchically impotent process, like chaos. It is vertical in different, specifically in a complex way with its incommensurable levels. This suggests that evolution theory should be elaborated in vertical dimension as essentially complex process.

Nonetheless, it is a common error assuming that evolutionary logic in general is somehow tied mainly to vertical processes (Adams, 2009). In this regard, evolutionary metaphors are at least in economics similarly ineffective to physical metaphors of classical economists. Horizontal aspect of evolution is classically conceptualised as less important to vertical. For many orthodox authors horizontal evolution is not an independent form of evolution, rather they regards it as a part of variation (Gontier, 2006). Or they see it as incorporated in a black box in a form of the concept invisible hand which is introduced as *deus ex machina* in an evolutionary mechanism of coordination between opposite economic forces of supply and demand that coordinate behind our backs, hidden to our eyes, inaccessible to our minds so leaving everybody without a possibility of substantive interference into spontaneous emergence of novelty and qualitative change. All one can do when faced with horizontal mechanism of such complexity that can never be fully understood, is to submit to it (Hayek, 1992). Despite its direct inaccessibility to our mind it is exactly this black box, by the view of followers, which contributes the core logic in rational explanation of creative outcome of market coordination.

In both frames, classical and evolutionary, verticalism in economics turns out as necessary – but not for understanding things – only as justification for domination of one particular version of truth (Olsen, 2006). The outcome is again Pythagorean: for those relying on simplistic conception of world it is more appropriate to accept idea of all mighty black box then a concept of irrationality. To frame social explanation into a black box is certainly more acceptable solution than throwing heretics to the fish – but still hardly satisfactory for modern rational mind sincerely devoted to neutral search of objective truth. To gain better insight into emergence mechanism, which is needed for comprehending social complexity, one needs incorporating horizontal aspect as equally important for understanding to the vertical aspect.

More contemporary authors who rely on complex explanation of evaluation theory do not see evolution only as a vertical, but also as a massively horizontal process (Riofrio, 2013), such as in the case of horizontal gene transfer (Woese, 2004), hybridization, parasitism, or symbiogenesis

(Gontier, 2006). Even more is horizontal axis of comprehension important in social context due to its cultural, ideological, life-style, religious etc. multiplicities which normally push the social evolution in several directions at the same time (Heylighen, 1989). These various social cores are conjectured as holistic, just as list of all lists, but they are not all encompassing, so they cannot be neutral and so they are related to each other as agonistic and as subjects of horizontal selection. For instance, liberal and sociodemocratic ideology produce divergent understanding of social realities and its driving mechanisms (Giddens, 1989). Each option consists of a specific domain of experiences, which is not only legitimate but also supported by logically equally valid arguments. Due to their horizontality, cultures, societies or economies are evolutionary not directly comparable, as they cannot pass through the same evolutionary stages in the same order as they change – rather, they change in incompatible ways, which can only be comprehended from the inside, applying its internal formative logic.

Hence, multiplicity of social forms assembles society as a horizontally complex structure (Bourdieu in Couldry, 2005; Ravetz, 2003). For Heylighen (1989) complex evolution must be conceptualised as parallel, distributed and 'multilinear' process (Steward, 1955). Similar conclusion is relevant also in economy as Carly Fiorina (2004), former CEO in a leading computer company, said: 'value in this era of technology is delivered horizontally, not in vertical silos, by department, by application, by process', which demands a move away from vertical market specialization to horizontal integration. Horizontal perspective is emphasised further in alternative economic models, such as horizontal production chains cantered on the quality, origin and identity of each product, advancement of common goods, and in open economy with sharing, gender equality, sustainable development or equal access to public goods by the vulnerable groups. In hybrid models of welfare creation such as socio-economic or socio-ecological models horizontal links are central driving force. Global models of multi-polar world can similarly be comprehended only if they also incorporate horizontal perspective as explanatory equally important to verticalism of global market, technology or planetary concerns.

Need for inclusion of horizontal perspective into methodology of social research seems straightforward, but this has not been confirmed with theoretical development of the field, even less in practical application. Two opposed approaches have been advanced in science to account for horizontal complexity and they are both of little use for us, because they persistently approach social complexity with the methodological simplicity. The first takes horizontal issues as exclusive and primary important; the other takes them as only secondary important.

The first option results from the observation that horizontality arises from multiplication of primary scopes so it leads the system to get structured in multilineal way. In this way

horizontality is perceived as a differentiating principle and so it is applied in a divisive way to justify segregation or 'pillarization' of social concerns into non-overlapping domains, such as economic, social and environmental domain of sustainability (see Picture 2, some later). Coexisting horizontal issues are organised as parallel to each other and separate complexes. However, in this way a complex matter is departmentalised and so effectively verticalized. The attempt to see horizontality as a primary explanatory axe, paradoxically but not inconsistently ends in its verticalization, since primary categories, such as sustainability domains, are usually meant as vertical structures. Nevertheless, vertical application of horizontal values is widely practiced such as in policy impact evaluation (Radej, 2014) – such as when horizontal criteria are only added as obligatory to all previously relevant classical evaluation criteria (efficiency, effectiveness, relevance, ...).

To avoid the problem of pillarization, horizontal aspect of system dynamics is alternatively assumed as dominant to vertical aspect. This is strongly supported view in part of mainstream social science. Horizontality in this case emphasises secondary contents as meanings resulting from overlap between multiple system's evaluation domains. That, which seems of secondary meaning, validates itself as a key point for elaboration of the primary meaning (Althusser, in Levačić, 2009). This was evident already to Adam Smith, who built the assumption into his key concept of the invisible hand of the market. Its function is to spontaneously extend social order (Hayek, 1992, Nobel laureate for economics in 1974) through evaluation of a tacit (or dispersed, secondary) knowledge. This knowledge is in itself useless to individuals and becomes meaningful only in interaction with others in their joint formation of aggregate market supply and demand, which in their overlap results in evolution of equilibrium price, as its vertically inevitable and subjected result. Hayek says our primary intentions and actions are one thing, but their broader social wide effect is something completely different. If a person only did what she thought she is doing, the truth about society would be contained within a simple statement of intentions.

Even long before Hayek, Scottish philosopher David Hume wrote that those things which are for the public benefit are not a product of primary values such as of intentional rationalist calculation. The happiness of a community is not promoted by trying to instil a passion for the public good in people directly, but by animating them with a 'spirit of avarice and industry, art and luxury' so that the same result comes about indirectly (in Barry, 1982). Popper also takes the view that the unintended consequences of action are the principal concern of social science and that the existence of such consequences is a precondition for the very possibility of the scientific understanding of a complex society (Vernon, 1976). Another example, when there is no

straightforward mechanism to install an optimal public policy, a policy proposal that is the most secondary effective, in its indirect and overlapping impacts, ought to be selected as the most advantageous for all (cf. Demsetz, 1969 in Schnellenbach, 2005). As societies grow more complex, policy-makers should be increasingly aware not only of their own agency's primary aims and effectiveness on their targeted area of impact, but also of wider implications and unwanted effects of their secondary overlapping impact on others and so on a wider society in general.

Smith and later Hayek actually rotated evolutionary mechanism from vertical dynamics to basically horizontal and a coordinative process which is spontaneously driven by secondary effects or indirect impacts of purposeful actions. Vertical outcome of coordination is seen merely a consequence and thus submitted to the main causal force in horizontal processes. If this rotation is observed with categories introduced with the Cynefin frame, Smithean process as mere expansion or retraction of the same scale invariant fractal result, is a chaotic, not specifically an evolutionary system. Hayekian system is horizontally idealised to the point that the deep meanings such as constitutive ones, which are of course organised as vertical structures, remain passive in comprehending of the system and its routine reproduction. Persistent dominance of horizontality as a driver of system transformation over verticality would gradually result in a loss of the systemic scope and lead to increased system diversity without really enhancing opportunities for its members. An illustration is the consumer society where market supplies an increasing variety of different goods with decreasing consumers' choice. If all processes in a social system were decisively secondary, the society as a whole would gradually lost its inner compass, become unstable, and endanger its identity by externally imposed dispositions.

The conclusion from one sided application of horizontality principle seems rather straightforward. If horizontality is taken either exclusively in the macro – pillarization, or exclusively in the micro setting, as secondary, then inclusion of horizontality into the methodology for explanation can not really contribute to better understanding of complex society's transformative mechanism but again only collapses complex concerns into one or the other variant of overly simplistic and one dimensional reasoning.

To comprehend social complexity as a distinct concept which is untranslatable into simple framing, one needs to draw from rich previous achievements by orthodox classics and later advancements with the system science, theory of chaos and theory of evolution. None of these is sufficient as a frame for studying complex social issue, since complexity is not reducible to any of them. Despite that a concept of social complexity cannot but 'stand on their shoulders'.

A lot can be learned from comparison of pre-complex theories. On the one side evolutionary algorithm replicates Newtonian paradigm: it submits to the same verticalist logic – even though not brought about by cumulative but in embedded progression; it also aims at building a tree of life as a uniform classificatory scheme of evolutionary achievements. On the other side, evolution principle sharply distinguishes from principle of simplicity because it is creative and emerges qualitatively new forms. Evolutionary theory also shares common characteristics with the chaos theory as evident in its dependency on small initial changes and iterative development. But theory of chaos operates with nonlinearity in a horizontal direction while theory of evolution progresses nonlinearly in a vertical direction. Similar to the linear approach and the system theory, chaos also enables direct interaction between micro and macro level of the concerned process. Contrary to simplicity and chaos, in the system theory and in evolutionary theory micro and macro level are connected only indirectly via the mesoscopic intermediary – either by their input-output relations or via selection process. This explains that evolutionary theory is important for understanding complex processes because it introduces into explanation a mechanism of creative emergence. Truth in this concern is not understood as something outside us that exists in its inert state once and for all but as something unfinished that is emerging trough contradictory contributions of participants.

Despite this, evolutionary explanation alone is not sufficient to describe social complexity because social processes can not be clarified without taking into account distinct discontinuities and incommensurability of oppositions about the principal issues – such kind of conflict is unknown in natural processes. They for instance never question internal logic under which they develop. Social opposition are, undoubtedly, deliberate and conscious – neither naturally essential nor simply spontaneous. According to Simon, mass societies would not exist without deep and irresolvable contradictions (Simon, 1969). Because the social world is first of all the site of continual struggles to define what the social world is (Wacquant, 1989).

It is observed that natural selection is preserving rather than changing types, for it discourages wide deviation in any direction (Cooley, 1897). In a given broad context, principle of survival of the fittest is conservative. Market differentiation or system differentiation is nothing more than the repetition of system formation within existing systems (Luhmann, 1995). Progressivist concept of evolution is actually conservative, since it is not progress, not evolution into higher forms in the same frame but radical change, emergence of new frames that is important in studying transformative processes. Belgian philosopher Isabelle Stengers (1997) clarifies that complexity differs from evolutionary emergence in that ‘the notion of emergence implies a physical genesis of the new, whereas the notion of complexity would correspond to a conceptual

genesis'. For instance, Schumpeterian version of selection mechanism is conservative. It is only 'creatively destructive' and so able to change the system in every particular specifics, however it is not deconstructively creative (Derrida, in Lawlor, 2008) and so able to develop radically beyond its constitutional or paradigmatic determinants and conceptual frames. For example Schumpeter is not able of side lining an innovator as the central agent in his evolutionary model for a cosmopolitan or perhaps, if it is for social good, for an artist. Radical invention many times arises as antisystemic event, in parallel, marginal or directly opposite to the dominant selection mechanisms in society, such as against the main currents at the research institutions in university or in corporations. Possibility of radical change needs to be better understood for definition of social complexity and its operational mechanism. So the next question of the inquiry is, building on previous findings, how to conceptualise radical change and incorporate it into operational definition of social complexity.

Faculties of the Hybrid

One of the most persistently recurring difficulties in previous attempts to surpass non-complex concepts of truth is unresolved question on how to integrate vertical and horizontal aspects or primary and secondary considerations in researching non-simple social issues. Groenewegen and Vromen (1996) have developed a thesis that evolution in horizontal and in vertical direction are equally important processes. Horizontal process crystallises which group characteristics are the most favourable. Vertical evolution transmits individually favourable characteristics to the level of the group. Sterelny (2007) has applied this biological argument in analogy with social processes (Mc Shea, 1996) when he developed theory with two types of social complexity: vertical and horizontal complexity. Vertical complexity measures the depth of the hierarchical organization an agent experiences – such as individuals are hierarchically embedded in families, villages, tribes... Verticality relates to micro-macro division resulting from discontinuity between individual and collective levels of judgment about social matters which usually cannot be, as shown by Arrow's theorem, overcome with simple aggregation from micro to macro level, such as in microeconomics, or vice versa, in macroeconomics. There is more than one level of factual description and each is irreducible – equally fundamental, but conceptually autonomous. This develops complexity in vertical direction. Therefore, when talking about verticality we do not think on different social realities but of different frames on different levels of analysis (Ritzer, 1990). Levels do not by themselves explain anything, they only determine how we see the world. Bar-Yam (2004) says that levels are constructs that allow observer to position himself in relation to the object of observation, they only frame the possibilities of observer on the relation specific-

general, which themselves and their meaning is entirely dependent on observer's scope, and so on horizontal view, not of level of observation.

Horizontal complexity on the other side is linked to differentiation at a given level, such as in economic class, gender, religion, region, ethnicity, group interest, sector or thematic focus. A horizontal aspect separates entities within given system level, because usually there are incompatible descriptions or facts on the same level of discourse (Lynch 1998 in Cat, 2010). For instance, in a given society agents have legitimate, but very different visions of what is good for the community as a whole, what is ethical or about needs of future generations. An example of this is tension between economic, social and ecological aspect of sustainability. James (2002) offers in his *Pragmatism* another simple example illustrating his conviction that a given reality can be observed differently, in dependence of our scope to which reality only passively submits. 27 is equal to 3^3, 3×9, 26+1, 100-73 etc.; these variants are equally valid and application of a particular one wholly depends on specific needs. This sort of rational diversity is produced socially and gives rise to horizontal dynamics. The difference between desired and actual developments acts as another determining factor (Burgelman in Germaine, 2010) not present in natural world. Dilthey, German idealistic thinker from XIX century in this regard wrote that human life can be understood only in social categories, which are not used in description of physical objects, such as scope, value, and ideal (Hollis, 2002) and these all exist in horizontal relation to each other.

Bar-Yam (2004) distinguishes between the scale in vertical and the scope in horizontal direction of emergent processes. He gives an illustrative example: ‘Consider observing a system through a camera that has a zoom lens. For a fixed aperture camera, the use of a zoom couples scope and resolution in the image it provides. As we zoom in on the image we see a smaller part of the world at a progressively greater resolution… We must allow a decoupling of scope and resolution, so that the system as a whole can be considered at differing resolutions as well as part by part. For this purpose scale can be considered as related to the focus of a camera—a blurry image is a larger scale image—whereas scope is related to the aperture size and choice of direction of observation.’ When a system is observed from the aspect of its many horizontal scopes, this reveals how different lower level subsystems relate to the system as a whole. When we are concerned with different levels of detail we observe a system on higher or lower level.

The need for some entirely specific definition of social complexity arises from very specific type of complexity that seems valid for describing social systems. Social systems must be approached as double complex issue: complexity may lie in the structure of a system, but it may also lie in the eye of a beholder of that system (Simon, 1977). Social reality consists of both, physical and

subjective reality, so it needs to be theorised in as double complex framed between horizontal and vertical axis.

Here we have conflicting conceptual demands for studying complexity – on one side to integrate two axes, but on the other that axes remain separated. The request begs a methodological solution that simultaneously enables both. One possible approach to responding this problem is orthogonal organisation of demands as two independent, but still minimally intersecting axes. Orthogonal orientation immediately refuses one-sided explanatory logics of evolutionary verticalism as well as horizontalism of chaos theory and instead imposes both as equally valid even though maximally divergent explanatory axes.

Orthogonality further emphasizes not only that two aspects develop in different worlds, but also that they can only make sense to each other, when we succeed in devising worlds in the middle ('*zwischenwelten*'; Willke, 2001 in Ankersmit, 2005) that is able to mediate between them. So it is needed somehow to extend insight into complex issue with intermediate or meso evaluation of its domains in relation to what essentially they are not. If this reads a bit too exotic for the time being, let it then serve only as an announcement of a challenge – directly derived from orthogonality – which is in further elaborated some later.

One technical possibility for meeting this confusing request is substantiation of axes – giving them concrete meaning and then relating them to each other. As Lynch points out, pluralism arises precisely from a duality between vertical and horizontal valuations. Vertical pluralism is inter-level pluralism, the view that there is more than one level of factual description. Horizontal pluralism is intra-level pluralism, the view that there may be incompatible descriptions or facts on the same level of discourse (Lynch 1998; in Cat, 2010) such as between interest groups, ideologies or cultures. Before proceeding on to the resolution of the enigmatic methodological challenge, we first need to capitalise on our achievements as intermediary milestones on the road towards operational definition of social complexity.

What can we gain from expositions developed so far for the purpose stated? Concept of social complexity can obviously not escape from dualistic logic the same as it has been found out previously that it can neither escape from monistic logic which is engraved in its orderliness. These ‘failures’ lead one to search for a plural or triadic logic, which not only links monistic and dualistic reasoning but also establishes more appropriate frame for studying social complexity as very specific type of orderliness. Initially it has been acknowledged that operationalization of social complexity requires incommensurability of oppositions as its conceptual point of departure. Incommensurability as a relation is oppositional in its nature, so it necessarily relates to at least two incompatible aspects so that any possibility for exclusively monistic explanation

of complex issue must be excluded. Even though social complexity involves dual logic, it can not be satisfactorily explained from dual viewpoint, like concepts of simplicity and chaos. Incommensurability refers to intrinsically plural relationship so it involves triadic logic ('three-body problem' in physics; Poincaré, 1913), which must be formalised between at least three agents, or constituent domains – even tough they all remain connected in series of bilateral links.

Dual reasoning is nevertheless indispensable for understanding emergence of complexity in triadic formulation. Hegel wrote that to produce triadic logic manipulation of two orthogonal distinctions is needed, specifically in his argument between universal and particular, and between direct and indirect (Vernon, 1976). Family for example rests on direct relations but it puts forward particular goals, while state rests on indirect relations but it aspires for universal goals. Society is then complex precisely because it is situated in the middle when it intermediates between family and state when it is forwarding universal aspirations which are partly mediated and partly direct.

Merely as short digression: intersection between two dualities must produce something more than triadic result – the missing situation from the above example is indirect provision of the particular and this would fit into chaotic system from Cynefin scheme. This chaotic residual may have been seen by philosopher as irrelevant – probably because it does not operate in his classically simple frame. However, omission of non-linear content is not appropriate beyond simple frame of reasoning. This does not spoil the principle itself since we also distinguished between complex as triadic and chaotic as dyadic systems; but we dare to feel contested and propose the principle more precisely: intersection of two distinctions produces triadic (complex) outcome with chaotic residual. This seems consistent with Cynefin which squeezes complexity between simplicity and chaos as their conceptual hybrid. Our main discussion is about triadic structure of complexity to which we shall return again.

Social complexity as a concept connects dual and triadic logic. Two axes stand for vertical-horizontal duality of social complexity, while internal triadic assembly of each axis (as further elucidated below) invokes plural character of complexity. In methodological words: orthogonal orientation of meaning axes invokes Cartesian reasoning that needs to be internally further reordered into matrical, cross-sectional or Leontief's input-output presentation (1953, Nobel prize for economics, 1973). Matrix suggests observing complex social reality as a kind of organised networks (Rossiter, 2006). If this can be confirmed, as it is aspired, then at least as far as methodological possibilities are concerned, social complexity can be modelled in a rather straightforward and uncomplicated way.

Our concern is to observe social as partly ordered and partly non-ordered issues located between order and chaos as ordered type of complexity. Social researchers are dealing with 'realistically complex systems' (Heylighen, 1989) which allow only for their permissible diversity (Galston, 2002), beyond which complex system crosses the border on the edge of chaos and breaks down into chaotic system. Ordered complex systems are characteristic for their 'moderate span' (Simon, 1962) which clearly distinguishes them from chaotic or linear systems of small span between micro and macro level. Systems are moderately spanned when the number of subsystems into which each system is partitioned is restrained but larger then two. Introducing modularity into the construction of systems is necessary to provide that a complex whole is built from smaller number, say of three smaller wholes of sub-systemic modules. Moderate span will not 'kill the complexity' since each partitions itself is not homogenous but is further subdivided in three sub entities on lower level so that partitioning continues on the sub-system level too (Simon, 1962), etc. Society is thus not like a sand pile made of individual particles which simply group together to create a whole without the first forming partial wholes (partitions) which gradually build ever larger social complexes.

The imperative of triadic thinking may be supported with some more fundamental insights. French comparative philologist Georges Dumézil (1987) has studied ideology between archaic civilisations dating back to the early II millennium BCE, which practiced triadic organisation of society between the class of wise men, warriors and labourers. Triadic structure is specific to Indo-Europeans and well preserved through antique, to middle age and modern period, even tough in varying intensities. French historian, who researched middle age Christianity, Jacques Le Goff studies the emergence of purgatory as the third level of the after world beside hell and heaven. Doctrine was adopted as an official only in XIII century when Christianity is reviving its Indo-European character (Le Goff, 2009). Hegelian dialectics, with thesis-antithesis-synthesis as its three main elements is another stronghold of triadic logic, even tough packed into dyadic framework of antagonism of opposites.

Further, Polish mathematician Jan Łukasiewicz (1917 in Simons, 2014) formally developed three part logic as extension of the Aristotelian classical two part logic. Łukasiewicz was the forerunner of paraconsistent logic that is devoted to the study of logical systems based on inconsistent theories (i.e., theories which have contradictory theses) but which are not trivial (Schumann, Smarandache, 2007). A triadic statement is true or false, or possible – a particularly important option when studying propositions without only one true statements, since they are either indecidable between many valid claims, or they relate to the future (Baylis, 1936) or resolve problems of infinity such as in the case of studying universal values and absolute claims.

American philosopher Charles Sanders Peirce (1931, 2004) developed a philosophical scheme in which triadic thinking is given outstanding role. He explained three phenomenological categories of reality: firstness, secondness and thirdness. Each of these conforms to one of three basic forms of logical reasoning about the nature of reality: monads (such as Pythagoras, Laozi, Leibniz, Einstein), diads (Aristotle, Descartes, Durkheim) and triads (Heraclitus, Dumézil, Berlin, Le Goff) and accordingly to three independent branches of philosophy (Ford, Ford, 1994), monist, dualist and pluralist.

Firstness is related in this scheme to essence or being which is independent from anything else. This form is not controversial, it can only be source of everything, and it leads nowhere but exists in itself as intrinsic quality. Its inherent logic is monism – a view that there is only one principle, essence, substance or energy in this Universe. Despite its many appearances and diversities, the universe is really just one thing, to which everything is commensurable (Huffman, 2006). All genuine questions must have a true answer, and one only. Examples of category, born in firstness are religious dogma, logical axiom, a reference to universal category of truth or values or a classical concept of a science as unified. Pythagorean ideal of universal harmony resides in the same neighbourhood.

Secondness is a category of actually and specifically existent, which leads to something which is not itself. In Peirce's words, the second is that which is what it is by force of something to which it is second. It meets us in such facts as 'another', 'relation', 'effect', 'dependence', 'independence', 'negation', 'reality', or 'result'. The idea of second must be reckoned as an easy one to comprehend as it is eminently tangible. Secondness implies dualistic logic. A binary distinction is useful in the words of Lefèbvre (in Goodchild, 2008) in identifying 'contrasts, oppositions and antagonisms'. The dyad is the metaphysical correlative of the proposition or hypothesis, as the monad is of the term (Peirce, 1931, 2004) or of the axiomatic postulate. As soon as something is discussed, related, or linked, it becomes a concept or an idea – that which is 'dual' (Macmurray, 1935), divided, the expression of im/balance or causal interaction and necessarily also of exclusion of the other for its difference. A given subject as limited in scale and scope of his observation of world is immersed in secondness immediately when he addresses absolute categories of firstness with his intellectual capacity able to achieve direct insight only into partial or specific working mechanisms of eternal truth – so this intellectual capacity is not accompanied with faculty to generalise insights beyond its limited potentials. This throws rational subject into permanent antagonism against the absolute truth and so as already present among Pythagoreans, against each other. Dualist path of rationality enlightens society about the

highest truths but for high price of tearing every trace of unity of their interrelations which essentially constitute it.

Thirdness finally deals in representations not in things and relations between them. It is a mediated category which intermediates thought, novelty, generality, convention or rule. The third is that which is what it is owing to things between which it mediates and which it brings into relation to each other (Mats, Paavola, 2003), so it acknowledges diversity and emphasises the view of plurality. Pluralists claim that diverse values are incommensurable with each other, as they cannot be ranked according to one common measure or principle (Thorsen, 2004). Pluralism as device for talking about the many is intended to be neutral on substance such as the issue of ultimate truth bearers (Beall, Restall, 1999). This can only be achieved with application of triangular thinking (Goodchild, 2008) in many-valued logics which is not classical (true – false) and can not result in singular result with homogeneous meaning but produces multifaceted result with heterogeneous content.

None of these three forms of logical reasoning has an advantage over the other as such. But it turns out that thirdness is the one which will be privileged in actions that generate meaning from initially incomplete, inconsistent and thus complex concerns (Peirce, 1931, 2004). Pythagoreans in this regard asked for help heretics eating fish to intermediate in their disputes, while modern scientific minds apply an invisible hand hidden in a black box to intermediate between micro and macro perspective of social issues. More decent for their scientific call are efforts of system scientists who elucidate a concept of thirdness in their effort to deal with incompatible systemic sub-units as intermediated trough relations between them. Thirdness is shifted to its new height again with theory of evolution with its selection mechanism that intermediates between biological complexities and uniform order of life. For systematic review of application of triadic paradigms in various fields of science see Judge (2011).

Why stop at three, asks Peirce, so that we don't need to? Why not go on to find a new conception of reality with four or five domains for each axis, and so on indefinitely? The reason is that while it is impossible to form a genuine three without introducing something of a different nature from the unit and the pair, while four, five, and every higher number can be formed by mere complications of threes. A given issue certainly can be analysed into even higher complexities but these cannot rise to the height of philosophical categories so fundamental as those that have been considered between 1, 2 and 3 (Peirce, 1931, 2004). Thus, there is no essential need to extend triadic logic further. Ancient Chinese philosopher and poet Laozi, as a member of a Chinese monistic philosophical tradition Taoism, has it this way in the *Tao Te Ching*, a classical Taoist teaching from VI century BCE: 'Tao gives birth to one. One gives birth to two. Two gives

birth to three. Three gives birth to all things and all beings.'[12] Analogously in mathematics, the next major step from three part logic is not four part but *n*-part fuzzy logic (Zadeh, 1965) capable of producing clear answers on fuzzy questions with large or even indeterminable number of intermediate options between true and false.

So we will stop at three and take an opportunity to rest for a bit and look back to see from where we arrived. Simplicity is linked to the principle of firstness, system theory and chaos to the principle of secondness, even though with visible triadic content, but not really expressive because they are applied only one-dimensionally. Evolution and complexity are conceptualised in the frame of thirdness, even though involving also content of firstness and secondness.

For the purpose of working summary it will be helpful to provide comparison of schematizations of triadic concept in all previously discussed theories – simple, complicated, systemic, chaotic and complex (Picture 2). Complex situation is introductory presented with three parallel lines (pillars, A, B, C) where each line vertically represents one integral domain with independent meaning to a given social issue, for instance economic, social and environmental domain of sustainable development (Picture 2.1). This is simple presentation which is effective in emphasising differentiated primary evaluation domains, but it can not go beyond principal concerns since it is not presenting intersections between pillars, which are more relevant in every-day life, because they feed conflicts and synergies. These intersecting points (a, b, c) are incorporated in illustration 2.2 with a set of triangulated or intersecting lines, which are connective for pairs of domains (A, B, C); this kind of presentation falls in the category of complicated ones – just imagine situation with eleven intersecting domains or priority axes, like in Slovenian development strategy by 2020.[13] Next even more advanced possibility is to present complex structure in a systemic way with a triangle (Picture 2.3), which integrates two previous approaches. Triangle presents two components: independent primary domains of evaluation in three angles (A, B, C) as well as secondary relationships between pairs of them presented with three sides of the triangle (a, b, c), which are connecting for the whole system. In this illustration, relative to previous one, what is connective for the system are not occasional intersections due to accidental situations denoted by intersection points, but systematic connections, denoted by sides.

Even more integrative presentation is offered by the Sierpiński triangle (Picture 2.4). This puts forward a chaotic view, with a fractal triangles embedded within a triangle. It successfully shows

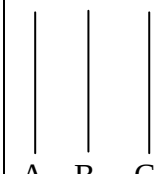
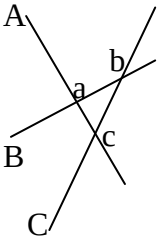
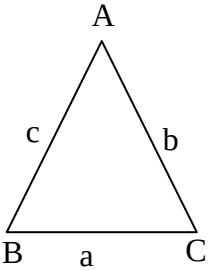
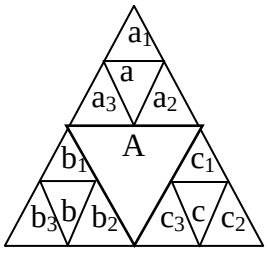
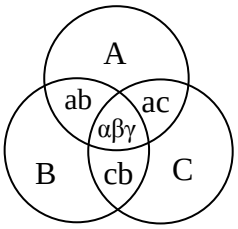
[12] http://www.with.org/tao_te_ching_en.pdf, Apr 2014.

[13] Operativni program za izvajanje Evropske kohezijske politike v obdobju 2014 -2020. CCI 2014SI16MAOP001. MGRT, Ljubljana.

how system can be divided on sub-systems or modules on higher and lower levels, which is relevant to show that the triadic logic is hierarchic, but in scale invariant and uncreative way. The last in a row is complex presentation with Venn diagram (Picture 2.4) consisting horizontally of three partly overlapping and partly non overlapping circles, to account for primary (A, B, C) and secondary aspects indiscriminately. Venn diagram is obtained from Leontief's matrix with correlation of its components. Complex presentation is superior to presentation with Sierpiński triangle because it also focuses attention on the intermediate area of overlap, not bare relations, even less accidental intersections between domains. Intermediate level produces synthesis between horizontal domains. Synthesis is two-step procedure: first as an overlap or correlation between two domain circles (ab, ac, bc) and then an overlap between three circles (αβγ).

Every step in Picture 2 when observed from left to right shows horizontal intermediation in deeper meaning – from complete absence in first, to punctual intersection in the second to linear or relational representation in third. Fourth one presents ability of intermediary process to extend into itself (A, a, a_1…), in this way again repeating triangular logic from the second case. The last one adds a set of heterogeneous or hybrid intermediate categories to description, correlations 'ab' or 'αβγ', which allude to broad areas of horizontal cooperation between otherwise incompatible system domains. We shall return to these overlapping categories soon and elaborate them further. Before that we also want to get acquainted with a vertical aspect of triadic structure of complexity.

Picture 2: Different types of triadic structures and their methodological treatment

				
2.1 Simple (Method: P)	2.2 Complicated (Method: P + T)	2.3 Systemic (Method: P + T)	2.4 Chaotic (Method: P+T+P+T…)	2.5 Complex (Method: P+T+C)

Legend of symbols: P = Pillarisation; T = Triangulation; C = Correlation

Vertical complexity is presented in Venn diagram with three levels denoted by A, ab and αβγ. Vertical complexity has been previously applied in triadic manner by several prominent authors in micro-meso-macro ordering. Ravetz (2006) claims that a complex issue is three-level structure because it is arranged hierarchically in relations above-, below- and co-. At level zero (co-), observer makes evidence of details on level below with the aim to recognise their common

characteristics and to form integral conclusions on the level above. Three level procedure has been formalised by O'Neill et al. (1989 in Easterling, Kok, 2002) in their hierarchy theory of levels which aims to explain causal relationships between analytical levels. Hierarchy theory roughly posits that a system needs to be described at a minimum of three separate levels. To comprehend multilevel systems it is necessary to understand processes between levels, how levels relate to each other. The level of interest at which observer is situated (level 0) is a component of a higher level (level +1) with slower dynamics acting over larger distances, forming constraining boundary conditions. Level 0 is divided into constituent components at the next lower level (level -1). Processes operating at this level are generally faster moving and lesser in spatial extent, providing the mechanisms that regulate level 0 behavior (see Easterling and Kok 2003).

Geels and Kemp (2000 in Geels, 2002) developed their multi-level perspective (Geels, 2007) for studying technological transitions, building on O'Neill. Their model argues that transitions come about through the alignment of processes at different levels. It distinguishes three analytical levels. The niche-level accounts for the emergence of innovations, the sociotechnical regime level accounts for the stability of existing systems, and the sociotechnical landscape level that accounts for exogenous macro-developments. Three levels provide different degrees of structuration to activities in local practices. In niches, structuration is relatively weak, because networks are precarious and cognitive rules are diffuse and unstable. Actors need to put in a lot of ‘work’ to uphold the niche. In sociotechnical regimes, structuration is stronger. It is possible to deviate from regime-rules, but this is difficult, and takes a lot of effort. Sociotechnical landscapes are hard to deviate from, providing even stronger structuration (Geels, Kemp, 2000, in Geels, 2002).

Veblen was among the first social scientists, who understood society as a triadic hierarchical structure. Veblen’s analytical approach can be in present terminology viewed as a micro-meso-macro framework in which micro relates to individual habits of action and thought, meso to institutions and 'institutional logics', and macro to the 'cultural complex' of society (Brette, Mehier, 2005). Institutions are mesoscopic factor that is essential in the structuring of social relationships; they are instrumental in indirect intermediation between individuals and collective through institutionalised habits. Institutions can be informal, but their joint function is to extract the main rules, conserve traditions and accumulate experiences for future generations. Gradually institutions become too rigid and selection process intensifies and brings about selective adaptation of institutions (Hodgson, 2005).

Schumpeter came to analogous conclusion about crucial importance of middle as intermediate level of structuration, only that he took entirely opposite approach from Veblen. For him evolutionary dynamics is not involved in institutional habituation but just the opposite, it is a result of innovation that leads to creative destruction of habituated institutional settings. Schumpeter's entrepreneur constantly carries out novelty on micro level, luring swarms of followers on the meso level, which may be or not retained at macro level as a systemic novelty. So the proper analytical structure of evolutionary economics is in terms of micro–meso–macro (Dopfer 2006). Following this tradition, neo-Schumpeterians, Kurt Dopfer from Switzerland and Australians John Foster and Jason Potts (2004) have developed an analytical framework for evolutionary economics based on a three-level architecture. Micro refers to the individual and the systems they organize, and macro consists of the population structure of systems of meso. Micro structure is between the elements of the meso, and macro structure is between meso elements (Dopfer, Foster, Potts 2004). They are placing the meso-domain at the central stage of micro-mezo-macro framework (Tae-Hee, 2008; Dopfer 2006) because in an open-system changes occur at the meso level as a result of processes, which are radically evolutionary and emergent, meaning that a novelty arose ‘out of nothing’ (Weinberg, 1975 in Easterling, Kok, 2002), in particularly not out of any prefabricated frame or plan. Systematic review of social research based on meso level reasoning is available in Dopfer (2011) and Elsner (2009).

Already Heraclitus of Ephesus (V. century BCE) specifically placed human on the intermediate level between gods and apes, because human has some characteristics of both (Lorenz, 2005).[14] Later Christian theology invented purgatory as an intermediate level which bridges the gap between interests of individuals which are mortal and concerns of human race which lasts for millenniums (Le Goff, 2009). Buddhist philosophy applies logic of un-excluded middle path, which leads to direct insight into reality because it transcends contradictory claims about existence. In Plato’s ideal state, a polis is a mesocosm which operates as the intermediate level between macrocosm of the universe of nature and microcosm of individual. Mesocosm is the field of social life and human organisation where members develop all four aspects of culture: science, art, religion and politics. Human being prepares itself at meso level to establish a contact between culture and the universal as a precondition for the possibility of insight into the higher truths of natural order and into distinction between good and bad (Sow, 1980).

Systems are conceptualised as relational and modular structures in mesoscopic fashion. Evolutionary selection too is essentially mesoscopic process. In the postmodern societies Giddens (1989) locates a field of a radical middle. Radical middle is not part of traditional

[14] Wikipedia, #Mezocosm, jan. 2014.

political centrism formed for softening binary oppositions in society with unprincipled compromises. The new middle is radical because it involves unbridgeable oppositions and it is middle because it is non-exclusionary for its oppositions – a paradoxical concept if its holistic capacity is observed in a linear frame.

Meso level reasoning introduces what Malthus (in Cremaschi, Dascal, 1996) described as the 'doctrine of the middle', which enables mesoscopic description (Dopfer et al., 2004), '*une déscription médiane*' (Prigogine in Wallerstein, 1998). The new middle is rooted in its opposite horizons so that exhibits bi-modality, which gives it a hybrid perspective of the system. As situated in 'the un-excluded middle' (Wallerstein, 2004) of social oppositions meso level enables mid-level articulation of multiple rationales – and so facilitating irrational comparisons. Hybrid category shares its characteristics with its constituting poles (vertical and horizontal), such as concepts of weak incommensurability and weak commensurability. Hybrid categories are applied in the intermediate mode of reasoning (Le Goff, 2009) which has no dogmas and doctrines. It is first of all only a method, only a corridor in hotel lobby which leads to many different rooms or theories, which branch away from it each into its own narrow niche (James, 2002). Mesoscopic reasoning is inherently intelligent since intelligence is mesoscopic phenomenon. *Inter legere* (lat.) means ability to read in between of a given complex content (Krishnamurti, Bohm, 1986), ability to overcome obstacles by taking thought, hence the ability to deal with cognitive complexity (Gottfredson, 1998) where partly contradicting and partly converging factual claims are weighted. Meso is located precisely where social life is lived and where it shall primarily be comprehended. Society as transforming and plural structure is a mesoscopic process and so Easterling and Kok (2002) claim that meso is the perspective from where the modelling of social complexity is the most tractable a priori.

With application of hybrid categories in intermediate way of reasoning and in this way applying mesoscopic logic, there is no further rationale to theorise social relations in form of diads and so exclusively in antagonistic discourse – such as with Marxism or with critical theory, neither to model them exclusively with weak metaphors, loose terms and mystical theories of change and qualitative emergence, such as in the mainstream neoliberal economics or in postmodern sociology. Mesoscopic logic refers only to intermediate processes but it nevertheless persists as a radical category – with its distinctively cohesive logic and apparatus – which refuses relativism of postmodern sociology, without simultaneously invoking need for submission to uniformity. Intermediation is about organisation of unity and diversity in mesoscopic relations which are mutually reinforcing for both of them.

This brings us finally to the point where operational framing of social complexity as a mesoscopic concept can be outlined. A given social issue is a double complex issue when its interpretation consists of vertically and horizontally explanatory axes which are internally plural and so composed of (at least) three incommensurable meaning domains with clashing rationales; all domains are integral for understanding of social issue but alone insufficient until they are also evaluated 'irrationally' – against what they are not – which is only feasible in the perspective of bi-modally hybrid categories of evaluation which emerge for observer contextually in marginal overlaps between domains at meso level; meso level is located precisely where horizontal and vertical axes intersect – in such a way conferring mesoscopically complex frame of partly overlapping and partly non-overlapping meanings of a given social issue an objectifying function which produces results with holistic potential that can be generalised. New knowledge or evaluation can be achieved only pragmatically, only for a given broad purpose and as preliminary until some new understanding is obtained on how to implement more fully all aspects of social complexity in evaluation of social issues.

Three examples have been selected and studied to test just given operational framing and elaborate its practical aspects but also to reflect some additional theoretical implications of mesoscopic apparatus of social research. The first two examples are chosen from the field of evaluation of policy impacts. Similar to coordination and change management, evaluation seems one of the most genuine fields for studying social complexity. Evaluation is together with science intrinsic approach to studying social processes. What is preceded to scientific research and what follows it is inherently linked to valuation (Hollis, 2002). Scientific practice is concerned with search for causes and laws, while evaluation is concerned with the search of meaning (Winch, 1958 in Hollis, 2002). The art of evaluation in particular lies in ensuring that the measurable and commensurable does not drive out the immeasurable (Matarasao, 1996) and incommensurable. Science and evaluation or more generally, rational and irrational valuations shall somehow find a common ground to be able to comprehend complex social processes neutrally – for the general good and not serving any particular ideology, value system or a paradigm.

Collective action raises questions not only on truth but also on right and wrong, on justice and injustice, hope and hopelessness (Tilly, 1978). Truth, right and good needs to be rigorously distinguished in reasoning about social matters. What is recognized as truth is not necessarily also right and good. For instance, when an existential minimum of income (aspect of truth) is set by social policy below the agreed limit of poverty (normative aspect), as it is presently in Slovenia, this contributes to the reproduction of material conditions of miserable life in a community as a whole (aspect of good). In the hands of policy-makers, truth and justice are

sometimes opposed to what a society recognizes as necessary for the preservation of common good. In the evaluation of social matters the social truths and social rules provide only a frame of judgment. The frame itself does not confer any meaning to social matters until it is evaluated from all incommensurable aspects of common good. This, of course, raises a set of methodological troubles in the conventionally simplistic evaluation approaches, linked to our inability of direct comparisons, trade-off and synthesise of all these incompatible evaluation domains into policy relevant findings and socially integrative interventions.

So the first case study examines an aggregation problem in evaluation of policy impacts (Scriven, 1994). Impact evaluators of large-scale and multi-domain policy interventions have had mounting difficulties in aggregating detailed assessment results into a summative conclusion when impacts are not commensurable. However, it turns out that they usually think in terms of simplicity, not complexity. They fail to observe that majority of policy impacts are hybrid in nature – for instance when assessing economic policy's impacts on social indicators of valuation – so they are only weakly incommensurable and can be aggregated at least partially. Mesoscopic synthesis is obtained in two step aggregation procedure from correlation of three partial aggregates of policy impacts on evaluation domains. Synthesis on meso level does not emerge into a singular result but into a set of integral messages with heterogeneous content.

After finding mesoscopic solution for conventional aggregation problem in vertical direction, the same problem is next studied in horizontal direction, simply by broadening number of evaluation domains from three to four. It turns out that with this extension we can expand Dopfer et al.'s (2004) classification of meso sublevels 1, 2, 3 adding sublevels 2a and 2b. The main achievement is not substantial, it can not essentially change previous conclusions from the three-part evaluation model, only that synthesis results are composed as even more heterogeneous. This case study's conclusions suggest that social matters need to be studied in a meso-meso-meso framework. In meso setting, micro and macro are both configured as purely conceptual levels: microscopic elements are never isolated except in a idealistic concept and macroscopic level can not be touched directly from microscopic level just like one can not impact the macrocosm in Plato or gods in Heraclitus.

Three main findings are drawn from the case study. First, precondition for neutral evaluation is not only to accomplish an objective analysis of data but also a consistent organisation and synthesis of analytical findings. Second, in the context of complex indeterminacy it is useless to evaluate only vertical achievement of goals (Simon, 1979). Instead, mesoscopic evaluation is focused on assessment of synergies. And third, meso logic is extensive into itself. Case study is

accomplished on sustainable impact evaluation of development programme for Slovenian north-eastern region Pomurje (Radej, 2014).

As discussed at opening pages, social disintegration is indicative evidence for arguing that modern societies have become complex. It is not that importance of social integration is ignored in standard social sciences. In classical theories integration is among focal concerns: it can be achieved either spontaneously from below or it is imposed from above. However, pursuing these simplistic strategies in present conditions is among the main drivers of further social disintegration. This is the main concern for the second study case.

Process of social integration is classically rationalised in a dichotomy between its mechanic and organic counterparts (Durkheim, 1897). The former concerns preservation of structural order with the means of balancing principal system oppositions to achieve negative integration between primary or vertical concerns. The latter is concerned with correlated secondary interactions among members (positive integration on horizontal plain) which produce cohesion. Giddens (1989) clarifies a mechanism of integration with the double hermeneutic principle. People produce structural order through their habituated interactions; when established, structural order refines a framework inside which people are supposed to interact. Newly established order is either accepted and reaffirmed or challenged from below with a demand to institutionalise practices differently. This integrative mechanism is circular. Circular explanations are ordinary in social sciences. It is not wrong to apply circular explanation to the issues which are circular in their nature. However, traditional approach fails to explain how one can interfere with integrative processes in society neither compromising its contradictory mechanisms nor mystifying them when locking them into the black box of double hermeneutics.

To address this question, one needs to go beyond classical binary theory of social integration (mechanic/organic) and first translate it into triadic notion. For this purpose a new hybrid category of weak balance is proposed. Social integration is described with three measures now: the first is a strong balance as a measure of mechanic integration between concerns of primary importance which are set vertically; the second is weak cohesion as the measure of organic integration on horizontal axis; weak balance as the third is derived from correlation of secondary content shared by incommensurable social sub-systems or evaluation domains. In evaluation of socially incommensurable matters, correlation cannot produce scalar result as it does conventionally, but decays into two components – covariance which describes weak cohesion and standard deviation which in our setting describes weak balance – measuring not the strength of relationships but its mutuality – with the aim of assessing if social ties are weaved in an emancipatory way. In a contemporary society where relative comparisons are decisive,

interactions are valued higher when they share social content with the means of mutual understanding, recognition of legitimate oppositions, fairly sharing the benefits of economic transactions as well as of global environmental and local social responsibility.

As a specific aspect of balance, the concept of weak balance is closely linked to mechanic integration. Simultaneously, weak balance is also related to organic integration since it arises through correlation. Concept of weak balance is therefore double embedded in mechanic as well as in organic aspect of social integration, which thus ceases to be treated as binary divided but arose in plural setting with the third, intermediating category in its centre. As a result, double hermeneutic (Giddens, 1989) is not needed any more as a central interpretation frame for social complexity.

Mesoscopic strategy of social integration implies a combined approach. The most mechanically integrative are structural (vertical) interventions that optimize the conditions for higher reciprocity of relations in organic horizontal exchanges. Historical examples are the abolition of slavery, introduction of universal voting rights, or imposition of ecological standards for businesses – they all revolutionised social structure simply by abolishing exclusion of one social group or values and so increasing opportunities for social interaction and spontaneous creativity for all. And the opposite, the most horizontally integrative are those organic interactions between individuals or in local communities that are internalising into their narrow concerns legitimate aspirations of others beyond mere respecting their legally guaranteed rights. For instance when individual acts as a cosmopolitan she overcomes bias and ignorance by taking broad and self-reflected view (Calhoun, in Haferkamp, 1992). The issue is illustrated by the example of evaluation of national energy programme's impact on territorial cohesion of Slovenia (Radej, Golobič, 2013).

The first two study cases are dealing with systemic concerns on how to aggregate micro to macro data into 'social welfare function' in the presence of social incommensurability and further how to interpret its results from the aspect of their contribution to social integration. Neither evaluative study case is strictly ideal example for mesoscopic elaboration of social complexity. Following its operational framing, meso level reasoning is intrinsic for evaluation of complex social processes. In the Cynefin framework systemic and complex are clearly distinguished. Systemic processes are linked to structure of organisations, like state, not to organic operation in unstructured forms like in society. Social process shall be approached as anti-systemic category (Wallerstein, 2006) and so analysed separately from systemic imperatives for synthesis and integration. As social complexity is anti-systemic category so its interpretative logic needs to be primarily conceptualised from the anti-systemic perspective too.

Ordered social systems, such as states, produce their structures with the means of exclusion for increasing part of structurally unfitting members of society and their 'irrational' concerns. In response to systemic exclusion those excluded tend to establish themselves as an anti-systemic form of sociality and so as a sociality in its essence. This is the main subject for the third study case (Radej, 2013). Meso as un-exclusionary logic does not emerge from purposeful efforts driven by ideological visions of politicians neither by rational achievements of scientists. Instead it originates from practices of social exclusion of the irrational element. Such an inversion is needed as a principal matter of consistency if one aims at presenting meso concept of complexity in a Hippasian heretic and irrational manner instead of in Pythagorean bigoted harmonies – chauvinism might have reincarnated behind our backs when ability to synthesise and integrate in a complex frame is regained with the achievements of the first two case studies. The irrational thesis claims that social complexity can not be appropriately comprehended without being rooted in incommensurable results of social exclusion, as civilised substitute for throwing opponents across the board of a boat to feed the fish.

Recent wave of mass popular dissent, such as Occupy movement in 2011 and 2012, claiming to represent the 99% majority of the excluded population, reminds that it is necessary to understand social dynamics from the perspective of social exclusion. One of the leading theorists on anarchism in Germany at the end of the 19th century, Gustav Landauer (1900) is remembered for demanding construction of an alternative community with 'the inclusion of the excluded as excluded' (Agamben in Blair et. al, 2002). Antisystem movements, like antiglobalist, antinuclear or antielitistic, are the driver of this process. They suffer from an organisational problem, since they refuse vertical structuration as their excludedness is exactly the result of over structured society. So they fail to perform together against the System and this hampers their effectiveness in achieving outstanding political innovations, while its horizontalism in the same time also invokes 'the tyranny of structurelessness' (Freeman, 1972).

In the third case study we first hypothesise that organisational problem of antisystem movements is a complex challenge. Movements can resolve their organisational problem by abandoning programmatic similarity as a common denominator of their organising. It has been observed that movements are usually more radical in their programs than in their operation, or vice versa, such as classical trade unions or Occupy movement respectively. Their program-action footprints are inconsistent unless they link with movements with symmetrical opposite footprints and so form heterogeneous coalition. Hybridisation strategy of structuration is needed between movements with symmetrically dissimilar footprint to maintain their internal consistency in a heterogeneous way so that their structuration does not imperil their categorical dissimilarity.

Three main types of antisystemic movements are usually distinguished, reflecting different modalities of social exclusion: reformist, revolutionary and autonomist movements. When they overlap into hybrid forms to achieve more structured level of operation, three coalitions are obtained: quasi-, semi- and orto-antisystemic. They complement each other in mobilisation of followers, production of autonomous alternatives, and in capacity to defend boundaries of their autonomy. Initially postulated organisational problem of antisystem movements is being resolved with formation of antisystem structure (such as world forums, Anonymous, autonomous zones…) which emerges in overlap between three antisystem coalitions.

Now the initial antisystem conflict between society ('the good') and the system ('the bad', 'the beast') can be decomposed into two independent conflicts: a conflict between competing system vs. antisystem structures (bad vs. bad) and between competing interest social groups (good vs. good), such as classes. Multiplication of previously binary relation between the society and the system changes the exclusion mechanisms and emerges a new sociality which is self-constructed and sustainable. Here exclusion is not concerned any more with dark side of society, but establishes itself as a starting point for reasoning about radical social innovations. The achievement is essential for possibility that diverse aspects of social complexity in foreseeable future gradually converge into complex society.

Regained ability to recompose deep system conflicts between the ruler and the ruled from binary to triadic composition involves possibilities to construct complex society that is based on autonomy of its creative members. Isolation of antagonistic social struggles into structural battles leaves society deantagonised which is also why intervention with meso logic can be observed as radical. This of course does not mean that society will eventually become less conflictual, probably just the opposite. Deantagonised milieu in a meso society opens doors wide open for expression of multi-polar class conflict. Class conflict is now situated on meso level as an irresolvable disagreement between multi-polar interest groups concerning the definition and appropriate implementation of their irreconcilable visions of social good.

When society sets itself free from any particular type of structure (systemic or antisystemic), it releases a large part of constructive potentials for articulation of disagreements as well as their effective exploitation for the enhancement of the public goods. This presently hidden, dark energy of contemporary societies can be creatively employed because it invokes social synergy and releases huge potential for social innovation. More importantly, it also establishes capacities for self-ordering of members and sub-system entities in decreasingly structured ways. In this way complex society decreasingly relies on the ruler as a guarantee for its collective strength and wealth. And this is also one of our main - even though not really highlighted - motivations

behind the proposed methodological journey from a concept of social complexity to a sketchy notion of complex society.

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