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Abstracts

Rationalities, Social Science and the State: A Still Troubled Symbiosis, Stuart Holland and Juozas Kasputis

The notion of state has permeated scientific concepts in both explicit and implicit ways. This paper recognises but also qualifies the case of Immanuel Wallerstein that the State is 'conceptual container' on the grounds that while the State has a profound influence, with Foucauldian surveillance, on what not only is researched but also is taught, alternative thinking is not entirely constrained by this.

This paper has shown just a small part of the picture where "the quality of disinterestedness has never been universally achieved in practice" (Derek Bok, 1982, p. 151). There is no unique recipe how to overcome "the maturity problem" of the social sciences and "existential crisis" of social scientists. Sadly, the ignorance of these issues still has been prevalent in the science. Many social scientists have chosen the attitude which can be expressed by the statement "I prefer to do science and not to reflect on it". But the research of social processes needs to be a self-reflective activity. Self-reflexivity and critical self-assessment should be internalized by every social scientist at least to maintain a connection with studied social reality. Otherwise the Social Science will persist in scrutinizing fixed patterns and 'routinized experiences' in unbreakable vicious circle.

Rationality and the Rise and Fall of Homo Hierarchicus, Juozas Kasputis

The paper contributes to the discussion regarding the hierarchy within contemporary organisation. It criticises so-called 'natural' and 'rational' necessities justifying a hierarchy. Its formal procedures are expected to provide a rigorous transmission of information and between different levels of management. A key issue identified by the paper is the formalisation of language in claiming value-free knowledge and 'detached' observation as the basis for the neutral rationality and aspired efficiency. This presumption of rationality is deeply imbued with quantification and mathematisation of social sciences thus becoming not only a management but also a philosophical and scientific issue. Social mathematics, physics, or biology is the universe of Homo Hierarchicus. But this should be seriously reconsidered as abetting rather than aiding understanding of social complexity.

The Social Sciences in a Chaordic Age: A Search for New Meaning and Relevance, Jody Jensen

The period we live in has been characterized as the end of history, empire, the nation state, neo-liberalism, the end of Europe, and the end of the world system. The contemporary period has also been described in terms of "civilizational crisis." In another framework we are living in a Chaordic Age where the science of complexity – the behavior of self-governing organisms (organizations or systems) – harmoniously or disharmoniously blend the characteristics of order + chaos, and is neither hierarchical nor anarchic. It can be characterized positively and negatively, but it is an unstable, uncertain, and transitional age with no clear sets of rules.

A particular scientific world view has become dominant, influential and successful in modern sciences today. Science and technology have transformed the way we view ourselves, our societies and our place in the cosmos. However, just as science and technology seem to be at the peak of their power, unexpected problems are disrupting the sciences from within.

This reflects a deeper and more serious problem regarding scientific inquiry. Science is being held back by old assumptions that have become dogmas, the biggest of which is that science already knows all the answers, and only the details need to be worked out. A transformational paradigm shift is required from a mechanistic world view to an organic world view to better address the challenges of the new millennium.

The question to social scientists in this chaotic age of discontinuities, is how do we renew our increasingly marginalized disciplines, with inter- and trans-disciplinary research that redefines our key terms and provides alternatives to the challenges we face. How do we reinvent the social sciences today in order to become more relevant to the societies we serve?

About the Authors

Stuart Holland studied and taught history and political theory at Oxford, then became an adviser to British Prime Minister Harold Wilson on European affairs. In 1967, he gained the consent of Charles De Gaulle for a second British application to join the European Community on the basis of a confederal Europe, mutual currency support and a European Technology Community. Resigning from no. 10 when Wilson did not follow this through, he finished an economics doctorate at Oxford and taught at Sussex University. From 1979 to 1989 he was a Labour Member of Parliament and then worked with Jacques Delors on EU policies for economic and social cohesion, including the recommendation of Eurobonds as a solution to the Eurozone crisis on the model of the Roosevelt New Deal. He has published papers and books on economic theory, social and political theory, public enterprise, planning, regional policy, economic integration, international development and global economic governance.

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Rationalities, Social Science and the State: A Still Troubled Symbiosis

Stuart Holland and Juozas Kasputis

Words have become unfaithful things to me,
or else am I an overflowing sea,
goalless and hesitant, without a shore.
Vain words, articulated once before,
I carry like dikes, or signposts made of wood,
torn hedges carried by a straying flood.

Babits Mihály (1883–1941), Jonah's prayer
Translated by Jess Perlman

Introduction

The growth of knowledge has always included opposing worldviews and clashes of distinct interests. This includes different rationalities which either have served or disserved the State. A Copernican world defied the Catholic Church. Cartesian philosophy and Newtonian physics incited a major split between an allegedly knowing subject and external realities. As an outcome, many dualisms emerged: subjectivity/objectivity, particular/universal, etc. Hegelian dialectics elaborated such approach to its most extreme. The pretension of social science to be value-free assumed a neutral observer collating external facts. Yet both Hume and Adam Smith challenged Descartes *cogito* as banal, stressing that it is not because we think that we are but rather than how we think is who we have become through the values, dispositions and beliefs that we have consciously or less than consciously acquired from life experience, and that no perception is neutral. Hume anticipated Bourdieu both on *habitus* and also on reflexivity in his concept of “the reflexive mind” yet this then was lost by the presumption, such as by Bertrand Russell, that Hume was a “mere empiricist”. Logical positivism then claimed that an appeal to ‘facts’ could dismiss metaphysics, invoking the logical atomism of Russell and the early Wittgenstein. But which Wittgenstein transcended not in the sense of transcendental metaphysics, though he was deeply influenced by Schopenhauer, but – after a road to Damascus encounter with Sraffa – coming to realise that meanings depend on context and that their context needs to be understood.

Which we suggest in this paper is that these issues are highly relevant to the troubled relationship between rationality – or rationalities – and the State. For the ambition of Social Science to represent social reality is unfulfilled, the aim of State to eliminate grievances and inequality within society remains unachieved. Both Social Science and the State are flawed in their unsuccessful liaison. The paper addresses this in terms of the claim of Nietzsche that “God is dead” which, after Darwin, appeared to be the case at least for natural scientists following him such as Huxley. Yet which is less clearly so with the resurgence of Islamic fundamentalism in response to assault on Islamic values by a West which also has presumed that the superiority of its “rationality” has entitled it to impose

regime change on States and governments whether they are Islamic, or secular. And where the “rationality” has been assumed to be the superiority of a western model of democracy even if, as Rousseau (1762) commented on the England of his own time, that English think themselves free but in what sense are they, that in every seven years (the parliamentary mandate in his time), they can vote for the better of two bad alternatives and in between elections remain as unfree as before.

While western “democracy” recently has confirmed this in the case of the region of the world in which it started and which it claimed would be its response to two world wars and in the statement of Robert Schumann that a future war between France and Germany not only would be morally unthinkable but materially impossible. When its draft Constitution initially was rejected by the only electorates to whom it was put, France, the Netherlands and Ireland, it was not ‘rethought’ but recycled as a Lisbon Treaty endorsed only by governments rather than peoples. When the electorate in Greece chose a Syriza government opposed to austerity in January 2014 German finance minister Wolfgang Schäuble declared that “the election alters nothing”, which he then repeated after the overwhelming rejection of austerity in the referendum the following July, in both cases claiming that governments had to obey the rules on reductions of debt and deficits and “structural reforms” reducing the social protection of labour, even though these had no scientific foundation as recently recognised by the IMF. While economic, which once prided itself on being “the queen of the social sciences” has been fundamentally flawed by false premises concerning rationality, as in the theories of “rational expectations” and “efficient markets” that paved the path to the subprime crisis and then the worst financial crisis in the West since 1929.

This paper seeks to inform such issues by questioning whether there is or can be a “social science” rather than studies of the external world that inevitably are influenced not only by subjectivity but also by prevailing ideologies that may bear scant relation to realities. Also in submitting that the quest for a single scientific “rationality” is vain in that there are a range of conscious or less than conscious rationalities. In doing so it adopts an “archaeology of knowledge” approach on the lines of Foucault and both his case, and that of others such as the lesser known Chilean psychologist and psychoanalyst Ignacio Matte Blanco that there are different logics influencing behaviour at both conscious and less than conscious levels which either may inform - or deform - decision-making. Such as also the power of metaphor as in the case of Adam Smith’s persistently misrepresented “invisible hand” which has been used by Milton Friedman and others to suggest that markets are consistently more rational than governments, and that this justifies the case to “roll back the frontiers of the State” which in practice has reversed the commitment of Roosevelt in the 1930s New Deal and post-war governments in Europe to public policies which should ensure that States govern markets rather than markets govern States.

Not a "Natural" Science

Social phenomena differ from natural ones. Social interactions do not readily suit the same generalizations as physical ones. But natural sciences are supposed to be closer to the goal of high promising objectivity. The social scientist is a human being first of all and only then a scientist as such. The persistent questioning of methodological fundamentals indicates not only some incompleteness of social sciences as an unfinished project but whether it ever can be so. The production of signs and symbols (mathematical as well as linguistic) is an open process and may be an inexhaustible source of creativity and freedom, but also of manipulation and ideological domination. There is no coincidence that objective and value-free science has been promoted as the best way to counteract subjective biases and unscientific external influences. Social sciences have occupied a unique position, somewhere in between of natural sciences and humanities. Yet this 'betweenness' may either be felicitous, or a curse, either enlightening or confounding understanding.

The image of "pure" science has been highly seductive. Especially, such view fits a framework of presumably value-free science thriving on 'un-biased' knowledge. But this kind of scientific establishment is itself susceptible to bias because of selective historical approach. Moreover, it can directly lead to overwhelming instrumentality avoiding truly nontechnical questions. From the ancient times people were prone to certainties and definite forms of guidance in this contingent world. Discovered regularities and continuous references to the past experience ensured the growth of knowledge and provided with certain directions in decision making. Eventually, this kind of thought contributed to the evolution of mechanical and deterministic framework. The major proponents of 'value-free' science have tended to dismiss "metaphysics". Huge effort was devoted to distinguishing scientific thought from philosophy or religion. Yet science originally has evolved from religion and philosophy what does not necessary presume cutting off overall connections. These relations are not indispensably smooth but definitely creative in terms of challenging tension. The reliance on the concept of rationality can entail the source of distortion as well. More than that, the whole narrative of irreconcilable opposition between science and religion posing the question of survival distracts from broader scope and brings about certain negative consequences. One of them is the problem of neutral observer. David Christian has indicated it by returning to primary genesis – the mythology and the myth of creation as a unified knowledge in modern terms.

A modern creation myth will not and cannot hope to be "neutral". Modern knowledge offers no omniscient "knower", no neutral observation point from which all objects, from quarks to humans to galaxies, have equal significance. We cannot be everywhere at once. So the very idea of knowledge from no particular point of view is senseless...It is thus the questions we ask that dictate the general shape of all creation myths. And because we are humans, humans are guaranteed to occupy more space in a creation of myth than they do in the universe as a whole.

Christian 2004: 6

This has been paralleled in economics. Such as the presumption of mainstream economic theory of “perfect competition” which has been the basis of the theories of “rational expectations” and “efficient markets” which paved the path to the subprime crisis and then the worst financial crisis of the western world since 1929. For such theory alleges that entrepreneurs or other rational agents not only have perfect information on what they are doing or others are doing in their own market area, but such information on what all other entrepreneurs or agents are doing in all markets, everywhere. Or, in other words, omniscience, which in realms such as some religions is assumed to be an attribute not of humans, but of Gods.

Paul Romer, recently appointed chief economist to the World Bank, has described perfect competition as ‘the scholarly equivalent of creation myths, or simple stories that economists tell themselves and each other to give meaning and structure to their current research efforts’ (Romer, 1994, p. 3). Paul Krugman (2009) has observed that mainstream economics creates blind spots by ignoring what it cannot formalise, that economic models are metaphors, not truth, and that much of its failure to reflect what is happening in the world stems not from lack of sophisticated answers, but from asking the wrong questions, which is precisely the point stressed by Wittgenstein (1953). Krugman also has recognised that these are games that aspirant economists need to play if they are to be accepted by the mainstream, also thereby echoing Wittgenstein (1953) on language games, and the degree to which we may tacitly or otherwise become trapped by them. Like Romer, Krugman (2009) also has admitted that these have about as much relation to the real world as do biblical creation myths.

But such myths and metaphors not only are language games by those who consent to play them. They can become unquestioned in institutions with global reach and power such as the IMF, the World Bank and the World Trade Organization with potentially fatal outcomes. For example, the conceptual device of *ceteris paribus* or ‘everything else being equal’ was central to the deflate-devalue-deregulate catechism for ‘structural adjustment’ that both the World Bank and the IMF demanded of developing economies from the early 1980s through ‘cross conditionality’. But the Bank and the Fund imposed this on so many low and middle income countries as to force them into beggar-my-neighbour devaluation for what largely were the same commodity exports and beggar-my-neighbour deflation with across the board cuts in investment, employment, income and consumption.

The Self and the Other

It is well recognised that David Hume was a founder of experimental method in philosophy and that he questioned claims to certainty in knowledge. Also, that he deeply influenced his younger fellow Scot Adam Smith and that both were influenced by the moral philosopher Francis Hutcheson. A wealth of literature attests to this while Smith (1759) himself refers extensively and approvingly to Hutcheson in his *Theory of Moral Sentiments*. Yet there also is a common perception, echoed by Bertrand Russell, that Hume was a mere empiricist rather than, drawing on Hutcheson, that he had developed the concept of a reflexive mind relating external to ‘internal’ perception and anticipated

recent cognitive psychology in claiming the central importance of connections between current perception and what already is 'antecedently present to the mind' (Holland, S. and Oliveira T.C.: 2013).

What thereby has been "lost" in assumed linear progress in social science is that in their approach to meaning and method Hume and Smith were less 'modern' than what now would be deemed 'post-modern'; that Hume already had opened frontiers between philosophy and psychology which later philosophy such as 'logical positivism', and claims for 'positive economics' such as by Milton Friedman, displaced. Notably, Hume also warned that presumption of cause and effect could be mere coincidence, which the theories of rational expectations and efficient markets that paved the path to the subprime crisis also displaced. Further that, by contrast with the presumption of much social science that it is 'value free', both Hume and Smith recognised that any cognition is influenced by the values dispositions and beliefs that we have less than consciously come to acquire from life and professional experience.

Hume (1739) advanced this in terms of 'connections' between current cognition and what already is 'antecedently present' to the mind. He submitted that the 'reflexive mind' becomes habitually disposed to general ways of perceiving and thinking which influence how we make sense of the external world and what we expect the future to be. This stress on habitual thinking. Though not recognised by Bourdieu, anticipated his concept of *habitus* in the sense of the world in to which we are born, bred and then have our being and how we come to acquire the values and beliefs that influence not only our behaviour but also our perceptions of the external world. Or, as Schopenhauer, influenced by Hume, conceptualised this, the relations between the Self and the Other and where the other is not only the external world but also our personal and social relations. Moreover, Hume had stressed that:

The mind stops not here.... With this system of perceptions there is another connected by custom, or, if you will, by the relation of cause and effect [that] forms them into a new system, which it likewise dignifies with the title of *realities* (author's emphasis).

Hume 1740, vol. I: 108

Nor were Hume's claims for connections between current cognition and what already was 'antecedently present to the mind' a passing observation or metaphor, such as Smith's use only once of the term 'invisible hand' in *The Wealth of Nations*. He saw them as his main claim to make a contribution to human understanding, and thereby anticipated recent connectionist theory in cognitive psychology which also has been informed by neural research (e.g. Cleeremans, 1997; Glöckner & Betsch, 2008; Sadler-Smith, 2008; Glöckner & Witteman, 2010), and to which we return.

Yet which has a significance that has tended to be neglected since, in the degree that this is the case, there can be no objective Social Science nor a single Rationality, despite Cartesian presumptions for this. And which we now seek to support in terms of

“rationalities” and also “logics” which range wider and deeper than those of Descartes, and tend to confirm both Hume and Bourdieu.

Perceptions, Beliefs and Rationalities

One of the better observations of Bertrand Russell is that the human mind cannot bear very much uncertainty. Freud had put it differently in claiming that people cannot bear very much reality. But there is a distinction between the two observations. Freud’s was pessimistic Russell’s, although allowing for pessimism, was not, as demonstrated in his later life in which he not only argued for but physically protested against nuclear weapons which, in the case of the END initiative of the Bertrand Russell Peace in campaigning for European Nuclear Disarmament, managed to achieve.

Nonetheless, in Social Science, which has followed Russell and other rationalists rather than Freud, since it could be presumed that to follow Freud would sink human understanding into the depths of Nietzschean Dionysian desires, this has led to a quest for certainty in terms of an unimpeachable and single rationality that is equivalent to a “truth” that was lost with the challenge to faith in religion.

Which was embodied by Paul Samuelson who, with a background in mathematics and economics but none in philosophy, claimed that mathematics and language are identical and in so doing not only stripped psychology from Keynes but spawned generations of premise dependent algebraic models such as those which, thereafter, were to mislead Western policy makers into believing that there had been a post Keynesian economic revolution proving that markets were rational rather than that those playing with or manipulating them, were fallible and thereby would enable not only the fallibility of markets, but also of western democracy in the sense that it could not assure that people would govern markets rather than markets govern people.

And which also relates to both historical context and to the arbitrariness of perceptions. For, in 1938, Samuelson was one of four Rockefeller fellows at Harvard who had formed a reading group on Keynes’ *General Theory*, yet each of whom emerged with different understanding of the implications of Keynes. Another was John Kenneth Galbraith, who saw the need to match demand management by recognition of the market power of big business and the role of trades unions in countervailing it. A third was Robert Marjolin, who drew on Keynes and the concept of effective demand, but saw the need for long-term investment as central, and shortly was to achieve this as head of the Marshall Aid European Recovery Programme. The fourth was the economic historian Eric Roll, who later was engaged by Marjolin as one of the ‘committee of four’ approving or disapproving submissions for Marshall Aid finance for recovery.

Yet many of the next generation of economists presuming to be Keynesians rarely read Keynes rather than Samuelson’s *Economics* or similar hybrid texts posthumously wedding him to an economics of self-adjusting markets such as later were to be resurrected in theories of rational expectations and their Panglossian claims to be able to predict the future. Crucially, Samuelson stripped out the psychology which had been

central to Keynes' *General Theory*. In doing so he had claimed in a 1952 paper in *The American Economic Review* that mathematics and language were identical:

Mathematics *is* (author's emphasis) language. I mean this quite literally... For in deepest logic – and leaving out all tactical and pedagogical considerations – the two media are strictly identical.

Samuelson (ibid): 56

This paralleled what Wittgenstein had assumed in the algebraic 'truth functions' of his 1922 *Tractatus* but then, in his later work, rejected. Thus in the nineteenth edition of *Economics* (2010) Samuelson and Nordhaus claimed that:

What an economist does, therefore, is try very hard to keep positive science cleanly separated from normative judgments—to draw a line between the economic calculations of the head and the human feelings of the heart.

Samuelson and Nordhaus (ibid): 336

The textbook has propagated the binary distinction of normative/positive or prescriptive/descriptive by implying the definition of positive economics as "the analysis of facts and behavior in an economy, or "the way things are"" (Samuelson and Nordhaus, ibid: 669). Yet Samuelson appears to have been unaware that the task he set himself in aiming to achieve 'true analysis' or 'truth' was Kant's claim that there are propositions which are true by definition and universally valid. He thereby wrongly encouraged the presumption that economics was an exact science whereas Kuhn (1996), drawing on the later Wittgenstein, and the influence on them both of *Gestalt* psychology, such as Jastrow, has shown that perception of the same phenomena by either individuals or scientists from different disciplines can be entirely different. Thus, facts do not speak for themselves. How they speak to us, at least when either we perceive them or is voiced by others on how we should perceive them, is how tend do so. Which already involved assumptions, presumptions, dispositions and beliefs, and also, underlying or overlying thus, major explicit – or implicit – ideological values and interests.

Many of the alleged 'laws' and 'truths' which Samuelson then purported were founded on the 'as if' premises against which Vaihinger (2001), endorsed by both Freud and Jung, had warned, in the sense that they may be disproved by realities yet survive in public perception as self-evident. Even though many to most of those in mainstream economics were demonstrably false, such as allegedly diminishing returns to scale without which there can be neither micro partial equilibrium nor therefore macro general equilibrium. Or that the principle of comparative advantage can maximise global welfare in which, while echoing Ricardo, and in company with Piketty, Samuelson entirely displaced capital mobility; that foreign direct investment rather than comparative advantage has driven postwar trade and, with it, Smith's absolute rather than Ricardo's comparative advantage.

Language, Truths and Logics

The logical positivists of the Vienna Circle in the 1930s, influenced by Carnap, who in turn had been influenced by the early Wittgenstein, assumed that they had abolished metaphysics by certain “truth functions”. In this, like Wittgenstein in the last proposition of his 1922 *Tractatus*, which he had derived from Schopenhauer, they claimed that “whereof one cannot speak one should remain silent”. For Schopenhauer this did not mean that philosophy had nothing to say but that there were only some things that it could meaningfully say. A young Ayer, after a brief stay in Vienna with Carnap and some others, return to the UK and published his highly influential *Language Truth and Logic*. Asked later how he would define philosophy, Ayer replied “if p, then not minus p”. The study of symbolic logic thereafter was presumed in the teaching of philosophy in the UK, as in the course on Philosophy, Politics and Economics at Oxford, to be what philosophy was about.

Yet this not only displaced the later Wittgenstein, whose posthumous *Philosophical Investigations* (1953) was a refutation of such a limited approach to understanding meanings. It also displaced a range of insights from psychology and other continental European philosophy. Such as that the unconscious might have its own logic which was not that of inferential reasoning. For some time appreciation of this was blocked by Freud’s claim that the unconscious was the bed of only irrational drives and desires. But Bourdieu, notably, submitted that any individual is driven by different logics, at different levels of consciousness.

Bourdieu’s (1990) use of logic includes:

- a *voluntaristic* logic by which we tend to ‘know what we want’ and may be driven by it, as in either actively seeking to justify or realise something;
- a *practical* logic which ‘entails neither a theoretical knowledge of norms and formal rules nor a conscious elaboration of strategies’ but is implicit in what we do and expect;
- a *normative* logic including values of which in the main we are less than conscious.

Bourdieu explained his concept of voluntaristic logic in terms of *role-dispositions*. He distinguished between paradigmatic or ‘dispositional’ rules or norms, and those that are inter-active or ‘situational’. Notably, paradigmatic norms tend to be deeply embedded in institutions and assumed, whereas situational norms are explicit and concern social action and interaction. He also distinguished between the grammar of language as paradigmatic and speech as situational, writing in his *Logic of Practice*, Bourdieu (1990) of his concept of *habitus* that it:

[e]nsures the active presence of past experiences... in the form of schemes of perception, thought and action’ and that these influence our perception of what is

correct or incorrect more constantly and more reliably than all formal rules and explicit norms...

Bourdieu 1990: 54

This concept of schemes or schema of thought less than consciously influencing current perception and judgements was pioneered in the 1930s by Bartlett, then republished in 1995 and has been well accepted in cognitive and organisational psychology since. Bartlett found that people tend to draw on 'schema' and also 'overlapping schema' in which the unconscious already has organised previous sense making in memory which also is consistent with the findings by Weick (1979, 1985, and 1995).

In parallel, although less well known, Freud's presumption that the unconscious was only the bed of less than rational drives and desires was challenged by the Chilean mathematician and psychoanalyst, Ignacio Matte Blanco both from his clinical case work and from Russell and Whitehead's mathematical set theory. Matte Blanco claimed that the unconscious symmetrises current cognition with 'what we know already' so that we do not have to suffer 'inferential overload'.

But Matte Blanco went further, conceptualising conscious and unconscious logic as interfacing on an unbounded or infinite continuum ranging from an asymmetrical 'stream of consciousness' in daily life through to deeply symmetrical unconscious thinking which also arguably is what James Joyce was doing in both his *Ulysses* and in *Finnegan's Wake*. Matte Blanco found this process bi-logical, meaning not that we are in two minds, but that the mind copes with asymmetry in current experience by relating symmetrising it with earlier sense-making of sets of previous experience.

Yet such symmetrisation does not depend on in depth psychoanalysis. It can happen at a bus stop. Thus, a mother is the mother of her child, yet shares being a mother or 'motherhood' with the set of all other mothers, which is why even on a casual meeting with others they can symmetrise an unbounded range of experience and values in a smile when another mother is trying to deal with a recalcitrant or distressed child, without explicitly previously knowing them, rather than 'knowing' that they mutually share the trials and tribulations implied by motherhood.

Or can be notorious, as in Margaret Thatcher demanding from her business managers in the House of Commons appropriately name "the whips" whether a candidate for promotion was "one of us".

Set theory also has a wider social base in terms of jobs and professions. A nurse or a teacher is an individual but also a part of 'a set' of people who are nurses or teachers, and similarly can share a whole range of professional values, experience and concerns relating to care of others without conceptualising the degree to which this is symmetrisation. Set theory is familiar in the phrase 'mind-sets' of which Senge (2006) rightly has made much in terms of limited ability to escape from them in management. It also was integral to the cybernetics and open systems theory of Gregory Bateson (1979)

who worked on patterns-of-patterns, or meta-patterns which he claimed were relevant both how the mind works and to understanding of the external world. Publishing in the same year as Matte Blanco, Mintzberg (1990) found that much of the organisational decision-making of top managers can be described in terms of 'organised sets of behaviour' (Mintzberg, *ibid*: 5) but which also have their own implicit rather than explicit logics.

What we are submitting therefore is that there is no single "rationality" such as has been the pretension of much post Enlightenment and "modernist" thinking but a range of rationalities which may well be entirely consistent in themselves, yet also either consistently right, or wrong depending on who judges them in which historical and social context and, especially, on what explicit or implicit premises.

Social Science and the State

Science cannot afford to be solely preoccupied with technical problems or just theory. Everywhere, it confronts the State which can constrain and confine it. Yet what this paper now submits is that this neither need be nor always implies explicit or implicit submission. Even if Copernicus had to submit, his ideas survived and changed perception not only of the world but also of the universe. Thus, Marx's Communist Manifesto, with Engels, startled both the dominant aristocracy and the emergent capitalism of his time. Yet also was subject to Popper's criterion of falsification in the sense that the workers of the world did not unite. Whereas Marx nonetheless was right in many other regards such as in claiming that the State – in his time - never had been a neutral or benevolent associate of science. For example, even Kepler (1571-1630) needed to provide astrological services for Emperor in order to independently secure his astronomic research. As Russell, if wrong on Hume, otherwise aptly has put it:

Thus, the practical experts who employ scientific technique, and still more the governments and large firms which employ the practical experts, acquire a quite different temper from that of the men of science i.e. a temper full of a sense of limitless power, of arrogant certainty, and of pleasure in manipulation even of human material. This is the very reverse of the scientific temper, but it cannot be denied that science has helped to promote it.

Russell 1956: 245-246

Yet which we suggest nonetheless has been overstated, including by Wallerstein. In that intellect, rather than a presumption to "social science" as such, both can challenge a prevailing ideology and reverse it. Russell has issued a warning which is still very relevant,

The threat to intellectual freedom is greater in our day than at any time since 1660; but it does not now come from the Christian Churches. It comes from governments, which, owing to the modern danger of anarchy and chaos, have

succeeded to the sacrosanct character formerly belonging to the ecclesiastical authorities.

B. Russell 1956: 251

The disregard of this problem can lead to the future society which will treat a democracy as another one unfulfilled dream about human beings who can be more than physio-chemical entities (Huxley 2007).

A Troubled Relationship

The importance of social sciences has been established as big historical changes took place at the end of the 18th century. Traditional foundations of society, such as religion and monarchy, had lost their dominant power though not utterly. The science has been introduced as alternative consolidating factor. The ideas of progress and melioration have generated a common target for social sciences and states. Simultaneously, this delicate relation has become permeated with ideological and methodological disdain of unpredictability and uncertainty. Social sciences were supposed to provide a better understanding of social transformations for the sake of societal well-being. But there is a problem both deeply philosophical and very banal – the idealised outcome presumed by mainstream economics, with its presumption of the maximisation of global welfare through the free working of market forces, has not happened. The economic models got it wrong. As Stiglitz has put it:

Most of us would not like to think that we conform to the view of man that underlies prevailing economic models, which is of a calculating, rational, self-serving, and self-interested individual. There is no room for human empathy, public spiritedness, or altruism. One interesting aspect of economics is that the model provides a better description of economists than it does of others, and the longer students study economics, the more like the model they become. What economists mean by rationality is not exactly what most people mean. What economists mean is better described as consistency.

Stiglitz 2010: 249

Yet, if consistent, also may be consistently wrong....

The institutionalisation of social sciences has been started at the end of the 19th century. Of course, due to the increasing importance of proper handling of social changes the demand for 'societal management' has been aroused much earlier. It is a very interesting concurrence that among first social theoreticians and practitioners civil servants were in significant numbers after the fall of religion's influence. So called Mandarins exerted not only administrative power but also intellectual one. The notion of state has permeated scientific concepts in both explicit and implicit ways. This paper follows the aim to disclose the presence of state as 'conceptual container' (after Immanuel Wallerstein) within social sciences what is deeply connected with the problem of knowledge. It is enough to remember the famous statement of Francis Bacon that knowledge is the power

itself. The power relations have shaped scientific thinking as a certain way of dealing with research object. It is in a big contrast with critical thinking aimed at returning wisdom into scientific framework thus opposing instrumentality and utility directed research mainly dependant on self-interested sponsors.

It is a perfect example of indoctrination within educational system as it would be an ideological indoctrination to consolidate a state. These two deficiencies of indoctrinated scientists and indoctrinating states are two sides of the same coin. The institutionalisation of social sciences took place together with the emergence of nation-states at the end of the 19th century: “the lay and socially oriented Third Republic in France; the authoritarian bureaucratic state dominating the society of Imperial Germany; and the unified Italian nation-state based on the interdependence of urban and rural elite groups in the north and south” (P. Wagner 2001: 10). Newly established states needed analytical tools enabling to consolidate society within specified boundaries. Not surprisingly, German universities at that time employed many Mandarins – professors simultaneously holding the positions in state service. Social sciences were supposed to sustain the functionality of states. Wagner (2001) does not identify the institutionalisation of social sciences with foundational period. He, like Hirschman (1997), has indicated that major ideas of social sciences stem from older long-lasting discussions. During the 20th century social sciences have experienced many fundamental transformations inside methodological framework. But the question regarding the maturity or transformative phase of social sciences still has not been properly answered. World War I and World War II have coincided in time with boom of social sciences but only some of it had much to do with saving or restoring societies after cataclysms. The Social Science was simply mobilised by the State. It does not mean a constant ‘enslavement’; it presupposes a call of ‘duty’. The mobilisation ends sooner or later but the request can be made in the future again and the Social Science has to stay in readiness (it is worse than manifest ‘enslavement’). The notion of detached observer has been compromised entirely. Following Wagner (2001), “in terms of epistemology, social science saw itself forced to largely abandon the idea of representing social reality and accepted the view that conceptual constructions were dependent both on the means and forms of observation and perception and on the interest of the observer in the social world” (p. 43). Rationality is nothing else but a disguised mask of the ‘political’ (Wallerstein,1999). This is a core of methodological and analytical vicious circle, it has captivated the social sciences into enclosed delusional framework of aspirational reality. The Social Science has claimed a monopoly to analyse social processes, the State has monopolised a position for sole agent of changes.

The idea of progress is relatively new in the context of history because Christianity has complied with pessimistic worldview about imperfect order in contrast to Eden (Bury 1920); Hertzler 1965; Wallerstein 1999). As noted by Hertzler (1965: 224),

With the advent of Hegelianism, social reform began to acquire efficient and opportunistic tactics which gradually began to convert longings into reality. The ideal of perfection began to be influenced by a sense of possibility.

Since the 19th century (from the moment of institutionalisation) the social sciences have indulged themselves into optimistic belief about social betterment owing to the states. There was a high expectation that social reforms will be successful by following rational principles. During the 20th century the State has failed to secure a social progress (whatever it may be) as the Social Science has not been successful in adequate understanding of social reality. The possible explanation for that is provided by the Gulbenkian Commission and Wallerstein (1996) – the social sciences have been too much state-centric which means that studied social entities are usually restricted by state boundaries. The State still has remained as ‘natural’ phenomena for research, both explicit and implicit framework.

The certain knowledge that had been promised us by social scientists seemed an evident consequence of their faith in progress. It found expression in the belief in steady improvements that would be implemented by “experts”, in which the “enabling” state would play a key role in the effort to reform society. The social sciences were expected to abet this process of rational, gradual improvement.

Wallerstein 1996: 81-82

The complexity of social entities has exceeded the boundaries of states nowadays and the State as conceptual container has lost its relevance for the social sciences. Of course, despite the growing importance of extra-state social processes the necessity to understand state mechanisms still has remained (Wallerstein 1996). But in addition to that, value-free approach has to be seriously reconsidered within social sciences. It is nothing radically new about that, “when our reforms are not touched by a sense of values, the result is that purely temporal ends are taken as ultimate, and we have such notions as efficiency or organization regarded as the very touchstone of social improvement” (Mumford 1928: 254-255).

Social sciences have not been successful in conceptual demarcation from the State yet. Indeed, Albert O. Hirschman (1997) has exposed very serious political implications within social sciences since their emergence. Most interestingly, his analysis refers to the 17th and 18th centuries. And it is not surprising, because this historical period marks the beginning of great social and economic transformations which still have affected current global political structure, and social sciences respectively. The onset of industrialisation in the 19th century cannot be the only point of departure for historical analysis of emerging social sciences. Clearly, the institutionalisation of social sciences had started before the end of the 19th century, as the demand to improve the knowledge of the physical functioning of the external long before the industrialization.

The beginning of that story does come with the Renaissance, but not through the development of a new ethic, that is, of new rules of conduct for the individual.

Rather it will be traced here to a new turn in the theory of the state, to the attempt at improving statecraft within the existing order.

Hirschman 1997: 12

Yet also needs qualification, and in significant regards is wrong. For intellectual elites, the authority of religion was seriously shaken in the 17th century but its ethics / and especially The Protestant Ethic / was to survive through to the 21st century and with devastating effects for what should have been the most rational political reconstruction of Europe after WW2 since Kant aspired for “perpetual peace”.

Hirschman (1997) also has submitted that “the idea of engineering social progress by cleverly setting up one passion to fight another became a fairly common pastime in the course of the eighteenth century” (p. 26). The principle of countervailing passions and irrationality was integral to Montesquieu’s tripartite system. Montesquieu’s tripartite system implied the separation of powers between a legislature, an executive, and a judiciary. It still has remained as one of the basic principles of democracy, and allegedly able to preventing the concentration of power.

The “Enlightened State”

The rational reconstruction of society with continuously augmented knowledge has been claimed by some of the most notable advocates of rational thought. Bacon’s “New Atlantis” written in 1622 was governed according to what he presumed were principles of scientific method, and was of the foundational statements of the case for a “rational State”. Kant then later assumed that this had achieved the peak of rationality in the 18th Prussia of Frederick the Great.

On which, in several sense, at the time / his own time / he had good reasons. Frederick was very enlightened. He rejected his father’s insistence that he should train as a soldier, wanting to be a philosopher. The language of his court was not German but French. He took advice from and valued Voltaire. He introduced a civil service based on merit rather than hereditary privilege. When succeeding to the throne of Prussia, he always sought negotiation rather than confrontation. It was only when Prussia was threatened by other powers that he was ruthless, by constraint rather than desire.

Yet, influenced by this, which was the Prussian State of his time, and though aspiring to “categorical imperatives”, Kant made a categorical error, not dissimilar to the Whig tradition in Britain at the time, that progress in government, and its humanity, was linear. Whereas Hegel recognised that it was dialectical, and that the proposition or thesis of progress could be counteracted or contradicted by regress, even if he then underestimated the degree to which an emerging synthesis could be negative rather than positive.

The Unenlightened State

As what to be dramatically and perversely illustrated by the National Socialist seizure of power in Germany in 1933 which not only subordinated a legislature and co-opted a judiciary by force, but also suborned a whole general of alleged value/free social scientists.

Moreover, Montesquieu's tripartite system can be contradicted not only when an executive may so influence the appointment of a judiciary, including a Supreme Court, as to influence what and how it is disposed to judge. An executive also may override or bypass a legislature. As not only was the case with the National Socialist seizure of power in Germany in the 1930s, but also has been the case with an increasing hegemonic Germany since reunification, which former Chancellors such as Adenauer, Brandt, Schmidt and Kohl sought to avoid.

Rational and Irrational Agents

The problem is that such an enlightened system needs constant intellectual, ideological and political maintenance if it is not to collapse. The alleged "rational agent" is rational only within a given paradigm which, if dominant, also will tend to dominate how he or she thinks. As Stiglitz (2010) has reflected, most of his economic colleagues are committed to a spurious rationality which may be consistent but also consistently wrong. The Social Science founded on rationality and objectivity discovers itself in a dubious position (if there is enough of critical reflexivity). The worldview of social scientist becomes shaped by the pervasive presence of State even on methodological level, and it is not just about providing obligatory or non-obligatory policy advice. This presence may be disguised under the labels of "social utility" or "political relevance". Mason has warned about the way governments and central banks make policy:

The agent-based model, instead of reducing reality to a few variables, tries to replicate reality – and its randomness – in detail. Such models are common in weather prediction, or city transport planning: think of them as a professional version of the computer game Sim City. In an agent-based model, you don't try to work out whether a million people will, on aggregate, buy more bread or less bread. You create a million digital "people" and unleash them in world with digital bread and digital money.

Mason 2016

Premise Dependent "Systems Thinking"

The positioning of social scientist as detached and objective observer is flawed in the degree to which it presumes to be dealing with alleged "facts". This was warned against by David Hume (1739, 1740) to whom social scientists may in passing refer but too few of whom either have read, or grasped, which also depends on the perception by an individual of what is meant by an author. What is influenced by the values, dispositions and recent experience of the perceiver even if he has been one of the most eminent

philosophers of the 20th century and renowned for an encyclopaedic *History of Western Philosophy*.

Thus, Bertrand Russell (1947) dismissed Hume as a “mere empiricist” and a “dead end” in philosophy. Yet this neglected that Hume’s aim was to outline an anatomy of the reflexive mind and connections between conscious and pre-conscious thought. Following Hutcheson, and influencing both Adam Smith, and Schopenhauer, Hume claimed that anything that we think or believe connects external perception with internal perception and that no cognition is neutral rather than influenced by values, dispositions and beliefs acquired from earlier life experience (Holland & Oliveira 2013).

Thus, while Hume and Adam Smith are often aligned with Descartes as among the first of the ‘moderns’, they countered his *Cogito ergo sum* with the claim that how we think is who we have *become* through life experience and education; that our perceptions are influenced by dispositions, values and beliefs formed by these; that no cognition is value free, and that neglect of this in ‘systems thinking’ could lead to ‘dangerous errors’.

Hume claimed that there are reflexive connections between current perception and what is already ‘antecedently present to the mind’ which recently has gained confirmation from neural research and ‘connectionist’ theory in cognitive psychology references. He also claimed that what is perceived depends on the habitual dispositions and values of the perceiver, while this is less than consciously acquired from life experience in what Pierre Bourdieu (1977, 1984, 1990), if without reference to either Hume or Smith, later conceptualised as *habitus* and is central to ‘the reflexive mind’ which does not simply induce or deduct from the external world but influences perception of it.

The State and Statistics

Gunnar Myrdal, who had extensive political experience both as minister in Sweden in the 1930s and then as Secretary General of the post-war UN Economic Commission for Europe, has stressed that “man is, as Aristotle told us, a political animal, and social science is a political science, in this sense” (Myrdal 1944: 1043). He disputed attempts to validate economics by value-free premises assuming to preclude subjectivities and interpretive validations and submitted, as had Hume, that the social scientist cannot distance himself/herself from personal values, dispositions and beliefs. He also pointed out that statistical treatment always implies either an explicit or implicit conceptual framework determining the relevance of data and the degree to which it may or may not adequately represent the external world.

The collection of data is systematised by governments through their national statistical offices or by private businesses themselves in doing market research. But this, as also the recent fashion for “Big Data” can raise not only big issues but also big problems regarding the neutrality of statistics even though these purport to report “facts”. We have touched on this earlier in relation to the case of Hume (1748, 1749) that “realities” are what we presume rather than exist independently of our own conceptual perceptions or misperceptions. But the rise of the modern state since Hume has transformed the scope

and scale of misperceptions through the evolution of what are widely deemed “official statistics”.

Besides which, although a common perception or misperception of the word “statistics” is that they are “facts”, the term “statistics” itself is originated from “the state”, and what it needed, or thought it needed, is function (Wallerstein 2001). But which may be either limited, or misleading or wrong. Thus statistical data is usually compiled according to the realistic or spurious needs of the State. Leontief (1982) also has emphasized that supposedly neutral statistics can be unscientifically partial. Even the most sophisticated mathematical models in social sciences are inadequate if input data for them is collected and supplied with biases.

An example of current relevance is national accounts. These were highly influenced when devised from the 1930s by a Keynesian conceptual framework and Keynes’s presumption in The Concluding Notes of his *General Theory* concerning the social philosophy to which it might lead that provided the State intervened to assure effective demand, the supply side of the economy could be left to the processes of “perfect or imperfect competition”. As well as his presumption that nation states still were an effective basis for policy formulation and full employment policies combining monetary and fiscal policies, therefore focusing on such accounts on national income and expenditure rather than data also concerning the supply side of the economy. Yet, even in his time, and more so since WW2, the supply side of economies has been dominated by giant transnational corporations which have qualified “perfect and imperfect competition” and dominate economic outcomes (Stiglitz 2016). Their nature as transnationals means that they can manipulate prices between their subsidiaries in different countries in a manner that can promote a fiscal crisis for states. Whereas national accounts do not in fact account for this. Each system of such accounts registers such transnationals as if they were national and does trace their transfer pricing. While proposals even at a high level that such accounts should be reformed, as made by then Commission President Jacques Delors to the statistical office of the European Union, Eurostat, were blocked by pressure from transnationals while he was President and not pursued further thereafter (Holland 2015).

Or, in statistical terms, how one measures money. There are different definitions of this ranging from M1 (cash in hand, the total of all physical currency, plus part of bank reserves, plus current account balances); M2 (most savings accounts, money market accounts, some mutual funds and small certificates of deposits); M3 (other certificates of deposits, institutional money, mutual funds and repurchase agreements), plus others.

Milton Friedman claimed that a constant rate of increase of M3 would ensure a benign non/inflationary expansion of an economy. But none of these definitions yields a significant general correlation with prices, inflation or employment in the manner that Friedman initially assumed. The one serious attempt to target money supply in modern history - during the first and second Thatcher governments - totally failed and was abandoned. Within a year of her government coming to office in 1979 and targeting an

annual rate of growth of M3 of 7-11% a year, M3 took off in the second half of 1980 at nearly 25% a year. In response the government started cutting public spending and works, such as in public housing.

Bankruptcies ensued among small and medium firms on a massive scale with, on the figures compiled by the Cambridge Department of Economics, a threefold increase of unemployment to 4.5 million which was denied by the government since it changed the statistical definition of unemployment nearly twenty times during the decade. It then, in a classic confirmation of Foucault (1977) on surveillance and punishment, cut the budget of the Cambridge Department of Economics from twelve researchers to two. And also shrunk its monetary target from M3 to a so-called M0 (M nought) and in October 1985 simply announced that it no longer would be setting monetary targets.

Yet, as Vaihinger (2001) warned, even if a theory is refuted by evidence it can survive intact. And those who claimed to challenge this, much as in theological denunciations of earlier challenges to knowledge, were excommunicated from public funding.

Research, Teaching and Surveillance

Inversely, the Social Science and the State are intimately, if not incestuously, liaised. Since the decline in Weber's terms of traditional authority, the modern State has become the arbiter of what should be both researched and taught and not least, in both cases, because it is the paymaster.

This has been well put by Foucault (1995) who stressed that the rise of mass education meant the emergence of educational norms. First, it needed school leavers who could read, write and calculate so that employers could be sure that they were 'getting value' by hiring them. Second, it needed reliable output which, third, implied measurability and, with it, formal assessment. But also that knowledge is power and that the power to commission research by the State is power rewards for conformity and exclusion for dissent, which also implies surveillance according to a prevailing paradigm or norm of what not only should be taught, but also thought. As he put it:

The judges of normality are present everywhere. We are in the society of the teacher-judge, the doctor-judge, the educator-judge... after the age of 'inquisitorial' justice, we have entered the age of 'examinatory justice'.

Foucault, *ibid*: 304-305

Foucault's (1972, 1995) case is that received knowledge has the power to inform, or to repress, at any level. This may be from the pinnacle of national assessment and funding hierarchies for research, down to lower levels concerning individual and group behaviour, while 'academic discipline' includes the power to punish by not gaining publication or gaining preferment if one challenges a prevailing paradigm.

Researchers thereby come to learn what is likely to be accepted by funding bodies and adapt their proposals accordingly, reinforcing conformism, however much they also

resent this. A *Financial Times* survey (Green 2008) of assessment exercises by the higher education authorities of England, Wales, Scotland and Northern Ireland reported on the common view of academics that the criteria for such assessments of either teaching methods or research proposals:

...distorted research output, created a cut-throat hire-and-fire labour market among academics and imposed intolerable pressures on institutions that should be concentrating their efforts on producing excellence rather than demonstrating it to government inspections.

Green (ibid)

In the UK case, Foucauldian surveillance has become all pervasive. Patricia Broadfoot, Professor of Education at the University of Bristol, before becoming a University vice-chancellor, has criticised:

...the advent of comprehensive national testing at frequent intervals throughout the course of compulsory schooling; the regular publications of 'league tables' of examination results; the obligation for schools and local education authorities to engage in detailed target-setting, and a punitive inspection system that provides arbitrary and public judgements including naming and shaming those deemed to be failing.

Broadfoot 2000: 209

In higher education, the same surveillance dominates, and has meant:

...the advent of the research assessment exercise – formal assessment of each institution's research quality; teaching quality assessment; the introduction of standards for newly qualifying teachers, as well as attempts to regulate initial and in-service training more generally, and a range of other provisions for audit and the monitoring of quality.

Broadfoot (ibid)

The outcome is:

As the language of performance indicators, audit and quality control and review becomes daily more pervasive in all sectors of education, it is clear that Foucault's 'hierarchical authority' and 'normalizing judgement' have become one of the definitive characteristics of contemporary provision. (While this) elaborate edifice is based on the rationalist assumption that the data so produced are accurate and meaningful despite the now enormous body of research literature documenting the inherent vagaries of what is, inevitably, a process shot through with human subjectivity.

Broadfoot (ibid)

Economics versus Political Economy: Neither 'Pure' nor 'Value Free'

But the difficulty of doing 'pure' or 'value free' research in 'social sciences' is not only due to their incestuous liaison of with State sponsored research. There is the question whether it ever can be either pure or value free. Following Myrdal (1944) again:

Economics – or “political economy”, to use the old-fashioned but much more adequate term (the attribute “political” has been dropped for convenience and as a tribute to the purity of science) – is the oldest branch of social science in the sense that it was the earliest to develop into a system of observations and inferences organized under the principle of social laws. In economics we can most conveniently study the influence of the static and fatalistic general bias upon the development of a social science discipline. From natural science it clearly borrowed the concept of “equilibrium”. This concept, as well as the derived concepts of “balance”, “stability”, “normal”, are all often heavily loaded with the static and fatalistic valuations. The “assumptions” of economic theory have been useful. But their load of inherited static and fatalistic valuations is heavy, and they will often turn into convenient covers for biases in this direction.

Myrdal 1944: 1047-1048

Myrdal has criticized the idea of “disinterested social science” but not the rationality itself. He has suggested to redefine it in terms of compatibility with values making rationality no less agreeable with reason this way. It coincides with Karl Mannheim’s (1954: 5) proposal for a new type of objectivity “attainable not through the exclusion of evaluations but through the critical awareness and control of them”. Accordingly, scientific terms within social sciences inevitably are “value-loaded” because, for example, the study object of economics is not only money, wealth or material resources but also intentional and spontaneous human beings following the purposes what is excluded from mathematical models. A prevalent use of mathematics usually is positioned as value-free practice aiming to objectivity through quantification. This trend has become very influential in social sciences, especially after World War 2.

Wassily Leontief, a highly accomplished mathematician and econometrician, who introduced input-output analysis to the West, has criticised a mathematical preoccupation within economics on the grounds that “the emperor has no clothes”:

Two trained engineers Leon Walras and Vilfredo Pareto translated Classical Economics with considerable refinement and elaboration into a concise language of algebra and calculus and called it the General Equilibrium Theory.

Leontief 1982

It means that a stable equilibrium scheme is not suitable for the analysis of dynamic processes within economies and societies. As was admitted by Walras who is assumed by mainstream economists to have been the founding father of such an approach. But, though he pioneered it, also was highly critical of its limits, writing in his *Elements of Pure*

Economy (1874) that he supposed the movement of economic production and consumption stopped for an instant in order to consider the conditions for equilibrium. Then adding that he has done what mathematicians do who, to rationalize mechanics elaborate the static before the *dynamic*. In this case the classical excuse “do not blame the theory” is misplaced.

Mathematics and Language

A further problem is that while mathematics is a formal language of science but it cannot be equated with the language itself. Mathematical language is supposed to transfer the content of knowledge within sciences by most possible exactness avoiding all conceivable imperfections of ‘natural’ languages. The formal procedures of proof resemble certain ‘grammatical correctness’ which sustains mathematical truths. But the social reality is not subordinated to mathematical truths despite many sophisticated attempts to impose them. Actually, Yuri I. Manin (1981: 3) has made a relevant remark that mathematical proof is ‘an essentially finite procedure’ due to Kurt Gödel who in the 1930’s “proved that for this reason provability is significantly narrower than truth, even when one only talks about the integers”. Mathematics have explored in the abstract way the patterns and sets of things surrounding human beings. Eventually, it has turned into the application on practical level where ‘organisation’ and ‘management’ takes place. The State by its essential definition is supposed to compensate the imperfections of human nature. It has been positioned as the major condition for social coexistence in front of imminent chaos and uncertainty. In those terms the State could be conceived as the most “realistic” social utopia, though not perfect enough but other alternatives being worse. The finalisation of this project has been seen as fulfilled dream of social harmony protected against all kinds of destructive forces. Instrumental and bureaucratic intellect has exploited mathematics as purified language though it is only formal language. The ideal State needs an ideal language capable to mirror the social reality and to transfer the content of knowledge in most precise way. This kind of language is antithetical to any interpretations which are treated like a source of distortions. And it is exactly identical to ideological practices.

Ideologies are customarily presented as affirmative beliefs in values, institutions, and policies...What is striking, however, is that each characterization derives its impact from the presumed faults of the alternative.

Kenneth R. Hoover 2003: 235

The concept of integer contains some flavour of platonic idea. Not surprisingly, many post-modern thinkers have criticized the statistics as disguised racist practice of deriving non-existent averages and simplified aggregates. Anyway, the same problems of aggregation of quantitative data and modelling persist in the Social Science too. The sociological approach enables to analyse the additional functions of mathematics within social sciences, such as internal consolidation and control of alternatives. According to Bourdieu (2004: 48-51), mathematical formalisms “set up a very strong social separation between professionals and amateurs, insiders and outsiders”. This means that

mathematics can be positioned as the price of entry to the discipline for newcomers. The appropriate usage of mathematical tools indicates not only the professional competence of scientists but also certain loyalty to corresponding worldview. As noted by Bourdieu (ibid), each scientific discipline has been as a separate field of forces constructing objectivity as social product dependent on commonly accepted presuppositions in the same field. The scientific capital of scientist, team or research group implies the level of their authority inside discipline. For the outsiders it means the price of entry into the discipline according to appropriate competence and loyalty. P. Bourdieu (2004: 47) distinguishes a scientific field from a political one yet he has depicted the autonomy of science as not a given, but “a historical conquest, endlessly having to be undertaken anew”.

Disconnection, Displacement and Denial: The Subprime Crisis

But struggles within a discipline may or may not connect with struggles in the social world. Consciously or otherwise the economics as a discipline may displace and deny what is happening or change it in a manner that is perverse for social wellbeing. An example is the repeal of the Glass/Steagall Act in the US in 1999.

As John Kay (2009) has observed, liberal democracies in principle deploy two means for accountability and legitimation - markets and the ballot box. But mergers and acquisitions without due oversight had encouraged financial institutions ‘too big to fail’.

With delayed effect, the deregulation of finance by the Thatcher government from what in the mid-1980s with unconscious irony was deemed the ‘Big Bang’ abetted the financial crisis of 2007-2008. As did the repeal in 1999 of the 1933 Glass-Steagall Act by Larry Summers as US Treasury Secretary thereby revoking the New Deal separation of commercial from speculative banking. Summers’ repeal of Glass-Steagall had reduced the reserves that banks needed to hold from 8% to 2%.

Meanwhile, Federal Reserve chair Alan Greenspan reduced base interest rates to 1% to counter a crisis of confidence on markets after the collapse of the dot.com bubble. A borrowing boom ensued. But nothing was learned up from the dot.com bubble itself, or the collapse the year before the repeal of Glass-Steagall of the Long Term Capital Management hedge fund, founded by two of the Chicago economists who had gained Nobel laureates for their contributions to rational expectations theory, Merton and Scholes.

Claims for ‘creative financial engineering’ continued apace through ‘derivatives’ which should have been income based, but were not since, as with a subprime mortgage, there was no guarantee that borrowers could service them. They were sold by US banks to European banks through ‘structured investment vehicles’, which were structured only in name, since they were ‘off balance sheet’ and not covered even by the minimal assets by then required after the repeal of the Glass-Steagall Act.

When the subprime crisis broke and caused a ‘credit crunch’ in inter-bank lending this prompted no less than 390 European banks to call for injection of funds from the European Central Bank. In August 2008 world stock markets collapsed by up to a quarter. After the crash, the European Commissioner for Competition Policy, Nellie Kroes, held bilateral meetings with the chief executives of major banks and reported that most of them ‘were in denial, claiming that ‘their bank’ had no problems – only others did’ (Holland 2011: 52).

“Structural Reforms”

Another example is the “structural reforms” demanded by the Troikas of the European Commission, the European Central Bank and the International Monetary Fund since the onset of the Eurozone crisis in 2009. Their presumption was that if that if business could fire workers more easily, then new and innovative firms would be able to attract them to expand their business. Likewise, the lower labour costs that the new enterprises would gain from reduction of social protection would increase the competitiveness of Europe as a whole in the face of globalisation.

This narrative has been extremely well ‘marketed’ by the European Commission and related institutions and interest groups since the onset of the Eurozone crisis (Janssen 2016). Yet the narrative, like many others from neoliberal economics such as that macroeconomic austerity is the only way to resolve high unemployment and low growth, is a myth.

In the IMF’s April 2016 *World Economic Outlook*, the Fund’s research staff recognised that while productivity can be increased by innovation, through investing more in research and development, by training and using more highly skilled labour and information technologies, it reported that there is no evidence whatsoever from the advanced economies of negative effects on total factor productivity that result from labour market regulation. As labour market deregulation has been a key ingredient in the ‘structural reforms’ and ‘structural adjustment’ austerity programmes demanded by the Troika of the IMF, the European Central Bank and the European Commission in several European member states, this raises serious questions not only about the intellectual and ideological basis of how the crisis since 2009 in the Eurozone has been mismanaged but also the lack of democratic legitimation in imposing austerity on Greece despite its rejection by Greek electors in both January and July 2015 (Holland 2016).

Summary

This paper has shown just a small part of the picture where “the quality of disinterestedness has never been universally achieved in practice” (Derek Bok 1982: 151). There is no unique recipe how to overcome “the maturity problem” of the social sciences and “existential crisis” of social scientists. Sadly, the ignorance of these issues is still prevalent in the sciences. Many social scientists have chosen the attitude which can be expressed by the statement “I prefer to do science and not to reflect on it”. But the research of social processes needs to be a self-reflective activity. Self-reflexivity and

critical self-assessment should be internalized by every social scientist at least to maintain a connection with studied social reality. Otherwise the Social Sciences will persist in scrutinizing fixed patterns and 'routinized experiences' in unbreakable vicious circle.

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Rationality and the Rise and Fall of Homo Hierarchicus

Juozas Kasputis

The most usual definition of management mainly refers to an act of making a decision in accordance to interests and goals of certain organization. It means, that 'organized' people can be divided into two major groups: ones who make decisions and others who implement decisions. Even the simplest kind of organisation indicates the presence of hierarchical order which ensures that decisions are smoothly (as much as possible) implemented. There are diverse and complicated forms of organisational hierarchy including many chains of middle-management with various levels of autonomy. Accordingly, the notion of "decision" can be replaced by "command" or "instruction" with performative outcomes such as "accomplishment" or "execution". Hierarchy is a formal structure of organisation maintained by officially approved rules. A fundamental slogan of managing human activities in hierarchical way is "Efficiency and more of efficiency". The efficient organisation is supposed to achieve the maximum of results at the minimum of costs. Not surprisingly, a formal structure needs a formal language purified from all imperfections of ordinary language like vagueness or too ambivalent interpretation. Guidance and commands must be produced and feedback reports must be delivered through formalised lines what should guarantee the most exact content of information transferred. Mathematics is a scientific instance of formal language. So, it is not a coincidence that management within hierarchical organisations is permeated by quantitative techniques. But do they provide adequate assistance? A mathematician has a privilege to be engaged primarily with abstract concepts and patterns on theoretical level. For example, physicists, as scientists studying natural phenomena, are not completely satisfied with the assistance of mathematics. The formal language can be helpful but its rigour has not been always adequate to studied phenomena which does not easily surrender to formal treatment. In this case, a poetical practice may be more relevant. This is Bohr's advice to Heisenberg:

We must be clear that, when it comes to atoms, language can be used only as in poetry. The poet, too, is not nearly so concerned with describing facts as with creating images and establishing mental connections.

Heisenberg 1971: 41

Manin shares the same sentiment,

A good physicist uses formalism as a poet uses language. He justifies the neglect of the commands of rigor by an eventual appeal to physical truth, as a mathematician cannot permit himself to do.

Manin 1981: 5

Dyson (1979) has brilliant memories how discussions among physicists and mathematicians were proceeded under Oppenheimer at Princeton. Social phenomena are more complicated than natural ones but social sciences are invaded by formalisms in no

less a way. Leontief (1982) has expressed a big concern regarding too much of applied mathematics within economics. Formal approaches have introduced fatalistic and static notions into social sciences absolutely ignoring human values and indulging in 'routinized' procedures. Bourdieu (2004) has presumed that too many mathematicians retreated to social sciences in search for safer shelter due to their inability (or incompetence) to secure academic career in theoretical mathematics. However, social sciences were institutionalised just at the end of the 19th century, later than natural sciences (Wagner 2001). It is a common practice in methodological disputes to juxtapose social and natural sciences. The impressive success of Newtonian physics has established long standing standards for scientific method. From an epistemological point of view social sciences still have not been mature enough. Critical realism has debunked a rationality of social sciences as a blind and desperate move in following natural sciences at the expense of deeper understanding of social processes.

In both cases, there is an explicit and implicit presupposition about the superiority of natural sciences, like some sort of 'physics envy' (Taleb 2007). But it is also possible to make an alternative critical analysis without epistemological allegations, temporal dimensions and an institutional framework. It should be useful to change a perspective or to switch Gestalt for the sake of better insight. Is it a provocative statement that neither of social nor natural sciences is primary? For somebody it may sound trivial or superficial, others may be inspired to introduce more of human value into science. However, it should be an interesting way to change that sense of inferiority in social sciences regarding 'arrogant certainty' of natural sciences. Presumed neutral data collected and compiled in datasets has disguised the very important human dimension which seriously jeopardizes whole notion of absolute detachment. The units of measurement are the result of social conventions which sometimes are achieved after ferocious political battles. Empirical studies cannot proceed without antecedent assumptions which involve conventional units. A "metre" for measuring a space and a "second" for measuring a time were not discovered in nature. For the sake of convenience, they had to be agreed upon in advance. Rueff's book "From the Physical to the Social Sciences" (published in 1929) is a marvellous piece for everybody who wish to study social sciences, and not just from historical perspective. The title of the book does not presuppose the direction of methodological development, it rather indicates the change of focus and a return of discussion to parallel development of sciences. Rueff (1929) has referred to the history of measurement units, such as metre or second, disclosing one of the ways human beings impose their worldview through the sciences. The importance of integers and equations is not denied but the issue of anthropocentric point of view has remained. The human worldview likely would be affected if the standardization of measures had been changed. If the measures proceed with "different" metre or centimetre, scientists will start to observe the world with different eyes. Small changes can produce a big effect. Despite the date of publication Rueff's text has contained some statements anticipating French postmodernism. For example, "Outside of ourselves, there is not, nor can there be, any criterion of truth" (Rueff 1929: 7).

Russell (1956) has pointed out another case when social theory induced a breakthrough in natural sciences - Darwin's theory of evolution. Many contemporary social scientists enjoyed introducing evolutionary ideas from biology into social sciences in order to oppose mechanistic trends. Such as the concept of evolutionary economics in contrast to conventional equilibrium economics which is too much captivated by mechanical models of rationality and perfect information (Metcalf, 1998). So called, Neo-Darwinism has thrived by coupling social and natural sciences thanks to complexity and evolution theories (Khalil and Boulding, 1996). Russell (1956) has indicated that Darwin himself could not derive evolution theory from the previous achievements of natural sciences. For example, geology was not developed enough to be finally independent from the orthodox theology at the first half of the 19th century. So,

Darwin's theory was essentially an extension to the animal and vegetable world of *laissez-faire* economics, and was suggested by Malthus's theory of population. All living things reproduce themselves so fast that the greater part of each generation must die without having reached the age to leave descendents...There is therefore, both within each species and as between different species, a constant competition, in which penalty of defeat is death. It follows that, if some members of a species differ from others in any way which gives them an advantage, they are more likely to survive.

Russell 1956: 72-73

According to Russell (1956), Darwin's theory was no more than generalisation of everyday experience. And this generalisation has disguised certain affirmative values dependent on specific historical context. It seems that biology's input into social sciences still has been ambiguous. Maybe, it will sound too radical, if in the spirit of Bourdieu's "sociological Leninism" (Verdes-Leroux, 2001), but an overwhelming 'invasion' of biologists arguably did a dis-service for social sciences like that of mathematicians. Of course, interdisciplinary studies should be continuous but a critical approach should be preserved too, especially due to persisting 'popular and fashionable' trends within sciences. Not least since beyond integers or evolutionary frameworks hides the rationality of self-interest and power. Yet, it is a dubious rationality wearing a mask of alleged "objective forces" and being implicitly partial. It creates impersonal frameworks of power sustaining all kinds of hierarchy. Dissent and opposition are treated as irrational destructive behaviour. But this kind of rationality cannot stand any serious scientific analysis,

The declaration that a failure to put self's interest first is irrational is neither an empirically proven fact nor a valid deduction from reasonable premises, but a historically contingent, ethical position that derives its appeal from the individualistic, competitive philosophy of West that was supported by Darwinian theory, and more recently by the biologists who attribute "selfishness" to genes.

Kagan 2009: 177

The discussion about rationality and human values in science also may have some implications for management issues. Science is more theoretical and speculative. Management is a more practical activity. The realms of concern related to social sciences and management do not totally coincide but do overlap. All in all, the social sciences and management face a common problem of human values only differently accentuated. Both value-free science and formalistic management are completely idealistic concepts and inadequate to reality. But nothing else drives human beings so much as ideas with ideological flavour. All that needs to be done within a neoliberal paradigm is just a proper constraint of informal imperfections. According to Myrdal (1944), all conflicts of values in social sciences are resolved through rationalisations which bridge incoherencies by belief systems. Absolutely formal management is very rigid and inflexible like strict bureaucracy. But there exists even a slightest possibility that bureaucratic or military command can be distorted by informal predisposition of values. And it is not a final disaster for any hierarchical organisation because only this way a survival of organisational structure is maintained. Inflexible and rigid hierarchies resemble technical structures capable to perform a finite set of functions. They are doomed to failure of performance in case of new unexpected challenges in economy, society, politics, and military. The management as an act of making decisions and of organising is directly dependent on norms and values. Normativity has framed and directed all human actions. A rational machinery of capitalism is trying to tame and to domesticate informal human values in usual way of "capitalisation". That is why the notion of social capital has been introduced. The properly handled social capital should become another useful factor for profit making. But the model of social capital has been flawed from the beginning. Actually, it is one of the best examples that zealous commitment to rationality is itself irrational (Stiglitz 2010). The whole division of human values into formal/informal and rational/irrational is something inappropriate in the 21st century because of obsolete Cartesian dualism of mind and body. But it is exactly what the prophet of rationality and Rockefeller type of intellectual Fukuyama (2000) is trying to do. He is a grand thinker but his inclinations on validating the presence of hierarchies by 'human nature' contain pseudo-religious flavour like also fake entity of Homo Hierarchicus.

Fukuyama's book *The Great Disruption* (2000) is some sort of response to the rising civil society and new ideas regarding a reconfiguration of organisational framework in order to replace hierarchical structures by spontaneous networks having higher degree of freedom. It sounds like discarding vertical top-down framework of domination and introducing horizontal spontaneous network with less hierarchy. This seems very promising and Fukuyama (2000) does not attack that idea straightforwardly. And he is right in own terms because this classification of social order (hierarchical order vs. spontaneous order) is endorsed by him personally. There should be some precautions in order to analyse Fukuyama's 'rational' proposal because it hides a rhetorical trap with arbitrary extreme cases of "hierarchy" and "spontaneity". It should be relevant to follow Barthes's (1992) advice, "... how absurd it is to try to contest our society without ever conceiving the very limits of the language by which (instrumental relation) we claim to

contest it: it is trying to destroy the wolf by lodging comfortably in its gullet” (p. 8). Fukuyama (2000) is very well aware about complex systems and chaos theory which cannot be denied. Self-organised non-deterministic ‘schools’ are common case in the nature. But his universe of norms in Figure 1 (Fukuyama 2000: 148) actually is framing an intentionally selected piece of reality. It is a very ambiguous framework because this kind of “selection” is close to arbitrary “creation”. In other words, it is an ideological preaching in the name of rationality with guise of “objectivity”. The selective interpretation of meaning and manipulative game with causal links imposes certain affirmative values. Fukuyama (2000) has assigned to social capital all norms which prevail outside hierarchical authorities. Obviously, the idea is to combine social capital and civil society in order to ground and purify the presence of authority.

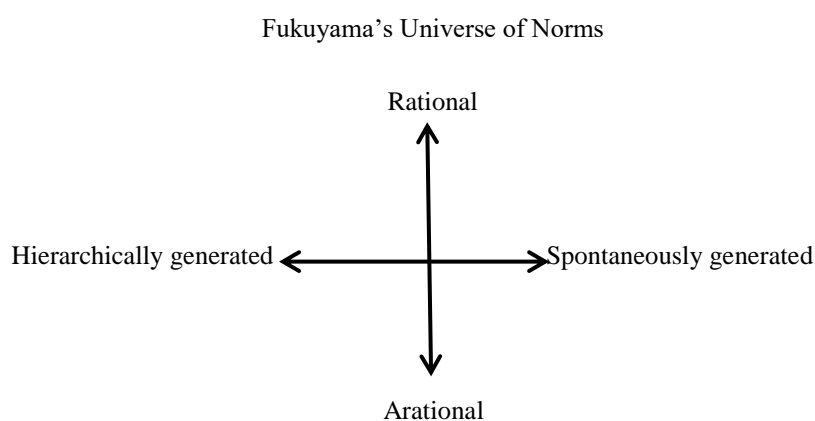


Figure 1. Fukuyama’s a four-quadrant matrix of possible types of norms

Following Fukuyama (2000), hierarchy is a source of formal social rules imposed by authority (bureaucratic, religious, etc.) and spontaneously generated norms mostly are informal, inherited. The definition of rational norms has indicated what is wrong with rationality itself – allegedly, these norms are chosen after rational choice in rational discussion. The only discrepancy in this definition is, namely, who sets the terms of discussion. The whole scheme displaying how norms are distributed has merely illusory appearance of symmetrical allocation. All arational and spontaneously generated norms are presupposed to pass a “filter” of rationality and hierarchy. Alternatives are left aside as rejected and unapproved (or just simply ignored and not considered) till the next ‘rational discussion’. Within hierarchy the authority ‘makes rational choice’ from available “pool” of spontaneous and informal norms. The definition of rational choice is inconsistent due to inability to define exactly what is meant a “rational”. More than this, Kagan (2009: 169) has pointed out, that

A popular definition of a rational decision asserts that it is the best means of gratifying a wish based on a conclusion derived from the gathering of an optimal

amount of information. This abstract definition fails to stipulate the best means of gratifying a desire or the meaning of an optimal amount of information.

The presence of sovereign authority has presupposed the dialectical tension between 'rational' and 'arational' like that one in paradox of Master and Servant relation introduced by Hegel. The major idea behind this paradox is that Master and Servant cannot exist without each other because they fulfil each other's existence despite hierarchical conflict. Fukuyama's (2000) four-quadrant matrix has reduced a complex world into a picture with fixed and polarized categories. It's a partial worldview and a perfect example of 'applied metaphysics' as warned long ago by Marx (1937 [1847]). Following him, everything which is reduced to logical categories has been just the abstraction of social relations. F. Fukuyama's (2000) approach has been entangled with his own religious sources even though exclusively referring to Max Weber.

The norms that produce social capital, by contrast, must substantively include virtues like truth telling, the meeting of obligations, and reciprocity. Not surprisingly, these norms overlap to a significant degree with those Puritan values that Marx Weber found critical to the development of Western capitalism in his book "The Protestant Ethic and the Spirit of Capitalism".

Fukuyama 2000: 17

It seems that Fukuyama (2000) has attempted to extend a Weberian framework upon current social issues but this intellectual jump from the end of the 19th century has been ended as naïve "Americanism" with self-confident superiority. The most explicit of Fukuyama's (2000: 17-18) examples of social disruption are from non-Puritan areas like Latin America or Southern Italy. Puritanism in his sense is a bridge transferring informal family values into external formalised activities such as doing business. Fukuyama (2000) has intended to present more soft and flexible version of 'Newtonian mechanistic' top-down organisational structure. The 21st century represents quite challenging time period for that kind of hierarchical organisations with deeply ingrained formal routines. For example, the management theory has been seriously considering biological metaphors for organic bottom-up organisations. So, in order to counteract anti-hierarchical trends in management theory Fukuyama (2000: 222) has saved his own "biological" argument for Homo Hierarchicus – "people by nature like to organize themselves hierarchically". The main idea behind this statement is transmitted in strikingly "obvious" terms: the dominance in hierarchy increases the level of serotonin in the brain according to the studies of chimpanzees' competitive sexual selection and their fights for alpha male status. Fukuyama (2000) has equated it to the similar impact of antidepressants known as SSRIs (selective serotonin reuptake inhibitors) with such brand names like Prozac, Zoloft, Celexa, etc. Besides that, he has claimed that higher status within hierarchy brings better emotional reward because recognition is supposed to be one of the basic social needs for human beings. And this is exactly the same point where Fukuyama's (2000) Homo Hierarchicus project starts to fall into pieces not reaching the final stage.

The explanation of phenomenon in causal terms has always persisted in the realm of cause-effect studies. It has become a formal way of “doing a proper science”. Effectively revealed causal links enables to predict future processes or to retrodict into the past but this is only a part of the story. The prediction and retrodiction have remained as ideal forms of scientific activity which still has not been realised throughout sciences. The overwhelming success of Newtonian physics for a while had provided universal paradigm to be followed by all scientists. But later discoveries of natural sciences, especially in biology and chemistry, were not completely affirmative in regard to this mechanistic approach. Human behaviour, as social processes in general, does not obey to certain “laws” though some regularities and patterns may exist. Besides which, even physics including thermodynamics, quantum mechanics and complexity theory does not wholly rely on Newtonian and Cartesian premises. Predictability assumes controllability, such as ability to control future events and prevent crises. But historical record of successful social predictions is not impressive. The problem is not the precision itself but the whole concept of cause-effect. The expectations built on past regularities and routines cannot help to avoid huge disasters and failures in the future. The mechanism of cause-effect works pretty well in mechanics in clockwork fashion. The decreasing power of Church and religion has empowered a new secular theology of amelioration – a progress. This way of reasoning presupposes the developmental pattern of growth towards ‘higher’ social forms. The dependence of current state on previous one means the ability (or, at least, the aspiration) to predict future state. This is a backbone of the linearity concept or, in other words, reversibility (Figure 2).

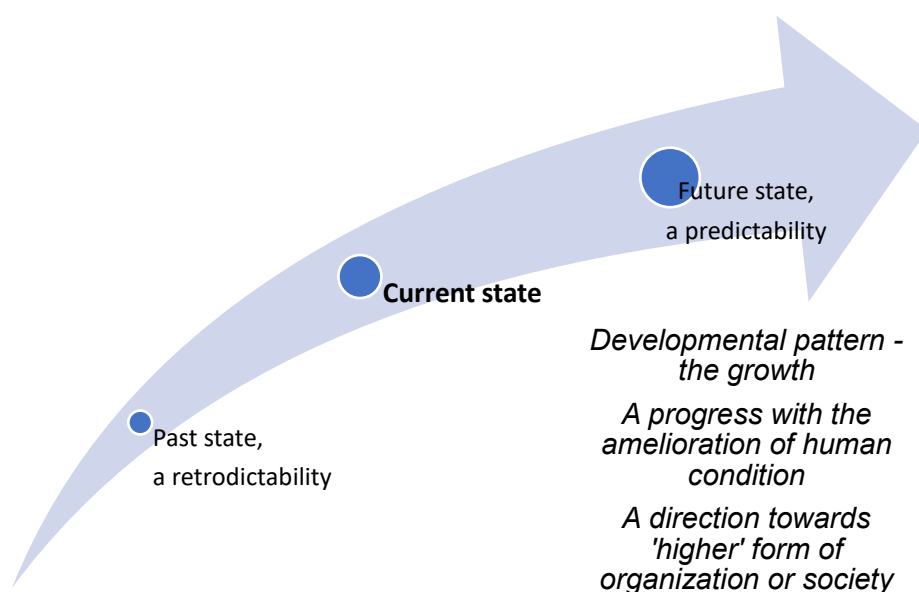


Figure 2. Linearity

The notion of reversibility is borrowed from classical physics. With given laws and formulas it enables precisely to retrodict or predict the past or future states of physical processes. In case the precision is unachievable it can be replaced by the calculus of probability. One of the prominent model assumptions of this kind is Markov Chain – a sequence of vectors with probability criterion where each vector in sequence depends

only on previous state. A probability gives a wider account for quantifiable result but it still has retained a restraining power. So, not surprisingly, deterministic predictions or probabilistic calculations are quite useful in sustaining hierarchical structures because they frame strategical planning and provide top-down consolidation. But social complexity and uncertainty do not surrender themselves to finite formalisms as easily as the theory may expect. First of all, future oriented calculations and planning tend to disguise the projection of many interest for maintaining power relations within hierarchies. The hierarchical organisation projecting itself into the future needs some sort of 'clarity window' based on rational values. It is like a set of parameters within which organisation fits itself. And, consequently, each link (or position, or employee) in hierarchy is granted a permission to act within certain limits of responsibility. It gives a false sense of security and consistency because social reality consists of non-linear processes too.

The formal rigidity of hierarchical structures bears some resemblance to rational agent-based modelling in orthodox economics. The only problem is that the idea of general equilibrium is mainly a theoretical assumption. It is impossible to predict the future by ignoring non-linear dynamics. As it is indicated by Lachmann (1998) following Schackle, the future can be imaginable but not predictable because the calculus of probabilities is relevant to groups of events but not to human choices. Other proponents of alternative approach such as Eichner and Kregel (1998) have criticized the extraordinary preoccupation with optimality in rational models where social optimality is demonstrated as if the real world was to resemble the model. The hierarchical organisation has been driven by the ideal of optimality which sets narrow goals and decreases the overall flexibility and innovativeness. All in all, economics and business management are not supposed to be identical disciplines but they both can suffer from the concept of rational expectations on theoretical and practical level. The idea of prediction may be replaced by foresight but the precise prediction is unattainable like complete foresight or perfect information.

In this case the remark of Davidson (1998) is very relevant thus suggesting the notion of accuracy (meaning "care to obtain conformity with fact or truth") instead of precision (meaning "sharpness to minute detail"). Maybe, the conformity with truth is also unrealistic even if it seems less dogmatic and not so trapped by perfectionism. In the case of hierarchical organisation precision and perfection denote the fear of loose interpretation. To put it simply, the precision of formal language is supposed to transfer orders and reports in most possible plain way without losses of information. But formalisms do not make anything simpler, they compartmentalise reality into fixed concepts with permanent meanings. This kind of affirmative permanence has ideological or even a theological flavour. It encloses organisation within restricted forms of behaviour and firm (but narrow) directions for the future. Presumably, evolutionary development favours "the fittest" capable to exploit opportunities and to calculate possibilities. But quite often the notion of "fitness" is taken out of context and separated from the idea of adaptive processes. Thus "fitness" has become a justification for current

state of affairs as a frozen moment in the presence. From this point of superiority, the future is predicted and the past is retrodicted in terms of higher authorities within hierarchical structures.

Interestingly, yet this does not provide with genuine picture of future but also distorts the past. Critical analysis has suggested that from historical perspective rational explanation is mere a foundational myth. The modern theology of progress and rationality is relatively young one and not necessarily indispensable. It has managed to become dominant due to the rise of capitalism in the 19th century. Mechanistic worldview and large-scale industrialisation have imposed a belief that “discovered” social laws will pave a way to the brighter future and more sustainable society with fewer grievances. All what has been expected is just to follow and obey ‘invisible’ market forces. In this regard, Russell has issued a relevant warning, “the same laws which produce growth also produce decay” (Russell 1956: 81). Supposedly “discovered” social laws should be better declared as coincident regularities and routines. Holland and Oliveira (2013: 48) following Hume and Smith have indicated the deficiencies of premise-dependant ‘systems thinking’, “...Hume’s stress that what is perceived depends on the habitual dispositions and values of the perceiver, has implications for suggesting that that there is no ‘value free’ social science and while decision makers on markets allegedly have been guided, as it were, by an invisible hand, most of them have been driven by values, beliefs and dispositions less than consciously acquired from life experience and education ...”.

‘Systems thinking’ with assumed neutrality of knowledge has maintained the idea of formal hierarchies in management theory. From critical point of view, it is not just simply erroneous thinking because it may be useful in maintaining impersonal but pervasive mechanisms of control. This kind of delusional approach can pose a significant danger to the existence of organisation. The disregard for the human values and insistent argument for cause-effect relations can result in circular reasoning which comprises methodological vicious circle. This leads to the construction of systems of thought and models then taking an action and behaving “‘as if’ the world matches these” (Holland 2015: 112). Hoover (2003: 220) has recounted one of the insightful reflections by Isaiah Berlin that human beings tend “to find a unitary pattern in which the whole world of experience, past, present, and future, actual, possible, and unfulfilled, is symmetrically ordered”. Hierarchical structure of organisation, as it is expected, should ensure the survival and maintain institutional ‘fitness’ within economy. Bankrupt of firms usually are explained in rational terms like miscalculations of management, inability to react to the change of demand, modified market regulation by government, etc. But deeper analysis can reveal the inner self-destructive drive within ‘rational expectations’. This is a vicious circle – an irrational adherence to rational value-free modelling. The impressive failure in 1998 of speculative hedge fund Long Term Capital Management, run by the Nobel laureates Merton and Scholes, has exemplified the inconsistency between econometric predictability and real market fluctuations. ‘Scientific method’ did not help in managing long-term financial investments. Highly sophisticated mathematical calculations ignored Keynes’s claim “that there was no basis for predicting long-term

expectations since these depended on group and mass psychology” (Holland 2015: 115). Certainly, the ‘fitness’ of many firms needs to be “corrected” by external market regulators like in case of tightening the control of financial sector. Cause-effect reasoning has imposed ideological, socially conditioned and institutional constraints in unjustified apotheosis of market rationality (Holland, *ibid.*).

For such reasons, there is a need also to reassess Homo Hierarchicus. Hierarchy does not fit everybody. It is rather an imposed pattern of organisation. However, Fukuyama (2000: 227) has implied on the behalf of Homo Hierarchicus:

There is a final reason why hierarchy is not about to disappear from modern organizations any time soon: human beings *by nature* (italics by author) like to organize themselves hierarchically – or to put it more precisely, those on the top of hierarchies find the satisfaction that recognition of their social status brings so enjoyable that it frequently outweighs money and material wealth as a source of happiness. Those on the bottom of hierarchies like it much less, but they usually have no choice. In any case, there are enough hierarchies scattered about in modern societies that most people can end up in the middle to upper range of at least one of them. Either way, what people dislike most is not hierarchy in principle, but hierarchies in which they end up in the bottom.

Fukuyama (2000) has categorised social norms to formal/informal (rational/arational) in order to distinguish values which could be helpful to argument for hierarchies and to understate alternative proposals. But his statements like assigning informal values to organised crime or promoting hierarchy as more transparent than networks do not seem persuasive enough. It is quite noticeable that author feels about it similarly. And here comes the strongest arguments tested in various ideological battlefields – biological and religious ones. The invoked ‘by nature’ really sounds like unquestionable ruling by a judge without any right to lodge an appeal. Previously mentioned connection between chimpanzees’ competitive sexual selection and the higher level of serotonin within alpha males’ brains is the striking example of flawed cause-effect reasoning. There are several counter-arguments against this way of making correlations and exploiting them within different contexts just for the sake of defending controversial belief. The image of a boss as an alpha male has been more widely accepted than challenged. Let’s assume for the moment that this allegation has some realistic foundation. It is impossible to have a perfectly clear picture of everybody’s sexual life but this does not seem to be a common practice, at least in ‘civilised’ part of the world. It is highly doubtful that a head of bigger firm or corporation will “have” all female subordinates in “this” sense with due respect to his potential and possible desire to do “it”. There are many moral, judicial and physical obstacles in this regard including famous ‘business first’. Alpha male status works better as affirmative shield for imposing hierarchical solutions but less so as a foundational premise for hierarchy in modern organisations.

But this little provoking thought experiment is supposed to draw a closer attention to the issue of “hierarchical” happiness or, in other words, the myth of serotonin. Serotonin as a chemical compound within human brains is widely expected to be a physical substance

of happiness or good psychological well-being. The shortage of serotonin and depression is a causal link admitted in psychiatric practice. Fukuyama (2000) has operated a double causal link of serotonin – non-depression and non-depression - hierarchy. And, of course, chimpanzees because they are always first, before human beings. But let's leave chimpanzees aside now, they simply deserve some respect. The series of causal links in linear fashion are used to build an argument but sometimes they conceal serious gaps. For example, the problem with serotonin addresses the challenge of analysing statistical data and interpreting medical research. Selective serotonin reuptake inhibitors (SSRIs) is a very popular group of antidepressants which increases the level of serotonin in brain thus presumably curing of the depression. But there is extremely disturbing statistical data of antidepressants' consumption (it presupposes a distinct market with certain patterns of consumer behaviour), especially in the United States. According to the US National Health and Nutrition Examination Surveys 2005 – 2008 (by National Centre for Health Statistics – NCHS), antidepressants were the third most common prescription drug taken by Americans of all ages and the most frequently used by persons aged 18 – 44 years in 2005 – 2008. Thanks to Pratt, Brody and Qiuping Gu (2011) who have sorted out NCHS data, there is indicated nearly 400% increase of antidepressant use in the United States among all ages from 1988–1994 through 2005–2008. Some eleven percent of Americans aged 12 years and over take antidepressant medication. Of course, antidepressants are used to treat not only depression but also various forms of anxiety disorders. The problem has gained a truly pandemic scale and if Fukuyama's causal links are reversed it can be tempting to discuss a failing idea of hierarchy within modern society. But there is no need "to play" under the same principles of cause-effect reasoning. People can be frustrated and anxious, many of them search for the easiest and simplest solution in order to counterbalance experienced emptiness in contemporary society such as Durkheim's anomie. It is obvious that classical hierarchical systems cannot provide a relevant answer to actual social challenges. It does not sound as adequate proposal. Troubled people cannot necessarily find a suitable hierarchy to 'fit in'. Indeed, hierarchy itself may be more a problem than a solution. This story of serotonin shows how it is possible to reverse cause and effect in order to manipulate people's mind. As also Hume's ("An Enquiry Concerning Human Understanding", [1748]) case that while we can assume cause-effect, we cannot necessarily prove it. The biological foundations of human behaviour cannot be reduced to mechanistic interplay in terms of formal models. The supposedly failing mechanism should be fixed by replacing broken parts or by refuelling. Such way of reasoning has monopolised the decision making by disseminating rigid patterns of solutions which become strictly protected by copyright.

But the monopoly of expertise does not assure the relevance of problem treatment despite assumed objectivity and rationality. Ubiquitous formalisms pretend to claim undistorted universality but social complexity (and critical thinking) has eroded this worldview. Kagan (2009: 54) has noted that "current obsession with the biological bases for all deviant behaviors or unwanted moods" is due to increasing political power of the major pharmaceutical companies. Kirsch (2014) has made a thorough analysis of pharmaceutical tests for antidepressants. It has revealed many issues on institutional,

industrial and theoretically scientific level regarding the regulation of market and researches on serotonin. If depression is treated according to chemical imbalance theory then a lack of serotonin is supposed to be a primary reason of illness. But there is a wide range of side effects of antidepressants'. Sexual dysfunction affects 70 – 80% of patients on selective serotonin reuptake inhibitors (SSRIs), long-term weight gain, insomnia, nausea, and diarrhoea. Kirsch (2014) has indicated that approximately 20% of patients attempting to quit taking antidepressants show withdrawal symptoms similar to seeking to addiction. Other issues include increased idealisation of suicide among children and young adults, increased risks of stroke and death among older adults, increased risk of miscarriage or birth malformations for pregnant women. With the consequence that “antidepressants increase the risk of relapse after one has recovered” (Kirsch 2014: 132). This analysis has uncovered that serotonin has shaky foundations. It also is possible that the US Food and Drug Administration (FDA) use flawed procedures to approve drugs. According to Kirsch (2014: 130),

The FDA requires two adequately conducted clinical trials showing a significant difference between drug and placebo. But there is a loophole: There is no limit to the number of trials that can be conducted in search of these two significant trials. Trials showing negative results simply do not count. Furthermore, the clinical significance of the findings is not considered. All that matters is that the results are statistically significant.

While reviewing pharmaceutical trials Kirsch and his colleagues did not find any significant differences between antidepressants and placebos. More simply, human beings are too complex to be cured by single chemically synthesized switches like selective serotonin reuptake inhibitors (SSRIs). Kirsch has proposed a combination of psychotherapy, antidepressants and alternatives such as physical exercises or acupuncture as the best treatment for depression. Antidepressants should be prescribed only as a last resort in severe cases. Thus, the story of serotonin has shown much more complex interactions than the simple cause-effect relations assumed by many in the medical hierarchy.

Similarly, the hierarchical mode cannot be supported by religious, or to be more precise, Puritanical sentiment. Fukuyama (2000) has referred to Weber in promoting the importance of Puritanism for establishing market relations and values which are commonly known as capitalism. The initial economic success in accordance with political and military power of state has strengthened the global dominance of capitalism. As any kind of evangelism, capitalism does not tolerate opposing values of ‘alternatives’. A peaceful coexistence does not automatically presuppose a tolerance, it can disguise a self-indulgence with satisfied (or delusional) superiority feeling. The diffusion of ‘free’ market values has been always followed by the shadow of religion. So to speak, the technique of conversion was impressively elaborated within religious practices. Even now the term ‘conversion’ has been used with strong religious flavour outside confessional usage. Moral values do not emerge from aside human experience (like out of nothing) despite being imposed by certain authorities. Anyway, there is a strong trend to incline that universal values should be cleansed from subjective differences in order to remain

objective and rational. Fukuyama's (2000) way of reasoning is permeated with evangelicalism. According to him and drawing uncritically on Weber, the merit of Protestant revolution "was not so much that it encouraged honesty, reciprocity, and thrift among individual entrepreneurs, but that these virtues were for the first time widely practiced outside the family" (Fukuyama 2000: 18). He submits that a more advanced and developed religion (i.e., Puritanism) has outmatched a backward one (i.e., Catholicism). By contrast, Tawney (1954) has been strongly critical of Weber, submitting that in his "Religion and the Rise of Capitalism". The Protestant Reformation should not be seen as monolithic movement solely responsible for the rise of capitalism. The detail, as always, matters,

Where Lutheranism had been socially conservative, deferential to established political authorities, the exponent of a personal, almost a quietistic, piety, Calvinism was an active and radical force. It was a creed which sought, not merely to purify the individual, but reconstruct Church and State, and to renew society by penetrating every department of life, public as well as private, with the influence of religion.

Tawney 1954: 91

Fukuyama (2000) goes further with the "purification" process in his view how rational/formal values are constructed, deploying the concept of social capital, as "purification" on behalf of society. For example, informal values are good in maintaining family's bonds but in public affairs may result in nepotism. Yet Fukuyama "restrains" informal values within a double straitjacket. First as just indicated, he 'capitalises' them under high sounding label 'social capital', which has advantages and disadvantages. For, by analogy with physical capital, there is a big danger of destructive misuse. Physical capital can be turned into production of killing devices, while social capital can sustain organized crime or nepotism. Secondly, the label 'capital' itself presupposes the existence and even necessity of an owner or efficient manager. It is a sin to mismanage a capital, which needs a higher authority, implies the need for a secular saviour and rationality embodied in formal hierarchies. Everything has to be under control. A "purified" social capital has to be embodied in formal hierarchies for the common good. Fukuyama's (2000) rational procedure of "purification" therefore should eliminate the deficiency of informal values (social capital). So-called objective outcome of this process should gain some sort of universality such as in the hierarchical structures of modern organisations. The problem is that this pattern does not fit social reality. Fukuyama's approach is not convincing because it is constructed on flawed cause-effect reasoning. There is nothing wrong with cause-effect reasoning in physics or engineering but human behaviour has too much of uncertainty. Too big preoccupation with cause-effect framework for social reality has something arational in itself. Though Fukuyama (2000) has indicated Puritanism as initial driving force for universal and rational values, the question still remains to be answered: does the hierarchy originate out of necessity to control a chaos of informal values? Is there any need to "purify" them? The question is valid, but the answer is complex. For, as Tawney, with reason, submits:

...The heart of man holds mysteries of contradiction which live in vigorous incompatibility together. When the shrivelled tissues lie in our hand, the spiritual bond still eludes us. In every human soul, there is a socialist and an individualist, an authoritarian and a fanatic for liberty, as in each there is a Catholic and a Protestant.

Tawney 1954: 176

The developmental way of reasoning since the 19th century has been captivated by the idea of directional evolution. It has a tendency to assume a coherent direction of change what monopolizes foresight by narrowing a range of alternatives. Besides which, it requires a set of criteria to validate a proper or 'higher' phase of development in comparison with previous one. Yet, as stressed by Pareto, no one knows for sure how the past may relate to the future whereas this kind of imposed worldview "celebrates" a continuous path to certainty on its own terms. The directional development supplies a narrative about uniting the previous scattered lines of evolution into common one containing shared aspirational values. It resembles a graphical structure of hierarchy – lower-ranking positions subordinated to middle-management which is accordingly subordinated to superior management, etc. At the highest end of each hierarchy is the head of organization who embodies the aspiration for growth and delineates intra-hierarchical relations. But Fukuyama's reasoning about the rise of hierarchy and, respectively, Homo Hierarchicus is dependent on 'rational' simplifications. The idea of cause-effect itself isolates explained phenomena in order to avoid complications. It is a closed system of thought mainly preoccupied with closed models in order to be secured from 'distortions'. As the result, a model has been separated from reality, and studied phenomena have been explained endogenously. For example, the notion of 'free market' is explained separately from society and state. In this case, a 'free market' has been endowed with its own laws of interaction and evolution – rational expectations, equilibrium, the survival of the fittest, etc. Braudel (1992: 225-226) following Karl Polanyi has strongly criticised this sort of approach, "...the economy is only a 'subdivision' of social life, one which is enveloped in the networks and constraints of social reality and has only disentangled itself recently (sometimes not even then) from these multiple threads".

A historical analysis can reveal a more fundamental complexity within the social realm. The rise of modern capitalism and liberalism is usually associated with industrialisation in the 19th century. But even such industrialisation itself is not a completely modern phenomenon. There were huge enterprises in the Northern Italy, 13th–15th centuries, involving banking networks, industrial activities and global trade. Most interestingly, as indicated by Braudel (1992), a patriarchal mode was not an obstacle for international business. To the contrary, it was a common way of handling business. Servants and other employees were 'assigned' to certain household enterprises. The family household was literally a business headquarters and all hired employees had to follow family's rules which included traditional values. So, neither Catholicism nor family values (contrary to "Puritanist" theory) had prevented the emergence of highly vital business practices. After

the geographical discoveries of Columbus, the importance of Mediterranean Sea had started to shrink. Accordingly, this ended the dominance of such economic centres like Genoa or Venice. Braudel (1992) has emphasized another significant factor in the history of commerce – the State – which is usually neglected in current theory of economics or management. The history of the modern state and organisation were deeply interconnected, “...the most colossal of modern enterprises, the state, helped others to grow as it increased in stature itself” (Braudel 1992: 443). Since the 17th century monopolies rather than competition also became very important fiscal instruments for the state. The distribution of monopolistic privileges in certain sectors of overseas trade were supposed to help the state in financial difficulties. The granted monopoly fostered a duplication of organisational structure between the state and companies.

The conclusion to be borne in mind for the present is that the power apparatus, the might that pervades and permeates every structure, is something more than the state. It is the sum of the political, social, economic and cultural hierarchies, a collection of means of coercion where the state’s presence is always felt, where it is often the keystone of the whole, but where it is seldom if ever solely in control. It may even be eclipsed, or destroyed; but it always reconstitutes itself, unfailingly, as if it were somehow a biological necessity of society.

Braudel 1992: 554-555

The power apparatus of the state has become everywhere present, but not necessarily explicit. A hierarchy has been sustained by the delegation of power from the state in terms of tradition and law. Every new employee enters the relation not only with employer but also with the state. It does not have to be only a welfare state with explicit judicial enforcement on labour regulations. A violation of job contract mainly presupposes a breach in hierarchy, and vice versa. A hierarchy is a sanctioned form of organisation. The presence of state has been disguised by various “foundational” mythologies.

A myth can be defined as a narrative about the origin of our world and as authority due to intergenerational transmission. A mythical account has been extended to almost mystical realm of genesis regarding to which even contemporary science cannot provide final answers. A myth is a mixture of creativity and curiosity that it may be a precursor for scientific thought (Popper 2008). At this point epistemological values meet moral ones because human beings are both observers and participants within a myth such as of ‘scientific progress’. This has been echoed as a problem of detached observer and ethical responsibility in the scientific framework. Kolakowski (2001) has claimed moral constraints of ‘mythical reality’. By surrendering to the ‘objectifying gaze’ of myth human beings as participants do not view the current moment of their own existence as a new absolute beginning which gives to myth “a universally valid, generally binding, and universally human meaning” (Kolakowski 2001: 19). Consequently, it leads to ‘unconditional obligation’ which is not a part of knowledge but nevertheless is a key element of human survival because fundamental answers to simple dilemmas of “good or evil” cannot be neglected. But the epistemological value of myth, if without moral

implications, has been appreciated by a range of scientists too. Many mythical narratives belonging to different ethnic groups include common explanatory patterns. For example, cosmological theories still have cohered quite significantly with mythical reality. What makes a myth so important for science is its universality and pervasiveness. Transcendent universality is one of the greatest aspirations of Newtonian science. It is oriented towards constructing the one and only algorithm which should supply solutions for all scientific problems including social ones. But this kind of Universal Theory of Everything has failed even in physics (Barrow 2007). As mentioned previously, human beings rarely are capable of effective retrospection and much less of precise foresight. Newly emerged dominant values, such as these of markets, can have equivalent power of influential religion though they have appeared only two to three centuries ago. The past moment becomes a historical nebula where interpretation of the meaning can easily mingle with manipulation of the meaning. As Midgley (2003) puts in:

Myths are not lies. Nor are they detached stories. They are imaginative patterns, networks of powerful symbols that suggest particular ways of interpreting the world. They shape its meaning. For instance, machine imagery, which began to pervade our thought in the seventeenth century, is still potent today.

Midgley 2003: 1

The Church has lost its consolidating and explanatory authority starting since Renaissance. But it was the State which lost more in vanishing religious authority as it needs a system of values which should justify state's existence not only in physical but also in moral terms. The absence of this leads to its delegitimation. Of course, that does not presuppose a total collapse of society because society cannot be equated with the State. However, social complexity has not been subjected to ideal categorisations or precise distinctions. There is no doubt, that some social groups are fused with a state apparatus, therefore state problems may be perceived to contaminate society and vice versa. So, as the State needs certain mechanisms ('machine imagery') to channel passions and other "arationalities" a proper alternative substitution for religion was introduced – science. Scientific discoveries regarding astronomical and physical laws were impressive because they showed another kind of perfect regularity than God. The ultimate promise of religion has been replaced by science. Midgley (2003: 20) has made a very important observation in this regard: "the connection of physics with other studies is not itself a part of physics". This connection can be established by philosophical speculations or...myth (including the myth of rationality). A myth with its universal pervasiveness is privileged in not needing to disclose a beginning (or premises) but it is able to generate both values and norms. Human beings are susceptible to myth-like narratives and only critical analysis can reveal its flaws. Simply speaking, a myth is helpful instrument to transform scientific metaphor into what then is assumed to be scientific fact. A clockwork mechanism metaphor has invaded the social realm as exemplified by so called scientific management – Taylorism. The production-line philosophy of 'one belt way' fits a hierarchy which is a direct heritage of industrialisation. Not surprisingly, industrial way

of thinking and mode of activity are prevalent in those modern organisations where strong hierarchy is found including scientific institutions

A hierarchical structure for an organisation is justifiable and necessary in many areas of public administration and business. But from a critical and historical point of view it is not plausible to justify a hierarchy because of 'natural' and 'rational' necessity. It leaves out of picture many creative and productive alternatives on how to organise and manage social activities. The human aspiration to tame Nature has turned out into more ambitious one – to manage uncertainty. But this growth of ambition is not exclusively supported by the increased capacities of human reason. The progress itself did not diminish human anxiety and fear. Much that allegedly is improved only may be a more sophisticated technique to “repress disturbing human experiences” (Hankiss 2001: 9). A hierarchy definitely looks like a haven for existential (and professional) security in front of present uncertainty (which, actually, was never absent). As it is emphasized by Hankiss (2001: 1-2), a fear is a major factor for human existence,

In order to mitigate this fear, human beings and communities have surrounded themselves – not only with the walls of their houses and cities, with instruments and weapons, laws and institutions, but also – with protective spheres of symbols: myths and religions, values and belief systems, hypotheses and theories, the shining constellation of works of art. In a word, with a brilliant construct: civilization.

A variational evolution has enabled human beings to possess and improve a great variety of ways to organise their activities. A hierarchy is not a unique solution to achieve the best possible results. Human happiness is a vague notion but a hierarchical structure of modern organisation is not the only mode of management to satisfy creative and socially responsible professionals. Blurred lines between formal and informal ways of management have given a chance for 'hybridized' social activities like social entrepreneurship (Jensen 2010). There are many common ideas elaborated for both sciences and management in order to gain more autonomy from formalised frameworks. Interdisciplinary studies may prevent narrowness and short-sighted specialisation, so for modern organization plagued by formal procedures and short-sighted profit seeking a good option is 'synthetical' management (Fontrodona 2002). 'Synthetic' functions of management can enable pluralism such as allowing follow scientific inquiry thus embracing management inquiry – a new business idea is proposed to be treated like research hypothesis. Besides which, management practice can be enriched by complexity theory (McMillan, 2008). According to her, management should treat a change as normal process and preserve the organisation on 'the edge of chaos' “where the parts of a system never quite lock and yet never quite break up either” (McMillan 2008: 55). It also is important to keep in mind Dyson's remark (1979, 1997) that all quantitative changes in the long run turn into qualitative ones. A hierarchy being available as such nevertheless is not a natural or social necessity. Homo Hierarchicus, like its “cousin” Homo Economicus, is just another rational fiction.

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The Social Sciences in a Chaordic Age: A Search for New Meaning and Relevance*

Jody Jensen

Every original idea is imaginative, because only imagination can trigger creativity. This is why imagination is just as essential in science and technology as in the arts and humanities. The difference between these two pairs of fields is that in science and technology imagination is disciplined rather than free.

Mario Bunge 2012: 1

Introduction

In science fiction novels, the 21st century is usually described as either the century where everything went wrong, or when humanity finally got it right due to some miraculous transformation. We do, in fact, need to discover alternatives, soon, before we create even more suffering through the reckless misuse of the natural system.

Other formulations for the present age include 'Axial Age' (Karl Jaspers) that describes how people all over the world are struggling to find new meaning in the very new conditions of existence as a result of industrial, technical and communications revolutions. The existential need for meaning and comfort now require, some believe, a new spiritual revolution (Karen Armstrong), or a global awakening (Michael Shaker) which envisions a paradigm shift from a mechanistic world view to an organic world view.

The period we live in has been characterized as the end of history, empire, the nation state, neo-liberalism, the end of Europe, and the end of the world system. The contemporary period has also been described in terms of "civilizational crisis." In another framework we are living in a Age where the science of complexity – the behavior of self-governing organisms (organizations or systems) – harmoniously or disharmoniously blend the characteristics of order + chaos, and is neither hierarchical nor anarchic. It can be characterized positively and negatively, but it is an unstable, uncertain, and transitional age with no clear sets of rules.

The question to social scientists in this chaordic age of discontinuities, is how do we renew our increasingly marginalized disciplines, with inter- and trans-disciplinary research that redefines our key terms and provides alternatives to the challenges we face. How do we reinvent the social sciences today in order to become more relevant to the societies we serve?

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According to Stephen Gill (2000), politicization “from below” may constitute a major, if not revolutionary, change in the emerging world order, which could perhaps be more democratic.

We do indeed stand at a moment of transformation. But this is not that of an already established, newly globalized world with clear rules. Rather we are located in an age of transition, transition not merely of a few backward countries who need to catch up with the spirit of globalization, but a transition in which the entire capitalist world system will be transformed into something else (Mittleman 2000: 262).

The question put to social scientists in this chaotic age of discontinuities, is how do we renew our increasingly marginalized disciplines, with inter- and trans-disciplinary research that redefines our key terms and provides alternatives to the challenges we face. How do we reinvent the social sciences today in order to become more relevant to the societies we serve?

The Problem with Science

In his book, *Science Set Free: Ten Paths to New Discovery*, Rupert Sheldrake (2012) discusses the ‘scientific worldview’ that has become dominant, influential and successful in modern sciences today. He agrees that our lives have been profoundly influenced by the advancement of scientific endeavor in medical research and technology. This has transformed the way we view ourselves, our societies and our place in the cosmos. But, he says, “in the second decade of the twenty-first century, when science and technology seem to be at the peak of their power, when their influence has spread all over the world and when their triumph seems indisputable, unexpected problems are disrupting the sciences from within” (Sheldrake 2012: 6). Sheldrake says that most scientists accept that these problems will eventually be solved by continuing the same kind of research and practise from which the problems and tensions emerged, and this he believes reflects a deeper and more serious problem regarding scientific inquiry (Sheldrake 2012: 6). Sheldrake argues that science is being held back by old assumptions that have become dogmas, the biggest of which is that science already knows all the answers, and only the details need to be worked out. The contemporary scientific creed is based on the 10 core beliefs or dogmas below:

- 1) Everything is essentially mechanical.
- 2) All matter is unconscious.
- 3) The total amount of energy and matter is always the same.
- 4) The laws of nature are fixed.
- 5) Nature is purposeless.
- 6) All biological inheritance is material.
- 7) Minds are inside heads and are nothing but the activity of brains.
- 8) Memory is stored in material traces of the brain.

- 9) Unexplained phenomena such as telepathy are illusory.
- 10) Mechanistic medicine is the only one that really works.

Sheldrake's arguments are presented with many clear examples that show how these beliefs compose the philosophy or ideology of materialism, where everything is essentially material or physical, even the human mind. His purpose is to "set science free," from its own dogmas to increase its relevance and credibility to tackle really existing problems.

In Samuel Arbesman's (2012), *The Half-Life of Facts: Why Everything We Know has an Expiration Date*, an anecdote is related that many medical schools tell their students that half of what they have been taught will be wrong within five years – the teachers just don't know which half. What we know about the world is constantly changing, yet our approach to knowledge and the communication of that knowledge has remained the same. The extreme technical and specialized nature of contemporary scientific discourse alienates all but the initiated, creating an increasing gulf between the sciences and the societies in which they work. This is quite surprising considering the explosion and proliferation of the information society, and the possibilities this provides for better communication and dialogue.

Arbesman comes from the field of 'scientometrics', which is the study of measuring and analysing science, technology and innovation, or the science of science. He explains that knowledge in most fields systematically and predictably evolves. In some fields, change occurs over a few years, in others over centuries. But most of what we know are called 'mesofacts' that often change over a single human lifetime. This is important because if we are more aware of how our knowledge changes over time, we are better equipped to deal with contemporary challenges, like improvement in the allocation of resources by companies or governments, for example.

Science is absorbed with its role to explain the nature of everything, and then tries to convert others to believe in the particular methods, explanations and models. For example, since the 1960s, physicists and mathematicians have developed a framework called 'string theory' to try and reconcile general relativity with quantum mechanics. Over the years, "it has evolved into the default mainstream theory, even as it has failed to deliver on much of its early promise" (Powell 2015). Powell's article discusses the implications for Einstein's theory of relativity, and the basic assumption (going back to Aristotle) that space is continuous and infinitely divisible, so that any distance could be divided into even smaller distances. This is being questioned by Craig Hogan, a theoretical astrophysicist at the University of Chicago and the director of the Center for Particle Astrophysics at Fermilab who argues that there might be an unbreakable smallest unit of distance: a quantum of space.

What emerges from the dust-up could be nothing less than a third revolution in modern physics, with staggering implications. It could tell us where the laws of

nature came from, and whether the cosmos is built on uncertainty or whether it is fundamentally deterministic, with every event linked definitively to a cause (Powell 2015).

There have been many great feuds in science that have been popularized in accounts like Hellman's *Great Feuds in Science*; *Great Feuds in Technology*; *Great Feuds in Mathematics* (1998, 2004, 2006 respectively), of Levy's (2010) *Scientific Feuds: from Galileo to the Human Genome Project*. In many of these cases the assumption that science has successfully delivered accurate knowledge based on authoritative sources does not bear close scrutiny.

Scientists with radically new ideas have difficulty getting an audience among their more orthodox brethren. Sometimes they are ignored or rejected because of personal animosities or simple inertia. In other cases, the rejection seems to violate the canons of open-minded scientific inquiry. Through the whole spectrum of the sciences, one can document an astonishing disregard for facts which contradict fashionable theories, stereotyping of acceptable approaches to problems and theories, and the waving of academic credentials and ritual invocation of the specialist's mystique to discourage criticism from 'outsiders' (Judge 2012).

Science is engrossed with the importance of 'validation', which is most often carried out in the framework of statistical analysis, that often excludes other factors that may appear to be at least as significant if not more than others. This reflects 'downstream thinking', that is, a blind focus on imminent causes rather than on the root causes of phenomena, as is the case with many social issues and challenges, including the present migration crisis and terrorism.

Besides the obsession with validation, some other systemic knowledge processes that are neglected by science are outlined here by Judge (2012) as an expansion of Sheldrake: selective appreciation of the creative imagination; unexamined preoccupation with professional reputation and recognition (self-referencing, references in peer-reviewed journals); deprecation of alternatives and anomalies that challenge conventional models; methodological dependence on questionable engagement with society; uncritical belief of science in the appropriateness of its own process; institutionalized incoherence and disagreement; lack of recognition of the constraints and opportunities of an information society; self-referential inadequacy of 'metascience'.

In Sheldrake's (2012) final chapter, "The Illusions of Objectivity," he questions the 'objectivity' of science, by asking the question "whose objectivity?" Science praises innovation and creativity only within the currently accepted paradigm that is approved by accepted scientific authorities. For example, the imaginative reframing of paradigms

is most often disparaged by the old order, until the new paradigm comes into full being which, most often, occurs after the proponents of the old order have died.

The current practise of science inhibits creative and imaginative thinking in most fields, thereby reinforcing the general tendency to capitulate to present authorities. While the tendency of science is to deprecate or condemn alternative worldviews, there is little capacity of science to reflect on these processes and to discover more holistic ways of relating to perspectives that challenge the current order. This incapacity or reluctance is reinforced also in other sectors of society, in governance and management structures (see below), and the practise of democracy. In other words, there is an uncritical belief of science in the appropriateness of its own process (Judge 2012). This is complicated by the fact that government and industry supported scientific research is many times complicit with the prevailing power structures, on whom it depends for research funding.

Loren Eiseley (1964), wrote that all human undertakings are driven by the imagination, be they artistic, scientific, or humanistic. The danger lies in the strict enforcement of the separation of academic disciplines, and the cult of 'professionalism' based on the self-acknowledgement of approved authorities, that is depleting the creative and imaginative power of the sciences. He passionately laments the loss of the capacity to wonder in a divided, money-driven world of big science. He rearticulates, in fact, Einstein's thought: "The most beautiful thing we can experience is the mysterious. It is the source of all true art and science. He to whom the emotion is a stranger, who can not longer pause to wonder and stand wrapped in awe, is as good as dead – his eyes are closed."

Paradigm Shift

Our whole world society appears to be following a distinct pattern that occurs very rarely in history, one that has led in the past to total reinventions of the world within very short periods of time. *In short, we are in the midst of a classic paradigm shift and are fast approaching the tipping point of the whole process.*

Michael Shacker 2013: 31

The present crises are connected by a mechanistic world view that has dominated for the past 300 years and that has endangered the environment and quality of life, societies and individuals. In a mechanistic world view, we all become parts of the machine and mere objects, reified, commodified. The fatal flaw of a mechanistic world view is eloquently elaborated by Michael Shacker (2013) in his work, *Global Awakening, New Science and the 21st Century Enlightenment*. Referring to William Barret's (1979), *Illusion of Technique*, he explains that the smooth operation of the machine becomes everything in the mind of the technician; and since there is no meaning that can be derived from a machine, life becomes meaningless.

Our whole mechanistic society now reflects this meaningless and purposeless world view. ... *The illusion of technique* helps us understand this fatal flaw of mechanistic dogma and how it fails to confront reality. In short, the lure of the machine outweighs the mounds of scientific data showing the fragile interconnections of Earth and its biosphere. Social, environmental and health concerns are swept under the rug and ignored. The mechanistic paradigm is thus dysfunctional at its core – so we find ourselves in the mechanistic dilemma (Shacker 2013: 29-30).

He continues by addressing the necessity of “more-than-ordinary” thinking and action to transcend the mechanistic dilemma to extract the planet and humanity from its current precarious situation.

The crisis is further exacerbated by the collusion between big business and increasingly self-defensive, nationalistic governments who by all means want to maintain their power positions and monopolistic control of market forces. This is clearly seen in the increasing incidents of state violence by state sanctioned police forces against populations that have arisen to protest against economic and social inequalities resulting from the financial crisis and increasing economic consolidation of the 1%, as well as aspirations for a more democratic politics of participation.

What is common in the many ways the states and their authorities, and economic players react is their strong insistence on historic divided-ness and cultural differences as well as the complete lack or rejection of the holistic approach in dealing with grave social, political, economic, and ecological problems. Threatened in their existence and legitimacy, old institutions, interest groups and other powerful global, regional and national stakeholders are keen to entrench themselves and fight one another to secure their interests and survival. The new wave of disintegration and self-isolation is a result of the failure of global and regional ‘caretaker’ or ‘guardian’ institutions such as the UN, the WTO, the World Bank, the IMF or the European Union. Instead of contributing globally and regionally to more democracy, equality, peace and human security, these institutions themselves contribute to the survival of the old paradigm of inequality and division, human vulnerability and insecurity. A new paradigmatic approach should ensure the acceptance and understanding of the inevitability of a holistic view of humankind, together with its self-created institutions, markets, nationstates and means of violence. The vision and practice of a **wisdom based society** that turns knowledge into organic and holistic practices has to gradually replace the old paradigm of a knowledge-based society that was established on the premise and special historical understanding of fragmentation and division. Awareness of increasing interdependence and interconnection in various spheres of our common existence is a slow process that needs to speed up to reflect a new planetary and species consciousness.

*The Structure of Scientific Revolutions:
Medieval, Mechanistic and Organic World Views*

A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die....

Max Planck 1949: 33-34

Every world view needs to answer the fundamental questions of who we are, how we got where we are, and where we are going that is delivered in a new story or narrative frame. The current crisis of world view requires a paradigm shift which will move humanity into a new world system and mind-set. Paradigm shifts or 'flips' have occurred before. Thomas Kuhn (1962) formulated the structure of scientific revolution as follows:

- Emergence of an anomaly that contradicts the old world view. Nature violates the expectations of normal sciences and answers have to be found outside the paradigm.
- The emergence of a new paradigm or way of thought. A revolutionary period upsets the stability of the normal science period.
- Crisis ensues and there is reconsideration of the old paradigm by new thinker(s) to explain anomalies and a new narrative emerges.
- Bitter struggle develops; there is resistance to the new from old scientists; paradigm wars are fought by the new world view with facts and by the old world view with ideology.
- The new paradigm wins the struggle, and a new normal science period begins with the new underlying analogy/model, new scientific methods, and a changed set of rules.

Since humanity has experienced this before, Michael Schacker has presented the evolution of historical paradigms in the following way:

Table 1: Comparison of Medieval and Mechanistic World Views (Shacker 2013: 36)

Medieval World View	Mechanistic World View
God is responsible for all events on earth.	God or nature merely sets the universe in motion, natural law determines the rest; it is the clockwork universe of Newton.
God's creation is only 6000 years old.	The universe is very old, the earth millions to billions of years old, formed by natural forces.
There are two sets of laws: one for earth, one for heaven.	One set of natural laws governs the earth and the universe.
Geocentric universe: Earth does not move.	Helocentric solar system: the earth orbits the sun.
King and nobility have the divine right to rule.	The right to govern derives from the people; kings are tyrants.
Medieval laws and value system are designed to protect the lands and power of kings, the aristocracy and the church.	Laws and values are designed to provide liberty and equality to all men, to protect the pursuit of happiness, and to derive power from the people in a democracy.

Table 2: Comparison of Mechanistic and Organic World Views (Shacker 2013: 41).

Mechanistic World View	Organic World View
Limited mechanistic models underlie traditional science and medicine and cannot explain living systems adequately; ecological, health and economic breakdowns.	Encompassing organic/biological models underlie new-paradigm sciences from physics to agriculture, medicine, technology, economics, and psychology.
Clockwork universe: no purpose is assigned to humanity or to the universe; we live in a vast static cosmos.	Complexity-centered universe: evolution means we are always evolving to the next level.
Anthropocentric universe: planet earth is treated as a non-living thing to be exploited.	Complexity-centered universe: planet earth is shown to be a living system.
Newtonian physics is limited to the macroworld, non-living things only.	New physics studies the sub-atomic realm; law of organics and other theories explain living systems.

Time and space are quantified.	Life, evolution, and consciousness are quantified and given meaning.
Studies objects and things as separate parts.	Studies the relationship between objects and things
Old paradigm culture is based on oil, ultranationalism and militarism; huge military budgets, small foreign aid; top 1% owns 45% of the wealth.	Counterculture is based on transition from oil, world peace and sustainable development; increase foreign aid to \$50 billion to stop terrorism; new economics to eliminate poverty.
Laws and values are designed to protect the rights of men, especially corporations and men with property.	Laws and values are designed to protect the rights of all, from women to blacks, gays and all minorities, especially the poor and middle classes.
Belief that war has always been a part of human nature.	War has been invented and can be transcended in a future world of peace.

I have adjusted Kuhn's scientific revolution and incorporated Shacker's paradigm shift into our contemporary period in the following:

I. The Emergence of Anomalies, 1970s to the present

- Increase in the number of economic crises and market volatility
- Increase in the number of manmade disasters
- Population increases, as well as industrial material exploitation, put increased strain on the natural environment
- Increased concentration of corporate global power (see the definitive study by Vitali, Glattfelder, Battiston 2011).
- Increased economic inequality within and between nations and regions

II. The Backlash Phase, 1980-1995

- **Conservative backlash**, fundamentalist revivals (but they begin to slowly break down because of internal divisions and corruption)
- Rise of the New Right (Reagan and Thatcher – government is evil, free market is infallible)
- Scandals pile up: bailouts (already in 1984, a Savings and Loan bailout for more than \$400 billion), arms deals, resisting end to apartheid, Lebanon invasion, rise of Saddam Hussein, AIDS and women's rights ignored.
- Increasing environmental catastrophes: Chernobyl, Bhopal, Exxon Valdez, Fukushima – the mechanistic dilemma deepens. Recognition that the mechanistic world view can never solve the problems of its own making.

III. The Intensive Phase (1991-2011)

- Regressive presidencies
- Corporate World Domination (oil wars, GMOs)
- Activist Millennial or Phoenix Generation (Dennis 2015)
- Integrative medicine
- Global Education – the Future University ('Multiversity')
- Regenerative regional planning (e.g., Kőszeg KRAFT project, see, Miszlivetz, et.al 2014)

IV. The Transformational Phase/ Existential Challenges (2012-2050)

- Climate change, and exponential population growth repercussions and the development of alternative energy sources
- The future of employment: technological unemployment; social versus market values, universal basic income
- New economic models: prosperity without growth, green and blue economies, sharing economy and participatory economics, community capitalism, resource-based economy and the collaborative commons
- Reinventing governance, democracy and political participation
- Regenerative Revolution: New economics, technological/social innovation will replace the macroeconomics machine models of today. It will be based on organic development and the interdependence of life processes. (see, e.g., www.GlobalRegen.net, www.kraftprojekt.hu).

A Tale of Two Cultures

A great poet is always timely. A great philosopher is an urgent need. There's no rush for Isaac Newton. We were quite happy with Aristotle's cosmos. Personally, I preferred it. Fifty-five crystal spheres geared to God's crankshaft is my idea of a satisfying universe. I can't think of anything more trivial than the speed of light. Quarks, quasars – big bangs, black holes – who gives a shit? How did you people con us out of all that status? All that money? And why are you so pleased with yourselves? ... If knowledge isn't self-knowledge it isn't doing much, mate. Is the universe expanding? Is it contracting? ... Leave me out. I can expand my universe without you.

From Tom Stoppard's play *Arcadia* (1993), quoted in Jacobs (2014)

The division of scientific disciplines is recognized as both old and new. Some authors (Dirks 1996) trace the origins back to the ancient Greeks, and already in the 16th century scholars and philosophers complained about the fragmentation of knowledge (e.g., in the works of Sir Francis Bacon we clearly encounter the disruption of relations between science and social philosophy). At the base of this divergence was the rapid growth and expansion of the sciences.

For many years, Immanuel Wallerstein wrote about the two cultures of scholarship. But before we expand on Wallerstein's analysis, a brief discussion on the background of the debate is necessary. Wallerstein based his reasoning on both the lecture and publications of C.P. Snow (1959), on the topic of the two cultures, that is science and philosophy (*The Two Cultures and the Scientific Revolution*). This debate was actually introduced even earlier in the 1880s by Mathew Arnold in another Rede Lecture in 1882, entitled "Literature and Science," a clear precursor to Snow's later lecture, and in letters responding to Thomas Henry Huxley's advocacy of scientific endeavor over the study of humanities. Arnold's response takes a practical look at the education of young people, arguing "that while the study of the sciences could fill the mind with facts, the humanities could move the human spirit" (Jacobs 2014). Arnold emphasized the need for culture to be protected in order to guide human conduct in the face of moral challenges presented by modern science. This could not be more relevant today considering the challenges facing societies relating to, for example, genetic engineering, increasing weapons of mass destruction, and the underlying assumption that every problem we face has a technological solution.

What Snow later developed in his Rede Lecture in 1959 emphasized that because of the expansion of intellectual specialization in the 19th century, the sciences and humanities had become mutually incomprehensible to one another. The gulf between these two cultures of thought was deliberate and a clear product of 19th century thinking. Science was assigned the task of looking for 'truth'; while philosophy, and what became known more generally as the humanities (history, and later economics, sociology, and political science), was positioned to search for the 'good'. The progress of the last 200 years has tried to reunite the search for 'truth' and the search for the 'good' under the label of social science as established in the 19th century. In the 19th century, the disciplinary boundaries took shape at universities. After WW II, massive expansion and development of universities produced more and more disciplines and departments. One problem of the rapid growth of science was that there was too much information spread across the disciplines for any one person to handle. This has only been exacerbated in the 20th and 21st centuries with technological developments and the 24/7 provision of information to many researchers and academics.

Wallerstein observes, that rather than reunifying these two cultures, social science has itself been torn apart by the dissonance between the two distinct approaches to inquiry, or cultures of knowledge. But Wallerstein (1999) recognizes two remarkable intellectual developments of the last decades that perhaps provide evidence of a process of overcoming the split of the two cultures that points towards a more holistic approach to scientific analysis. The first is called 'complexity studies' in the natural sciences, and the other is called 'cultural studies' in the humanities. Complexity studies rejects the Newtonian science that assumed that there were simple underlying formulae that explained everything. Complexity studies, Wallerstein argues, reveals rather that formulae can at best reflect only partial reality, that may explicate the past, but never the future. This is a transformation that Ilya Prigogine (1996) called moving from a

'geometrical universe' to a 'narrative universe'. The universe is filled with structures that constantly evolve, and then reach points of inequilibrium that cannot be sustained, when bifurcation takes place and new paths are found and new structures and systems established. Although we do not know what, for example, a new world system or structure will look like, as individuals and collectives we can have more impact at these times, because we are not under the constraints of the old or emerging new world system. Therefore, the age we live in is more open to human intervention and creativity (Wallerstein 2000: 251-252).

Cultural studies do not just study culture as such anymore, but rather how, when, why and in what forms culture is produced, and how cultural products are received by others, and for what reasons. Therefore, cultural studies has moved away from the traditional humanities into the realm of the social sciences and the explanation of reality as a constructed reality.

With the move of natural science towards social sciences via complexity studies, and the move of humanities towards the social sciences via cultural studies, we are in the process of overcoming the two cultures of knowledge by recognizing that reality is constructed. This gradual process of overcoming the artificial distinction between hard and separate disciplines, and moving towards the unification of scientific and human endeavor, provides the basis not only for holistic scientific enquiry, but for the basis of new, regenerative educational models, and 'multi-versities' as oppose to 'uni-versities'. Pinker (2014) declares that instead of science being the enemy of humanities, that they both share a common enemy which is an educational system that avoids addressing the complex and varied global challenges of our age. Real and exacting critical training in any field is essential in order to prepare young people today for the uncertainties and unexpected surprises they will face.

In academic scholarship (research as well as education), particularly in the social sciences, there is an increasing tendency to try to bridge the fragmentary nature of knowledge to create truly transdisciplinary methodologies. New methodology is needed that is not tied to compartmentalized disciplinary categories that reflect and reproduce a mechanistic world view. Knowledge produced through the cross-fertilization of tools, information and methodologies requires a new type of university that can aid in the production of a complex understanding of contemporary global challenges. A 'multiversity' needs to be different in fundamental ways from today's obsolete, out-of-touch, and petrified institutions. New institutions should be 'learning' and not just teaching institutions where the co-creation of knowledge is translated into programs that promote self-reflection and self-correction, in systems, policies and societies. This way new knowledge hubs can steadily reconfigure their own capacities to include new partners and methods to assess and address changing realities. The social and natural sciences, as well as technical innovations, should also be socially responsible. In the first place, the question needs to be asked: does the research serve the interests of societies

and if so, in what ways will it be useful identifying and providing relevant alternatives for solutions to problems.

Integrative Cognitive Tools: Wholeness and the Implicate Order Revisited

...science itself is demanding a new, non-fragmentary world view, in the sense that the present approach of analysis of the world into independently existent parts does not work very well in modern physics. It is shown that both in relativity theory and quantum theory, notions implying the undivided wholeness of the universe would provide a much more orderly way of considering the general nature of reality.

David Bohm 1980: xiii

...Science is in transition to a new form of rationality based on complexity, one that moves beyond the rationality of determinism and therefore of a future that has already been decided. And the fact that the future is not given is a source of basic hope.

Immanuel Wallerstein 1999: 166-167

The main challenges are to overcome dogma, complacency and the neglect of reflection on scientific processes, 'objectivity' and underlying structures; at the same time enabling the synergistic exploration of trans-disciplinary research in order to imagine new worlds and new futures through a collective process of co-creation. This can take the form of the 'wisdom of crowds' approach by Surokiewicki (2004), Csermely (2015), among others. A brief summary of my own research is based on the inadequacy of current analytical models to assess and analyze the new methods and pervasiveness of social organization at the global level. Through the application of complexity theory and the study of the 'emergence' of new cultural forms, new narratives, and new networks under the surface of societies, a better framework is approached to account for the diversity and spread of new networks of social connectivity and activism. When initiatives emerge to the surface they can presage fundamental social and structural changes. I have found that the emergence of new 'order' in complex systems is prompted by small, singular events that result in small disorders that intensify and cause instability where the novelty emerges. If the new issues, methods, identities, structures and forms of protest are widely imitated, then what began as a singular innovation can spread within the protest system and transform it. This critical phase reflects the idea that, dependent on initial conditions, small causes can have large effects. The qualities of self-organization, networking, and synergy as emergent qualities can then be employed to construct a dynamic concept of contemporary protests.

Another application to our interconnected and interdependent planet emerges from 'entanglement theory' which describes how particles of energy or matter can become correlated to predictably interact with each other regardless of how far apart they are.

Quantum entanglement allows qubits [quantum bits] that are separated by incredible distances to interact with each other immediately, in a communication that is not limited to the speed of light. No matter how great the distance between the correlated particles, they will remain entangled as long as they are isolated (Whatis.com 2006).

Einstein called quantum entanglement a "spooky action at a distance", but it is a really existing phenomenon that has been demonstrated in experiments, although the mechanism behind it cannot be fully explained by any existing theory. One proposal suggests that all particles on earth were once compacted tightly together and, as a consequence, maintain a connectedness. This includes the particles that make up each one of us. Recent events certainly reinforce the one-ness of humanity and the crises we face together, and the need to meliorate current conflicts between each other, and between us and the planet. This kind of perspective could lead to a new understanding of our place in the universe, informing the way we conduct our behaviour.

In my research, I am also interested in 'entropy' and the application of Social Entropy Theory (SET) and the Second Law of Thermodynamics to networks, societies and civilizations. Social entropy measures the natural decay within a social system. It can comprise the disintegration of social structures and social relations. Legal institutions, as well as political and educational/scientific institutions expend much energy maintaining structures to decrease systemic entropy to try and maintain the system. But the Second Law of Thermodynamics states that entropy production is irreversible and tends to increase over time in any naturally occurring process. 'Anomie' is the maximum state of social entropy, which can lead to the general breakdown of social networks, the fragmentation of social identities and the regulatory function of social values in societies over time. Cooperation is replaced with conflict and chaos.

This kind of analysis of social phenomenon through the use of theory from the natural and physical sciences is gaining momentum. The world's problems are too complex and interdependent to be defined within traditional disciplines. The challenge and responsibility of science today is to bring together people with different backgrounds and experience since no one has all the information required to deal with the gravity of issues we are facing.

The kinds of networks of which we are part of today appear to have deeply innovative qualities of density, temporality, spontaneity, and de-territorialization, crossing time as well as space. Recently, the Japanese government has decided to phase out the social sciences and humanities, claiming that they are no longer relevant to today's world and today's problems (Sawa 2015). This action may be a bit extreme, but it does emphasize

the challenge for the social sciences and humanities to become more relevant when addressing global issues. If we are condemned to live in extraordinary times, where all known 'truths' are being disputed, and where the certainties that have operated until now have evaporated, where does this leave the social sciences?

New social sciences, connecting them with the natural sciences, is more important now than ever, and can become more relevant at times like these. In a complex world, the social sciences can act as the conscience and critique of societies and institutions. As social scientists, we engage in critical analysis that moves beyond the accumulation of data, to reflect, inform, and provide future alternatives and ways out of crisis. In contrast to journalists, politicians, and pundits, who are satisfied with soundbites, responsible social scientists accept the complexity of the age and refuse, for example, to see contemporary conflicts in the framework of a 'clash of civilizations', which inspired disastrous foreign policies for which both global peripheries and traditional centers are now paying a high price in terms of migration and terrorism. Relevant social sciences must challenge simplistic and black-and-white thinking that reduces the hopes of hundreds of millions of people into simple contrasts between good and evil. Critical social scientists insist on the complexity of the world, and that there is nothing inevitable about neo-liberal capitalism, and that the withdrawal of the state from society and from its responsibilities is not a necessity, but a political choice. The perceived breakdown of basic civility, the return of nationalism and extremism in Europe, has more complex causes than the challenges of new migrations and immigrants. This may be out of step with the requirements of one type of contemporary reality, for example, reflected in the media, that performs an unrelenting 'social acceleration' where there is no time for detail, subtlety, balance and complex thinking, but it is crucial.

Another example can be taken from the management or rather mis-management of the financial crisis. When it came, and in its aftermath, it became clear that existing economic and financial models were seriously limited, oversimplistic and overconfident and actually helped to create the crisis in the first place. This is reflected in a combination of opinions not only from people who are skeptical of the neo-liberal, unregulated, post-Bretton Woods global capitalist system, but from people who actually worked at the heart of finance and expressed concern that we do not understand the complexity or interdependence of the economic systems that drive our modern societies. We are, in fact, surrounded by systems made up of many interconnected and interacting parts like swarms of birds or fish, ecosystems, even brains, and this includes financial markets. Complexity theory tells us that what looks like complex behavior from the outside is actually the result of a few simple rules of interaction. So in order to begin to understand a system you need to look at the interactions.

Complex systems have a unique characteristic that is called 'emergence' which means that a system as a whole cannot be understood or predicted by examining the components of the system, because the system as a whole starts to reveal a particular behavior. **Therefore, the whole is literally more than the sum of individual parts.**

Networks also represent complex systems and the nodes in a network are its components and the links are the interactions.

Applying this analysis to economic networks (but also to social and political networks) is new and reveals a surprising gap in the literature and analysis. In a definitive study Vitali, Glattfelder, Battiston (2011) present, for example, the extent of trans-national company (TNC) control of global wealth and finances. The TNC network they analyzed was structured with a periphery and a center. The center contained about 75% of all players, and in the center there was a tiny but dominant core of highly interconnected companies. Although they only make up 36% of total TNCs, they control 95% of the total operating revenue of all TNCs.

After computing network control with 600,000 nodes of interconnections, they found that the top 737 shareholders (making up 0.123%) have the potential to collectively control 80% of all TNC value. What are the implications of this high connection in the core of global finance? First of all, the high degree of control is extreme; and second, the high degree of interconnectivity of the top players in the core poses a significant systemic risk to the global economy, because any disruption in the core will quickly spread through the entire system. The study concludes that the network is probably the result of self-organization which is an emergent property and that the network depends on the rules of interaction in the system.

The realization that crisis is the new normal state of affairs requires radical and innovative rethinking, and not just palliatives. For example, we need to see the market as an aspect of human existence that cannot be divorced from the rest of life, yet the possibility that we should stop and rethink the market simply does not arise. Karl Polányi (2001) in *The Great Transformation*, presented a set of interrelated and intertwined phenomena. With extraordinary prescience, he warned that crisis would come. He rejected the idea that the market is 'self-regulating' and can correct itself. There is no 'invisible hand' such as the market fundamentalists maintain, so there is nothing inevitable or 'natural' about the way markets work: **they are always shaped by political decisions and powerful private interests**. These observations and propositions were for the most part rather neglected during the past decades and by the explicit or tacit consensus of both social scientists and political analysts. In most cases analysts deal with each crisis as separate, isolated phenomena. This negligence and restricted perception (based upon the paradigm of the sovereign nation state and doctrine of independent academic disciplines) is greatly responsible for the present global turmoil which is at its heart a civilizational crisis. One of the major negative results is the lack of responsibility-taking for global or transnational disasters by the dominant players and stakeholders – from national and regional political leaders and institutions via institutions of knowledge creation and distribution including eminent social scientists.

This institutionalised irresponsibility and indifference surrounded by a tacit consensus about divided-ness as an unchangeable given is to a significant degree responsible for

undermining and emptying out democracies as well as for endangering the future of human existence on the planet. The recent return of the nation state and accompanying nationalistic cliches and prejudices within Europe and all around its borders resulted in the rise of rightwing and religious extremism, populism and an increasing rejection of multiculturalism. Xenophobia, racism and anti-semitism has been growing not only in the peripheries but also in the core countries of established democracies of affluent societies. This will only increase with the influx of refugees and migrants and the threat of new terrorist attacks, unless the inter-, cross-, multi-disciplinary 'wisdom of the crowd' can be leveraged to envision better possible futures.

The critical approach that is needed also leads to questions about the university itself, and about the research industry in which we are all embedded. The economic crisis became a pretext for profound transformations in how knowledge is produced and what kind of knowledge matters. We live in a complex, inter-dependent world where, on the one hand, governments say they need to downsize, open markets, and foster personal responsibility, while, at the same time they bail out banks and regulate our lives in increasingly invasive forms of controls over employment, personal conduct and appearance, and through surveillance. This also determines the nature of the research that is conducted. A creative, innovative and responsible approach to the social sciences and research entails a much greater engagement and deeper involvement in being a producer of ideas, a critic of society, and a member of intellectual networks where new ideas and new visions emerge for possible futures.

The social sciences need to embrace uncertainty because "... uncertainty is wondrous, and [if] certainty were to be real, would be moral death. If we were certain of the future, there would be no moral compulsion to do anything ... If everything is uncertain, then the future is open to creativity, not merely human creativity, but the creativity of all nature" (Wallerstein 1999: 4).

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