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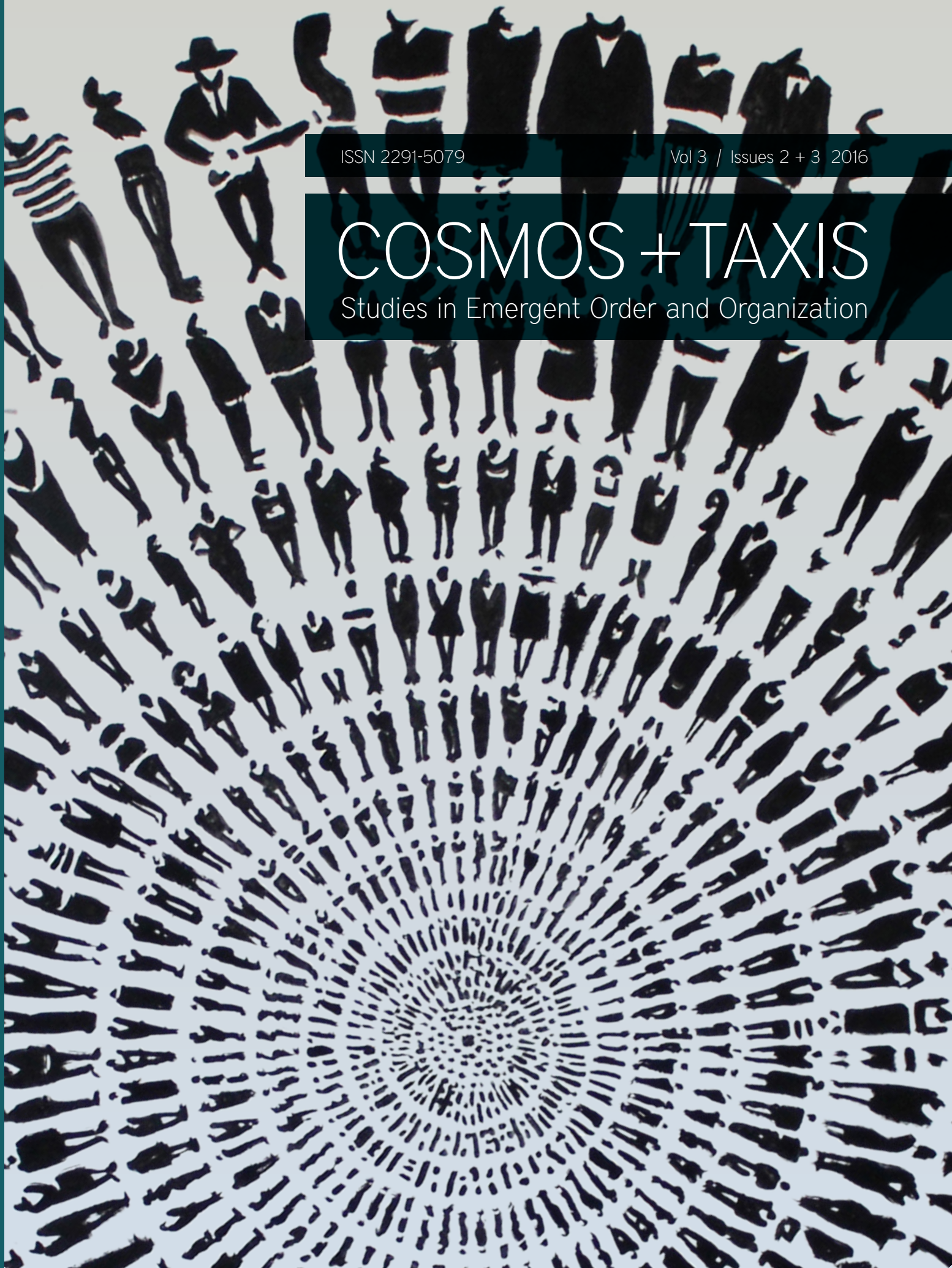

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IN THIS ISSUE

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Introduction: Methodological Individualism, Structural Constraints, and Social Complexity

FRANCESCO DI IORIO

Department of Public Administration
Southeast University
Jiulonghu Campus
Nanjing 211189
China

Email: francedi.iorio@gmail.com
Web: http://francesco-di-iorio.com

Bio-sketch: Francesco Di Iorio is Associate Professor of Philosophy and Social Science in the Public Administration Department at Southeast University, China. He research is focused on the individualism-holism debate, the Austrian school of economics, Popper's critical rationalism, and phenomenological hermeneutics. He is the author of the monograph *Cognitive Autonomy and Methodological Individualism* (Springer, 2015).

Abstract: This special issue of COSMOS+TAXIS is devoted to the non-reductionist variant of methodological individualism and analyses its nature and heuristic power from both an historical and methodological standpoint. It opposes the dominant assumption that social scientists need to get rid of the individualist tradition and develop alternative approaches because of the devastating arguments provided against reductionism by philosophy and systems theory. A basic assumption is that the tendency to equate methodological individualism and reductionism is both historically and logically untenable and that, as a consequence, arguments against the latter do not undermine the former.

Keywords: complexity, holism, methodological individualism, reductionism, social ontology

TWO VARIANTS OF METHODOLOGICAL INDIVIDUALISM

Methodological individualism does not have a good reputation in some sectors of the philosophy of social science because it is often regarded as committed to reductionism, where reductionism means an atomistic theory of society that is mistaken because it naively denies both the systemic nature of the social world and the structural constraints imposed on the individuals by socio-cultural factors. Despite its popularity, the interpretation of methodological individualism in terms of reductionism must be rejected because reductionism—which has been theorized by the social contract theory and some atomistic economic approaches—is only the more simplistic variant of methodological individualism (see Boettke 2012, p. 147; Boettke and Candela 2015; Demeulenaere 2011, p. 11; Di Iorio 2015, pp. 89-92; 2016; Hayek 1948 pp. 1-32; Jarvie 2001, pp. 117 ff.; Manzo 2014, p. 21; Tuomela 1990). This variant is criticized and challenged by a non-reductionist one, which is rooted in the Scottish Enlightenment and includes authors belonging to various schools, such as Weber, Menger, Simmel, Spencer, Mises, Hayek, Popper, Watkins, Merton, Crozier and Boudon.

As understood by this second variant of methodological individualism, the individualism-holism debate is, contrary to what is often supposed today, unrelated to the opposition between reductionism and anti-reductionism. Rather, it is a conflict between a non-atomistic theory of human autonomy—strictly linked to an invisible hand model of explanation and a systemic conception of the social world—and a theory of socio-cultural heteronomy (see Boudon 2013, p. 25; Di Iorio 2015, p. 75 ff.). By 'holism', the non-reductionist variant of methodological individualism means a secular version of what Popper ([1945]1966a, p. 17) called the "theistic" interpretations of history, i.e. a view that conceives

history and social order as being caused by superhuman hidden powers and individuals as unconscious instruments of those powers. Understood in these terms, holism is the idea, rooted in Hegel's and Comte's philosophies of history and developed by various sociological and philosophical schools, that what matters and must be seen as the proper object of investigation in social sciences are mechanisms of unconscious social determination that make individuals remote-controlled and mold the society as an organized structure (Antiseri and Pellicani 1995; Antiseri 2007; Boudon 2013; Cubeddu 1993; Dawe 1970; Di Nuoscio 2016; Watkins 1957). By contrast, the non-reductionist variant of methodological individualism argues that individuals are self-determined beings and that social order, and social phenomena more generally, must be explained as largely unintentional results of human actions—actions explainable on taking into account the meanings that individuals attach to them, i.e. using an interpretative approach (*Verstehen*). According to this view, the fact that the ultimate causes of social phenomena must be sought within individuals rather than outside them does not mean that social conditioning does not exist, but only that, since human actions result from interpretative skills, this conditioning must be explained by assuming that the influence of the social environment is never mechanical, but always mediated by these skills (see Bronner 2007, pp. 166-167; Boudon and Bourricaud 1990, p. 13 ff.; Di Iorio 2015, pp. 98-115).

Many non-reductionist individualists (e.g. Mises [1949] 1998 42-45; Hayek 1952, p. 54; Popper 1966a, pp. 26 ff., 204 ff.) have stressed that the opposition between holism and individualism regarding the explanation of action and the ultimate causes of social phenomena must be seen as strictly related to a conflict over the ontology of collective nouns. According to these authors, methodological individualism interprets collective nouns that refer to social entities (e.g. the EU single market, the American Democratic Party, the British Army, the Catholic Church, and so on) in nominalist terms. This means that, although collective nouns cannot be semantically reduced to strictly individual properties, they do not refer to independent substances, i.e. to *sui generis* entities that exist independently of individuals like, for example, a stone or a tree. Collective nouns refer rather to individuals and the systemic and irreducible proprieties that emerge from their existence, their beliefs, their intentions and their interactions (See Dawe 1970; Di Iorio 2015; Di Nuoscio 2016; Nadeau 2003; Petitot 2012; Rainone 1990; Tuomela 1989; Zahale 2015). By contrast, the holist ontology as understood and criticized by non-reductionist individualists is a form of Platonic realism. It assumes that, since collective nouns refer to Platonic supra-individual substances (like the 'structures' as understood by the French structuralists), individuals and their actions are derivatives of these substances, which means that they are unimportant from an ontological and explanatory standpoint. Framed in these terms, the ontological opposition between nominalism and realism is strictly related to the methodological opposition between individualist autonomy and holistic heteronomy. If collective nouns are conceived in nominalist terms, then the object of social sciences is represented by individuals (and emergent properties that concern a set of individuals), and the causes of actions must be sought within individuals, i.e. in their views and beliefs. On the contrary, if collective nouns are conceived in realist terms, the object of social sciences is represented by supra-individual Platonic substances, and the ultimate causes of actions must be sought outside individuals (Antiseri and Pellicani 1995; Pribam 2008, p. 120).

IDEALIST REDUCTIONISM AND SEMANTIC REDUCTIONISM

The holistic perspective criticized by methodological individualism, which was very influential until few decades ago, is no longer regarded as very appealing, and it is largely rejected today. However, methodological individualism is less popular than ever precisely because the entire individualist tradition is confused with atomism and reductionism. Most of the contemporary critics of methodological individualism reject holistic heteronomy, but they assume that holism was partly correct in that it was, unlike methodological individualism, an anti-reductionist and systemic theory of the social world (e.g. Bunge 1996; Kincaid 1986, 1996, 2014; Little 2014; Pettit 1993; Sawyer 2002, 2003; Udehn 2001). As a consequence, they defend a middle ground between holism and individualism, i.e.a 'synthesis' of these two paradigms merging an anti-reductionist approach, understood as a typical feature of holism rejected by methodological individualism, and a theory of human autonomy. This synthesis is sometimes called "structural individualism" (Udehn 2001, p. 318).

The widespread tendency to reject traditional individualism in the name of a new kind of structural (and anti-reductionist) individualism seems to be based on a mistaken and oversimplified interpretation of the former approach. This is because, as stressed by Demeulenaere (2011, p. 11), methodological individualists, or at least a

great number of them, "have always defended the idea that individuals are, let us say, 'embedded' in social situations that can be called 'social structures', and are in no respect isolated atoms moving in a social vacuum". The notion of "structural individualism … is … inherent to…methodological individualism from the very beginning, as opposed to some versions of economic atomism" (ibid.). Within non-reductionist individualism, institutions and rules clearly have "effects upon individual action" (ibid.) even though they "have no direct 'energy' of their own" (ibid.; see also Demeulenaere 2012, pp. 25-26).

The accusation of 'reductionism' levelled against the entire individualist tradition, so widespread today, is expressed in two variants. The first interprets methodological individualism in terms of *idealist reductionism*; the second in terms of *semantic reductionism* (see Di Iorio 2015, pp. 103 ff; 2016). According to the interpretation of methodological individualism in terms of idealist reductionism (e.g. Archer 1995; Bhaskar 1979; Lawson 1997; Udehn 2001), this approach is mistaken because it denies the objective existence of the social structure and the constraints imposed by this structure on agents. Methodological individualism is interpreted in these terms because of its contention that social phenomena must be explained through the understanding of the meaning that the individuals attach to their actions, i.e. through a *Verstehen* approach. This approach is regarded as committed to the idea that the social system and social constraints must be reduced to purely subjective mental constructs. It is argued that methodological individualism is mistaken because this system and these constraints exist independently of the agent's opinion about what he or she is free or not free to do, i.e. of his/her subjective standpoint. In other words, methodological individualism is seen as an anti-realist theory of the social world that interprets this world as a pure mental creation and denies that an objective social structure, characterized by a set of rules, sanctions and social positions, really exists outside the agent's mind and entails his or her voluntarist powers being bounded. Methodological individualism is equated to the contention that neither the social world nor social conditioning can be regarded in terms of objective reality and effective constraints (for more details on this point see King 2004; Di Iorio 2016).

This criticism of methodological individualism does not seem to be fair. This is because this approach, or at least its non-reductionist variant, acknowledges that, from a sociological standpoint, personal and purely subjective beliefs "are more or less irrelevant" because they "are not the basis of social life" (King 2004, 190).[1]

Methodological individualism explains the social world and the constraints that this world imposes on agents in terms of "collective beliefs" and of unintended consequences related to these "collective beliefs" (Boudon 1971; see Di Iorio 2015, p. 104). In other words, in analyzing the foundations of the social life and social conditioning, methodological individualism does not apply its interpretative approach (*Verstehen*) to purely personal and subjective opinions. Instead, it applies this approach to an "intersubjective" world (Schütz 1967, p. 218), i.e. to largely shared meanings, and it focuses on the real and concrete consequences of these shared meanings—consequences that can sometimes entail very brutal objective constraints on agents. As Hayek (1952, p. 34) pointed out, social systems must be seen as "the implications of many people holding certain views". From the standpoint of methodological individualism, understanding the typical meanings that agents attach to their actions is the first step in explaining "the unintended or undesigned" nature of social structures and social constraints (1952, p. 25). From this it follows that methodological individualism cannot be equated to an anti-realist or idealist theory of structural constraints assuming that these constraints are mere subjective creations of a single human mind and that the agent's voluntarist powers are unbounded. According to methodological individualism, since the social world cannot be reduced to a purely personal idea about what the social world is, this world cannot be changed voluntarily by a single will. Instead, the social world and the constraints that it imposes on agents can be altered only if the common view shared by many people changes (see King 2014; Di Iorio 2016).

The second variant of the interpretation of methodological individualism as reductionist is couched in terms of semantic reductionism. According to this variant, the claim by methodological individualists that social phenomena must be explained in terms of individuals means that this approach is supportive of a principle of semantic reduction of social properties to individual ones (see Rainone 1990, pp. 169 ff.; Petroni 1991, p. 16; Zahale and Collin 2014, pp. 2-10; Di Iorio 2016, 2015). This interpretation of methodological individualism, which developed within analytic philosophy, has been defended by authors such as Mandelbaum (1955), Lukes (1973), Ruben (1985), Kincaid (1986, 1990), Little (1990), Sawyer (2002, 2003) and Elder-Vass (2014). Conceived in terms of semantic reductionism, methodological individualism is criticized on the grounds that: (i) social phenomena cannot be analyzed without referring to concepts and laws that are semantically irreducible

to strictly individual properties; and (ii) that the existence of semantically irreducible factors and laws that causally influence mind and action cannot be denied. This interpretation of methodological individualism in terms of semantic reductionism seems implausible: (i) because many eminent advocates of methodological individualism, namely the representatives of what I have called above "the non-reductionist variant" of this approach, explicitly criticized this kind of reductionism and (ii) because the history of methodological individualism provides countless examples of models of explanation, related to the concepts of "system" and "unintended consequences of human actions", inconsistent with semantic reductionism (see Boettke and Candela 2015; Di Iorio 2016, p. 105)

As clarified by both Boudon (1971, pp. 1-4) and Popper (1957, p. 82), from the standpoint of (non-reductionist) methodological individualism, the impossibility of semantically reducing social properties to strictly individual ones is trivially true. These two thinkers agreed that examples of social explanations that do not refer to semantically irreducible social properties cannot be found, and that the analysis of social phenomena in terms of irreducible properties is simply necessary and cannot be avoided. Developing a criticism of atomism and reductionism, Hayek (1967, p. 70), followed a similar line of reasoning. He argued that a society "is more than the mere sum of its parts" because it is a system, characterized by emergent properties, which presupposes that its constitutive elements are "related to each other in a particular manner" (ibid.; see Lewis 2011; 2014). Long before Hayek, Carl Menger, a major influence on him, had pointed out that, according to methodological individualism, the individual's intentions and actions must be regarded as parts of an irreducible structure (see Antiseri 2007, p. 141 ff; Campagnolo 2013). For Menger ([1883]1985, 142), "social structures … in respect to their parts are higher units". In addition, they are endowed with "functions" that "are vital expressions of these structures in their totality" (p. 139). According to Menger (p. 147), society is a system because each part of it—each individual or each social subsystem (like a family or a firm)—"serves the normal function of the whole, conditions and influences it, and in turn is conditioned and influenced by it in its normal nature and its normal function".

One of the reasons why the interpretation of methodological individualism in terms of semantic reductionism must be rejected is the strong connection between this approach and the concept of unintended consequences (see Boettke and Candela 2015; Boudon 2013; Bouvier 2011; Di Iorio 2016, p. 106; Dupuy 2004; Petitot 2012). Explanations in terms of unintended consequences are inconsistent with semantic reductionism because they refer to emergent global properties that are irreducible to purely psychological and individual properties and laws. Explanations of this kind are irreducible to the agents' mental and behavioral properties. Hayek's analysis of the market in terms of a self-organizing system is an example of an irreducible individualist explanation based on the concept of unintended consequences (see Hayek 1948, pp. 77 ff; 1952; Bouvier 2011). Moreover, it shows how methodological individualism, as understood by the variant defended by Hayek, admits the existence of social emergent properties that causally influence action and restrict human freedom. Consider Hayek's prices theory, which is central to his theory of the market's self-organization. Like Mises, Hayek argues that market prices play a crucial role in market coordination (Hayek 1948, p.. 85 ff.; Mises [1922]1981). Prices unintentionally emerge from the aggregation of different individual evaluations and distributed items of information. Because of their unintentional nature, they are semantically irreducible. According to Hayek (and Mises), the coordination power of prices depends on the fact that they affect and limit the freedom of choice of agents, who need to adapt their decisions to price variations. Hayek stresses that prices are unintentionally created by human choices and that they in turn affect those choices, i.e. that the whole economic system causally influence its parts and vice versa (see Di Iorio 2016).

The interpretation of methodological individualism in terms of semantic reductionism stems from a misunderstanding of the individualist contention that social phenomena must be explained *in terms of individuals* (see Jarvie 1972, p. 157; Di Iorio 2015, pp. 107-108; 2016). This contention is confused with the idea that social phenomena must be semantically reduced to strictly individual properties and laws. However, by "explanations in terms of individuals", the non-reductionist variant of methodological individualism does not mean that social phenomena must be explained through such a reduction, but something completely different. It means that social sciences must reject the holistic substantialist ontology of collective nouns and the explanatory models of history and society in terms of heteronomy strictly related to this ontology. The non-reductionist variant of methodological individualism assumes that individuals are the ultimate engine of history and social dynamics, and it interprets the social system and its semantically irreducible properties in anti-substantialist terms, i.e. in terms of unintended consequences produced by individuals, their beliefs,

actions and interactions (for more details on this point, see Di Iorio 2016, pp. 105-111; Di Nuoscio 2016; Manzo 2014, p. 21; McGinley 2012; Rainone 2002; Tuomela 1990, p. 34; Watkins 1957).

COMPLEX METHODOLOGICAL INDIVIDUALISM

This special issue of COSMOS + TAXIS is devoted to the non-reductionist variant of methodological individualism and analyses its nature and heuristic power from both an historical and methodological standpoint. It opposes the dominant assumption that social scientists need to get rid of the individualist tradition and develop alternative approaches because of the devastating arguments provided against reductionism by philosophy and systems theory. A basic assumption is that the tendency to equate methodological individualism and reductionism is both historically and logically untenable and that, as a consequence, arguments against the latter do not undermine the former.

Many articles focus on a specific subvariant of non-reductionist individualism that the French philosopher Jean-Pierre Dupuy (1992; 2004) called "complex methodological individualism". This subvariant, unlike other non-reductionist individualist approaches such as interpretative sociology (e.g. Weber, Aron, Boudon) and the individualist social philosophy defended by Popper and his pupils, merges the concept of methodological individualism with that of self-organizing complex system (See also Dupuy and Dumouchel 1983; Petitot 2009; 2012).[2] Its privileged—but not unique—object of study is the market society and its cultural and evolutionary presuppositions. As stressed by Hayek (1973, pp. xviii- xix), who has been the most eminent advocate of this complex methodological individualism, the origins of this approach must be traced back to the Scottish Enlightenment, i.e. to the work of authors such as Bernard De Mandeville, Adam Smith, Adam Ferguson, and David Hume. These thinkers interpreted market society in terms of spontaneous order and the invisible hand, anticipating the explanatory method in terms of complex self-organizing system used by the complexity sciences and systems theory. Apart from Hayek and the thinkers of the Scottish Enlightenment, other important theorists of this complex methodological individualism are Lord Acton, Herbert Spencer, and the other members of the Austrian school of economics, namely Carl Menger and Ludwig von Mises. According to Hayek, even if the representatives of the tradition of the spontaneous order in philosophy and economics did not use the complexity sciences' terminology and the term "complex self-organizing system", which has been invented only in relatively recent times, they basically took the same approach as these sciences and must be considered their precursors. Hayek stressed the heuristic utility of applying this new terminology to the traditional individualist analysis of market society in invisible-hand terms because of its greater precision, clarity and accuracy.

According to complex methodological individualism, market society must be interpreted as a complex self-organizing system because it is a very open system (in the sense that its initial conditions change in a continuous and unpredictable manner) comprising an extremely high number of operatively autonomous components (agents), whose activities are dynamically coordinated through a spontaneous process. There is no central direction within a market society. The cooperation and coordination of agents depends on their compliance with some general and abstract rules that govern their direct interactions and allow the formation of market prices (see Birner 1994, p. 2 ff.; Hayek 1973, pp. 34 ff.; Marsh and Onof 2008; Nemo 1988; Petitot 2012). Within a market, prices work as a cybernetic mechanism in the sense that they reflect information about countless local temporary circumstances and ensure the use of a distributed knowledge so as to allow the agents' coordination (see Hayek 1948, pp. 77 ff.). The emergent global behavior of the system, which develops unintentionally, is characterized by a dynamic and constant adaptation of the local to the global, and the global to the local. In other words, it is based on a recursive loop between individuals and the prices unintentionally produced by human decisions which in turn influence those decisions (see Boettke and Candela 2015; Dupuy 2004). This global behavior is predictable only in terms of very general patterns, but it is unpredictable in detail because of the complexity of the system, i.e. because of its extreme openness. This complexity entails the constant and unpredictable change of the initial conditions, and it is related to the operative autonomy of the high number of agents who compose the system, as well as to the constant variation of their circumstantial knowledge. A strict application of the *ceteris paribus* clause, which is required for detailed previsions, is possible only for a system that can be assumed to be closed, while it is impossible for a complex self-organizing system (see Di Iorio 2015, pp. 42-43; Dupuy 1990; Petitot 2012; Di Nuoscio 2016; Caldwell 2007, p. 363; 2009, pp. 13 ff.).[3] Since a market is based on spontaneous cooperation for adaptive and evolutionary reasons, i.e. because its complexity cannot be mastered, a planned economy cannot match its performances and is bound to

fail. By means of self-organization, a market system uses a distributed knowledge that cannot be centralized.

I would like to conclude this short introduction with a terminological remark. The term 'complex methodological individualism', which designates a specific subvariant of non-reductionist methodological individualism, is useful to distinguish this subvariant from both reductionist individualism and other subvariants of non-reductionist methodological individualism. Its utility partly depends on the widespread confusions about the meaning of the generic term 'methodological individualism', i.e. on the tendency to use the expression as a synonym of 'reductionism'. Given these confusions and the existence of different variants and subvariants of methodological individualism, referring to the methodological assumptions of the tradition of the spontaneous order using the generic term 'methodological individualism' seems, although correct, less informative and accurate than using the term 'complex methodological individualism'.[4]

NOTES

1 King (2004), who defended the interpretative approach developed by Weber and other eminent representatives of the *Verstehen* tradition from the objections developed by Bhaskar and other critical realists, does not call the *Verstehen* approach "methodological individualism" as I do. However, the essence of his view on the philosophical and methodological assumptions of the social sciences does not differ from mine. It seems to me that he is supportive of an approach consistent with what I called above "the non-reductionist variant of methodological individualism".

2 To be noted is that Weber (pp. 63 ff.) used the concept of complexity to criticize the planned economy in the first book of Economy and Society. Moreover, Popper (1957, pp. 36-40) referred to this concept as well, stressing its importance in social sciences, although he did not focus on it in detail. As a consequence, the distinction between complex methodological individualism and other variants of non-reductionist individualism must not be interpreted as clear-cut.

3 Although Hayek was one of the originators of complexity theory, he did not provide a good definition of "complexity" (see Di Iorio 2015; Dupuy 1990; Petitot 2002; Di Nuoscio 2006; Caldwell 2009). Hayek (1967) argued that "complexity" results from the fact that the behavior of certain systems is highly unpredictable (except for some general patterns) because it is determined by a very high number of variables. However, even systems made up of a very large number of variables can be perfectly predictable if they are closed. Hayek's definition of complexity neglects to take into account a point stressed by Hayek himself in his works on market and mind, i.e. the constant and unpredictable change of the initial conditions which affect complex systems: these systems are extremely open systems (Hayek 1952b, pp. 185 ff.; 1967, pp. 55 ff.; see also Nadeau 1997, pp. 67 ff.; Caldwell 2004, p. 363; Di Nuoscio 2006, pp. 46-48; Marsh 2010, pp. 140-141).

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Cultural Evolution, Group Selection and Methodological Individualism: A Plea for Hayek

ROBERT NADEAU
Department of Philosophy
Université du Québec à Montréal

Email: nadeau.robert@uqam.ca

Bio-sketch: Robert Nadeau is a retired Professor from the Department of Philosophy at the Université du Québec à Montréal. His primary research interests include the philosophy of social science and especially the methodology of economics. He is the author of *Vocabulaire technique et analytique de l'épistémologie* (Presses Universitaires de France, 1999) and has published several papers on the writings of Friedrich Hayek.

Abstract: It is obvious that most, if not all, of Hayek's critics and commentators are uncomfortable with the evolutionary turn he took over the years, and, especially, with his concept of group selection, particularly in view of the alleged inconsistency of these views with his strongly held position on methodological individualism. I argue here in favor of Hayek's case that there is indeed no such inconsistency. I establish from the start that Hayek's analysis of cultural group selection is in line with what he aimed to do in the socialist calculation debate during the 1930s and 1940s. This analysis serves to reinforce on empirical grounds the thesis of the superiority of market economy over any kind of centrally planned and directed economic system. I then stress that this economic superiority, explained by Hayek in terms of just rules of conduct and perception, does not at all concern what it is to be "good" in the philosophical sense. Hence, Hayek avoids the pitfalls of naturalist fallacy. I argue moreover that for Hayek the system of rules defining liberalism was not necessarily bound to emerge in human history, for the market economy is a thoroughly contingent expanding spontaneous order. In the final part, I try to show that, contrary to what is usually believed, Hayek's methodological individualism is not of a reductionist but of an *emergentist* brand. I insist that evolutionary group selection, in Hayek's sense, is a cultural and not a neo-Darwinian process. I furthermore argue that, logically speaking, cultural groups *supervene* on individuals, meaning that more successful rules of just conduct and perception followed by individual economic agents may confer superiority to some communities of interacting individuals over other populations. Group selection has then to be seen as the surface effect and never the root cause of individual action. I conclude that the Hayekian idea—perhaps a bit hazy—of group selection is completely consistent with Hayek's methodological individualist stance.

Keywords: cultural evolution, socialism, market economy, socialist calculation debate, price mechanism, rules of just conduct and perception, naturalistic fallacy, group selection, rule of law, methodological individualism, supervenience.

If we had to identify the topic of reflection that goes through the work of Hayek, from the first writings to his very last book, we would probably point to the critique of socialism. Conceived as an ideal-type of economic system and policy, socialism is characterized by a centrally-planned production system, with an omnipotent and well intentioned political body. And it was the profound belief of Hayek that economic theory can scientifically demonstrate that socialism is a monumental intellectual error. However, it has not been sufficiently clarified that, long after the socialist calculation debate of the 1930s and 1940s, the development of an evolutionary perspective in the work of Hayek is, on balance, nothing else than a further extension of this fundamental issue. It is important to see precisely Hayek's objective in trying to articulate a systematic theory of cultural evolution: it is first of all to provide one more basic argument to his thesis that a socialist type of economy is, if not impossible as claimed by Mises, at least "impracticable" as he prefers to say. For Hayek, a genuine market economy, based primarily on the free functioning of the price mechanism, is likely to be highly superior in efficiency to any state-directed production system.

Hayek's argument encountered two major objections, which we will examine here. According to the first, Hayek would be guilty of the naturalist fallacy. Following this line of reasoning, Hayek's theory of cultural evolution explicitly aims to establish that, during the historical evolution of societies struggling to maintain and establish their supremacy, the best moral rules of conduct would necessarily tend to prevale. The counterargument states that thinking that the evolution of human communities inevitably results in the very best moral situations is a mere sophistic reasoning. According to the second objection, this theory of cultural evolution, being based on the biological mechanism of group selection, would be fundamentally inconsistent with the principle of methodological individualism that Hayek fully embraces. Indeed, how could it be acceptable to think on the one hand that it is groups, i.e. supra-individual entities, which determine by their action the cultural evolution of society and claim on the other hand that only individual actions do induce, particularly by their unintentional consequences, the implementation and subsequent transformation of the network of institutions forming the fabric of society?

I plan to first show what is really at stake in Hayek's theory of cultural evolution, assuming that what he intends to do by appealing to biological and anthropological considerations is to push further his criticism of the idea of a planned economy by comparing its operation to that of a market economy. I will then confront the two objections raised against Hayek's theory identified above. I will insist that Hayek, contrary to what many critics have argued, never committed the naturalist fallacy, although many of his critics have openly accused him of fallaciously supporting the thesis that cultural evolution proved that the market economy was an optimal socio-economic system, and that it was therefore morally superior and preferable to any kind of socialist economy. Finally, in opposition to what is generally believed to be the case, I will argue that Hayek's cultural evolutionist theory, even if based on a partly defective group selection concept, is, strictly speaking, consistent with the view that he endorses on methodological individualism.

I. THE GIST OF HAYEK'S CULTURAL EVOLUTION THEORY

It is generally accepted today that the Hayekian evolutionary perspective, as incomplete and insatisfactory it may have remained in his own eyes, converges entirely with the views he articulated during the socialist calculation debate. In this crucial debate of the 1930s and 1940s, Hayek came to overhaul drastically his research program and definitively broke with the standard static equilibrium approach to the market economy. He then put at the center of his renewed intellectual concerns the crucial idea that the most significant issue of economics, if not of all social sciences, was the explanation of social coordination. Thus his works become more overtly concerned with juridical, political, sociological, anthropological and methodological issues. And first of all, the complex question of how people can best economically coordinate themselves could not be solved without deeply exploring the way we use knowledge in society.[1]

This has indeed been fully acknowledged. For example Erich Streissler stresses that a socialist, i.e. a centrally planned and directed economy, "will only achieve a much lower degree of efficiency at much higher cost than a free enterprise system" (Streissler 1994, p. 68), He insightfully reconstructs the core of Hayek's arguments against socialism as including three "impossibility theorems " (ibid.: p. 65 and *sq*.) stating that: 1) In the real world goods are not easily specified; commodities are not homogeneous and fully standardized; quality is not constant but declining over time, and full quality control is impossible; 2) Costs are not objectively given, but are mere subjective estimates; they are objectively determinable only *ex post*, not *ex ante*; and 3) Knowledge is uncentralizable in an economic direction center of decision because we do not even know what knowledge we use, and therefore cannot communicate it fully to others. Hayek's main point is that economic knowledge is dispersed, not complete and made of contradictory bits; it is local in Polanyi's sense. This is why for Hayek socialism is ultimately a chimera.

But at the same time, while insisting on the impracticability of socialism, Hayek comes to highlight what makes market economy more efficient. It is not sufficient to show that socialism fails to solve the economic problem: Hayek believes he can show alltogether how the market economy achieves this goal. In line with the purely economic argument already presented in the socialist calculation debate, Hayek's cultural evolution theory (CET) presents a different line of reasoning, a more empirical one which contains, as

will be seen, methodological challenges which we will have to consider.

Hayek's evolutionary argument carries economic considerations just as much as the first one. Even though he ultimately uses biological and anthropological ideas to support it, it must be acknowledge that Hayek did already outline this point of view in 1939 (Hayek 1939). This way of thinking became full-blown and acquired all its weight with the publication of *The Road to Serfdom* in 1944. As a theoretical argument, it ended up becoming, by 1960, fully evolutionary, and remained so up to the end. It also underwent a complementary development in his trilogy *Law, Legislation and Liberty* (Hayek 1973, 1976, 1979).

This CET forms the hard core of Hayek's philosophical and scientific stance in favor of economic liberalism. As such the CET concerns the very same central problem of economic theory than the one advocated during the socialist calculation debate. But we face this time a different sort of argument because the CET is a genuine empirical conjecture. It is of course in Hayek's very last book (Hayek 1988) that his CET was fully articulated.[2] This book, prepared for publication by William Bartley while Hayek was very ill, was published the year before the Soviet Union collapsed. In the following years, the book has spawned a heated debate about whether we could read it as an authentic work of Hayek. Whatever conclusion we reach here, we at least can say that, in this ultimate book, socialism, globally contrasted with liberalism from the cultural evolutionary standpoint, appears to be openly consistent with Hayek's previously published works.

We must keep in mind that, in the socialist calculation debate, Hayek was facing opponents who sought to establish "that not only was central direction of economic activity practicable" but that it would even be "superior to a system of competition" (Hayek 1935a, p. 71). From the start, then, the terms of Hayek's debate with socialist economists, as well as Mises's, were given an orientation that was methodologically comparative. As already said, Hayek contrasted the form of order that results from an emergent evolutionary process to one that is "rationally constructed" by human beings, for example legislators. On that basis, Hayek's analysis of spontaneous social and economic order really does serve to counter the arguments of "constructivistic rationalism" (Hayek 1973, pp. 8-11) and undeniably includes as one of its essential elements the thesis that market economies are superior as forms of social order to all centrally planned economies. Hayek preferred the term *catallaxy* to refer to competitive economy considered as a rule-based process and favored the phrase 'Rule of Law' instead of 'laissez-faire' to characterize the underlying mechanism at work in such a process (Hayek 1939, p. 219). Hayek claimed that this economic system has to be considered wholly as a social spontaneous order because it is an evolutionary and unintentional process based on the price mechanism working in an appropriate institutional context. Consequently, the resulting social and economic order is never intended as such, nor is it controlled by anyone. But it surely can be argued that the consequences of the actions of each and every individual taking part in the process necessarily contribute to its aggregate result.

Basing himself on a shrewd analysis of catallaxy, Hayek put forward the theoretical claim that it manifestly forms an order which is far superior to any kind of state-controlled social and economic order. Hayek was speaking here not only of an economic superiority in terms of efficiently allocated resources, but also of a social and political superiority in terms of the quality of life that such an economic order, based on the free market, makes possible for the large majority of people. Hayek always maintained as a core thesis of his economic theory and of his political philosophy that a socialist economy, i.e. a social order generated by an interventionist state and governed or regulated by an authoritative decision centre, could lead to such undesirable results as limitations on human rights and liberties–if not to complete serfdom (Hayek 1944; 1988).[3] The error of constructivistic rationalism is to assume that a designed economic order will necessarily be superior to an unplanned one just because it will be formed by and based on Reason. But, as Hayek points out, Reason itself is the product of evolution and should not be seen as capable of planning and directing cultural evolution. More than that, economic planning by itself does not create order, if by "order" we mean, along with Hayek, "a state of affairs in which a multiplicity of elements of various kinds are so related to each other that we may learn from our acquaintance with some spatial or temporal part of the whole to form correct expectations concerning the rest, or at least expectations that have a good chance of being correct" (Hayek 1973, p. 36). Human reason, and especially the product of individual minds of a small group of people, however inspired, wise, knowledgeable and thoughtful they may be, cannot by itself achieve an order that would be better than the one from which rationality itself progressively emerged. As one of Hayek's commentators has argued, "[O]n the contrary, by disturbing the regularities based on impersonal rules which are the product of evolutionary learning, rationalist social engineering results, if not in chaos, at least

in unworkable or unnecessary coercive organizational structures" (Dobuzinskis 1989, p. 243).

Hayek proved absolutely confident that economic analysis could demonstrate that socialism was not only a social blunder and a political failure, but above all a formidable scientific error. The evolutionary argument puts forward a completely different conceptual framework tightening the anti-socialist argument. By calling attention to facts concerning the global process of cultural evolution, typically analyzed by Hayek as a struggle or competition between moral traditions (i.e. systems of rules of just conduct and perception and not philosophical norms) where the more efficient social and economic orders will prevail and eventually dominate all others, Hayek grounds on empirical evidence his argument stating the superiority of competitive economy over planned economy.

The socialist calculation debate has almost always been interpreted *negatively*. Following the traditional reading, Hayek, and Mises before him, criticized socialism (market socialism in Hayek's case) in order to demonstrate what Hayek has called the "impracticability" of socialism conceived as a "centrally planned economy".[4] I maintain that Hayek's crucial aim is rather *positive*. Hayek is indeed striving to define a method suited to prove the superior efficiency not only of market-based economy (or 'free market economy', or again 'competitive economy') but also, and more globally, of what he calls the "extended society" (or the 'catallaxy', or again the 'Great Society', which corresponds to what Popper has called the "Open Society").

Without a doubt, the whole socialist calculation argument is from this standpoint better seen as a *comparative* argument: and here comparison is not done for its own sake, for it is used to prove something. Hayek's aim is not only to substantiate the theoretical point that socialism is impractical (a negative claim) but furthermore to provide evidence that market economy offers a better solution to the allocation problem (a positive claim). As long as the economic problem concerns allocating scarce resources to different social ends that compete against each another, the most rational way to settle the question is to compare different economic systems in order to reach a conclusive and convincing answer. For Hayek, if the question has to be formulated in comparative terms, it is clearly because what is at stake in the market socialism debate is the relative efficiency of two economic models, the first propounding state intervention in an overall planning of the economy, the other propounding coordinated growth of the economy by spontaneous social forces working under the Rule of Law. "The main point is very simple", writes Hayek: "It is that comprehensive economic planning, which is regarded as necessary to organize economic activity *on more rational and efficient lines*, presupposes a *much more complete agreement* on the relative importance of the different social ends than actually exists, and that in consequence, in order to be able to plan, the planning authority must impose upon the people the detailed code of values that is lacking" (Hayek 1939 [1997], p. 193, my emphasis). The same point is made again for example in *The Road to Serfdom*. There can be no doubt that from the start, and more preeminently in Hayek's case than in Mises', the question is put in a form that is thoroughly comparative: the proper method to discuss the question in all its implications is to compare both models conceived as ideal-types (private *versus* public ownership of the means of production, dispersed and fragmented knowledge *versus* centralized information, pricing system *versus* prices determined by a Central Planning Board; incentives in terms of profits for entrepreneurs *versus* incentives in terms of political rewards for the state-owned enterprises, etc.).

The purpose of Hayek's CET is to provide an evolutionary demonstration of the superiority of liberalism over socialism. And again, the issue is addressed as an essentially scientific question. For Hayek "the notion that, in the last resort, the whole debate is a matter of value judgment and not of facts has prevented professional students of the market order from stressing forcibly enough that socialism possibly do what it promises" (Hayek 1988, p. 8). But the ultimate aim of the debate is not only to debunk the "fatal conceit" of socialism but to support the general argument that market economy is largely superior as an efficient socio-economic order to any kind of planned economic order. Catallaxy is held to be pre-eminent because it is more efficient, and it is said to be more efficient because it is alleged that no central political organism can adequately replace or even simulate the market pricing process. Hence, a full-fledged spontaneous social order will always be economically preferable to a full-blown collectivist planned one. For sure, this is in line with Hayek's understanding of what the whole socialist calculation debate was about (see Hayek 1935, 1940). He avowedly claims, not on moral but on theoretical and empirical grounds, that a resolutely interventionist state is bound to fail as the source of social and economic order: it could not only eventually lead progressively to serfdom, but it could also ultimately cause the collapse of the whole economy.

Hayek's evolutionary argument trying to demonstrate that liberalism is to be preferred to socialism as a system of rules of just conduct and perception bringing about a superior

socio-economic order has to be considered not only as an integral part of Hayek's analysis *but as its boldest claim*. It has moreover been subjected to fierce criticism for instance by Dobuzinkis (1989), De Vlieghere (1994), Jossa (1994), Lukes (1997), Steele (1994), Zappia (1999) and especially Dupuy (1988, 1992).[5] The common denominator to all these critical comments is based on the following reasoning: if one adopts, as Hayek does, an evolutionary perspective, one cannot prove that a social order based on market processes is the best possible one. As Angelo Petroni wrote, "If anyone assumes an evolutionary point of view, where the individuals have a severely limited knowledge about the environment and their own rules of conduct, there is simply no room for saying that anything similar to optimality exists in Hayek's world" (Petroni 1995, p. 119). Indeed, if social and economic orders are plainly contingent, i.e. if they are the unintended and unforeseeable products of evolution in a struggle for the survival of the fittest, then the question of which is the optimal one is empirically irresolvable because we cannot predict which one will outlast all the others. Would this counterargument hold, then advocating that market economies and liberal orders are, on an absolute scale, the best possible social and economic traditions would be an untestable claim, hence it could not be considered a legitimate scientific conjecture but only the expression of an ideological preference.

But this criticism of Hayek's evolutionary argument is flawed for it misses the point. First of all we should stress that the kind of evolutionary argument Hayek is using is part of what has been called by Gould and Lewontin the 'adaptationist programme', but it has nothing to do with what they called the 'Panglossian paradigm'.[6] As long as we compare as ideal-types the centrally planned economy with the competitive economy, as long as we look at both to find out which has the comparative advantage relative to the other, and as long as we do not use any kind of absolute scale to compare their respective merits as social and economic systems, we can surely maintain as Hayek does, at least as a bold conjecture, that liberalism is superior in efficiency to socialism. This hypothesis has to be discussed on scientific grounds, considered for its explanatory robustness and its predictive power (if any) and judged at face value. Surely, it cannot be dismissed from the start as logically faulty. It is of course both disputable on a conceptual basis and refutable on observational grounds. But it would clearly be a methodological mistake to reject it as intrinsically inconsistent or as logically unwarranted. As such the socialist calculation theoretical argument and the cultural evolution argument are the two sides of one and the same coin. These two arguments have to be considered not only as consistent but also as forming one of Hayek's boldest claims in political economy.

II. DOES HAYEK AVOID THE NATURALISTIC FALLACY?

Hayek undeniably sees "the price system as the best one" (Hayek 1939 [1997], p. 215). Time and again he insists on the superior efficiency of capitalism over socialism. For instance, starting from the bare fact that "the only known mechanism by which the knowledge of all can be utilized (is) the price mechanism" (Hayek 1939 [1997], p. 196), and being perfectly aware of the fact that sometimes the price system is inapplicable and is supplemented, he notes that "the problem we are discussing is not, however, whether the price system must be supplemented, whether a substitute must be found where in the nature of the case it is inapplicable, but whether it ought to be supplanted where the conditions for its working exist or can be created. The question is whether we can do better than by the spontaneous collaboration secured by the market, and not whether needed services, which cannot be priced and therefore will not be obtainable on the market, have to be provided in some other way" (Hayek 1939 [1997], p. 197).

This political-economic argument is indeed closely related to Hayek's anti-constructivist stance and leans on a theory of spontaneous socio-economic order. What is at stake here is not whether socialism is applicable or not but whether it is more enviable than liberalism. What seems to be representative of Hayek's analysis of spontaneous social and economic order is that, converging with the socialist calculation debate, it tries to show that cultural evolution of societies actually leads to the emergence of rules superior to other possible systems. One can surely maintain, as John Gray does, that there are no moral value judgments really at stake here (Gray, 1984, pp. 33-4; 118-125), but it is hard to miss the fact that Hayek's analysis serves to support a pre-eminence claim with respect to the market economy. Asserting that competitive economy should be considered as superior to centrally planned economy is *per se* a normative statement, but, as such, this has nothing to do with ethics. This kind of argument can readily be characterised as forming a sub-category of "invisible hand explanations", akin to the kind of extremal explanations found in evolutionary biology. In fact, many critics regard Hayek's cultural evolutionist views as seeking to demonstrate that market economy is an optimal historical outcome. Hayek's commentators believe themselves to be justified to rebuke Hayek for having supposedly grounded a

claim to moral optimality of liberalism on an evolutionary argument. But this point of view is completely undefensible. Has Hayek's cultural evolutionary considerations anything to do with a moral claim, and does it come down to upholding that the rules selected through the cultural evolution process are for that reason those that we should praise as morally desirable? It seems obvious that this is precisely what Vanberg has in mind when criticizing Hayek. But Hayek overtly denies committing this genetic fallacy. He writes: "I do not claim that the results of group selection of traditions are necessarily 'good' — any more than I claim that other things that have long survived in the course of evolution, such as cockroaches, have moral value" (Hayek 1988, p. 27). Moreover, Hayek denies that the extended society was bound to take place in human history: he explicitly considers that this economic system "has not been deliberately invented, but that it has spontaneously grown up long before we had learnt to understand its operation" and he regards it as "the result of a more or less accidental historical growth…" (Hayek 1941, p. 215). But these statements are in no way inconsistent with Hayek's inference that the competitive economy prove to be evolutionary superior to planned economy.

Vanberg legitimately wants to draw a neat and razor-sharp distinction between what makes systems of rules *desirable* and what accounts for their survival through the evolutionary process, i.e. their effective selection. He rightly claims that "what is desirable need not be at all what survives, and vice versa" (Vanberg 1993 [1994], p. 102). He goes further in claiming that spontaneous rules (e.g. property rules) need to be 'enforced' by a proper mechanism—a mechanism "that serves to exclude coercion and fraud as strategies of enrichment, ideally leaving voluntary exchange as the only avenue for the pursuit of one's interests" (*ibid.*). Referring to this 'enforcement mechanism', Vanberg adds that "it is because of these particular characteristics of the market process, because competitive behavior is 'restrained by appropriate rules of law' (Hayek 1978, p. 125), and not simply because of its evolutionary nature *per se*, that for classical liberals like Hayek markets are the favorite form of social organization" (*ibid.*). Even if this last remark is right, Vanberg does not seem to fully grasp Hayek's thought here: when comparing 'constructed order' to 'spontaneous order', we must keep in mind that the evolutionary advantage of the second system over the first is precisely due to the fact, explicitly stated by Hayek, that it works under the Rule of Law. This institutional framework is what guarantees that capitalism will develop on a competitive basis with no fixed global aims, as compared to a system that would develop by being directed and based on intended, all-encompassing ends. If this is right, then there is no distinction to be made in cultural evolution between rules that are socially and economically advantageous and rules that have evolutionary superiority. The claim is then the following: *ceteris paribus, the more efficient rules will tend to prevail in the long run*—this is what the evolutionary conjecture is about in economics and, *mutatis mutandis*, in biology as well.

But this theoretical conjecture has nothing to do with the ethical question of which set of rules is or should count as the most desirable. Vanberg believes that the analogy between 'market process understood as *evolution within rules*' and 'competitive selection of alternative problem-solving devices in ordinary markets' is "legitimate in so far as the rules and institutions that exist at any point in time, in any particular society, are obviously those that, *de facto*, did 'win out' in some kind of competition". As this cannot be the case in economics following Vanberg, then we should consider that "the suggested analogy between market competition and cultural evolution becomes misleading…when it comes to the question of what their factual survival can tell us about the desirability of rules and institutions" (Vanberg 1993 [1994], p. 102).

Vanberg is of course fully justified in thinking that we must meaningfully distinguish between 'what is good or desirable' and 'what survives'. But this distinction cannot be considered as a counterargument to Hayek's cultural evolution approach. Maurice Lagueux's very careful reading of Hayek is a bit different from Vanberg's. Lagueux insists that one will not find any form of teleological view in Hayek's evolutionary approach to economics: "Hayek could not have and indeed did not use the adaptation and survival criterion to establish that a structure like the market *will* in fact favor efficiently the correct functioning of society" (Lagueux 1988, p. 96).[7] And as far as moral or political justification is concerned, Lagueux adds that "the only property of being spontaneous does not give by itself anything that could help us base a value judgment on 'social order' or 'justice'" (Lagueux 1988, p. 102).[8]

This faultless reasoning shows that several of his critics have unfortunately missed the gist of Hayek's evolutionary standpoint: Hayek clearly does not see evolution as a process giving optimal moral results, but he advocates overtly that in the struggle for survival, those spontaneous social and economic orders, being based on the Rule of Law, have a clear evolutionary advantage over their constructivist counterparts. So competitive economy cannot be proven to be more morally desirable on an evolutionary basis, but it can

be proven to be more efficient than any kind of planned economic regime, since it can be shown that more people can earn their living in that kind of social and economic system. For Hayek, we have good reasons, scientific reasons of a certain kind, to think that people will be better off in a competitive and free economy than in a planned and centrally directed economy. My point here is not that Hayek's argument is indeed effectively proven scientifically true by him: it is that Hayek's argument is about the comparative economic robustness of two models or systems, something which has no bearing on the moral desirability and justifiability of the systems of rules involved. Accordingly, Hayek should not to be criticized for having based a normative claim ('we ought to be liberal') on an empirical conjecture ('rules of just conduct and perception sustaining competitive economy have the best chances to be selected in the cultural evolution process because they are efficiently superior').

One has to ask nevertheless whether this Hayekian optimality argument is fully consistent with the evolutionary standpoint Hayek is adopting, and I think it is. The idea of an '*optimum*' is surely not unfamiliar to economists: standard neoclassical economics in particular usually works with an optimality assumption when assuming that agents are rational. Furthermore, when theoretically extended, this paradigm includes information acquisition and transaction costs. But Vanberg's point against Hayek is that he "does not provide an independent definition of what 'appropriate' rules are, beyond the notion that they contribute to a *beneficial social order* (Vanberg 1986, p. 79). He further points out that "in talking of the 'appropriateness' of rules it may be necessary to specify the *relevant group* for which the resulting order is to be judged beneficial" (*ibid*., n. 4). This remark seems unjustified. For the criterion of the appropriateness of rules of just conduct and perception is formulated by Hayek in terms of population growth (see Hayek 1988, Ch. 8, pp. 120-134), this being directly related by Hayek to the socio-economic conditions which can most favorably play a causal role in the matter. It should be noted here that Hayek builds up a strong critical argument against Malthus and the Malthusian fear of overpopulation. Claiming that, as a matter of fact, in a market economy everyone gets a return exactly proportioned to what he/she contributes, Hayek also claims that the comparative advantages of economic systems can be devised in population-based terms: the population living under such conditions will tend to grow, a constantly expanding economic order being, by definition, one allowing a greater number of people to live and multiply. An expanding population will in turn eventually tend to increase economic efficiency. It is in comparing socialism and liberalism as two opposed socio- and politico-economic ideal-types that market process is conceived by Hayek to be the best 'discovery procedures' of information needed by individuals to act rationally, and as the best mechanism to work out spontaneously the 'coordination of all individual plans'. But of course this is not at all equivalent to saying that the best individual plans will necessarily be chosen and that the best social and economic order will inevitably result of the cultural evolution process.

Undoubtedly Hayek never claimed that competitive economies would in fact certainly give rise to absolutely optimal results just as he never wrote either that socialism would inevitably cause serfdom. Bruno Jossa writes nevertheless that "according to a widely shared interpretation [Hayek is confident] that social evolution will guarantee the survival of efficient institutions" (Jossa 1994, p. 80), but he adds that: "other well known advocates of economic liberalism, among them Viner and Buchanan, have severely criticized Hayek's opposition to institutional reforms by emphasizing that the institutions that are found to survive, and even to thrive, are not necessarily apt to maximize human capabilities. (…) In other words, according to Viner and Buchanan, cultural evolution does not guarantee the survival of the best institutions".[9]

Even if economic theory can demonstrate that the market economy is the best ever solution up until now to the resource allocation problem, one cannot say that liberalism will prove to be the best social and economic order ever possible in human history. Hayek should be praised for having shown that we have evolutionary evidence to believe that market–based spontaneous social orders outdistance in economic efficiency any form of centrally planned and directed society. But he should not be criticized for having propounded the view that, as an abstract and strongly idealized model (or ideal-type) of the economy, market process within the spontaneous social order working under the Rule of Law can, given the proper conditions, produce the best moral order ever possible. Hayek never endorsed historical determinism and he obviously never fell into the pitfalls of the naturalist fallacy. Moreover, methodologically speaking, his evolutionary argument about the economic superiority of a liberal order, i.e. of rules of just conduct and perception on which the market economy is based, qualifies as a comparative, not as a superlative argument.

III. IS CULTURAL GROUP SELECTION CONSISTENT WITH METHODOLOGICAL INDIVIDUALISM?

I now come to grips with the question of the alleged inconsistency between Hayek's cultural evolution theory and his professed methodological individualism. It is significant that those historians of economic thought who are discussing and trying to shed more light on Hayek's arguments against socialism often become hesitating and uncomfortable, if not embarrassed, when they take into consideration Hayek's professed evolutionary standpoint. And this is clearly related to the fact that Hayek made an unexpected use of the group selection concept. For instance, when Vanberg published his 1986 seminal paper, two years before the publication of Hayek's *The Fatal Conceit*, he had had access to Hayek's manuscript and referred to it explicitly.[10] "In his latest writings", writes Vanberg, "notably in his forthcoming book *The Fatal Conceit*, Hayek seems more and more to suggest an interpretation of the notion of group selection which is not based on the claim that individuals practice certain rules *because* they are beneficial to the group (…) Rather the argument is that those groups in which, *for whatever reason,* individuals are made to follow socially beneficial rules will be superior to groups with less beneficial rules, and that—via the superiority of the group—cultural evolution will select for appropriate rules" (Vanberg 1986, p. 89, n. 14). Vanberg's critique of this view is that "certain rules cannot be expected to emerge and to be enforced spontaneously, but require some 'organized apparatus' for their enforcement" (*ibid.*). But unfortunately "the idea of such a politically mediated process of cultural selection is left extremely vague in Hayek's writings" (*ibid.*). Agreeing with Steele (1994), Vanberg adds that "it is unclear for what period of human history Hayek considers this interpretation to be appropriate," that it can "perhaps be appropriate for a view measuring cultural development in terms of millennia" but surely not for us mortals who live on a much shorter timescale and who have to develop "an appropriate attitude towards the systems of rules" (*ibid.*) in which we find ourselves.

Following Vanberg's reading of Hayek, it seems that it is the rules of just conduct and perception that are the subject of the selection process: thus, the rules would be selected for the groups they favor in the economic struggle. But a somewhat different reading of Hayek is possible whereby it is rather the groups themselves that are selected and where they are so selected *for* the rules that the individuals in these groups actually follow. This changes the picture. Indeed the rules alluded to are not adopted by individuals through deliberation and following a rational choice and in view of the groups these rules tend to favor. The individuals who follow these rules do not most of the time have a clear awareness of what rules they are following precisely, and they would be in most cases unable to say why they do it, if only to do as others do themselves. These rules are learned through negative reinforcement and form feedback loops.

According to Hayek, the reasons why individuals in a given community will, generally speaking, follow tacit negative rules as far as their social and economic behavior is concerned is, of course, that they will tend to imitate successful social and economic behaviors. This being the case, the group in which they earn their living will tend to be economically successful, which is a guarantee of economic survival for them. So Hayek's argument goes this way: individuals follow rules which appear to them to be rules of just conduct and perception; individuals interacting in a community following those rules tend to be more successful than those that do not; more successful groups tend to be more extended (this is the idea of 'catallaxy'). Consequently, the more efficient and productive they get, the more people tend to follow these rules, so that this socio-economic regime tends to increase the population living under its norms and standards. Individuals get imitated for the rules they apparently follow (as for example in the language acquisition process); clearly groups of individuals get selected for the successful rules the individuals composing them follow. If this reconstruction is accurate, then Vanberg's reconstruction of Hayek's idea of evolutionary group selection is at odds with the one Hayek is effectively advocating. I must add that later in his work Vanberg takes a much more positive approach to Hayek's "evolutionary paradigm", conceding that this "is, in fact, a much more fundamental element of Hayek's thought than is commonly recognized" (Vanberg 1993 [1994], p. 95). But this leaves open the question of whether his 1986 interpretation of Hayek was sound in the first place, and I think not.

Vanberg writes moreover "that we have no reason to assume that there is some general spontaneous process at work on which we could blindly rely for the generation of appropriate rules" and furthermore "that the notion of cultural group selection is theoretically vague, inconsistent with the basic thrust of Hayek's individualistic approach and faulty judged on its own grounds" (Vanberg 1986 [1994], pp. 93-4). In the same vein, Stephen Boehm writes that Hayek is not the methodological individualist that he pretends to be (Boehm 1989, p. 221). Geoffrey Hodgson writes that "in an

evolutionary context, methodological individualism has to be either redefined or abandoned" (Hodgson 1991, p. 78). Hodgson himself rejects methodological individualism because it "takes the individual for granted" (Hodgson 1994, p. 419), whereas he thinks we need an analysis that goes deeper than the individual level in order to provide a causal explanation for the social and cultural factors of preference formation. To be sure, the 'unsoundness' and 'inconsistency' criticisms were raised by most if not all commentators of Hayek's work, such as Alain Leroux (1997) and many others.[11]

The notion of group selection seems very problematic to Vanberg and I concur with that remark—so vague, in fact, that it is not sure at all why we need this conceptual device within Hayek's CET. But what really matters is that 'group selection' is said to be 'inconsistent' with methodological individualism, and I take this point to be a highly significant criticism of Hayek's system of thought. But as I will try to show now, this conclusion is wrong. Methodological individualism is identified and characterized by Vanberg as "the guiding principle that aggregate social phenomena can be and should be explained in terms of individual actions, their interrelations, and their—largely unintended—combined effects" (Vanberg 1986, p. 80). In line with Adam Smith, it is presented as "an invisible-hand explanation" (Vanberg 1986, p. 81). Vanberg claims that, in order to be legitimate, this kind of explanation has "to show how the behavioral regularities, which a theory of spontaneous order assumes as given, can be explained as an unintended, but systematic outcome of a process of interaction among individuals who are separately pursuing their own ends" (*ibid*.).

To be fair I must add that Vanberg also stresses that "it should be noted that Hayek, in some places, seems to characterize the process of group selection in a way that would allow for a consistent, individualistic interpretation. He argues, for instance, that groups practicing more 'appropriate' or 'successful' orders will expand by attraction of outsiders, or that more successful orders will tend to prevail by being imitated by 'outsiders'. For such processes of *between-group migration* and *between-group imitation* to be taken into account, it is not necessary, however, to appeal to a special theory of *group selection* that would have to be added to the *individualistic* conception of cultural evolution…" (Vanberg 1986, p. 85, n. 12; 1994, p. 256, n. 26).

One could say that Vanberg himself almost found the solution to the problem he helped identify in the first place: Hayek does not in fact need any *biological* group selection theory. Consequently, the fact that he has adopted the Wynne-Edwards model of group selection,[12] a flawed model rejected by Wynne-Edwards himself, has absolutely no bearing on the point Hayek wants to make. As stated by Hayek in 1988, evolutionary biology is still striving to work out an adequate model of group selection but we should recognize that, even if there were no solution to the biological problem as stated, it would not have any adverse consequence for Hayek's theory of cultural evolution. How is that to be understood? The answer is straightforward in Hayek: cultural evolution is *not* a biological process after all, hence does not need to be articulated in an overall neo-Darwinian scheme of explanation. The fact that evolutionary economics is not Darwinian or neo-Darwinian in the sense of contemporary evolutionary biology has been made very clear in Lagueux (1988) and also, in more general terms, in Rosenberg (1992 and 1994).

But as far as modeling the biological evolution process is concerned, Hodgson (1991) did a tremendous job replying to one part of Vanberg's criticism. Hodgson showed in a carefully documented analysis that there were legitimate alternatives within evolutionary biology to the Wynne-Edwards model, which was inaptly based on the idea of altruism and self-sacrifice of individual organisms for the benefit of the species. And of course it cannot be denied that Hayek's theory of cultural evolution has been articulated as an analogy of biological evolution. As for orthodox evolutionary biologists, natural selection was conceived by Hayek as the statistical outcome of the working of time on biological organisms. Hayek is fully aware of the fact that the species that individual organisms come to form are exposed to blind variations, some of these variations being favorable to their rate of reproduction as a group and increasing their adaptation to their environment, but all others being disadvantageous and diminishing their capacity to adapt. It is with that model in mind that Hayek approached cultural evolution. It is worth noting that Geoffrey Hodgson wrongly criticized Hayek for not having seen that Carl Menger (and before him Adam Smith, David Hume and Bernard Mandeville) also espoused an 'evolutionist' viewpoint, but were aware that cultural evolution "is not equivalent to Darwinian evolution or natural selection in a fully specified sense" (Hodgson 1994, p. 408). For, the perspective adopted by Hayek clearly takes place as part of this tradition of thought.

I need to be clear ere: I wish neither to praise nor rearticulate more legitimately Hayek's group selection argument. My point is again purely methodological. I do not think that what Hayek called 'group selection' has anything to do with neo-Darwinism—and I think that Hayek himself was fully

aware of that.[13] This is why, in order to make sense of what Hayek meant by 'group selection', we do not need to find new and adequate biological models of cultural evolution, contrary to what Hodgson seems to believe. First of all, since cultural evolution is not a biological process, it need not be modeled as if it were one. The correct question here is not whether we can find a proper model of biological group selection, for I suppose we can, but whether we can stay connected with what Hayek wanted to explain and still stay within the cultural group selection framework. Contrary to a widespread criticism, Hayek's views on cultural evolution show no logical inconsistency with his methodological individualism (MI hereafter). This point requires a specific argumentation.

As far as MI is concerned, it should be recognized that there is more than one philosophical view that can be adopted here. Usually, MI is a reductionist stance: as a method to explain the working of society, MI assumes that every supra-individual entity must be 'explained away' by reducing it to its elements. 'Society' as a whole needs, in that sense, to be reduced to the actions of interacting individuals. MI is defined most of the time, like in Vanberg, as "the methodological presumption that, whatever phenomena at the social aggregate level we seek to explain, we ought to show how they result from the actions and interactions of individual human beings who, separately and jointly, pursue their interests as they see them, based on their own understanding of the world around them" (Vanberg 1994, p. 1). But this is clearly not what Hayek has in mind when adopting MI. When Hayek takes a stance as to the 'true individualistic' character of the method of social science, he means something quite different from reducibility: he advocates what he called a 'compositive' (or 'synthetic') method and considers that we have to start from individual actions in order to explain the aggregate level of society (the analysis is conducted bottom up) and there is no indication that we must follow the other path (we cannot have an analysis that goes top down). Something is then misleading in the reductionist conception of MI as far as Hayek is concerned: for the important thing to say is not that social institutions and structures result from human actions but that they *do not* result from the *intentions* of individual agents.

But even if we would invoke 'unintended consequences of action' to come closer to Hayek's view, something crucially important would still be missing here. Indeed it is quite true that for Hayek, as for all other individual methodologists, the building blocks of social and economic orders are individual actions and interactions, but what this means is that we must understand that the supra-individual level 'emerges' out of individual actions. This is what Hayek's 'compositive method' is all about. Hayek's MI doctrine is a form of "emergentism", and his methodological stance is radically anti-reductionist. What Hayek claims is that the 'compositive' method is what we need in social science, and not a 'resolutive' method.[14] In the physical sciences, what is observable is given at the macroscopic level while the unobservable is, strictly speaking, at the microscopic level. In the social sciences and in economics in particular, we find exactly the opposite: the observable (individual action) can only be given at the microscopic level and the macroscopic level (society) is by nature unobservable. For Hayek, the natural sciences are analytically oriented because they try to reduce complex entities like physical bodies to their simpler elements (atomic and subatomic particles). By comparison, social sciences need to follow a synthetic orientation because they have to explain how more complex phenomena like social institutions are constituted out of individual actions and beliefs, these being the only constituents that we can observe and have access to in the social sciences.

The best way to understand the relationship between individuals and groups (or society) is perhaps to refer to what has been called "supervenience" in the contemporary tradition of analytic philosophy. What mimimally specifies a supervenient relation is relatively simple to grasp: *between two systems of entities related to one other, the system A is said to occur (to supervene) on the system B if a difference in A cannot occur without a concomitant difference in B occurring also.* As a logical relation, supervenience relates in a non-reductionist fashion two levels of reality in such a way that the two levels co-vary without having to be isomorphic.[15] Just as 'mind' can be said to supervene on 'brain', society as a network of ruled institutions can be said to supervene on 'individual action'. And in the very same line of thinking, 'cultural groups' can be said to supervene on 'individual agents'. In more general terms, this means that for every modification of an observable 'social state', you necessarily will find a corresponding variation at the level of individual actions and events. But it does not mean that by a proper manipulation at the individual level, you will necessarily be able to get at will a particular pattern at the societal level. The antireductionist logical relation of supervenience seems to fit perfectly well Hayek's views on cultural evolution and methodological individualism as it also fits his neurophysiological theory of mind as articulated in *The Sensory Order* (more on this in Nadeau 2001).

The Hayekian brand of MI manifestly qualifies as emergentist as opposed to reductionist. By this I mean that cultural group selection *supervenes* on individual actions: it is then easily understood that rules of just conduct and perception followed by individual economic agents may confer superiority to the communities to which they belong over other populations with which they compete. Group selection in the Hayekian sense is the *effect*, never the *cause*, of individual behavior. Even if it was not explicitly used in Hayek's published works, supervenience is a concept that can help us understand adequately how cultural group selection comes about. Correctly stated, Hayek's conjecture goes this way: *groups of people are selected for their rules because the economically successful individuals get imitated by others and form dominating communities.* Precisely, Hayek's point is that just rules of conduct and perception get followed by more and more people, a moral tradition ("moral" in the sociological sense) gets progressively implemented and eventually reinforces itself because it confers a comparative advantage to groups of individuals that coordinate themselves in order to be better off in economic competition. The conclusion of such a reasoning is straightforward: even if Hayek effectively talks of 'group selection', it seems obvious that the explanatory device involved in the cultural evolution theory is thoroughly and exclusively based on individual actions, in particular when they produce unintended consequences. Hayek's evolutionary argument is by no means inconsistent with his methodological individualism. On the contrary, it gives it meaning and force.

IV. RECAPITULATION

It is obvious that most, if not all critics and commentators of Hayek mentioned here, have a different reading. I strived to establish from the start that Hayek's analysis of cultural group selection was in line with what he aimed to do in the socialist calculation debate. Hayek's cultural evolution theory serves clearly to reinforce on empirical grounds his analysis of what makes the superiority of the market economy over the centrally planed and directed economy. I argued that the kind of comparative superiority Hayek had in mind when opposing liberalism to socialism was only relative, and never absolute superiority. Hayek never argued that political economy could scientifically prove market economy to be the best ever possible historical result. I also stressed that economic superiority, even if it is for Hayek explainable in terms of just rules of conduct and perception, did not at all concern what is to be "good" in a moral sense. And I insisted moreover that for Hayek this system of rules defining liberalism was surely not necessarily bound to emerge in human history, for the market economy is a thoroughly contingent expanding spontaneous order. But I also made clear that its duration in time and its eventual domination evidently provides for Hayek an empirical argument in favor of its efficient superiority in comparison with a centrally planned and directed economy. Nothing seemed to be logically or methodologically deficient in Hayek's line of reasoning.

This being said, even if we cannot reach consensus on what to think about Hayek's case in favor of the superior efficiency of a market economy over a state economy, we should at least be able to converge on what Hayek's argument is not about. We should indeed be clear on the fact that Hayek does avoid the pitfalls of historical determinism and of the naturalist fallacy. Anyhow, what I intended to show is that, contrary to what is usually believed, Hayek's methodological individualism is not of a reductionist brand. MI is without a doubt one of the main tenets of Hayek's methodological stance, and he clearly distinguishes between a "true" and a "false" individualism. It should be noticeable that the Hayekian brand of MI is "emergentist" as opposed to "reductionist", and is conceptually consistent with the general idea of cultural group selection. It does not have to come within a precise theoretical model that one could find in evolutionary biology, if only because we are not talking here of an evolutionary process in the neo-Darwinian sense. I have argued that, logically speaking, cultural groups *supervene* on individuals, meaning that more successful rules of just conduct and perception followed by individual economic agents may confer superiority to some communities of interacting individuals over other populations. I highlighted the fact that group selection in the Hayekian sense is the surface effect and never the root cause of individual action. As a social reality, it forms in itself a paradigmatic kind of unintended consequence. Hence, for Hayek, human groups, as if they would form complex super-individual entities, which they are not, simply do not act, for only human individuals can make decisions and act accordingly. Furthermore they are not observable as such, for only individual entities are and can be. In this sense methodological individualism is completely consistent with Hayek's conjecture of cultural evolution even if it is based on the idea—perhaps a bit hazy—of group selection.

NOTES

1 According to Hayek, "(…) economics has come nearer than any other social science to an answer to that central question of all social sciences: How can the combination of fragments of knowledge existing in different minds bring about results which, if they were to be brought about deliberately, would require a knowledge on the part of the directing mind which no single person can possess?" (Hayek 1937 [1948], p. 54). See also Hayek, 1945 [1978].

2 There is a controversy over whether this last publication, written while Hayek was seriously ill, really reflects what he was thinking rather than the ideas of William Bartley, the first editorial director of Hayek's *Collected Works*, in which, paradoxically, Hayek's last book, *The Fatal Conceit—The Errors of Socialism*, appeared as the very first volume. Chapter 39 of Alan Ebenstein biography of Hayek (Ebenstein 2001, pp. 306-313) described how hard it was for Hayek to write his last work, which he so wanted to be of the highest quality. Ebenstein writes that, in the end, Hayek was dissatisfied with the result, adding that "he was also disappointed that he did not complete the work himself" (p. 312).

3 For sure Hayek never wrote that socialism would necessarily lead to serfdom (he disputed this point with Samuelson who saw an "inevitability thesis" in Hayek's argument: on this see Caldwell 1997, p. 1868, note 7) as he never claimed that competitive economies would always give optimal results.

4 Referring to the phrase "the impossibility of socialism", Hayek clearly rejects this wording of the problem: "(…) Mises had occasionally used the somewhat loose statement that socialism was impossible, while what he meant was that socialism made rational calculation impossible" (Hayek 1935a, p. 76). Hayek prefers to talk of the "impracticability" of socialism (p. 69 and *passim*).

5 For instance, Jean-Pierre Dupuy is very critical of Hayek's evolutionary argument precisely because it comes with a strong 'optimalist' view concerning the market economy. He writes: "Critics have been sensitive to what seems to be the major contradiction of Hayek's social philosophy. It relates to the status of the demonstration that establishes the absolute superiority of the market. Only the abstract orders that pass through the filter of cultural evolution can claim the highest rank. Never in particular can the human mind or reason conceive of such complex orders than those selected by evolution. The problem is obviously that Hayek can hardly claim that the market has passed the test successfully, since his work is a critique, as radical as it is 'rational' could we want to write, of modern civilization, guilty of having let itself be seduced by the sirens of constructivism. Therefore only one of two things can be true. Either Hayek must renounce his theory of cultural evolution and the superiority of the market based on rationalist arguments, or, if he sticks to it, he must admit that the extended market order is not the best that can be (Dupuy, 2002, p. 198, my translation).

6 Gould and Lewontin (1979) distinguished between three forms of 'adaptation': "what physiologists call 'adaptation': the phenotypic plasticity that permits organisms to mould their form to prevailing circumstances during ontogeny (…) Physiological adaptations are not heritable, though the capacity to develop them presumably is" . … Secondly, we have a 'heritable' form of non-Darwinian adaptation in humans (and, in rudimentary ways, in a few other advanced social species): cultural adaptation (with heritability imposed by learning). Much confused thinking in human sociobiology arises from a failure to distinguish this mode from Darwinian adaptation based on genetic variation… Finally, we have adaptation arising from the conventional Darwinian mechanism of selection upon genetic variation (p. 264). Hayek was obviously speaking about the second kind of evolutionary adaptation by way of cultural selection.

7 "... [Hayek] could not use and he has not really used the criteria of adaptation and survival to establish that a structure like the market is effectively able to efficiently promote the proper functioning of society. If such a structure could, in his view, have resulted from the spontaneous evolution of societies, one was not to conclude that any evolution was bound to result in a structure of this type. It would therefore also be unjust to see Hayek in a sort of unconditional apologist of the status quo that would justify this simply because it would be the fruit of a long evolution or even a long tradition. The market, according to Hayek, rather resembles a fragile structure that is imperfectly realized in the concrete history, a structure that the trials and errors of humanity risked destroying as much as they succeeded establishing" (Lagueux 1988, p. 96, my translation).

8 (…) the anti-teleological dimension of selection can not intervene decisively when comes into play the choice of institutions (...). The sole quality of being *spontaneous* does not bring by itself anything on which a value judg-

ment on the 'social order' or on 'justice' can be based" (p. 102, my translation). This analysis is rightly praised by Bruno Jossa (1994, p. 83).

9 Jossa's references are the following: Viner 1961, pp. 166-7; Buchanan 1975, pp. 130-1; Buchanan 1976, pp. 13-24. It should be noted that these texts were written long before Hayek's evolutionary ideas had been cleared up.

10 This paper was extensively revised by Vanberg, with many additions, in his 1994 book *Rules & Choice in Economics* (Vanberg 1994, Ch. 5, pp. 77-94.).

11 Pierre Garrouste (1999) is perhaps the only one to maintain loud and clear that "the Hayekian conception of evolution is consistent" (p. 99) and "coherent" (p. 100). In addition to chapters and books previously refered to, many other insightful comments are to be found in Bianchi (1994), Prisching (1989), Voight (1993) and Witt (1994).

12 V. C. Wynne-Edwards, *Animal Dispersion in Relation to Social Behavior*, Edinburgh: Oliver & Boyd, 1962.

13 Hayek follows in fact Popper and writes that "cultural evolution *simulates* Lamarckism" (Hayek 1988, p. 25).

14 Hayek indicates in *Scientism and Social Sciences* (Hayek 1942-43) [2010], p. 102, n. 4) that he borrowed the term 'compositive' (a translation of the German word *synthetisch*) from a handwritten note by Carl Menger on his own copy of the review of Menger's book *Methoden der Sozialwissenschaften* that Schmoller had published in *Jahrbuch für Gesetzgebung* (N. F., VII, 1883, p. 42). Schmoller had himself used the term "*deduktiv*" and Menger had written "*synthetisch*" just over it. (Cf. Hayek 1953, p. 130, n.33.) For a thorough historical study, see Cubeddu (1986).

15 The eminent British philosopher G. E. Moore reintroduced the concept of supervenience to modern philosophy. He did it through the english translation of passages from Aristotle's *Nicomachean Ethics*. In the sense we understand today, we owe it to the eminent American philosopher Donald Davidson to have initially introduced it in order to say that mental characteristics are in some sense dependent on physical ones without being identical to them.

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Social Research between the Use and Abuse of Reason

DARIO ANTISERI

Dipartimento di Scienze storiche e socio-politiche
Luiss Guido Carli
Viale Romania n. 32 – 00197 Roma
Italy

Email: dantiseri@luiss.it
Website: http://docenti.luiss.it/antiseri/chi-sono/

Bio-sketch: Dario Antiseri is Emeritus Professor at Luiss Guido Carli University in Italy. As an epistemologist and social philosopher, he is well-known for his work on Karl Popper and Hans-Georg Gadamer, and his idea that fallibilism and hermeneutics refer, not to two different methods but to the same one. His books on the history of philosophy and the philosophy of social science have been translated in several foreign languages. In February of 2002, along with Giovanni Reale, professor Antiseri received an honorary doctorate from Lomonosov Moscow State University.

Abstract: This brief article discusses the criticism that one of the most distinguished and eminent Italian sociologists, namely Professor Luciano Pellicani, has leveled at methodological individualism. Following Durkheim, Pelican defended the idea that culture is a holistic entity and must be regarded as an impersonal power that legislates, commands and punishes. The article argues that Pellicani falls into the trap of the realistic fallacy (that hypostasizes mental constructs) of methodological collectivism and that—contrary to what Pellicani claims—cultural constraints are easily and tranquilly explicable in terms of methodological individualism.

Keywords: Methodological individualism, Luciano Pellicani, situational logic, Max Weber, Ludwig von Mises

I

In order to understand the "object" and "duties" of the social sciences it is essential to survey the "nature" of collective concepts such as "state", "party", "class", "nation", "people", "union", "country", "government", "electorate", and so on. There are two traditions concerning the issue under consideration: the *collectivist* (Saint-Simon, Comte, Hegel, Marx, neo-Marxists, structuralists, etc.) and the *individualistic* (the Scottish School, Weber, Simmel, Menger, Mises, Hayek, Popper, Boudon, etc.) There are three issues at stake: an *ontological* problem; a *methodological* problem and a *political* problem. The ontological problem: what corresponds in reality to the collective terms? For *collectivists*, the collective terms correspond to substantial entities that shape, standardize, establish individuals; for *individualists*, individuals are the only things that exist, think and act. The methodological problem: what "objects" must the social researcher take into account, where must he begin his investigation? For the *collectivist*, research must consider those laws that create and produce the change of collective entities (states, nations, parties and so on); for the *individualist* the starting point of social research is human actions, whose interrelations give rise to events and social institutions, to deliberate consequences and unintended outcomes. The political problem: is the individual in function of the collective, for example of the state or party; or is the collective in function of the individuals? For the *collectivist* the first alternative applies; for the *individualist* the second.

In my view, there are the best reasons to consider the analysis of the unintended consequences of intentional human actions the specific task (Hayek would say: exclusive) of the social sciences. Human action has *motivations* and *consequences*: the motivations are the subject of the psychological sciences; the unintended consequences are not a problem; the unintended consequences are, in fact, the object of the social sciences. And the awareness of the inevitable onset of the unintended consequences of intentional human actions

destroys *constructivism* (as Hayek called the theory that *all* institutions and *all* social facts, in their genesis and changes, are outcomes of intentional actions, of plans drawn up, intended and realized); and the collapse of constructivism carries with it the collapse of the *conspiracy theory of society* (according to which, if all social events are results of intentional actions—and this is constructivism—then negative facts and social events, for example, rising unemployment, famine, etc., will necessarily be the result of plans or conspiracies of evil men) and *psychologism* (i.e., the theory that the explanation of all institutions and all social facts should be *reduced* to feelings, ambitions and intentions, and therefore to explanations of a psychological nature). Constructivism collapses because *not all* institutions and *not all* the social facts are outcomes of projects intended and realized—institutions such as, for example, language, currency, the market, the state; many localities have arisen spontaneously and many projects, although they succeed, do not succeed completely according to the original plans. The conspiracy theory collapses: because it is also true that the road to hell is paved with good intentions. And psychologism collapses: from the psychological sciences, in fact, there escapes the entire scope of unintended consequences. It is thus that, inside of methodological individualism, there is founded the *autonomy of sociology* in particular and of the social sciences in general.

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In the horizon of such considerations, for some time now I have found baseless the criticism that one of the most distinguished and seasoned Italian sociologists, namely Professor Luciano Pellicani, has levelled at methodological individualism. He is convinced that in front of the individual "there are independent social facts—beliefs, values, rules, etc.—that are *imposed* by virtue of their coercive-regulatory power; facts that often emerged in ancient times [...], that have acquired the status of impersonal and objective *normae agendi*"; facts that "are not entirely attributable to the facts relating to the thoughts and actions of individuals" (Pellicani 1990, p. 106). In the wake of Durkheim, Pellicani affirms that "beliefs, shared values, institutionalized norms, legitimate expectations can be treated as if they were things, as they are actually realities *external* to the individual, *independent* from him and equipped with an almost physical *resistance*" (Pellicani 1990, p. 107). And here is how he makes explicit, with an example, his anti-individualistic conception. "The first scene of the film *Il Faraone (The Pharaoh)* by Jerzy Kawalerowicz shows us the Egyptian army blocked, while conducting an exercise, by the presence of a beetle. The beetle for the Egyptians of the time when the story told by Kawalerowicz takes place was a sacred animal. In front of it, therefore, the army is obliged to make a wide diversion. The Pharaoh finds the thing absurd. 'Not even a donkey would change his march in front of an insect!' he exclaims angrily. 'But a donkey', replies the High Priest standing beside him, 'could never reign over Egypt.' In other words: the Pharaoh can order anything, except behaviors that the ruling religion strictly prohibits; he must, if he wants to rule without resistance, adapt to traditional customs, respect the established prejudices, conform to the institutionalized ways of thinking, feeling, and acting" (Pellicani 1990, p. 108).

Pellicani thus comments on this example: "If we start from the definition of social action of Weber (or Mises), all this is inexplicable. We are faced with a typical example of the conflict between what controls the *ratio* and what commands the *traditio*. And the *traditio* is not a simple acquired habit. It is something more; rather it is something very different from habit: it is an impersonal power that legislates, commands and punishes. Deviating from the path set by *traditio* is equivalent to clashing with a widespread moral force, invisible and yet very resistant. In fact, the film shows us the attempts of the Pharaoh to rule by trampling on religious customs, attempts which end with the revolt of his subjects, offended in their most sacred sentiments. Eventually the *traditio* triumphs over *ratio*: Pharaoh is overthrown and replaced by a man who, with the support of the priests, will restore the validity of the ancient customs" (ibid.)

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Well, the example cited by Pellicani is—contrary to what he claims—*easily* and *tranquilly* explicable in terms of methodological individualism or, if you will, of *situational logic*. And the comment Pellicani makes shows clearly how he falls into the trap of the realistic fallacy (that hypostasizes mental constructs) of methodological collectivism.

Mises affirms that if you understand that what sets action in motion are ideas, then you cannot but admit that these ideas originate in the minds of some individuals and are transmitted to others. In doing so, however, he has accepted the fundamental thesis of methodological individualism, that is, that it is the ideas sustained by individuals that determine their group loyalty, and a collective no longer appears as an entity acting independently or on its own initiative (Mises 1978, p. 78). And that an idea's (moral or religious,

for example) being rigid, unquestioned, spread over an entire population, and that it lasts for centuries, are not qualities that do not change the nature of the idea proposed and invented by someone, communicated to others, accepted by them and for them become a motive of action.

That being the case, it remains very difficult to understand how Pellicani can say that—if we start from the definition of social action, for example, of Mises—the episode from *Il Faraone* of Jerzy Kawalerowicz is inexplicable. The narration of the episode made in individualistic terms offers no difficulty: there are Egyptian soldiers marching, during a military exercise; along their journey these soldiers encounter a beetle; now, as the Egyptians of the time had the idea (widespread, normative, "formative", i.e., inwardly assimilated, invented by others in perhaps distant times, and subsequently accepted by most or perhaps all) that the beetle was a sacred animal and that it was forbidden—under the punishment of the gods—to cross the line marked by the presence of the beetle, they act in accordance with this idea: they change direction and make a wide diversion. In doing so they are *perfectly rational* (à la Mises, à la Popper): they face a problem, and their action—the problem solver—becomes understandable (rationally understandable) as it is appropriate to the problematic situation as they saw it. And why should those soldiers not have changed direction, if crossing the line marked by the beetle would have incurred the punishment of the gods? Obviously, in the situation *as the Egyptian soldiers and the High Priest saw it* (a conjecturally reconstructed situation), changing direction was the best-suited means to achieve the end of avoiding the damage to be incurred by the wrath of the gods.

Given, in short, their religious idea, the consequent action of the Egyptian soldiers was rational. Just as is *rational* today the action of those Italians who turn back and change path upon encountering a black cat crossing the street. One could say that the action of the Egyptian soldiers was rational, given their beliefs, but that these beliefs were not, however, at all rational. In this way, however, the question changes: what is accepted as true by one person may be false for another, true beliefs accepted and believed by entire groups for long periods have later been dismissed as illusory and false and replaced with other beliefs. But this does not change the fact that every individual acts and tries to solve problems through the ideas he considers true and well-founded. Many of us today equate the *rational attitude* with the *critical attitude*. This idea of rationality, however, does not affect in any way the *principle of rationality* which, as we know from Popper, simply assumes "the adaptation of our actions to our situations-problems as we see them," and that makes human actions understandable (Popper 1967, pp. 149-150).

IV

One more consideration. The episode of the film of Kawalerowicz shows us the struggle between individuals with different ideas; a fight that ends with the revolt of the subjects and the replacement of the Pharaoh. Pellicani comments on the outcome of this struggle between individuals stating: "eventually *traditio* wins out over *ratio*." One understands well what he means: the subjects who were fully convinced of the validity of the ideas of their fathers and their forefathers defeat the Pharaoh, who had different ideas from them. Here, too, however, what is striking is the *collectivistic style* of the Pellicani's phrasing: *traditio*, *ratio*, almost independent entities from the individuals and that work independently from the individuals. And then, why is the Pharaoh's idea *ratio*? Maybe because it accords with some idea of many of us today? Or maybe it is the duty of the historian to judge the *rationality* of the ideas of others? Nor do I think that this is even the task of the sociologist. The historian is faced with traces from which to reconstruct actions (and their consequences) of individuals who had certain ideas or beliefs. Nor does it seem to me, moreover, that the idea of the Pharaoh can be defined as *ratio* because it is different or new in relation to that of his subjects. *The Pharaoh's idea was simply different from that of his subjects*. There is no *ratio* in the abstract: this is what I mean. *Ratio*, or the idea of rationality understood as some of us understand it nowadays, and that is, as a critical attitude, is an idea that is the result of the ideas of other people who since the time of the pre-Socratics have proposed certain theories, and put together certain discussions, and so on. Not because an idea is new or different—as is the case of the Pharaoh—from the one shared by most, is it *ratio*. If it were, we would have to include in *ratio* all the most outlandish or dogmatic ideas of human history.

V

Pellicani once more insists: "To realize how inadequate the cognitive strategy is that the partisans of methodological individualism offer, it is enough to recall here the military conduct of the Aztecs against the *conquistadores*" (Pellicani 1990, p. 110). The Aztecs, writes Pellicani referring to *The Conquest of Mexico* by W. H. Prescott (1978), "did not try to bring down their enemies, but to take them prisoner to sacrifice them according to the rite imposed by their culture.

Such a practice was fully functional within a state organization whose main purpose was "the production and redistribution of substantial amounts of animal protein in the form of human flesh" (see Harris 1981, p. 124). But it proved to be highly irrational in front of the completely different way of conducting war by the Spaniards. Nevertheless, the Aztecs did not alter their military practice; and they did not do so because it was religiously sanctioned. Even when their capital was put under siege by Cortés, they gave up the fight according to the rigid schemas of their *traditio* and in so doing, procured their ruin" (Pellicani 1990, p. 110).

Well, before the description of such events Pellicani asks: "Is this not a particularly strong example of how tradition determines the *forma mentis* of men and, consequently, the way they act? Does this example not illustrate the coercive-normative nature of culture and its autonomy over individuals?"

To Pellicani's question I answer by saying that the example shows only that certain individuals had made their own ideas transmitted by their fathers, and that they acted according to them, unable to cope with, in this case, what was for them a new issue. But this is what always happens. If an individual does not have new ideas to propose, he uses those he has, which he has accepted from others. Castiglioni, in his *Storia della medicina* says that, at the beginning of the last century, Giovanni Rasori treated a case of pneumonia by withdrawing in four days 4230 grams of blood and administering 4-5 grams of emetic (stibiated tartar) (see Debenedetti 1947, p. 134). Everyone can imagine the outcome of the treatment. But what matters for us is to see that Rasori's therapeutic action was the result of a physio-pathological idea he had accepted from Brown and considered true. Individuals always act with the ideas they have, which they have accepted or have managed to create on their own, and consider valid.[1]

NOTES

1 This article draws directly from chapter 2 of Antiseri and Pellicani (1995).

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Complex Methodological Individualism[1]

JEAN PETITOT

École des hautes études en sciences sociales (EHESS)
Centre d'analyse et de mathématique sociales
190-198 avenue de France F75244 Paris Cedex 13 France
Bureau 567 – 5e étage
France

Email: petitot@ehess.fr
Web: http://jean.petitot.pagesperso-orange.fr/index.html

Bio-sketch: Jean Petitot, author of 12 books and over 300 papers, is a specialist of mathematical modeling in social and cognitive sciences and is a full member of the International Academy of Philosophy of Science. He has worked on complex methodological individualism and Hayek and co-edited with Philippe Nemo *Histoire du libéralisme en Europe* (Presses Universitaires de France, 2006).

Abstract: The paper begins with a few reminders of the history of complex methodological individualism in the general context of complex systems. It then focuses on Hayek's concepts of complexity, spontaneous order, and cultural evolution. In a second part, it sketches some models of a cooperative "invisible hand" in the theory of evolutionary games, in particular for the iterated and spatialized prisoner's dilemma.

Keywords: complex systems, cultural evolution, evolutionary games, Hayek, methodological individualism, prisoner's dilemma.

I: INTRODUCTION

To understand complex methodological individualism, we need to focus on some preliminary issues related to both emergence and reductionism.

Classically, a reductionist thesis posits that complex high level phenomena, structures and processes can be reduced, as far as their scientific explanation is concerned, to underlying lower level phenomena, structures and processes. The most paradigmatic and best-investigated example is the reduction of macroscopic thermodynamics to microscopic molecular and atomic movements (temperature = mean kinetic energy per degree of freedom, etc.). Let us begin with some conceptual precisions.

1. Reductionism can be a particular scientific thesis concerning a specific scientific theory: it is precisely the case with the reduction of macro thermodynamics to micro statistical mechanics. But it can be also a general metaphysical claim on the ultimate nature of reality. That is the case with different forms of monism. Idealist monism posits the universal reducibility of reality to mind while materialist monism posits the universal causal reducibility of reality to matter and energy. In this paper we will be concerned only with scientific reductionism.

2. Reductionism can concern theories dealing with empirical data and in that case focuses on the problem of causality. But it can also concern purely linguistic and formal theories. For instance lexical definitions or logical axioms consist in trying to reduce complex contents to a small list of primitive contents. In mathematics, many theories deal with the possibility of eliminating higher order concepts, objects or axioms in proofs and deflate rich theories to more restrained ones (theorems of elimination): for instance one can prove that quantifiers can be eliminated in algebraic geometry (Tarsky-Seidenberg) or that a proof using the axiom of choice can be transformed into a proof without the axiom of choice, etc. In this paper, we will be concerned only with theories having an empirical content.

3. Scientific object-oriented reductionism can be *objective* or *methodological*. It is ontological when it concerns explanations in terms of primitive objects (atoms, neurons, etc.) and methodological when it concerns deflationist nominalist explanations (Occam's razor). There are well known examples of eliminative methodological reductionism having eliminated pre-scientific speculative concepts and entities such as "phlogiston" or "vitalist entelechies", etc. To day, a very important debate in cognitive science has to do with the eliminability of "mental" or "conscious" concepts and their reduction to neural concepts (see e.g. the Dennett/Chalmers controversy). In this paper we will be concerned with "objective" reductionism.

4. Now, the main point is that, in our narrow, scientific, empirical, and objective sense, reductionism is by no means eliminativist and it is perfectly compatible with emergence in *complex systems* characterized at least by two levels of reality: a micro underlying level where a great number of elementary units are in interaction and a macro emergent one where *macro self-organized structures* emerge. In such a perspective, reductionism is inseparable from converse concepts such as "emergence", "supervenience" or "functionalism". Functionalism means that macro structures having a functional role can exist only if they are materially implemented in an underlying material substrate, but are at the same time, as functionally meaningful structures, largely *independent* of the fine grained physical properties of the substrate they are implemented in. The paradigmatic example is the opposition software/hardware in computer sciences (see philosophers like Putnam, Fodor, Pylyshyn, etc.) but functionalism also applies in natural sciences where it is an aspect of emergence.

5. There is a general agreement on the fact that in complex systems having different levels of reality at different scales, there exist collective behaviors ruled by laws that are not the laws of the micro underlying level. It is the case for critical phenomena, percolation, self-organized criticality, reaction-diffusion equations, dissipative structures, turbulence, cellular automata, neural networks, ant colonies, swarms, stock markets, etc. According to one's conception of laws, one can develop different conceptions of this empirical fact.

(i) *Eliminativism and epiphenomenalism*: laws being only empirical regularities lacking any objective (and a fortiori ontological) content (Hume's empiricist thesis), emerging structures are purely epiphenomenal and can be scientifically eliminated "salva veritate".

(ii) *Holistic realism* (it is the converse position): laws being real in the ontological sense, the emerging level possesses an ontological reality and cannot therefore be reduced.

(iii) *Causal reductionism and objective emergentism*: laws being objective, that is at the same time empirically grounded and mathematically formalized, the emerging level has no holistic ontological content but is nevertheless much more than a simple empirical regularity. It is *causally* reducible to complex interactions at the micro underlying level but it shares nevertheless some empirical and theoretical *autonomy*.

We will be concerned here with this third type of situation, that is with objective emergentism.

6. The main difficulty that has to be tackled in such a perspective is the relation between causal reduction and theoretical autonomy. *Mathematics* play here the fundamental role. Indeed, the formal equivalent to causal reduction is *mathematical deduction*. But deducibility is a syntactic property and doesn't entail any evident *conceptual* derivation (it is for that very reason that mathematics constitute an authentically "synthetic" knowledge even if their proofs are "analytical"). Therefore the fact that the structures and properties of the macro level can be mathematically deduced from the micro one doesn't mean that the representational content of its conceptual description can be reduced to the representational content of the micro level. A very spectacular example is that found in statistical physics where magnetic critical behaviors can be classified, via the *renormalization group*, in universal classes independent of the specific fine-grained physical structure of the substrate.

The renormalization group is a dynamical method that enables to define these universal behaviors as attractors of a certain dynamics on the space of Hamiltonians. Near the critical temperature ($T = T_c$) the macro variables of the system (magnetization, specific heat, magnetic susceptibility, etc.) follow power laws $(\Delta T)^{\propto}$ (where $\propto$ is called the critical exponent of the variable). Empirical data have shown that there exist universal classes of critical exponents linked by very precise relations. These universal classes depend only on very general abstract dimensional and symmetry properties of the substrate and not on its detailed physical structure. The point is that if you prove mathematically that such a critical phenomenon arises from a symmetry breaking of

an order parameter, this doesn't mean that this macro and abstract symmetry breaking modeled via group theory, has something to do with the concept of a spin of a particle. Causal reduction paralleling mathematical deduction is not a conceptual reduction. Moreover, the universality of critical exponents — that is the existence of invariants — proves that the emerging critical phenomenon under consideration has some measure of autonomy and belongs to an autonomous level of reality.

It is in this framework, that we will present some remarks on *Hayek's catallaxy* and *evolutionary game theory*.

II. COMPLEX METHODOLOGICAL INDIVIDUALISM IN HAYEK

Methodological individualism has to do with the reduction of collective properties to interactions between individual ones. *Complex* methodological individualism advocated by thinkers like Ludwig von Mises, Friedrich von Hayek or Jean-Pierre Dupuy is neither holistic nor eliminativist but *emergentist*.[2] Friedrich von Hayek paradigmatically represents it.

Hayek was one of the first to develop the consequences of the theories of self-organization and spontaneous order in cognitive and social sciences.

1. Hayek and the complexity problem

Hayek always strongly emphasized the specific properties of the complex socio-economic spontaneous order in modern open societies. It is a sophisticated self-organized order where "laissez faire" does not produce anarchy, but an order that is cognitively founded and would be impossible to obtain in another way. Its endogenous complexity is irreducible and, according to Hayek, dooms to failure any rationalist constructivism that would claim to create it artificially. Under the name of "constructivism", Hayek criticizes here a new type of reductionism, namely the possibility to reduce a natural complex order to the application of a system of rational rules. In a certain sense, he claims that there cannot exist an AI expert system for modern societies and markets.

The source of complexity has to be found in the fact that, in an open society, knowledge, competencies and informations are *distributed*, scattered over a great number of cognitively limited and interacting agents. The systemic properties of such systems cannot be conceptually controlled. The political control of social and economic orders rests on a methodological error.

Many consequences derive from this fundamental fact.

(i) Complexity prohibits at the same time a centralized hierarchical organization and a communal link of reciprocity characteristic of small closed communities. In modern open societies the interactions between agents is no longer ensured by consensus on shared values but by exchange of signals such as prices in a market. Market is a way of circulating information in a multi-agent system whose very complexity makes it opaque to its own agents. In a Hayekian "catallaxy" everyone cooperates with everyone else but without any shared ends. The individual aims are incommensurable with each other but mechanisms such as free trade and markets guarantee nevertheless a viable cooperation.

(ii) Complexity is an evolutionary process resulting from a selection of historico-cultural rules of behavior, practices, institutions that are impossible to master conceptually. In that sense, political, juridical, and social constructivism appears to be the dark side of the Enlightenment.

(iii) Rules that govern social exchanges and communication are abstract and formal. Social self-organized complex systems are governed by civil rights guaranteed by public laws.

The main critique raised by Hayek against political constructivism is that it does not understand what a complex order is and is in fact not "progressive" at all but "regressive".

2. Towards a rational justification of Hayekian anti-constructivism

Progressively, these problems have become accessible to scientific inquiry and modeling. In particular, the idea that many common-sense rules have been selected by an evolutionary process and constitute an optimizing collective form of "learning", seems to be essentially right. We will present below an illustration, but let us first recall some aspects of methodological individualism.

2.1. The paradigms of social order

The concept of spontaneous order must be put in historical context. It posits that pluralism and individual freedom are not sources of disorder, anarchy and social struggle but, on the contrary, a factor conducive to higher forms of organization. It stands in sharp contrast with three other paradigms:[3]

1. The paradigm of hierarchical order and absolute power theorized from the Renaissance by Machiavelli (1469-1527), then Bodin (1529-1596) and Hobbes (1588-1679), and put in practice for instance in Spain by Charles V and Philippe II, or in France by Richelieu, Louis XIV and Napoleon. It is in reaction to this form of absolutism that many demands arose for tolerance and human rights, from Grotius (1583-1645), Bayle (1647-1706) and Locke (1632-1704) to Kant (1724-1804), Humboldt (1767-1835) and Benjamin Constant (1767-1830). It was the source of many revolutions: in Netherlands, England, America and France (before the Terror). It was the main origin of modern science, techniques, the industrial revolution, and prosperity.

2. The revolutionary paradigm of rational constructivist order that rejects open society in the name of great ideals of equality and justice and relies on political planning to create a new humanity.

3. The conservative paradigm of natural order, which rejects also open society, but for an opposite reason: it champions a form of organicist holism and accuses modernity for having "atomized" society (individualism) and destroyed "natural communities" (family, corporations, churches, etc.).

The paradigm of spontaneous order posits a new conception of social order as neither natural (permanent and universal) nor artificial (rationally construed), but pluralist and self-organized, non hierarchical and polycentric. Evident examples of such orders are language, law or morals: they are not natural in the strict sense of the term, but they are neither artificial since nobody has ever made them. As the masters of the Scottish Enlightenment David Hume (1711-1776) and Adam Ferguson (1723-1816) emphasized, they are the results of human actions but not of human intentions.

2.2. Methodological individualism[4]

In this context, the problem of methodological individualism (MI) — that is of the reducibility of macro social structures to micro individual interactions of agents — is central. In classical sociology, *holistic realism* is dominant. According to it, social phenomena must be explained in terms of macro-social and supra-individual collective entities prior to individual agents and transcending them: states, churches, parties, classes, nations, markets, etc. Holism aims at explaining how such "real" social entities prescribe norms and values to individual subjects.

(i) For Saint-Simon (1760-1825, *De la physiologie appliquée à l'amélioration des institutions sociales*: 1813) and Auguste Comte (1798-1857, *Système de politique positive*: 1851) holism was a sort of "organicism", a "physiological" conception of the social reality opposing "mechanistic atomism" developed by "social physics".
(ii) With Durkheim (1859-1917, *De la division du travail social*: 1893, *Règles de la méthode sociologique*: 1895, *Les formes élémentaires de la vie religieuse*: 1912) holism is no longer biologically inspired and becomes a true sociological thesis. Social wholes exist and subsist *de re*, and determine the actions of empirical individuals. Of course, there exist "horizontal" interactions between individuals but the true social causality is "vertical" and "top down" and flows from social wholes to individual parts.

(iii) By definition, all variants of socialism and communism are also holistic.

MI considers that holism is a mythology. It rejects any substantial hypostasis of global concepts and develops a modern variant of the fight of nominalism against realist conceptions of universals. For it, as for Occam, social groups are aggregates and not substances. It is called methodological because it concerns explanation and not ontology.

For Karl Popper (*The Poverty of Historicism*, Economica, 1944 and Routledge, 1986), MI is an unassailable thesis according to which all collective phenomena must be reduced to actions, interactions, goals, hopes, thoughts of individual subjects as well as to the traditions they have created and maintained. For Jon Elster (*An Introduction to Karl Marx*, Cambridge University Press, 1986) it is the thesis according to which all social phenomena, their structure and change, can be explained using only individuals with their qualities, beliefs, goals and actions.

The founders of MI are well known:

(i) John Locke (1632-1704). Individuals are the basic social entities but they interact in a contractual society protected by the rule of law.
(ii) Bernard de Mandeville (1670-1733) and his celebrated "*The Grumbling Hive: or, Knaves Turn'd Honest*" (1705) also known as "*The Fable of the Bees; or, Private Vices, Public Benefits*" (1714). He triggered a tremendous

controversy (for instance with Berkeley) because he introduced a principle of *inversion* between individual intentions (micro-level) and non-intentional emerging social properties (macro-level). Individuals are intentionally selfish and governed by their private and local self-interest but their interactions generate, in a *non-intentional* way, a global social order propitious to public interest.

(iii) The Scottish Enlightenment: Hume, Ferguson (see above).

(iv) Adam Smith (1723-1790) and the "*invisible hand*" (*Theory of Moral Sentiments*, 1759, *The Wealth of Nations*, 1776). The essential feature of the invisible hand is that it drives subjects to collective ends that do not proceed from their intentions.

We see that methodological individualism concerns mechanisms of self-organization, which cannot be rationally computed by agents. Social cohesion, cooperation, prosperity are non-intentional effects emerging from an aggregation of selfish interests.

Many variants of MI proceeded from these early works, some more utilitarian and reductionist (John Stuart Mill 1806-1873, Léon Walras, 1834-1910 and Vilfredo Pareto, 1848-1923: *Traité de sociologie générale*, 1916), other more organicist (but not holistic, Herbert Spencer 1820-1903: *The Principles of Sociology*, London, Williams and Norgate, 1882-1898).

Complex MI was founded by the Austrian school: Carl Menger, Ludwig von Mises and Friedrich von Hayek. It rejects of course holist mythology, but it is emergentist; it is neither reductionist nor mechanistic. Carl Menger (1840-1921, *Grundsätze des Volkwirtschaftlehre*, 1871; *Untersuchungen über die Methode des Socialwissenschaften*, 1883) was the first to make explicit this problem of complexity. He was followed by Hayek who gave the best theoretical clarification of self-organized orders (language, religion, law, money, market, state, etc.) that are not the result of a collective intentional will. The parallel with theories in natural sciences (physics, biology, neurosciences) is striking.

(i) Order is a consequence of the coordination of individual agents.

(ii) Emerging collective structures acquire some autonomy even if they are causally reducible to individual interactions.

(iii) They are structurally stable if agents respect rules of law.

(iv) These rules result themselves from a form of cultural evolution.

(v) Emerging structures are non-intentional and unpredictable (no rational planning is possible).

(vi) It is a fundamental error to attribute intentionality to them. That error is one of the main sources of totalitarianism.

(vii) As we will see, cultural evolution is Darwinian in a specific, non biological, sense.

3. Cultural evolution and emerging ethical maxims

At the cognitive level, be it individual or social, according to Hayek, the origin of the rules governing perception and action, as well as that of conventions and norms, is evolutionary. These patterns result from a cultural selection—a collective learning—which is a competitive/cooperative process having favored the individuals and groups that applied them. They are like cultural short-cuts enabling people to behave rapidly and adaptively without having to recapitulate every time all the experiences and beliefs necessary to action. For Hayek, *common-sense* is a library of tacit knowledge routines and practical schemes patterning our experience after generic default schemes. It is necessary to act without being overwhelmed by the overflow of irrelevant informations coming from the environment. For Hayek (as for Mandeville, Hume or Ferguson), common sense norms are not repressive constraints but, on the contrary, cognitive achievements deeply adapted to the contingencies of life. Traditions express an "embodied knowledge" which is "phylogenetic" in the sense of cultural evolution, and it is therefore rational to comply with them "ontogenetically".

In much the same way as in evolutionary biology, phylogenetic a posteriori operate as ontogenetic a priori, common sense rules operate for the subjects as a priori frames. In this sense, we find in Hayek an evolutionary theory of the *self-transcendence* of behavioral rules. Like linguistic rules, they proceed from symbolic institutions whose origin is neither a rational omniscient intelligence nor a deliberative social contract.

We see how Hayek articulates cognitive psychology (the "sensory order") with the sociology of complex spontaneous orders ("catallaxy").

We know that the very concept of cultural evolution is quite problematic. For Hayek, as for Popper, cultural evolution selects groups and not individuals, subjects having to comply with rules that maximize the collective performances of their group. However, for the subject themselves, it is

impossible to understand in what operational sense these norms are socially fruitful because they encode a "phylogenetic" historical evolution. That's why they interpret them as *duties* and *values*. We must emphasize the originality of this conception:

1 As individuals cannot understand the pragmatic efficacy of norms, they accept them for *deontic* reasons. We recognize here a thesis that belongs in Kantian ethic.

2 However, norms being socially useful we recognize also a *utilitarian* conception of ethics (Jeremy Bentham, John Stuart Mill). The main difference is that the "computation" of moral maxims and actions is cognitively inaccessible for individuals.

Therefore, according to Hayek, cultural evolution implies that maxims of action can act for individuals as transcendent "categorical" imperatives[5] while they are at the same time immanent "hypothetical" (pragmatic) imperatives for cultures.[6] For cultures, maxims are caused by the viability of a social order from which individuals gain a lot. As was emphasized by John Gray, Hayekian utilitarianism is *indirect* and exemplifies the general evolutionary principle (Haeckel's law) according to which phylogenetic a posteriori operate ontogenetically as a priori. Hayek was able to reconcile, from within methodological individualism, reductionism with holism: social entities prescribe norms, rules and maxims to individuals.

It is interesting to highlight how Hayek succeeded in renewing the notion of categorical imperative as a deontological (non consequentialist) conception of actions. According to deontological theses, actions must be evaluated in a principled way independently of their consequences, while according to consequentialist theses they must be evaluated on the basis of a computation of the costs and benefits of their consequences. But as that kind of computation is impossible for a finite and limited rational mind, it is performed by cultural evolution. As was emphasized by Jean-Pierre Dupuy, cultural evolution is "utilitarian" but bears on "deontological" maxims that can be interpreted in accordance with a test of "categoricity".

III. THE EXAMPLE OF EVOLUTIONARY GAMES

Let us now consider an example of how social modeling upholds some Hayek's theses. We shall take the problem of selection of social rules and shows how it can be modeled in terms of evolutionary game theory.

Ever since the pioneering work of Robert Axelrod (see, e.g., Axelrod *et al.*, 1998), many models have been dedicated to underlying causal mechanisms of complex adaptive social systems (see e.g. Binmore 1994). The simplest and best-known example is that of the *Iterated Prisoner's Dilemma* (IPD).

3.1. The prisoner's dilemma

Let us first recall the classical Prisoner's Dilemma (Poundstone 1993). There are two players A and B and each player can choose one of two behaviors (strategies): d = defection and c = cooperation. In order to compute gains and losses (profits and deficits), we use a matrix of payoffs with columns $A(c)$ (A plays c) and $A(d)$, and lines $B(c)$ and $B(d)$. Each entry corresponds therefore to a one-shot game and we introduce the players's payoffs: the column player *A's* in the upper right corner and the line player *B's* in the lower left corner. The payoff matrix involves 4 terms:

$T = (d, c)$ = Temptation,
$S = (c, d)$ = Sucker,
$R = (c, c)$ = Reward,
$P = (d, d)$ = Punishment.

For the game to be interesting (there must exist a "dilemma") payoffs must satisfy the set of inequalities:

$T > R > P > S$.

Here is a typical example:

	A(c)	A(d)
B(c)	R = 3 R = 3	T = 5 S = 0
B(d)	S = 0 T = 5	P = 1 P = 1

Behaviors:
d = defection, c = cooperation

Payoffs:
T = (d, c) = 5, S = (c, d) = 0
R = (c, c) = 3, P = (d, d) = 1

Conditions:
T = 5 > R = 3 > P = 1 > S = 0
(T + S)/2 = 5/2 < R = 3

This extremely simple game is not trivial since it represents a situation where *individual* rationality is at odds with *collective* rationality. Indeed:

(i) If column player A plays c, then line player B gets R if he plays c and T if he plays d. As $T = 5 > R = 3$, it's in the interest of B to play d.

(ii) Now, if column player A plays d, then line player B gets S if he plays c and P if he plays d. As $P = 1 > S = 0$, it's still in the interest of B to play d.
(iii) Therefore, if B is *rational* in the individualist sense, he must play d whatever A's behavior. It is said that strategy d strictly *dominates* strategy c : d is better than c whatever the other player's behavior.
(iv) The same holds for A by symmetry.
(v) The rational outcome of the game is therefore the non-cooperative behavior (d, d), which leads to the very bad collective payoff ($P = 1$, $P = 1$).
(vi) But clearly, the cooperative behavior (c, c) would have led to a largely better collective payoff ($R = 3$, $R = 3$).
(vii) So individual rationality selects a poor (lose, lose) strategy (d, d) while a collective rationality would have selected a good (win, win) strategy (c, c).

The dilemma comes from the fact that for the above payoff matrix the double strategy (d, d) is the only *Nash equilibrium* (NE), that is the only strategy having the property that each player would do worse if they changed unilaterally their strategy.

One can generalize this basic example in multiple ways, introducing asymmetries, non-strict inequalities, neutral behaviors (a player can refuse to play), multiple players, probabilistic strategies (a player plays c with probability p and d with probability $1 - p$, etc.). The main result is that the dilemma is *robust*. How can we therefore explain the emergence of *cooperative* collective behaviors through an evolutionary selective process? It is clearly a fundamental problem.

3.2. The iterated prisoner's dilemma (IPD)

The situation changes completely when one *iterates* the game, because defection can then be punished and cooperation rewarded. We can in that case introduce genuine strategies. We must suppose that the number of moves is indeterminate to avoid *backward induction* (the possibility of defining a strategy by going backwards from the desired result to the initial move) that has the property of leading us back to the non-cooperative behavior (d, d) (double defection). We can test strategies such as G = "good" (sucker) = play always c (unconditional cooperation); M = "bad " (meany) = play always d (unconditional defection); *TFT* = "tit for tat" = start with c (initial cooperation), then play what the other player played at the previous move; V = "vindictive" = start with c and play d for ever as soon as the other player plays d (that is defection is punished as an irreversible betrayal), etc. One pits these strategies against one another over a great number of plays (for instance 1000) and one compares their scores. The notion of a Nash equilibrium (NE) must be revised since the strategy (*Id, Id*) that iterates the one-shot NE (d, d) remains a NE. But many other strategies yield the same result as *Id* when playing against *Id*, and there exist too many NE's. Hence the concept of "subgame perfect equilibrium" which is a NE for every sub-game of the game.

For pools of strategies that are not too complex, one finds that the strategy tit-for-tat (*TFT*) has a striking superiority. *TFT* does not win every time but it always gets a very good score. More generally, computer simulations show that the best strategies are nicely cooperative, rapidly reacting to defections ("retaliatory"), rapidly forgiving, and simple ("clear", without wiles). "Good" (sucker) and "bad" (meany) strategies are catastrophic.

3.3. Evolutionary games

Evolutionary game theory considers polymorphic populations of individuals using different strategies and defines new generations using the scores in a generalized competition: strategies with good scores increase their number of representatives while those with bad scores progressively vanish. Evolutionary theory is more realist than the classical one based on individual rationality. It substitutes a collective selective scheme to an impossible variational calculus. Moreover, it enables us to understand the dynamics that drive agents towards global equilibria (see e.g. Hofbauer & Sigmund 1988; Livet 1998; Samuelson 1997; Weibull 1996; Kirman 1998).

Let $\{s_i\}$ be the set of strategies and $\{p_i\}$ their respective probabilities (i.e. the proportions of the population playing them). We suppose that the size N of the population remains constant. Consider the case where there are only two strategies: c with probability = p and d with probability = $1 - p$). It is easy to compute the expectation of gains (utilities $U_c(p)$ and $U_d(p)$) for each strategy as a function of the parameter p. Recall that $T = (d, c)$, $S = (c, d)$, $R = (c, c)$, and $P = (d, d)$. If an agent plays c, the probability that he will play against another agent playing c is p and he will gain $(c, c) = R$, while the probability that he will play against another agent playing d is $1 - p$ and he will gain $(c, d) = S$. If the agent plays d, the probability that he will play against another agent playing c is p and he will gain $(d, c) = T$, while the probability that he will play against another agent playing d is $1 - p$ and he will gain $(d, d) = P$. We get therefore:

$$\begin{cases} U_c(p) = pR + (1-p)S \\ U_d(p) = pT + (1-p)P \end{cases}$$

The mean gain of the population is therefore given by the quadratic expression:

$$U(p) = pU_c(p) + (1-p)U_d(p) = p^2R + p(1-p)S + (1-p)pT + (1-p)^2P$$

that is:

$$U(p) = p^2R + p(1-p)(S+T) + (1-p)^2P$$

The evolution of the probability p is given by the *replication dynamic*

$$p' = p\big(U_c(p) - U(p)\big)$$

3.4. The "tit for tat" strategy: from common sense to dynamical models

In these models, agents are considered as "phenotypes" expressing "genotypes" identified with strategies, and "micro" strategies influence "macro" population dynamics. Simulations (which specialists of complex systems call "computational synthesis") provide extremely interesting results. Axelrod has shown that:

(i) Anti-cooperative strategies are eliminated, cooperation wins and becomes stable.
(ii) *TFT* dominates, but is *fragile* with respect to mutations; indeed sucker mutants *Ic* exhibit exactly the same behavior as *TFT* in a *TFT* environment; they can therefore substitute themselves progressively and "silently" for *TFT*, without any observable effect; but then "bad" mutants *Id* (meanies) can destabilize, invade and destroy the system.
(iii) For a strategy, to react to defections (to be retaliatory) is a condition for being *collectively stable*, that is to resist destabilizations by "bad" mutants.
(iv) If one introduces complex strategies, many subtle phenomena can occur. For instance, a non-cooperative strategy can use another one to eliminate cooperative strategies and eliminate its allies in a second step; social disorders enable some non-cooperative strategies to survive and even win the game, etc.
(v) Simulations show that there exist sophisticated refinements of *TFT*, which improve slightly its results in more complex contexts. But we can say that *TFT* is the most efficacious simple strategy.

Now, it is also an empirical anthropological and cultural fact that since ancient times *TFT* has been selected by common sense.

We meet here a typical *model of common-sense*:

(i) Simulations corroborate an old common sense rule proceeding from collective political and social knowledge.
(ii) But at the same time, they enable us to overcome naive common sense and to develop an *experimental* framework for virtual (modeled) cultural evolutions.

3.5. Sigmund's and Novak's generalizations

Many authors have studied factors that facilitate cooperation in the *IPD* when one changes the space of strategies, the interaction process, the adaptive responses, etc. We will say a few words on the introduction of "topological" relations of neighborhood between agents, each agent becoming able to imitate the one of his neighbors that makes the best score.

Consider for instance extremely simple strategies (i, p, q) where:

i = initial probability of cooperation,
p = probability of cooperation after a cooperative move by the other player,
q = probability of cooperation after a defective move by the other player.

We have trivially $Ic = (1,1,1)$, $Id = (0,0,0)$, $TFT = (1,1,0)$, $c_p = (p, p, p)$ (always c with probability p). Other interesting strategies are $GTFT = \left(1, 1, Min\left(1 - \frac{T-R}{R-S}, \frac{R-P}{T-P}\right)\right)$ and Kraines' "Pavlovian" strategy that resists *Id* well: play c after R or T, and d after P or S.

Sigmund and Nowak have shown that "bad" agents *Id* ("meanies") can win at the beginning of the game. However, *TFT* agents resist. Once the "good" *Ic* ("suckers") have been decimated, the exploiters can no longer abuse them and cooperative strategies of *TFT* type emerge. But after this emergence of cooperation, the *TFT* strategies are themselves overtaken by *GTFT*. However, the *GTFT* strategy is fragile and allows for the return of "bad" *Id*.

3.6. Spatialized IPD

In spatial *IPD*s, there exists a "topology", each agent having a few (fixed) neighbors with whom he interacts (on spatialized cooperation relations, see e.g. Dupuy & Torre 1999). Then defective strategies can no longer invade the system. Once again *TFT* strategies dominate because if two *TFT* agents appear by mutation and meet, they are immediately imitated and their strategy propagates until it has invaded the system. For instance, a sucker *S* with three *TFT* neighbors and a meanie neighbor *M* generated by a mutation is eliminated by this *M* at a first stage, and *M* wins. However, at a second stage the *M* agents must interact and have only *TFT* neighbors. Then *TFT* agents win, and the meanies *M* convert to *TFT*. In other words, fluctuations generating *M* agents are *recessive*. This mechanism explains the strong *stability* properties of evolutionary stable strategies such as *TFT* that cannot be destabilized by mutating invaders.

Let us give Nowak and May's example of systems defined on a square network with 8 neighbors by the payoff matrix:

	A(c)	A(d)
B(c)	R = 1 R = 1	T = b S = 0
B(d)	S = 0 T = b	P = 0 P = 0

Behaviors:
d = defection, c = cooperation

Payoffs:
T = (d, c) = Temptation,
S = (c, d) = Sucker,
R = (c, c) = Reward,
P = (d, d) = Punishment

Conditions:
T = b > R = 1 > P = 0 = S = 0

b is the parameter of the system. Take for instance a random initial configuration with 50% *c* and 50% *d*. One compares the scores (the score of each site being the sum of its gain and of the gains of its 8 neighbors) and each site adopts the strategy of its neighbor (including itself) that gets the best result. The conclusion (Zhen Cao and Rudolph Hwa [1999]) is extremely interesting, and a priori unexpected if one is not familiar with *critical phenomena* in physics and, more generally, with *bifurcation* processes. One gets:

(i) for $b < 1.8$, *c* dominates;
(ii) for $b > 2$, *d* dominates;

for *b* belonging to the interval $B_c = [1.8, 2]$ — called the *critical interval* — there exists a critical transition *c* ® *d*, with multi-scale nested clusters of *c* and *d*.

Here is a *Mathematica*™ implementation I computed using an algorithm due to Richard Gaylord and Kazume Nishidate. We code moves with colors: *c* then *c* = blue; *d* then *d* = red; *c* then *d* = yellow; *d* then *c* = green.

For $b = 1.5$ (under the critical interval) and an initial configuration "InitConfig" 50%-50%, we see (figure 1) that there is an initial catastrophe (in two steps) leading to an overwhelming domination of meanies (red). Then cooperation (*c*, *c*) (blue) restores and dominates progressively, through the extension of residual scattered nuclei having survived the catastrophic initial phase of decimation. Domination of cooperation is by the way non complete and leaves fracture lines of oscillating non-cooperation (*d*, *d*).

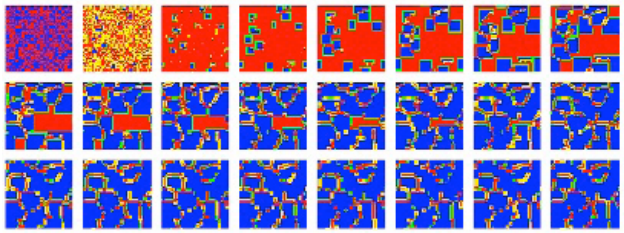

Figure 1. Nowak and May's example of a spatialized iterated prisonner dilemma defined on a square network with 8 neighbors and depending upon a parameter b. Moves are coded by colors: c then c = blue (cooperators); d then d = red (defectors); c then d = yellow; d then c = green. Value of b = 1.5 and the initial configuration "InitConfig" is 50% blue-50% red.

If we represent the temporal evolution of the sub-populations (*c*, *c*) and (*d*, *d*) we see very distinctly the initial decimation followed by a reconquest presenting small oscillating fluctuations. (See figure 2).

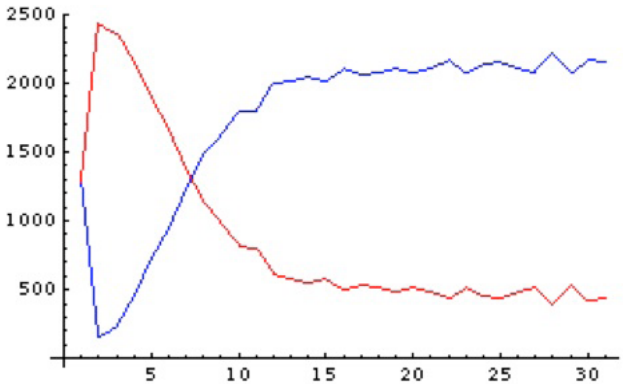

Figure 2. Temporal evolution of the sub-populations (c, c) and (d, d) in figure 1.

For $b = 2.1$ (above the critical interval) and a 50%-50% InitConfig, we see that d dominates immediately and totally (totalitarianism). (See figure 3).

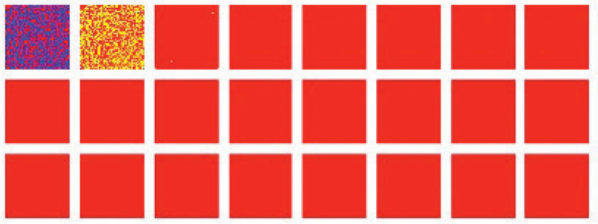

Figure 3. The system of figure 1 for the value of b = 2.1 and a 50%-50% InitConfig.

The curves of evolution are evident (no comment, figure 4):

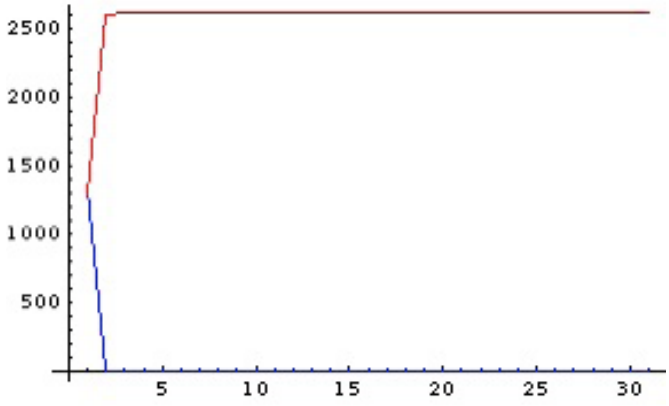

Figure 4. Temporal evolution of the sub-populations (c, c) and (d, d) in figure 3.

But if the value of the parameter $b = 1.85$ belongs to the critical interval and if we take a 50%-50% InitConfig, we see that (d, d) begins to dominate, next that (c, c) begins to reconquer ground by expanding from nuclei having resisted the initial extermination, but that, contrary to the first example $b = 1.5$, multi-scale nested clusters of c and d appear and expand: inside a blue island expanding in a red sea appears an expanding red lagoon, inside which emerges a smaller blue island, etc. (See figure 5).

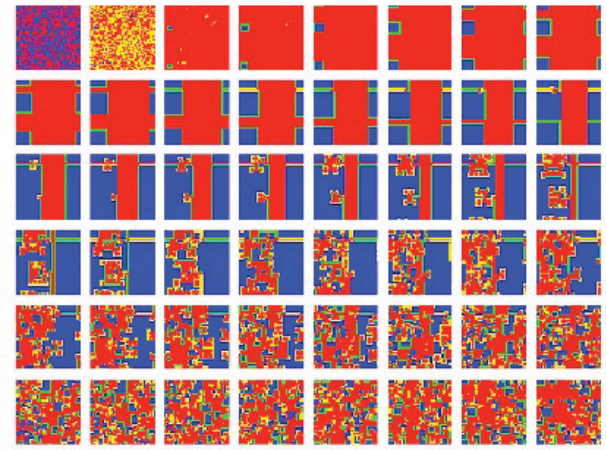

Figure 5. The system of figure 1 for the critical value of b = 1.85 and a 50%-50% InitConfig.

This critical dynamics is very apparent on the evolution curves where the curves (c, c) and (d, d) present, besides small oscillating fluctuations, large scale oscillations. (See figure 6).

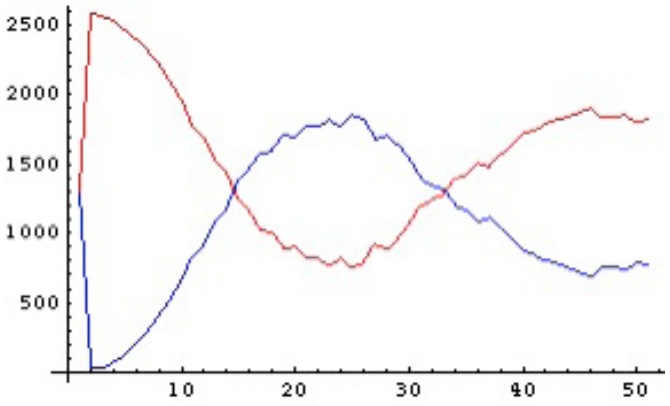

Figure 6. Temporal evolution of the sub-populations (c, c) and (d, d) in figure 5.

IV: CONCLUSION

We have seen on simple examples of evolutionary games how cooperation can spontaneously emerge as collective behavior in a population of individuals. We have retrieved very well-known common sense rules such as the tit-for-tat evolutionary stable strategy and modeled the evolutionary stability explaining how such a rule can have been selected by cultural evolution.

There exists to-day an extremely impressive amount of such computational syntheses that provide us with an experimental method for what we could call "Hayekian science", that is science based on complex methodological individualism, investigating the natural selection of behavior rules, and explaining how collective structures can emerge through self-organizing dynamics.

NOTES

1 This article draws directly from my articles: (i) "Modèles formels de la 'main invisible': de Hayek à la théorie des jeux évolutionniste". In Ph. Nemo and J. Petitot eds. *Histoire du libéralisme en Europe.* Paris: Presses Universitaires de France, pp. 1095-1114, 2006; and (ii) "Reduction and Emergence in Complex Systems". In Richard E. Lee ed. (Foreword by Immanuel Wallerstein), *Session III of Questioning Nineteenth-Century Assumptions about Knowledge, II Reductionism, SUNY Series,* Albany, NY: Fernand Braudel Center Studies in Historical Social Science, 2010. It also draws from a talk I gave at Centro di Metodologia delle Scienze Sociali, LUISS University on April the 28th 2004 at the invitation of Dario Antiseri and Enzo Di Nuoscio and from two talks presentented at the following two conferences organized by Francesco Di Iorio in Paris: (i) *L'évolution culturelle* (CREA, Ecole Polytechnique, 11-12 June 2007) and (ii) *Actualité de l'individualisme méthodologique* (EHESS, CREA-Ecole Polytechnique and Paris ISorbonne University, 22-23 June 2009).

2 On Hayek, see e.g. Hayek (1952), (1982), (1988), Nemo (1988), Nadeau (1998), Petitot (2000). On Dupuy, see e.g. Dupuy (1992), (1999).

3 Philippe Nemo: *Histoire des idées politiques aux Temps modernes et contemporains*, Puf 2002.

4 See Laurent (1994).

5 For Kant a normative judgement is "categorical" when it is independent of any end. Categorical prescriptions are purely "procedural".

6 For Kant a normative judgement is "hypothetical" when it is conditionned by an end and prescribes means to achieve the end (consequentialism).

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The Opposition Between Individual Autonomy and Social Determinism: A controversy by now settled? Proposals and approaches of social research.

ALBERTINA OLIVERIO
Department of Law and Social Sciences
Università degli Studi "G. d'Annunzio"
Chieti–Pescara
Via dei Vestini 31
66013 Chieti Scalo (CH)
Italy

Email: albertina.oliverio@unich.it
Web: http://www.unich.it/ugov/person/1122

Bio-sketch: Albertina Oliverio is University Professor of Philosophy of Social Sciences at the University of Chieti-Pescara. Her most recent books are *Rischi, paure e ricerca di certezze nella società contemporanea: un punto di vista interdisciplinare (Rubbettino, 2014)* and *Individuo, natura, società. Introduzione alla filosofia delle scienze sociali* (Mondadori, 2015).

Abstract: This paper analyses complex methodological individualism within the debate around individual autonomy and social determinism. It is shown how this approach constitutes an alternative both to methodological individualism and methodological collectivism. The paper then poses an open question as to whether this kind of individual/social opposition might be superseded by new trends in social research, looking at natural determinisms instead of individual deliberate action or social pressures.

Keywords: individual autonomy, social determinism, subjectivity, focal point, biological-evolutionary explanations

I. METHODOLOGICAL CONTRIBUTIONS TO THE INDIVIDUAL AUTONOMY VERSUS SOCIAL DETERMINISM DEBATE IN THE SOCIAL SCIENCES

The problem of the relationship and the possible opposition between individual autonomy and social determinism has always been an epistemological issue central to all the social sciences. It has given rise to explanatory models on the one hand related to 'methodological individualism', and on the other, to 'methodological collectivism', i.e. a liberal social philosophy for which the collective exists only through individual actions and therefore has no autonomy; or alternatively, a Marxist or orthodox structuralism for which the individual exists only as a vehicle of the institutions and structures.

Whilst from an ontological point of view, it is assumed on the basis of methodological individualism that there are no collective impersonal sets or entities (such as society, the market, the state, the family), but only individuals who constitute these collective phenomena, from a methodological point of view, the individualist explanation always starts from individual actions, which are regarded as the sole causes of collective phenomena. The latter are considered to arise from the aggregation of individual components whose principal feature often consists in an unintentionality whose most effective representation is perhaps the 'self-fulfilling prophecy' (Merton 1936). Methodological individualism safeguards individual autonomy in that, although the actor's behaviour is conditioned by the context in which it takes place, it is considered to be the outcome of the person's preferences, beliefs, and reasons. In other words, individuals actively 'jump' by choosing one course of action rather than another (Gambetta 1987). Among the classical sociologists it was Max Weber who more than any other promoted this methodological approach and who realized that the para-

digm of action, and an adequate theory of rationality, could be applied to all the social sciences and not confined to economics alone (Boudon 1984).

For methodological collectivism, ontological and logical-explanatory priority pertains to the collective rather than to the individual. Thus, a wide tradition of thought has shared the assumption that individual behaviour is entirely determined by the influence of social and collective entities (crowd, society, group, institutions, structures) which in turn transcend it. Gustave Le Bon (1895) explained collective phenomena by hypothesising their 'reification', thus making them autonomous from their individual components. At the same time, he attributed to them the property of reducing and erasing conscience. Precedence was thus given to unconscious and instinctive individual features easily manipulable with mechanisms such as imitation, contagion, and suggestion. In methodological collectivism, therefore, the social phenomenon prevails over individuals, 'pushing' them, dominating and determining their behaviour.

Many areas of social research oscillate between these two explanatory schemes. An example is provided by the explanation of the causes of delinquency. The classics of social research, from the Chicago School onwards, causally linked delinquency to a social matrix by assuming that the individual offender is 'pushed' into such behaviour by a wide range of social determinants: exclusion, increased unemployment and job insecurity, poverty, lack of education, and so on. An economic and social crisis can thus be considered the cause of tensions in certain social groups: for instance, young people, who are first to be affected by situations of this kind (e.g. young people in deprived neighbourhoods who do not have enough work to start a family). In this case, therefore, the underlying hypothesis is that society is violent and creates delinquency. This is the view taken by ecological studies on crime, which seek to identify urban variables (overcrowding, anomie, income level) and their links with high crime rates.

Of interest in this regard is a well-known study on the members of a gang of drug dealers (Bourgois 2001), which takes a determinist perspective to argue that it is the socio-cultural context which in part creates gangs. But it also hypothesises that this kind of parallel economy is based on rational reasoning: some individuals invent alternative strategies to earn income and thus make a choice to avoid poverty in extremely economically disadvantaged neighbourhoods. Contrary to a collectivist explanatory methodological framework, other authors maintain that crime is not caused—or not only caused—by economic and social factors. This is the case of those who adopt the approach of an actionist sociology à la Boudon, which subjects individual action to analysis of the reasons that individuals invoke to justify their behaviour. It is therefore necessary to understand why they choose to become criminals when they know that the costs of such a choice can often be very high (e.g. imprisonment). Delinquency is thus explained as a life choice determined by the immediacy of the reasoning that breaking the law brings more advantages (an affluent lifestyle, beautiful women, drugs, luxury cars, respect in the community) than costs (a mediocre job, routine work, low pay) (Cusson 2006). Obviously, the difference between these two explanatory systems relative to the causes of delinquency has major implications in terms of responsibility: on the one hand, it is society that is mainly responsible for deviant behaviour and the accent should be on the need of changes in social policies; on the other, it is individuals and the accent should be on sanctions.

II. THE ALTERNATION IN THE SOCIAL SCIENCES BETWEEN THE PARADIGM OF THE 'SOVEREIGN' INDIVIDUAL AND THAT OF 'OMNIPOTENT' SOCIAL STRUCTURES

In recent decades, this methodological opposition has generated important sociological debates on the relationship between the individual and society. Many argue that contemporary individualism, with all its facets, has arisen following the loss of influence by institutions and social structures, and at the same time that it has been to the detriment of society. Thus increasingly common are 'sovereign' individuals—monadic individuals closed in on themselves, only meaningful to themselves, narcissistic, the creators of their own identity and their own actions in total autonomy; individuals who enjoy both ever wider margins of choice in everyday life (sentimental, professional, moral) and greater reflexivity also from the critical point of view. If in fact, during the 1960s and 1970s the institutions and structures were attributed almost absolute regulatory power over individuals and could frame them, compel them, and dictate how they acted and thought, as in the case of Foucault's disciplinary institutions or Goffman's total ones. Today, however, it seems that these institutions have responded to these criticisms and rejected passive normative functions to create space for individual initiative and autonomy characterized by the two-fold ideal of self-realization (choice and self-ownership) and individual initiative (capacity to choose and act alone as the more valued style of action). Thus, to resume the example of

delinquency, from the individualist perspective crime is the result of an individualistic lifestyle. The demise of the classic forms of solidarity on the part of families and institutions has induced each individual to see others in instrumental terms. Furthermore, the atomization of society has made individuals more likely to contest prohibitions and authority in general. From this it follows that delinquency is just one choice among others (Roché 2004).

Anthony Giddens (1990) was undoubtedly one of the first to reflect on the fact that the strength of rules, traditions, routines, has weakened in late modernity, and that individuals are increasingly prone to calculate actions, to make choices, and to take decisions that affect their futures. This new sociology of the individual has been accompanied by a large body of literature which uses the term 'reflexivity' to denote the fact that the individual must construct a coherent identity and life-path that were once assigned or imposed. For some authors, this a new form of society which is 'post-traditional' in the sense that, although the 'traditional' elements of industrial or modern society (social classes, roles, integrated family, gender roles, faith in progress) have not disappeared or been replaced by other models, they have lost their strength. This tendency has been radicalized by globalization, the media and cultural movements, and the rise of identity claims which dismantle the traditional concept of society. The society of the individual is one characterized by the 'individualization of life': that is, the decomposition and then abandonment of the ways of life of industrial society in favour of those on whose basis individuals construct, express, and enact their own personal trajectories (Beck 1986). There consequently arise social risks associated with the increased individual autonomy in lifestyles and professional choices.

Thus appears the 'liquid modernity' theorized by Zygmunt Bauman (2000). While 'first' and 'solid' modernity developed certainties and social forms aspiring to greater solidity compared with that furnished by traditional societies, 'liquid' modernity weakens the last remaining institutions, traditions, norms and social representations. It engenders a society in which all the previous fundamentals, certainties, and forms of higher authority break down; a society characterized by permanent change, the impossibility of self-projection, and the fragility of both social and affective ties. The individuals of this liquid modern world live amid constant uncertainty because they belong to a society in ceaseless movement. They are characterized by a precarious identity which mainly affects the most disadvantaged, now increasingly abandoned and, paradoxically, subject to new forms of social dominance: for instance those of consumption and fashion which, as in a vicious circle, fuel a process of massification and social imitation that sometimes prevails over individualization.

However, some authors have emphasised that the assertion of the individual does not entail the cancellation of social norms and that, in this society, social rules do not signify compulsion. Society becomes something that directs individuals as a frame of reference, rather than being something which constrains them (Ehrenberg 2005). In short, individuals find the source of all their actions within themselves, but they always act and think within an instituted system, a social context in which there are rules of every kind. Likewise, the rule of individual autonomy is always made with reference to ideas that derive from society (Descombes 2003).

This alternation in the social sciences between the paradigm of the 'sovereign' individual and that of 'omnipotent' social structures perhaps entails that it is not a question of choosing between the individual and society, because the two co-exist, with the associated paradox that the individual is fully social and society is the outcome of individual actions. Consequently, the institutions still play a role in the society of individuals. Perhaps a sort of 'cognitive holism' closed to some ideas of Mary Douglas well represents these concepts (Douglas and Wildavsky 1982). Societies are collectives bound together by shared frames of thought conveyed by the institutions. An institution is memory, information which enables all to exercise their rationality as individuals. Knowledge is established collectively, used rationally by individuals, and then shattered by the complexity of social phenomena.

III. TOWARDS A COMPLEX METHODOLOGICAL INDIVIDUALISM?

It is therefore perhaps necessary to change the methodological perspective to account for this apparently paradoxical coexistence of individualism and collectivism. In this regard, one of the most interesting theses is that of Jean-Pierre Dupuy, who argues within the philosophy of mind that the 'individual subject no longer has a monopoly upon certain attributes of subjectivity' (Dupuy 2011) and that there exist 'quasi-subjects' or collective entities capable of exhibiting at least some of the attributes once thought to be exclusive to 'real' entities, namely individuals: in particular, the existence of mental states (Dupuy 1994). Complex methodological individualism, which stems from the tradition of the 'invisible

hand' and political economy from Ferguson to Hayek and which is in part similar to analytical sociology approaches (Hedström and Swedberg 1998; Coleman 1990), defines this theoretical schema. The idea is that people act and make society or social reality, i.e. that interactions produce collective phenomena that are much more complex than the actions which have produced them, spontaneous complex orders of Hayekian type which do not spring from design, will or conscience, but rather from individual disordered and separate actions which act synergetically to coordinate themselves and automatically generate something that cannot be reduced to them and whose properties are not found in any of the individuals or elements in question (Laurent 1994). Social reality is autonomous in the sense that it obeys its own laws independently of the efforts of people even though they have produced it. Thus, according to Dupuy, it seems possible of imagining the irreducibility of social reality with respect to individuals without, however, making it a substance or a subject (Dupuy 1992b). The whole results from the composition of the parts, but these simultaneously depend on the whole (Dupuy 1988).

Posing the question of the collective subject—i.e. whether it has the same attributes as individual subjects, if it can learn, know and remember—is to leave the framework of the methodological individualism that assumes that the collective can never be treated as a subject. This is a position midway between methodological individualism and methodological collectivism. The former is considered a 'reductionism' which reduces social reality to the effects of the interaction among individuals, ignoring the leap in complexity entailed by the transition from the individual to the collective. The latter is focused exclusively on 'the whole' to the detriment of individuals and of the reciprocal tie between the individual and collective levels (Dupuy 2004). Dupuy stresses that this process is not holistic: individuals are not subject to the social whole; and the fact that this surpasses and escapes them, not only does not deprive them of their freedom but is a necessary condition for their freedom. Individual freedom consists precisely in what individuals do of what social reality makes of them. It is thanks to what social reality gives them that individuals can set ends for themselves and achieve them. There is therefore no hierarchical relationship between the individual and the social whole, but rather a circular causality, a circular and recursive pattern of reciprocal definition (Dupuy 1992b). The formal being that ensues is thus different in nature and has unpredictable properties. It can therefore be said that a collective entity can learn, know, remember, analyse a situation, take decisions, and act. The notion of collective consciousness or that of collective memory can be analysed with this approach. In fact, one of the properties of the collective is a form of consciousness/memory distributed in a system of actors, embodied by rules or moral imperatives, and impossible for any individual brain to recapitulate. For example, it is not necessary that all the members of a nation remember the historical events of a particular era for this to produce ethical imperatives relative to the future. And yet this consciousness/memory involves something more than the partial consciousness/memories of individuals: a collective ethic, a national spirit, which is qualitatively different from its individual components.

In short, according to Dupuy, the concept of 'subjectivity' is deconstructed. This comes about if it is realized that a complex network of interactions among simple entities can exhibit significant properties and that this network can be conceived at both a micro and macro level. At the macro level, the attributes of subjectivity are not the monopoly of individual subjects because they can be also produced by collective entities. At the micro level, attributes of subjectivity are not attributes of individual subjects because they are emergent effects of 'subject-less processes'.

In this regard, Dupuy (1992a) introduces the idea of a complex 'self-transcendence' of social reality. This consists in the coexistence of two seemingly paradoxical propositions: on the one hand, that there are individuals who make, or rather 'enact', collective phenomena (a proposition inspired by individualism without lapsing into reductionist atomism); on the other, that collective phenomena are (infinitely) more complex than the individuals who have produced them and obey only their own laws in a complex process of self-organization. This makes it possible to defend the autonomy of social reality and its non-reducibility to psychology while remaining faithful to the golden rule of methodological individualism, i.e. do not transform collective phenomena into subjects (Dupuy 1992b).

This epistemological approach proposed by Dupuy raises a theoretical problem which relates to the considerations of many authors with respect to the overlap between a society characterized by increasing individualization (the contemporary individual freed from the traditional bonds of subordination) and the equally strong presence of new forms of social domination which sometimes seems to suggest that people evade the control of society. Hence, while on the one hand people are the constructors of their own society because they are free from the predetermined and external social reality, on the other hand the autonomy of the self-transcendent social whole means that the social outcome

autonomizes itself from its generating principle. This is a reciprocal co-definition that Dupuy links to René Girard's concept of 'mimesis' (Girard 1972). According to Girard, human desires are always dictated by the interaction with others, but their convergence on the same objects, desires, and interests causes rivalry because it is impossible for everyone to obtain the same thing. It is thus possible to account for the emergence of a polarization of human desires, without any pre-existing structure and through an intrinsically social process. The value of things is read in the desires of others. It is because an individual believes that another individual desires something that s/he will want it for him/herself. But in the same way, the desire of the other individual will be strengthened by the desire of the first individual. This mechanism leads to selection of the desire for something as the 'focal point' of the desires of these individuals and explains *a posteriori the beliefs of all. This interpretation of the concept of 'focal point' therefore pivots on the idea of* imitation. It is well known that the concept of focal point is to be found in certain games in which one of the existing Nash equilibria can emerge as a focal point if the anticipations of the players converge on it (Kreps 1990; Schelling 1960). According to this hypothesis, the players spontaneously converge on a particular equilibrium when all agents think that this is the most evident among the possible equilibria of the game. Focal points can therefore determine the equilibrium actually played. According to some studies, this convergence results from the fact that in a situation where the payments of all the players situated in certain equilibrium are higher that the payments that they receive at another point of equilibrium, the former equilibrium will naturally be chosen. According to other authors, however, one should consider a perhaps more convincing hypothesis, at least from a sociological point of view, to explain this convergence. This brings us back to Dupuy's reflections on social imitation. These studies maintain that the selection of the focal points and the spontaneous convergence of the players' anticipations on a unique balance are facilitated by social norms and sociocultural characteristics that may constitute a kind of 'situated rationality' of the players because, depending on the context and interactions with others, the existence of certain conventions is one reason why agents choose some actions rather than others and interpret identical situations similarly (Walliser 2000). For example, the ban on riding a motorbike without a helmet generally leads in the medium term to a decrease in the number of individuals who do not wear helmets. This is due to a range of social mechanisms, among which imitation indubitably has a central role. After some time, a larger number of motorcyclists are likely to find this ban compatible with their own preferences or desires. The measure may have provoked a rather negative reaction when first implemented, but it then became popular, not because of the consequences, which were not imagined, but because it changed the preferences and desires of the population. Individuals and collectives are therefore co-constructed: the preferences of individuals develop along the path that those individuals follow (and are not imposed externally), social reality is contained in each individual and does not precede relations among them (Chavalarias 2006).

IV. AND IF THE METHODOLOGICAL DEBATE AROUND INDIVIDUAL AND COLLECTIVE IS NOW POINTLESS? A LOOK AT NEW TRENDS OF SOCIAL EXPLANATION IN LIGHT OF NATURAL SCIENCES

In conclusion to this paper focusing upon complex methodological individualism as an alternative methodological perspective accounting for the apparently paradoxical coexistence of individualism and collectivism, we think it could perhaps be interesting to ask a question which opens a new area of discussion for a future paper: do not the relatively recent and increasingly close forms of 'naturalization' of social sciences (i.e. evolutionary psychology and, more recently, social neurosciences)suggest that this methodological debate around individual and collective is to some extent superfluous and outdated? This is equivalent to asking whether the individualist and collectivist explanatory models (and, therefore, also the complex methodological individualism one) have not been made obsolete by new ones that marginalize, restrict, if not annul, the role of both individual and social components.

Today increasingly frequent are studies that seek to identify the biological bases of intelligence, certain personality traits, and a range of social behaviours. As a matter of fact, despite the perplexities and criticisms, there are some areas in which it seems that consideration of the biological foundations of human behaviour is an opportunity for research which the social sciences should not miss. In this regard, one witnesses today an explosion of studies that emphasise the importance of emotions in social life and which investigate the natural origins of behaviours such as cooperation, empathy, altruism, and morality. The tendency to study individual behaviours and social phenomena in relational terms—that is, by taking into account the close ties of trust, reciprocity and solidarity that hold human beings together—seems

to be reinforced by a similar process ongoing in the natural sciences, where a predominantly individualistic view of evolution has given way to an interpretative approach centred on phenomena of altruism, cooperation, symbiosis and co-evolution.

Consider the case of the emotions, for example. Both evolutionary psychology research and neuroscientific studies in this area increasingly reject the old normative theories of choice and rationality tied to the logic of individual action's analysis and economic calculus (see Neumann and Morgenstern 1944), and they devise new ones based on evolutionary principles which take account of the fact that the human brain is the result of natural selection. A normative-economic conception of rationality is being superseded by an evolutionary rationality because the emotions can be conceived as resulting from evolution and as able to guide humans towards decisions that have benefits in terms of survival (among others, see LeDoux 1988). Anger, for example, can motivate punishment of those who breach particular norms, thereby promoting, among other things, the maintenance of order and social cohesion. Disgust causes offence and moralism. It thus fosters choices that prompt, for example, avoidance of both diseases and those who do not respect the rules. An interesting body of literature highlights that fear has certainly played an important role in evolutionary terms when one considers the dangers faced by the ancestors of humans in prehistoric times. On this view, therefore, the spread of behaviours and choices—like the cooperative ones adopted even when they may entail an individual cost and yield no personal advantage—are important in evolutionary terms because, in diverse forms, they have ensured the survival of the human race. The attention is therefore much more focused upon the analysis of biological and evolutionary mechanisms instead of the study of deliberate individual action processes or social entities. It is evident that this kind of explanations marginalizes individual and collective methodological debate even when revised as a complex methodological individualism à la Dupuy.

This kind of approach seems to favour the 'naturalization' of social research, in the sense of privileging biological-deterministic explanations rather than psycho-social ones. Within social sciences, a heated debate has arisen around these new trends in social research. It is in fact widely criticised both by those who believe that it relegates the individual, with his/her autonomy and rationality, to a marginal role, and by those who believe instead that it underestimates the influence on the individual of certain social processes and factors, primarily norms and interactions. At the same time, it is widely believed that it is important to 'open' the social sciences to an evolutionary-biological explanatory model of human and social behaviours since it constitutes an undoubtedly important alternative both to the rationalist perspective based on methodological individualism and collectivist social determinism. However, this once again raises the question of whether both individual autonomy and social determinism are being definitively superseded by this new explanatory perspective. The debate is open, and the problem of the origin of morality should make us understand why. Philosophers designate as a 'moral agent' an individual who is not content to obey his/her emotions but is able to analyse and decide in regard to his/her behaviour what is good and what is bad. Morality, in fact, does not rely simply on feelings or emotions, but rather on rules of behaviour that societies or individuals create. This is why the rules and boundaries of morality vary according to the society and the period. While in ancient times the moral community was limited to kin, clan, and allies that spoke the same language, over time it has extended first on national bases and then on universal ones. In substance, according to many scholars nature has created the emotional roots of moral attitudes (empathy, attachment, love, trust, hate, disgust, distrust, etc.). But, at the same time, it is widely assumed that the cognitive tendency to deliberate on the emotions then made it possible to act as a moral agent with respect to social contexts. Which explanatory direction should social research privilege with regard to such a theme or similar ones…? This question opens a new field of debate.

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Models of Human Action

PETER J. BOETTKE AND VIPIN P. VEETIL

Department of Economics
George Mason University
Fairfax, Virginia, USA

Email: pboettke@gmu.edu
Web: http://www.peter-boettke.com

Email: vpudiyad@gmu.edu
Web: http://grad.mercatus.org/vipin-veetil

Abstract: Standard modeling procedures treat the behavior of economic variables using stochastic-determinate equations. Two alternatives to this approach arose in the last quarter of the twentieth century: deterministic nonlinear equation models and agent-based models. The class of deterministic nonlinear equation models produce dynamic behavior without exogenous shocks, but these models are populated by agents incapable of self-organizing. Agent-based models, on the other hand, allow us to study interactions between synthetic actors and the phenomena that emerge from these interactions. In so far as economic phenomena—like prices, firms, nation states and business cycles—are products of human action but not human design, agent-based models are a more productive way forward in formal modeling of complex adaptive systems such as a market economy.

Keywords: Complexity, Agent-based Models, Hayek, Self-organizing Systems.

> The distinction between simplicity and complexity raises considerable philosophical difficulties when applied to statements. But there seems to exist a fairly easy and adequate way to measure the degree of complexity of different kinds of abstract patterns. The minimum number of elements of which an instance of the pattern must consist in order to exhibit all the characteristic attributes of the class of patterns in question appears to provide an unambiguous criterion
> (Hayek 1964, p. 333).

I. INTRODUCTION

Prices, firms, nation states and business cycles are some prominent phenomena of modern economic systems. Standard economic analysis begins with the presumption that these phenomena are *simple,* not *complex* (Foster 2005). Consider the following treatment of "prices" or "exchange ratios". Robinson Crusoe is on an island by himself. He has preferences, endowments and production possibilities.1 As a worker he sells labor and earns wages, as a firm he buys labor and produces goods, as a consumer he buys goods. He exchanges with himself, and the trade-offs he makes are represented as "exchanges ratios" and are called "prices". In this conception, prices are a *simple* phenomena because the minimum number of individuals necessary for their emergence is one. As Buchanan (1964) stressed, such isolated action easily shifts attention toward optimization and allocation, and away from the striving for evolution toward a solution that constitutes the ongoing exchange process in a complex adaptive economic system.

Real world prices are very different from prices in a Crusoe economy. Prices are a system of telecommunication that allows individuals to coordinate their plans. The system of prices along with other institutions allow us to communicate and coordinate, so significant is this idea that an economic system may be defined as a "set of roles tied together with channels of communication" (Boulding 1956, p. 205). Prices emerge out of the interaction between many individuals, some of whom are buyers, others sellers, yet others arbitrageurs. These interactions are often guided by social norms and structured through institutions like stock exchanges. Robinson Crusoe does not need a system of telecommunications because there is no one to communicate with. He can create coordination between his plans as a worker, a firm

and a consumer simply by ratiocination. In the real world, prices emerge when an economic system becomes so complex that other mechanisms of coordination fail. The characteristic attributes of the price system—-like stock exchanges, financial instruments and banking—-arise only at a certain scale. Prices are a complex phenomena in a Hayekian sense because the minimum number of elements necessary for the emergence of all its characteristic attributes is fairly large.[2]

However, the question of scale that relates to the price system is not scale in a statistical sense. For instance, the law of large numbers is a consequence of scale when individual elements are *independent*. In complex phenomena, scale matters because individual elements are interdependent and self-organizing. In a large society with identical individuals with identical and unchanging goals, coordination problems do not become more complex as the number of individuals increases. Scale matters in human systems precisely because individuals pursue their own goals and the market as such has no teleology. Prices serve to guide exchange and production decisions in a world with a multiplicity of ends and a scarcity of means. The relevant knowledge must continually be discovered by the participants in the system. The price system is a consequence of human action, but not human design. Individuals form interdependent plans and engage in exchange, these exchanges generate prices. No individual intends to create the collection of attributes we call the price system, nor does any individual posses these attributes in isolation from others, nonetheless it is their actions that creates this system. Once the price system emerges, it guides and motivates individual actions. The relation between the parts and the whole involves many channels of feedbacks (Wagner 2010). Individual action is autonomous but it is influenced by the nature of the system within which they act.

Individual-level actions generate system-level dynamics. Stock prices, GDP, composition of goods, price level, number and size of firms, all change over time. And the changes in these aggregate variables in turn influence individual-level actions through the guiding role of relative prices, and the discipline of profit and loss statements. Within contemporary formal theory there are three ways to model the dynamics of an economic system: stochastic-determinate models (SDM), non-linear deterministic models (NDM), and agent-based models (ABM). Each of these techniques corresponds to a different vision of human action and the economic system.

SDM have two elements: a set of linear difference or differential equations describing economic actors and a set of exogenous shocks. Linear systems are not capable of producing reasonable economic dynamics without exogenous shocks. This caricature of human beings goes back to psychological theories of the first half of twentieth century, from behaviorism to existentialism. Bertalanffy (1968) called this the 'robot view' of human beings. Humans are thought of as little more than impulse-response systems. Ragner Frisch, Robert Lucas and others developed the idea by modeling a collection of human beings as a single impulse-response system (Lou 1997). Lucas does not believe that each individual behaves like the representative individual, but that a system with a large number of agents behaves like a representative individual. He believes that the behavioral characteristics of individual economic actors wash out in large systems, so that the system as a whole behaves like a single rational optimizing agent (Hoover 2013). This view assumes away the interdependence between the plans of individual economic actors.

NDM use nonlinear difference and differential equations to describe individual economic actors. These equations are capable of producing dynamics without exogenous shocks. In essence, NDM replace the well-behaved robots of linear models with mutant avatars. Robots of linear models walk in straight lines, occasionally thrown off by exogenous shocks, only to return to their ordained path. The mutant robots of NDM walk along all kinds of strange paths and have a penchant for sharp turns. However, the robots that populate the SDM or NDM are incapable of self-organizing. They cannot discover prices, language, money, firms, churches and nation states. Neither SDM, nor NDM view an economy as a self-organizing system.

In contrast, ABM allow us to study the interaction between actors and the phenomena that emerge from these interactions. ABM are synthetic economies *in silico*. They are populated by agents who have motives, cognitive abilities and behaviors, and they interact within a defined rule environment. In some ABM, agents form rules using meta-rules (Luke 2009). Prices, firms and other economic phenomena emerge out of these interactions. In contrast, economic actors of SDM and NDM do not meet each other, they meet vectors of equilibrium prices. ABM are built on the idea that human systems possess a capacity to self-organize; as to how poorly and well they do so will be a function of the rule environment which governs their social intercourse.

The paper is organized as follows. Section 2 and 3 discuss SDM and NDM respectively. Section 4 discusses ABM and compares it to other modeling techniques. Section 5 offers concluding remarks.

II. THE QUEST FOR STOCHASTIC DETERMINISM

Ragnar Frisch (1933) in a pioneering paper claimed that the problem of economic dynamics ought to be divided into two parts: *propagation problem* and *impulse problem*. Frisch modeled an economy as a static system that is periodically hit by external shocks. The "shocks are absorbed in a continuous fashion by the system which acts as a stable resonator" (Frisch 1939, p. 639). The *impulse problem* is concerned with the distribution from which external shocks arrive. The *propagation problem* is concerned with the properties of an economic system that determine how it responds to external shocks. The existence of internal mechanisms that amplify or dampen external shocks means that there need not be any synchronism between an external shock and its impact on an economic system (Frisch 1933, p. 1). Short-lived shocks may produce responses with a long lifetime and shocks of small magnitude may elicit relatively large responses. Lucas (1975), for instance, presents a model where the effect of monetary and fiscal policy are distributed over time because no agent has perfect information about the state of the economy. Bernanke and Gertler (1995) present a model in which small policy shocks have significant impact on output and employment through the credit channel.

Frisch's bifurcation by itself was not novel. Such a bifurcation was a part of the analytical schema of Hume (1752), Wicksell (1898), Mises (1912) and Hayek (1933) who analyzed the propagation problems that arise as a consequence of monetary shocks. Frisch's ingenuity lies in having transformed Walras's static system into a dynamic model, without giving up its determinism:[3]

> In one respect, however, must the dynamic system be similar to the Walrasian: it must be determinate. That is to say, the theory must contain just as many equations as there are unknowns. Only by elaborating a theory that is determinate in this sense can we explain how one situation grows out of the foregoing. This, too, is a fact that has frequently been overlooked in business cycle analysis. Often the business cycle theorists have tried to do something which is equivalent to determining the evolution of a certain number of variables from a number of conditions that is smaller than the number of these variables. It would not be difficult to indicate example of this from the literature on business cycles (Frisch 1933, p. 2).

Frisch stood in sharp contrast to Hume, Wicksell, Mises and Hayek, all of whom analyzed out-of-equilibrium dynamics that arise due to monetary shocks. Hayek (1945, p. 91) thought that the obsession with equilibrium modeling led economists to "habitually disregard an essential imperfection of man's knowledge and the consequent need for a process by which knowledge is constantly communicated and acquired". In contrast to the intellectual framework of modern technical economic analysis, this Hayekian perspective, begins with a fundamental indeterminism: problems and variables are known but the equations are unknown. Demand and supply curves are not given, rather they reflect market relations that are discovered by economic actors (Hayek 1948). In the post-war years, much of the economic profession chose Frisch's stochastic-determinism over Hayek's fundamental indeterminism. So much so that "the 1960s and 1970s witnessed an almost complete unanimity on the use of linear-stochastic models in order to understand business cycles" (Boldrin 1988, p. 1).

III. DETERMINISTIC-NONLINEAR DYNAMICS MODELS

Unlike SDM, DNM work with *non-linear* difference and differential equations**.** Linear difference and differential equations are capable of generating one of four possible time paths. A time series may converge or diverge, and it may do so with or without oscillations. Divergence with oscillations means oscillations of ever increasing amplitude. Convergence with oscillations means that oscillations die out. Neither convergence nor divergence with oscillations reflect time-series economic data. SDM get around this problem by introducing exogenous shocks.

In contrast, nonlinear difference and differential equations are capable of producing dynamics which combine convergence, divergence, oscillations of various amplitudes and sharp turns that are characteristic of the onset of the economic crisis;[4] all this without exogenous shocks. Such systems are capable of chaotic behavior, whose "central characteristic is that the system does not repeat its past behavior" because of sensitivity to initial conditions (Baker 1996, p. 1). Richard Goodwin was one of the first economists to work with nonlinear equations (Venkatachalam and Velupillai 2011):

> By dropping the highly restrictive assumptions of linearity we neatly escape the rather embarrassing special conclusions which follow. Thus, whether we are deal-

> ing with difference or differential equations, so long as they are linear, they either explode or die away with the consequent disappearance of the cycle or the society. One may hope to avoid this unpleasant dilemma by choosing that case (as with the frictionless pendulum) just in between. Such a way out is helpful in the classroom, but it is nothing more than a mathematical abstraction. Therefore economists will be led, as natural scientists have been led, to seek in nonlinearities an explanation of the maintenance of oscillation (Goodwin 1951, pp. 1-2).

However Goodwin worked with models which did not have microfoundations. The nonlinear equations were written on Keynesian statistical aggregates or Marxian classes (Goodwin 1967). This made Goodwin's approach vulnerable to the rationality critique: if economic agents maximize quasi-concave utility functions, then why would they not arbitrage away non-linear oscillations? After all, they prefer smooth consumption to variable consumption. In the 1980s, Jess Benhabib, Richard Day and Jean-Michel Grandmont among others set about to answer this critique.[5] They developed models with optimizing rational individuals that produced nonlinear dynamics.[6]

Consider an over-lapping generations (OLG) model. Each generation—depicted by a representative agent—maximizes its utility function given constraints defined over state variables. The outcome of this optimization problem, combined with market equilibrium conditions, yields a relationship between state variables today and tomorrow. A system with two state variables, x and y, will yield equations of the following form: $x_{t+1} = f(x_t, y_t)$ and $y_{t+1} = g(x_t, y_t)$.

Typically, structures are imposed on the preferences and production function so that the functions *f* and *g* are linear. Non-transversality conditions are imposed to ensure that the state variables converge to a steady state on a saddle path. Such linear systems have been used to study a variety of economic phenomena including growth (Solow 1956), pensions (Azariadis 1993) and government bonds (Barro 1974).

However without restrictive assumptions on preferences and production functions, nothing guarantees that the functions *f* and *g* will be linear. This opens the doors to a wide variety of dynamics, including sequences that do not converge to a steady state value or well-behaved cycles. Benhabib and Day (1981) show that an OLG model can produce erratic behavior if preferences depend on realized past consumption. Benhabib and Day (1982, p. 37) "characterize and give examples of wide classes of utility functions which generate erratic dynamics in the standard, deterministic, overlapping generations model".

The one area where erratic behavior is most evident is economic growth. The United States has experienced a steady growth rate for more than two centuries, but "the US experience is the exception rather than the rule. Much of the world is characterized by miracles and disasters, by changing long-run growth rates, and not by countries with stable long-run growth rates" (Easterly and Levine 2002, p. 4). The tranquil world of neoclassical growth models does not come close to the experience of large swatches of humanity. Day (1982, 1983) shows that NDM yield chaotic dynamics, and arguably a better description of the world. Not too implausible assumptions on utility functions are capable of generating nonlinear dynamics—even chaotic behavior—in models with optimizing individuals.[7]

IV. AGENT-BASED MODELS

ABM is a technical means to study an economy as a complex adaptive system. In such systems, "economic agents (firms, consumers, investors) constantly change their actions and strategies in response to the outcome they mutually create" (Arthur 2013). And this interaction between economic actors creates a ecology of related plans (Wagner 2012). Some of these plans are mutually compatible, others are mutually incompatible, some relations are symbiotic, others are parasitic. A nexus of relations arises as a consequence of human action and in turn influences human action. This view of an economic system is fundamentally different from an equilibrium view, in which economic actors interact with an array of prices but do not interact with each other.

ABM are fundamentally different from SDM and NDM because they are not solved using as many equations as unknown. This motivates why they do not have the word 'deterministic' as a post-fix. An ABM is an synthetic economy *in silico*. It contains synthetic agents and rules of interaction among these agents. Each agent is a bundle of behavioral rules and an information set[8] (Axtell 2007). Agents may be 'intelligent', heuristic decision makers or random actors (Gode and Sunder 1993; Cliff and Bruten 1997). Similarly, agents may have access to local or global information. ABM are 'solved' by running the system forward in time and analyzing the resulting data. Which is why Axelrod (2007) says ABM is a "third way of doing science":

> Like deduction, it starts with a set of explicit assumptions. But unlike deduction, it does not prove theo-

> rems. Instead, a simulation generates data that can be analyzed inductively. Unlike typical induction, however, the simulated data comes from a rigorously specified set of rules rather than direct measurement of the real world. While induction can be used to find patterns in data, and deduction can be used to find consequences of assumptions, simulation modeling can be used as an aid intuition (Axelrod 2007, pp. 92-93).

Schelling (1971) built one of the first ABM.[9] Schelling analyzed segregation in US cities along racial lines. His basic intuition was that segregation is not necessarily an outcome of discriminatory preferences of a vast majority of individuals. In other words, macro-level properties are not necessarily possessed by micro-level actors. Rather macro-level properties may be an emergent outcome of individual choices. He placed two types of agents on a checkerboard. Each type had a mild preference for living in a neighborhood with some agents of the other type, but did not wish to live in neighborhood where the majority were of the other type. Initially agents were randomly distributed over the board. Each period agents are allowed to move to a nearby location which they prefer to their current location. Overtime one sees the emergence of spatial segregation despite the mild preference for diversity.[10] The Schelling Model is an example of an invisible hand explanation.[11] Social phenomena emerges out of the interaction between purposive actors who interact within an institutional setting. The emergent phenomena may be socially desirable (like market prices that guide economic activity) or undesirable (like racial segregation). The normative leaning of the analysis is institutionally contingent.[12]

ABM is one way, perhaps the best contemporary way, to pursue methodological individualistic approach to capture complex phenomena. It emphasizes exchange relations that emerge between economic actors pursuing their own ends.[13] Economics is neither the study of Robinson Crusoe on an island by himself, nor of a competitive equilibrium (Buchanan 1964). In a Crusoe economy, there are no economic problems to solve. In a competitive equilibrium, there are economic problems but economic actors do not solve them. In Buchanan's (1964, p. 218) words:

> A market is not competitive by assumption or by construction. A market becomes competitive, and competitive rules come to be established as institutions emerge to place limits on individual behavior patterns. It is this becoming process, brought about by the continuous pressure of human behavior in exchange, that is the central part of our discipline…

The institutions that emerge through the process of competition may be viewed as "knowledge". In the same way that knowledge in the human brain is stored in the strength and nature of *connections* between individual neurons, knowledge in a market economy is stored in the nexus of relations between economic actors (Hayek 1952; Smith 1997). A nexus of relation emerges as economic actors pursue their own ends given the existing structure. Potts (2001) draws the distinction between 'markets as an information processing system' and 'markets as a knowledge creating & organizing system'. The mechanism design literature studies markets as information processing systems given a set of relations between economic actors, i.e. given a state of knowledge. ABM provide an opportunity to study markets as knowledge creating & organizing systems, albeit an under-exploited opportunity. Consider Miller's (2001) study of the evolution of organizations using genetic algorithms. He models organizations as a collection of individuals and relations between them. A number of organizations with random relations between individuals is initialized. Over time organizations evolve through a process akin to natural selection. After several time periods, the fitness of organizations increases and all kinds of interesting structures emerge within organizations. These structures can be thought of as a *knowledge* embedded within an organization. They determine how the agents interact within an organization.

4.1 ABM and Stochasticity

The relationship between stochasticity and ABM is multifaceted. ABM use random number generators, however they work very differently from SDM. Stochasticity enters ABM in three ways. First, agents may be initialized with random draws of parameter values, for instance Axtell (2002) uses random draws from a uniform (0,1) distribution for Cobb-Douglas exponents in the utility functions of agents when they are initialized. *Second*, at the individual level random numbers may be used to model unpredictable behavior or forces that are exogenous to the model. Suppose, two agents meet, one of whom is willing to pay $10 for an apple and the other willing to accept $5. Presumably, the price at which they trade will depend on their relative bargaining power. If the origin and consequence of bargaining power are exogenous to the model, one can assume that they trade at a random price between $5 and $10. *Third*, random numbers

may be used to instantiate the rules of interaction. Imagine a model where agents meet through a process of binary matching. There are a variety of ways to implement such an algorithm; one way is to select two agents from the population using a random number generator. This process is known as a random activation.[14]

While in SDM, the law of large numbers washes out the stochastic elements to produce thin-tails, nothing guarantees such *thinning* in ABM. The reason is that in ABM individual level shocks work their way to system level outcomes through the interaction between agents. These interactions are capable of transforming shocks from well-behaved distributions into fat-tails of state variables. In fact, a basic rule of thumb in ABM is to use draws from a uniform distribution so that most—if not all—of the properties of the distribution of state variables is due to interaction between agents rather than random number generators. SDM too are capable of transforming shocks, however they are incapable bringing about as radical a transformation as ABM (Axtell 2014).

Consider the size distribution of firms in the US. It resembles a Pareto distribution for which the first moment is barely meaningful and the second moment does not exist. The modal firm has one employee, the mean firm has 19 employees. (Axtell 1999). However neither mode, nor mean are representative statistics. Walmart for instance employs nearly 1% of the US labor force[15]. US firm size distribution has fat tails. It would be difficult to build a SDM that would produce fat tails in firm size distribution. This can be done with an ABM. Axtell (2002) presents an ABM that produces over twenty stylized facts about US firm size distribution including fat tails.

Frisch was right in saying that there need not be a 'tight' relation between initiating force and the response of the system, however in SDM the relationship cannot be too 'loose' either. This is because SDM rule out interaction between economic actors. One illustration of the difference between a tight and a loose relation is the contrast between Lucas's (1975) Islands Model and Mises's Cycle Theory. In Lucas's Island Model, monetary disturbances create real miscoordination by driving a wedge between the perceived relative price and the actual relative price. This happens because agents observe the price level with a delay. In Mises's Cycle Theory, monetary disturbances create real miscoordiantion by driving a wedge between the market rate of interest and the natural rate of interest. In Lucas's model, there is a monotonic and predictable relation between the size of the monetary shock and the consequent real miscoordination. No such relation exists in Mises's Cycle Theory; the size, scope and nature of the real miscoordination depends on numerous factors like which agents get the newly create money, what they do with it and how the money travels around the economy system. The loose relation between the initiating force and the response of the system in Mises Cycle theory is due agent-interactions that happen as a consequence of the initiating force. In Lucas's Island, agents do not interact with each other, they interact with an array of prices. This makes all the difference.

4.2 ABM and Nonlinearity

Like DNM, ABM are capable of producing nonlinear dynamics.[16] Traditionally, the dynamics between prey and predator population have been studied using the Lotka-Volterra equations. These are systems of nonlinear equations that produce rich dynamics which are sensitive to initial conditions. ABM too can be used to study these dynamics. For instance, Wilensky's (2005) presents a ABM of predator-prey dynamics. Wilensky's ABM, like the Lotka-Volterra equations, is capable of generating a variety of dynamics including the extinction of both species and cyclical movement of the two populations. It works as follows:

> "…wolves and sheep wander randomly around the landscape, while the wolves look for sheep to prey on. Each step costs the wolves energy, and they must eat sheep in order to replenish their energy—when they run out of energy they die. To allow the population to continue, each wolf or sheep has a fixed probability of reproducing at each time step" (Wilensky 2005).

Though both ABM and DNM produce nonlinear dynamics, they reflect two different views on the *complexity.*[17] In DNM 'complexity' means erratic behavior of data.[18] We shall call this the 'output view of complexity'. In ABM 'complexity' means structural features of a system. A complex system is one in which *interactions* between parts of the system can generate properties at the system-level which were neither possessed by the components parts, nor were easy to deduce from the properties of component parts (Simon 1962). We shall call this the 'structural view of complexity'.

Lloyd (2001) lists more than twenty different definitions of complexity. He divides these definitions into three categories. The first category is concerned with how difficult it is to describe a system. The second category is concerned with how difficult it is to create a system, for instance computational complexity measures the difficulty associated with cre-

ating solutions to well-defined problems. The third category is concerned with the degree of organization of a system. The DNM definition of complexity belongs to the second category of Lloyd's taxonomy; it can be computationally difficult to solve systems of non-linear difference equations. The ABM definition of complexity belongs to the third category of Lloyd's taxonomy; the structure of relations between economic actors matters. Interestingly, both Simon (1962) and Hayek's (1967) views on complexity falls with the third category of Lloyd's taxonomy. Hayek (1967) claimed that the structures that emerge from the interactions between agents depend on the number of agents that interact. For instance, an economy consisting of Robinson Crusoe and Friday on an island is unlikely to use prices as a system of communication, though one might be able to impute exchange ratios. If we endow Crusoe and Friday with preferences used in Benhabib and Day's OLG models, the Crusoe-Friday economy will produce erratic behavior. However we would not call the Crusoe-Friday economy 'complex' in the Hayekian sense because only two elements were necessary to produce these patterns. Similarly, a miswired clock can produce nonlinear dynamics, but the clock is not a 'complex' system in the Hayekian sense. The global economy however is a complex system because many of its 'characteristic attributes'—like prices, stock markets, fat-tailed distributions wealth, firm size and nation states—may not exist at the scale of a ten or hundred people.[19]

V. CONCLUDING REMARKS

"The experience with which the sciences of human action have to deal is always an experience of *complex* phenomena" (Mises 1998, p. 31, italics added). Complex phenomena—like prices, social norms and formal institutions—emerge out of the interaction between purposefully acting human beings.[20] As Hayek (1974) noted in his Nobel lecture, an economy is a self-organizing complex system, where the properties of the macro-structures depends no only on the properties of the individual economic actors but also on how they connect with each other. How economic actors connect with each other is not predictable, rather it depends on how human beings respond to circumstances (Buchanan and Vanberg 1991). Human beings are heterogeneous not just in preferences and endowments, but in how they creatively respond to problems posed to them:

A stone is a thing that reacts in a definite way. Men react to the same stimuli in different ways, and the same man at different instants of time may react in ways different from his previous or later conduct. It is impossible to group men into classes whose members always react in the same way (Mises 1957, p. 5).

SDM view economic actors as impulse-response systems. And NDM view economic actors are mutant robots. Economic actors in neither model are capable of human action, and the system as a whole is not capable of self-organizing. Like characters of Beckett's play, they wait for a Walrasian auctioneer to compute prices and tell them what to do. Such a view of economic actors cannot be a useful foundation to understand emergent phenomena that are a consequence of human action but not human design. Agent-based models are a better way forward in understanding the emergence of such phenomena. Agents-based models are the technical counterpart to complex methodological individualism. Both recognize the relation between the parts and whole, and the variety of feedbacks between the two levels.

NOTES

1 A variety of standard models attempt to study systems with multiple individuals; these include general equilibrium theory, search theory and game theory. However, these models are not fundamentally different from the model of a Crusoe economy. Fundamentally, the standard approach seeks to derive *fixed points* from which the economy would not deviate. In this vision, prices are parameters that define the fixed point. For instance, general equilibrium theory works with many agents, some of whom are producers and others consumers. Equilibrium is defined as an arrangement in which consumers maximize utility, producers maximize profits and excess demand is zero. Both the Crusoe economy and general equilibrium theory avoid the question of price discovery. The Crusoe economy avoids the question because there is a single agent. General equilibrium theory avoids the question by assuming that forces outside the system compute prices. Search-theory, which an extension of general equilibrium theory to a stochastic environment shares much with the Crusoe economy (High 1983). In search-theory the distribution of equilibrium prices is computed by an authority outside the system. Neither the Crusoe economy, nor general equilibrium theory or search theory ask how price emerge from the interaction between economic agents. Similarly, Nash's theorem establishes conditions under which non-cooperative games have fixed points. No questions are asked

about how a system of interacting agents might discover such fixed points, if at all.

2 Pareto (1906) made the observation that when an economy becomes too large, it becomes infeasible to solve systems of equation to determine general equilibrium, even if they are given. He said that a decentralized system of autonomous interactions may solve such a problem faster than a centralized system that attempts to solve equations. Once an economy is large enough, political economy would come to the aid of mathematics. Recent results on the computational complexity of Brouwer's fixed-point theorem suggest that Pareto's comments were indeed insightful. Brouwer's fixed point lies in the class-NP, these are problems for which no known polynomial time algorithm exists, i.e. they cannot be solved in a reasonable time by a computer. Axtell (2005) shows that decentralized processes with autonomous agents can solve *some economic problems in a polynomial time.*

3 For a history of stochastic models in economics see Mirowski (1989).

4 For a survey of various nonlinear dynamics see Baumol and Benhabib (1989).

5 For a survey of deterministic-nonlinear dynamics models up to late 1980s see Boldrin (1988) and Lorenz (1993). For a discussion of the difference between deterministic-chaos and stochastic models from a statistical point of view see Bartlett (1990).

6 They developed some models of the old Keynesian fashion too. Day and Shafer (1985) show the emergence of chaotic dynamics in an IS-LM style model.

7 For a survey of more recent application of nonlinear dynamics to economics see Barnett et al (2015).

8 This ties in very nicely with the idea of encapsulation in Object-Oriented Programming.

9 Schelling did not build the first ABM. In fact, James M. Sakoda built a model of segregation with autonomous agents on a grid nearly three decades before Schelling. See Hegselmann (2014) for a discussion on why James M. Sakoda is an unknown pioneer. Also, see Vriend (1999) for a discussion on Hayek as a proto agent-based computational economist.

10 Wilensky (1997) built a Netlogo version of Schelling's model. There are some technical difference between Schelling's model and the Netlogo version. Schelling's model had sequential activation, i.e. agents moved sequentially beginning from those in the top left hand corner. The Netlogo model has uniform activation, i.e. all agents get to move every period. Another difference is that in Schelling model agents move to the nearest "satisfactory" square with distance measured in terms of squares one traverses horizontally and vertically. Whereas in the Netlogo implementation one moves to the most preferred plot in the vicinity, i.e. only one step at a time.

11 See Nozick (1974, pp. 18-22) for an explanation of what constitutes an "invisible hand explanation" and a list of what he considered at the time to be exemplars of "invisible hand explanations".

12 Eaton and Lispey (1975) built one of the first ABM of an economic system. They wished to study Hotelling-type spatial competition in a two dimensional space with more than three firms; a problem which is "very complex, perhaps intractable using conventional techniques" (Eaton and Lispey 1975, p. 40). In the years since, ABM have found a variety of applications in economics (Amman et al. 2006) and finance (LeBaron 2000, 2006) including asset pricing (Arthur et al. 1997), evolution of cooperation (Axelrod 1984; Axelrod 1997), industrial organization (Axtell et al. 2002; Axtell 1999), retirement behavior (Axtell and Epstein 1999), and emergence of states and nations (Cederman 1997).

13 Boettke (2012) makes a distinction between "mainstream economics" and "mainline economics". Mainstream economics studies optimizing rational agents making decisions in an institutionally antiseptic environment. Mainline economics, on the other hand, studies the emergence of institutions that facilitate exchange and competition between individuals pursuing their own ends. Mainline economics is all about squaring the rational choice postulate with the invisible hand theorem via institutional analysis. Also, see Simpson (2013) for a discussion of the difference between classical and neoclassical economics in their treatment of institutions, emergence and complexity.

14 Other activation regimes include uniform activation and sequential activation. In uniform activation agents are ordered in a list and then selected one by one. In sequential activation agents are selected in a particular sequence. In Schelling original model agents on the top left hand corner as the first to move and those on bottom right are the last, this is an example of sequential activation. Activation regimes may have importance consequences on model outcomes, see Nowak and May (1992), Huberman and Glance (1993) and Axtell (2001).

15 According to the World Bank US labor force in 2014 was 158,686,472. According to Walmart, in the US it employs more than 1.3 million associates.

16 This is not to say that every DNM can be represented using an ABM and vice-versa. This is an area where theorems are hard to come by.

17 See Rosser (2009) for a review of a wide variety of work that goes under the label of "complexity economics".

18 "This paper uses the familiar, neoclassical theory of capital accumulation to show how *complex* behavior can emerge from quite simple economic structures. Indeed, when sufficient nonlinearities and a production lag are present, the interaction alone of the propensity to save and the productivity of capital can lead to growth cycles that exhibit a wandering, sawtooth pattern not unlike those observed in reality. These fluctuations need not converge to a cycle of any regular periodicity so they are not quasi periodic" (Day 1982, p. 406, italics added).

19 In recent years, macroeconomists have begun studying the structural features of economic systems, with the hope that these may shed light on the behavior of macroeconomic variables. Hidalgo and Hausmann (2009) study the structural properties of international trade networks to understand the process of economic growth. Acemoglu et al (2012) and Carvalho (2014) study how the structure of production networks affects the evolution of macroeconomic variables.

20 Boettke (1989) explains how the "Austrian School" has a long tradition of using evolutionary ideas for economic analysis. And in this sense the Austrian School has much in common with institutionalists. Both emphasize change and the influence of institutions in guiding human action.

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Herbert Spencer and Friedrich von Hayek: Two Parallel Theories

ENZO DI NUOSCIO

Department of Humanities
University of Molise
Via Francesco De Sanctis, 1
86100 Campobasso
Italy

Email: dinuoscio@unimol.it
Web: http://docenti.unimol.it/index.php?u=v.dinuoscio&id=3

Bio-sketch: Enzo Di Nuoscio is full professor of Philosophy of Science at the University of Molise. He is Director of the Department of Humanities at the university and teaches methodology of social sciences at Luiss University of Rome. He is the author of several books and articles on methodological individualism, theory of rationality, social evolutionism, methodology of historiography, hermeneutics, critical rationalism, transcultural dialogue and the Austrian school of economics. His most recent books are *Ermeneutica ed Economia (*Rubbettino, 2015) and *Philosophy of Social Sciences* (Bardwell Press, 2016).

Abstract: A striking similarity exists between Spencer's and Hayek's epistemological, social and political views. Both are individualists, fallibilists, evolutionists, anti-constructivists, theorists of the "dispersion of knowledge" and of "spontaneous order", critics of legal positivism and socialism. Curiously, Hayek cites very few times Spencer and does not indicate him ever as one of his reference authors. This article highlights the affinity between these two thinkers by comparing some key aspects of their thought.

Keywords: Friedrich von Hayek, Herbert Spencer, methodological individualism, evolutionism, anti-constructivism

I. INTRODUCTION

It is rare to see associated the names of Herbert Spencer and of Friedrich von Hayek and even more rare to find the name of Spencer among those who have contributed to the tradition of methodological individualism. This partly depends: (i) on the fact that Spencer's prolific work is largely a positivistic cataloging of the most diverse social phenomena appeared in the entire course of human history and in every corner of the planet; and (ii) on its sometimes obsessive preoccupation in comparing social and biological organisms. Those characters have made before a large fortune and then an almost sudden obsolescence of Spencer's thought, and constitute a considerable obstacle to understand its most innovative aspect (Di Nuoscio 2000b, p. 117).

Beyond this hermeneutical difficulty, the work of Spencer can certainly be regarded as one of the cornerstones of *methodological individualism*. The English philosopher and sociologist, in fact, founded his theory of social evolution on a rigorous individualistic methodology, interpreting the social order as a spontaneous process that is accomplished by composing subjective actions direct to the private purposes. He uses epistemological categories (principle of rationality, unintended consequences, dispersion of knowledge, spontaneous order) that will be the key concepts of the best-established individualistic methodology of the twentieth century, especially that developed by the members of the Austrian School of Economics (Di Nuoscio 2000a).

In particular, if you examine carefully Spencer's epistemology, you may notice a striking similarity with what a century later will be the reflection of Friedrich von Hayek. Both are individualists, fallibilists, evolutionists, anti-constructivists, theorists of the "dispersion of knowledge" and of "spontaneous order", critics of legal positivism and left-liberals. And he is right a leading scholar of Hayek, as John Gray, when he argues that:

> "one of the gap in Hayek scholarship is any detailed comparison of his view with those of his classical predecessor, Herbert Spencer. This is surprising, since

> Hayek's philosophy has many affinities with Spencer's, including the aspiration of embedding the defence of liberty in a broad evolutionary framework" (Gray 1984, p. 103; Nemo 1988, p. 390).

Indeed, Hayek cites very few times Spencer and does not indicate him ever as one of his reference authors.

In this article I intend to highlight this affinity by comparing some key aspects of the epistemological reflection of these two great thinkers.

II. THE ONTOLOGICAL INDIVIDUALISM

Spencer's and Hayek's social and political theories are based on the same metaphysical presupposition: the *ontological individualism*. In the *Principles of Sociology* Spencer writes: "society is a collective name for a number of individuals" (Spencer 1897, p. 447); it "is nothing more that the sum of the lives of citizens" (Spencer 1894, p. 87). Only individuals and their actions really exist, and "all social action are determined by the actions of the individuals" (Spencer 1880, p. 301), so "that everything thought and felt and done in the course of social life is thought and felt and done in harmony with the laws on individual life, is also a truth, almost a truism, indeed; though on of which few seem conscious" (Op. cit., p. 297). Consequently, "to understand any fact in social evolution, we have to see it for as resulting from the joint actions of individuals" (Op. cit, p. 106; Spencer 1881, p. 16).

Of similar content the words of Hayek: "the existence in popular usage of such terms as 'society' or 'economy' is naïvely taken as evidence that there must be definite 'objects' corresponding them" (Hayek 1964, p. 58). This "collectivist approach is that it mistaken for facts what are no more than provisional theories, models constructed by the popular mind to explain the connection between some of the individual phenomena which we observe" (Op. cit., p. 54). This ontological collectivism, in the opinion of Hayek, is the product of a *naïve realism* which "uncritically to assume that where there are commonly used concept there must also be definite 'given' things which they describe is so deeply embedded in current thought about social phenomena that it requires a deliberate effort of will to free oneselves from it" (ibid).

III. THE EVOLUTIONARY ORIGINS OF SOCIAL INSTITUTIONS

In Spencer and Hayek there is a direct passage from the ontological individualism to the methodological individualism. They explain social phenomena as intentional, and above all, unintentional outcomes, generated by the combinations of rational actions. In particular, Spencer and Hayek share the systematic recourse to the category of unintended consequences to explain the genesis and functioning of some important social institutions and of the social order as a whole. Beyond what common sense would suggest, explains Spencer, the social processes produce results that "the scientific use of the imagination would never have anticipated them", and the task of the social scientist must be to show that almost the social and political institutions "are the marvelous results indirectly and unintentionally achieved by the cooperation of men who are severally pursuing their private ends" (Spencer 1871, p. 213).

Among the many social institutions of which Spencer proposes an evolutionary explanation, we find that relative to the genesis of the currency in which he proposes a thesis already expressed few years earlier by Carl Menger (1871, pp. 257ff.), and the one on the division of labor, that we find in Hayek a century later. The complex organization of the division of labour—Spencer explains in the *Principles of Sociology*—"is not originated by conscious agreement" (Spencer 1897, p. 77), not "from a command of a government", but "from a combination spontaneously evolved" (Spencer 1860, p. 145). "While each citizen has been pursuing his individual welfare and none taking thought about division of labour, or conscious of the need of it, division of labour has yet been ever becoming more complete. It has been doing this slowly and silently: few having observed it until quite modern times" (Op. cit., p. 150).[1] The division of labour develops "spontaneously" (Op. cit., p. 810), as a unwanted result "to satisfy personal needs" (Ibid.).

In *The Road to Serfdom* Hayek proposes the same thesis: "That the division of labour has reached the extend which makes modern civilisation possible we owe to the fact that it did not have to be consciously created" (1944, p. 52). The man "tumbled on a method by which the division of labour could be extended far beyond the limits within which it could have been planned. Any further growth of its complexity, therefore, far from making central direction more necessary, makes it more important than ever that we should

use a technique which does not depend on conscious control" (Ibid.).

IV. SPENCER: FROM THE "COMPULSORY COOPERATION" OF THE "MILITARY SOCIETY" TO THE "SPONTANEOUS COOPERATION" OF THE "INDUSTRIAL SOCIETY"

Proposing what would be later the Hayek's distinction between "spontaneous orders" and "constructed orders", Spencer considers the "compulsory cooperation" and the "spontaneous cooperation" the two principles which rule the social institutions. The "compulsory cooperation" is the basis of those organizations in which individuals "intentionally pursue public purposes", while the "spontaneous cooperation" is typical of "the complex social organizations, which not derive from a conscious agreement", in which the individual, pursuing "private purposes", unwittingly generate "public finalities" (Spencer 1897, p. 125).

The attempt to impose "compulsory cooperation" within social order, according to Spencer inevitably leads the "military society", a planned society in which "individual initiative is canceled" (Op., cit., p. 262) by suffocating bureaucratic organization "extended to all of society" with at the summit a "despotic government" (Op. cit., p. 296). This social planned order was typical of the "communist forms existed in primitive societies" and now, Spencer writes in the *Principles of Sociology*, published between 1882 and 1996, is revived by the "communist projects of our time", "incapable of conceive of any social fact as a result of spontaneous orders" (Op. cit., vol. II, p. 366).

To the "military society" based on "compulsory cooperation", Spencer opposes the "industrial society" based on "spontaneous cooperation". It is a social order in which "individuals employed in jobs of all kinds, which follow separately for private purposes, work together to achieve a public purpose not designed by them. Considered in the aggregate, their actions meet the needs of the whole society; but they are not dictated by an authority and are exercised by each with the aims of personal and not of all people welfare" (Op. cit., p. 590).

As well as support later Hayek, even for Spencer the "spontaneous cooperation" of the "industrial society" is ensured largely by the market catallactics logic, that even the English sociologist considers the most powerful system of self-organization, thanks to the regulative function ensured by the price system. The informations that guide the production "make the rounds of the city" and consequently "from hour to hour prices are adjusted, supplies are ordered hither or thither, and capital is drafted from place to place, according as there is greater or less need for it. All this goes on without any ministerial overseeing, without any dictation from those executive centres which combine the actions of the outer organs" (Spencer 1871, p. 218).

The ability of the self-regulation of "spontaneous order", Spencer says, "is more reliable than any legislative decision", because "when the desires are not few, universal and intense, but, like those remaining to be satisfied in the latter stages of civilization, numerous, partial, and moderate, the judgment of a government is no longer to be trusted. To select out of an immense number of minor wants, physical, intellectual, and moral, felt in different degrees by different classes, and by a total mass varying in every case, the want that is most pressing, is a task which no legislature can accomplish. No man or men by inspecting society can see what it most needs; society must be left to feel what it most needs" (Spencer 1852, p. 308). In the "industrial society" the task of political power must not be to "make him the individual actions directing them towards a single end", but to "protect the actions of the individual from interference that are not required by the mutual limitation of individual rights" (Spencer 1897, p. 399).

V. HAYEK: FROM THE "ORGANIZED ORDER" OF THE "MILITARY TYPE OF SOCIETY" TO THE "SPONTANEOUS ORDER" OF THE "COMMERCIAL TYPE OF SOCIETY"

Without any reference to Spencer, Hayek argues (using definitions almost literally spencerian) that at the two opposite types of orders—"spontaneous order" (cosmos) and "constructed order" (*taxis*)—correspond "two irreconcilable types of social organisation (…), the commercial and the military type of society" (Hayek 1944, pp. 130-131).

The *taxis* are an order designed and imposed, under which are not in force, as in the *cosmos*, abstract and impersonal rules (the *nomoi*), but that is regulated by a complex legislation (*thesis*), that programs the ends and regulates the relations between the individual components. This "constructed order", therefore, can only be used when there is "limited resources known to the organiser in the service of a unitary hierarchy of ends" (Hayek 1978, p. 76). Because of their intrinsic characteristics, the "constructed orders" "are relatively *simple* or at least necessarily confined to such moderate degree of complexity as the marker can still survey" (Hayek 1982, p. 38). This type of order is therefore not applicable to

organize the entire society, because it's impossible to centralize the knowledge necessary for this calculation. For these epistemological reasons the planning is impossible, because, as Hayek writes in *The Fatal Conceit*, "what cannot be known cannot be planned" (1988, p. 85).

The *cosmos* is instead the order that evolves spontaneously and that "is not the result of human design" (Hayek 1982, p. 19). Having formed unintentionally, it present "a degree of complexity that is not limited to what a human mind can master" (Op. cit., p. 38). This represents a great advantage for the realization of individual plans, because "the success of action in society depends on more particular facts than anyone can possibly know. And our whole civilization in consequence rests, and must rests, on our *believing* much that we cannot *know* to be true in Cartesian sense" (Op. cit., p. 12). The cosmos, then, is a system that are self-organized spontaneously according to a catallactic order and that, not depending on the computing capacity of any subject, allows to organize actions and knowledge on a large scale, allowing to best use of the experiences and knowledge accumulated with the evolutionary process. According to Hayek, this type of order is the organization principle of the "Great Society".

VI. SPENCER: THE SOCIAL PLANNING LEADS "FROM FREEDOM TO BONDAGE"

In an essay significantly entitled *From Freedom To Bondage* (1891), Spencer makes some devastating epistemological criticisms to the communists, and generally to all planners. Criticism that will be then one of the fundamental tenet of the thought of Hayek. The thesis is clear: the attempt of political power to replace the "spontaneous cooperation" to plan the entire society is inevitably destined to fail and produce "worse evils than those to be escaped" (Spencer 1891, p. 248). Against the rationalist constructivism of the planners, Spencer brings two epistemological arguments: the occurrence of unintended consequences and the impossibility to replace the market order with political decisions. Before to "meddle in a social organization" Spencer writes, the legislator must realize that it has a "natural history" (1884, p. 99), and that "the attempt to divert essentially the evolutionary course of society" can only to cause damage" (Spencer 1880, p. 254), because should "a superhuman power and intelligence" (Spencer 1853, p. 139) to control all variables to avoid "collateral evils they never looked for" (Op. cit., p. 143). The legislator has to learn from the fact that historically the major attempts at reforms have generated "evil worse instead of remedying them" (Op. cit., p. 151), because "the vice of empirical school of politicians" is £that they never look beyond proximate causes and immediate effects" (Op. cit., p. 142) and do not take into account that "not even the highest intelligences can anticipate the aggregate effects" (1981-93, p. 250) in society, just because the social and political events are dominated by a so complicated "fructifying causation" (Ibid). This fait explains because "well-meant measures often produce unforeseen mischief's" (Spencer 1853, p. 144), so "the faith in the method of achieving artificially this or that end, is continually discredited by failures to work the effects intended and by working unintended effects" (Spencer 1981-93, p. 250).[2]

The other argument put forward by Spencer against planners, concerns the impossibility of giving up the order of the market. The dynamics of free competition, he argues, allows an optimal allocation and management of economic resource, since "every private enterprise is dependent on the need for it" and it would be "impossible it is for to continue if there be no need" (Spencer 1981-93, p. 142). "Daily are new trades and new companies established. If they sub serve some existing public want, they take root and grow. If they do not, they die of inanition" (Op. cit., p. 149), and resources are used to make profit in another way. And all this happens spontaneously, "without agitation and without act of parliament" (Op. cit., p. 154). "Each men, Spencer explains, does that which he finds pays best; that pays best is that for which other men will give most; that for which they give most is that which, under circumstances, they most desire" (ibid). This system, which is the price system, is the only one able to continuously reorient the allocation of resources, in order to satisfy the immense aggregate of individual desires, expressed according to preference scales that are constantly changing on depending by the circumstances[3].

Give up this spontaneous mechanism means give up the only system able to solve this complicated calculation. It should, in fact, "a superhuman power and intelligence" to replace it, and "no Government or Parliament can do it" (Op. cit., p. 139). Therefore, any attempt to produce this calculation in the "theoretical way", that is, through centralized planning, not only is destined to fail, but most probably will produce "collateral evils (…) often graver than the original ones" (Op. cit., p. 142). This is what want to do the Communists, who, in the opinion of Spencer, "do not realize the impossibility to construct the complicated mechanism that the social order they envisioned necessarily imply" (Spencer 1891, p. 239). In fact, "if each is to be cared for by all, then the embodied all must get the means the necessary of life. What it gives to each must be taken from the accumulated

contributions; and it must therefore require from each his proportion must tell him how much he has to give to the general stock in the shape of production, that he may have so much in the shape of sustentation" (Spencer 1891, p. 240). And every individual must "obey those who say what he shall do, and at what hour, and where; and who give him his share food, clothing and shelter" (ibid). "If the competition is excluded, and with it buying and selling, there can be no voluntary Exchange of so much labour for so much produce; but there must be apportionment of the one to the other by appointed officers" (ibid).

Beyond the original intentions, the renunciation of free trade necessarily leads to the construction of a "colossal regulatory mechanism" that is able to comply with all means decisions and organize every aspect of economic, social and political life[4]. The consequence is "a tyranny of bureaucracies" (Spencer 1891, p. 244), which gives absolute power to those who are at the top of the bureaucratic machine[5], who "use without check whatever coercion seems to them needful in the interest of the system (which will practically become their own interest) will have no hesitation in imposing their rigorous rule over the entire lives of the actual workers; until, eventually, there is developed an official oligarchy, with its various grades, exercising a tyranny more gigantic and more terrible than any which the world has been" (Op. cit., p. 247).

To replace the "industrial society" with the "communist society", and then give up the "spontaneous cooperation", means—for Spencer—pass "from the freedom to the bondage", returning to a pervasive regime which "in principle, if not in appearance, the same as that which during the past generations was escaped from with much rejoicing"[6]. And this social order, moreover, will prove detrimental to the interests of the working classes. If the industrial society the self-interest" of the "ruling class" is braked by the successes of Trade Unions, "in a system of forced cooperation, such as the Communist, "the regulators, pursuing their personal interest with no less selfishness, could not be met by the combined resistance of free workers; an their power, unchecked as now by refusals to work save on prescribed terms, would grow and ramify and consolidate till it became irresistible" (Op. cit., p. 248).

The remedies of the Communists—Spencer concludes that, unlike Hayek, can not know the historical experience of the communist regimes—not only will be ineffective, "but will bring worse evils than those to be escape" (Spencer 1891, p. 247). The communist revolution, is the forecast of Spencer, will be no exception with respect to other "unnumbered revolutions", like the French one, "that have shown with wonderful persistence the contrast between the expected results and the achieved results" (Op cit., p. 241; see Rizzo 1999, p. 115).

VII. HAYEK: THE PLANNING IS "THE ROAD TO SERFDOM"

In *The Road to Serfdom* of Hayek we find—without any reference to Spencer—argument substantially identical to those expressed by Spencer in *From bondage to freedom*. The price mechanism is indispensable, for Hayek, because it's "the only method" capable of ensuring the "coordination" of a complex system of division of labor. "Because all the details of the changes constantly affecting the conditions of demand and supply of the different commodities can never be fully known, or quickly enough be collected and disseminated, by any one centre, what is required in some apparatus of registration which automatically records all the relevant effects of individual actions, and whose indications are the same time the result of, and guide for, all individual decisions" (Hayek 1944, pp. 51-52).

Once eliminated private property and, therefore, the competition—this is the Hayek's thesis—become "inevitable" the total planning of every aspect of social and economic life in achieving a single goal. "Economic control, Hayek explains, is not merely control of a sector of human life which can be separated from the rest; it is the control of the means for all our ends. And whoever has sole control of the means must also determine which ends are to served, which values are to be rated higher and which lower, in short, what men should believe and strive for" (Op. cit., p. 95). Economic planning, therefore, "would involve direction of almost the whole of our life", since there would be no one aspect of it "over which the planner would not exercise his 'conscious control'" (ibid).

The renunciation to the mechanism of catallaxy in favor of planning therefore inevitably leads to a colossal bureaucratic organization that has the power to decide in order to the relative importance of the different individual needs. Directing the entire social and economic system, it can be considered "the most powerful monopolist conceivable" (Op. cit., p. 96) and will be all-powerful and liberticide to the point that, like Spencer, Hayek also can be concluded that "the Road to Freedom was in fact the High Road to servitude" (Op. cit., p. 27).

VIII. EVOLUTIONARY LAW AND CRITICISM TO THE LEGAL POSITIVISM

In Spencer, and then Hayek, epistemological criticism to planning invest the role of the legislator. Both criticize the legal positivism that feeds the political constructivism and insist on the "ignorance of the legislator" and on the distinction between "positive law" and "evolutionary law". And both see in the "evolutionary law" the rules of "spontaneous order" and in the "positive law" the rules of the "constructed order".

According to Spencer, the planners, but also the constructivistic liberals, are motivated by prejudice that "the legislation is omnipotent" (Spencer 1853, p. 141) and, consequently, it can change the entire social organization. The constructivists forget that the social order, instead, "is the result indirectly and unintentionally achieved by the cooperation of men who are severally pursuing their private end" (Spencer 1871, p. 213). The result of this wrong conception is an "over-legislation", that even in liberal countries was reducing the margins of individual freedom.

The unsustainable epistemological conceit of the legislative constructivism is based, according to Spencer, on the erroneous identification between "positive law" and "evolutionary law". The "industrial society" is a self-organized order on the basis of rules spontaneously generated, of a "common law" produced by the free interplay between individuals. This mechanism has allowed the production of a quantity of knowledge that no government or parliament could never have. Criticizing the legal positivism of Bentham, which has ignored this essential difference between "right" and "law", Spencer says, "the reformed law did not create the right, but recognition of the right created the reformed law" (Spencer 1884, p. 122). The leader of the radical philosophers, in fact, assigned to the State a moral duty to pursue *the greatest happiness for the greatest number*, "by creating rights which it confers upon individuals: rights of personal security, regatta of protection of honour, rights of property, etc." (Bentham 1838-43, p. 301). This benthamian conception of law, in the opinion of Spencer, has proven "false" (Spencer 1884, p. 125) by the existence of rules pre-existing to the affirmation of forms of political organization and by the impossibility, due to the lack of the necessary knowledge, for any political power to create *ex nihilo* rules of behaviour (Op. cit., pp. 118-119).

The Hayekian distinction between "law", which is at the basis of "spontaneous orders", and "legislation", tool for the regulation of the "constructed orders", as well its hard criticism of legal positivism, reproduce in substance the thesis of Spencer. "Not all law can therefore be the product of legislation; but power to legislate presupposes the recognition of some common rules" (Hayek 1982/1993, p. 95). Before the legislation there is therefore a "customary law", that "is not the result of intention or design of a law-maker" (Op. cit., p. 81). They are the rules of conduct that govern the "spontaneous order" and that, for gnoseological reasons, can not be "product of deliberate design", but "pre-exist" to the political decisions (Op. cit., p. 89). Neglecting this distinction the positivists make two errors: assume a "a supreme legislator whose power cannot be limited" (Op. cit., p. 91) and to conceive any legal rule as an expression of the will of the legislator. Committing these errors, Bentham and the positivists had to assume "a omniscience which is never satisfied in real life and which, if it were ever true, would make the existence of those bodies of rules which we call morals and law not only superfluous but unaccountable and contrary to the assumption" (Op. cit., p. 20). The utilitarians, in substance, fall into a serious paradox: they want to establish rules denying at same time the assumption that produces the need of rules: human ignorance. "Man, Hayek writes, has developed rules of conduct not because he knows but because he does not know what all the consequences of a particular action will be" (Op. cit., pp. 21-21).

NOTES

1 "Our industrial organization, from its main outlines down to its minutest details, has become what it is, not simply without legislative guidance, but, to a considerable extent, in spite of legislative hindrances. It has arisen under the pressure of human wants and resulting activities" (Op. cit., p. 150; ibid).

2 "Every day brings examples of the way in which measures work these unexpected results" Spencer (1981-93, p. 250) and of "indirect effects, multiplying and again multiplying, that are often in the long run the reverse of those counted on" (Spencer 1880, pp. 378; 245). A sensational case is represented by the failure of the Poor Laws, that is, of those laws that were hailed as a great achievement of civilization in England, which "ended in making the people of each parish chargeable with the maintenance of their poor, while it re-established the severest penalties on vagabondage". The strong increase of the poor brought about an increase of this fee. "No one

imagine that, to escape poor's-rates, landlords would avoid building cottages, and would even clear cottages away; so causing over-crowding, with consequent evils, bodily and mental. No one imagined that workhouse, so called, would become places for idling in; and place where married couples would display their 'elective affinities' time after time". Yet, Spencer concludes, "these and detrimental results which it would take page to enumerate, culminating in that general result most detrimental of all—helping the worthless to multiply at the expense of the worthy—finally came out of measures taken out ages ago merely to mitigate certain immediate evils" (Spencer 1880, p. 94).

3 The economic activities managed by the State, suffer of some congenital defects: they are "lazy" to adapt to new situations; usually they are managed by no competent people; have a financial management misguided because there is no personal responsibility of executives; they are frequently affected by corruption, because not exposed to the "antiseptic principle" of the "free competition" (Op. cit., p. 147).

4 "Without alternative the work must be done, and without alternative the benefit, whatever it may be, must be accepted. For the worker may not leave his place at will and offer himself elsewhere. Under such a system he cannot be accepted elsewhere, save by order of the authorities"; (Op. cit., p. 240).

5 For Spencer, therefore, the waiver of the price system, which is the basis of free trade, inevitably leads to the affirmation of a state pervasive bureaucracy, which try to replace the economic calculation based on prices with central planning. It's just the case to highlight here, that before with *Socialism* (1922) and then with *Bureaucracy* (1944), Ludwig von Mises will insist—with arguments that in fact constitute a development of those spenceriane—the inevitable bureaucratic degeneration of any attempt to give up the price system. "The suppression of profit", Mises writes, inevitably leads to the "bureaucratization of the every sphere of human affairs" (Mises 1944, p. 6). Insisting, unlike Spencer, especially on the impossibility of economic calculation in a planned economy, Mises affair that "the pre-eminence of the capitalism system consists in the fact that it is the only system of social cooperation and division of labour which makes it possible to apply a method of reckoning and computation in planning new projects and appraising the usefulness of the operation of those plants farm and workshops already working. The impracticability of all schemes of socialism and central planning is to be seen in the impossibility of any kind of economic calculation under conditions in which there is no private ownership of the means of production and consequently no market process for these factors" (Mises 1944, p. 23). If, then, in a market economy the "sovereigns" are the consumers, who with their choices continually redirect the allocation of resources, in the planned economy "sovereigns" are the bureaucrats and the politicians who control it; from the decisions of this people depend the satisfaction of individual preferences (Mises 1944).

6 Slavery, Spencer writes in *The Man Versus the State*, depends on the degree to which each individual must work for others or can work for itself. "The degree of his slavery varies according to the ratio between that which he is forced to yield up and that which he is allowed to retain; and it matters not whether his master is a single person or a society" (Op. cit., p. 240. If without options, he has to labour for the society, and receives from the general stock such portion as the society awards him, he becomes a slave to the society. Socialistic arrangements necessitate an enslavement of this kind" (Spencer 1894, p. 41).

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The Identity of the Economic Agent – Seen From a Mengerian Point of View in a Philosophical and Historical context

GILLES CAMPAGNOLO

Groupement de Recherche en Economie Quantitative d'Aix-Marseille (GREQAM)
Aix-Marseilles School of Economics
Aix-Marseilles University, EHESS and CNRS (National Center for Scientific Research)
3 avenue Robert Schuman, office 107
13628 Aix-en-Provence Cedex 1
France

Email: Gilles.Campagnolo@univ-amu.fr
Web: http://www.amse-aixmarseille.fr/en/users/campagnolo

Bio-sketch: Gilles Campagnolo is Full Research Professor of Philosophy and Economics at CNRS, is Senior Research Director in Philosophy and Economics at GREQAM/AMSE, and is a foreign member of the *Ausschuss für die Geschichte der Wirtschaftswissenschaften im Verein für Socialpolitik*. He has worked extensively on Carl Menger. Campagnolo has published *Criticisms of Classical political economy: Menger, Austrian Economics and the German Historical School* (Routledge, 2010) and was nominated for the French-German Parliament Prize. His work of translating and editing Menger into French includes the first and only translation of Menger's *Untersuchungen über die Methode der Socialwissenschaften und der politischen Ökonomie insbesondere* (1883).

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Abstract: What is an 'economic agent'? Who is 'the' economic agent? This question is one of the basic issues dealt with by the founder of the Austrian school of Economics, Carl Menger (1840-1921) even though the terminology of his times was different from ours : Menger did not coin the term "methodological individualism", which his heir's, Friedrich von Wieser, and would popularized by Josef Schumpeter. But he gave all the elements necessary to build it. In the era around 1900's "self-realization and identity" were not discussed as today, so this paper, historically oriented, will aim at restoring the questioning upon the nature (das Wesen) and the identity of the economic agent in this era of the "Great Crossroads" of economic schools, and the way it was seen by the father of the methodology later known in economics as 'Methodological individualism' is here described against that background. Menger's views on how individuals interact with one another and how social complexity spontaneously builds in are here at stake.

INTRODUCTION

In a passage from his own copy of his 1871 *Grundsätze der Volkswirtschaftslehre*, Carl Menger wrote about one of his colleagues at the University of Vienna:

> Stein belongs to that kind of writers, fortunately rare in Germany, who confront a competent reader with hare-brained ideas that he puts forwards inadvertently to lecture that reader from a moral stand" (Menger 1871, p. 112).

Lorenz von Stein (1815-1890) used a written style that clearly Menger, the founder of the Austrian school of economics, did not judge to be "scientific". Menger also formulated similar reproaches towards Schmoller, the leader of the German Historical School of Economics, against whom he would fight a major academic battle, known as the "*Dispute over the Methods*" (*Methodenstreit*). But in the eyes of Menger, both Stein and Schmoller were united in the *wrong* kind of methodology they used—and although they diverged much, especially regarding their positioning towards Hegelianism: Stein prided himself with mastering a speculative approach (which could easily be shown as flawed).[1]

Conversely, Schmoller swore only by empirical historical studies, but they join in practicalities: economic policies, social legislation, and so forth.

Yet, the monarchy wished for both by Stein and by Schmoller was "social" in the sense that its administration should correspond to the national community understood as a morally structured entity. The latter should then be considered as a "collective", thus bringing forward a notion of "collective concept" that applied to "society", "the state", and so forth. Such use will be much argued upon, for and against, during the above mentioned "Dispute over the Methods" and is strictly opposite to what "methodological individualism" would be meaning, whose concepts (if not the term) Menger would put forth, clarify and make prevail.

The interpretation that is suggested by Stein's works can somehow be referred to Hegel's "objective spirit". But to say that the philosopher's views inspired the current of thought later labeled "institutionalism" would be going a little too far– we shall come back to that trend that played a major role in post-historical German economics, preceding and also paralleling the American movement well-known under that label. The very belief in "collective entities" as legitimate topics in economic studies was thus rooted in earlier stages, those the so-called "German historical school" assessed, never fully given up by Schmoller and his disciples in the "younger historical school". Yet, when they would be, by some of their heirs, like Max Weber, it will be precisely in the name of an analysis close to Menger's own (Weber himself drew consequences that would also later inspire so-called "Ordoliberalism" after World War I—a movement we shall not enter into here).

Let indivdualism be examined here from a philosophical and historical point of view on economics: we shall start from a Historical stand, where Stein and Schmoller make their appearance to better explain by contrast what kind of thought Menger was opposing. We will further our inquiry into six parts. We shall follow Menger's detailed comments on texts by Aristotle wherefrom he, surprisingly in his times, deciphered most basic components for a pattern of individualistic methodology to do research in economics in a "pure" manner and provide some of the fundamentals of post-classical economic theory.

Let me also make clear from the start one point that might otherwise be somehow disconcerting for readers, probably many from Economics departments, as well as possibly also some of their colleagues, in the history of thought section, but by no means all of them. With the term "methodological individualism", we mean here a notion that is in no way reductionist. The approach that denies the existence of social properties and their influence on the individual was simply foreign to Menger. The fact that many, maybe the majority of historians of economics and thought economic, may keep in mind such an approach has to do with other developments of economics than those related to Menger and to the Austrian school.

For the philosopher, one must strictly differentiate between Menger's individualistic stand and a reductionist approach too often put forth when looking at the history of economic thought in retrospect (albeit Mark Blaug's view, which I will not discuss here though). Rationality and the role of a clear explanation of what methodological individualism is (as can be seen in today's light in Maurice Lagueux 2010) must also be explained with regard to the origins of a more appropriate use. This is clearly found in Menger, even though the word came later: what is meant by this term was better expressed with other words and is now often misrepresented by this very word: so goes history, and that is why to get a much better knowledge of it and the philosophy it carries is recommended. This is what is aimed at in the present contribution. Otherwise, the reference to the concept of "methodological individualism" could appear as incorrect and misplaced to many who usually are victims of the reductionist view in economics. Menger was immune, moreover he provides the vaccine as be does not mean at all by his approach a reductionist approach but just the opposite, a free subjective-oriented vision of the economic individualistic agent.

A HISTORICAL START: FROM LORENZ VON STEIN AND GUSTAV VON SCHMOLLER ON TO MAX WEBER AND CARL MENGER

In the perspective upheld by Stein and by Schmoller, the economic agents were not individual subjects as such. For the former, an economic agent is the *status personae* that would also—and, as a matter of fact, as it is the case in *legal* terms—apply to societies, associations, etc. For the latter, these institutions were the 'real' subjects of economic analyses. Such mediating bodies could thus be regarded as "states in the state", and statesmen would always show some defiance towards them, but they could also use them, or count upon them.

Actually, this is what happened at a historical level: either through fighting such bodies, like trade-unions, which Bis-

marck prohibited in 1878 and whose followers, mutual associations, he was about to fight again in 1890 when he got dismissed by the emperor partly to avoid a foreseen crisis, or by associating them to power, industrial *Konzerne* like, say, Krupp's or Thyssen's, that depended much upon orders placed by the state (especially for the army), thus giving rise both to a powerful and influential military and industrial clusters.

As a consequence, the state's intervention was regarded as a *natural* component of the economy as a whole. Stein distingued capital and labor from a technical point of view, but rebuked Ricardian analysis in terms of a profit *vs*. wages arbitrage in the sharing of benefits, the very basis of the Marxian analytical framework and the Socialists' claims. Social rest or unrest depended, in Stein's view, on reasonable distributive schemes for legitimate social bonus-takers (the sick and the old, widows and orphans of workers, etc.). The regulatory consistency of such policies within an analytical framework of economic theory was not his prime concern—which does not mean he could not have been incorporated it. But it was rather Schmoller and the German historical school who succeeded in that integration, in order to make their claims all the more seriously and convincinglu: the *Verein für Socialpolitik* ("Union for Social Policy") was founded in 1872 and it became a specialized body actually achieving much fieldwork in the way Stein first inaugurated half a century earlier. Away from Classical political economy, that kind of economics represented there was both *national economics* (*of Germany*) and an "administered economics" which German and the Austrian governments needed and required from the *academia*.

If individual economic agents were not regarded as the *only* elements of economic analysis, yet they were reckoned as somehow important. Stein put forward the *Prinzip der Personalität*, and the Historicists consciously saw that individuals feem less cheated when contracting in terms they can accept without being forced into them (due to their weak position as sellers but of labor-force). Within civil and political society, if the state is seen as a neutral referee to which everyone can refer in case of necessity, the role of the prince is thus pivotal. One may say that, after all, Hegel's influence was there, in this "prince" who was not to take sides in any respect, but only to act as a "dot on letter *i*", only to sign in ultimate acceptance, nothing more—yet nothing less for, at the same time, the *whole* point of princely assent is thus to assess rights and *not* to tip the scales in favor of any class (especially the higher classes). (Bourgeois 1979).[2] Quite naturally, socialists eagerly demonstrated that the state was *not* neutral at all in reality, but a mere tool in the hands of the ruling classes/capitalists: one reckons the idea presented by Marx (at least one interpretation of it, with deep distrust towards the "reign of law"). The harsh criticism on "formal liberty on capitalism" is parallel to that difference between confidence and distrust towards the monarch, that divides socialists and thinkers who, though interested in social matters, are not in the least "socialists" (in the sense of "anti-capitalist). Actually the name given to Historicists by their opponents: "Socialists of the chair" (*Kathedersozialisten*) does not refer to anti-capitalism but to statist interventionism *in favor of capitalistic (notably industrial) development.*

All this takes the analysis further and further away from individualism indeed. In the posterity of the Historical School, the analysis by Max Weber, who remained faithful to a kind of historicism (no wonder when studying the "religions of the world"), showed the difference at the same time that Weber discovered he had to ground his studies on individual behavior and to regard "collective entities" merely as so many unquestioned (and uncertain) belief-matters. To quote his words in his letter to Liefmann dated March 9, 1920,[3] the notion that he wished to evacuate from the field of economics and sociology was precisely that of "*Kollektivbegriffe*" ("collective concepts") for their inadequate role in trying to examine behavioral patterns. In this case, methodological individualism was the obvious and essential solution to a renewal in the social sciences, historicism *included*.

WHAT DO *INDIVIDUALS* DO WHEN THEY TRADE? MENGER'S ARISTOTELIAN ANSWER.

To examine the question in the light of philosophy, Menger sought how to make sense of economic concepts by referring them to, and possibly grounding them on Aristotelian ethics. Because Menger wanted to understand how partners trade, and what the process of exchange exactly is, in order to build a science of the satisfaction of human needs *through* exchange, he turned back *before historicism* to philosophical thinking, of the Ancients, on the one hand, especially Aristotle, of British *political* philosophy (and not exclusively classical political economy), on the other hand.

It was not at all uncommon, but rather the general rule in his times to first study earlier thoughts in retrospect when discussing a matter and, in German-language academia, Aristotle was still regarded as the authority by excellence. But the reason why Menger turned to the Ancient philosopher

was not his authority generally speaking—it was some precise contents of his analysis of *individual* behavior. That may first be surprising and we shall develop here what Menger found in terms of exchange in the text of the Stagirite. The part played by philology to build an *individualistic methodological* frame rendered this analysis feasible—thus contributing to forge Menger's methodological individualism, whereas most authors of his times (and all economists) regarded Aristotle, on the contrary, as the paragon of a "collective" *polis*-oriented reasoning. Therefore, we shall insist upon Menger's reading of Aristotle, as much more was thus engaged than the Austrian economist's own respect paid to Ancient philosophy: that trend heavily contributed to changing science in economics at a deep level. For that result to obtain, the inspirational role of Aristotle was essential for Menger.

"In trade", which is the field where human beings exchange goods with the prospect of "satisfying their needs", what is "justice"? "Justice" that interests Menger is "fairness in trade" as a part of "particular justice" in the Aristotelian frame. Proportions that Aristotle proposed as valid in that domain are those the Ancient formulated as *arithmetical*: they work for *corrective* justice both in legal matters (in trials where thieves are made to give back their loot) and in freewill trade and business intercourse, that bears no regard to rank or merit. There, as long as a "contract" is accepted by two partners, they have to mutually provide each other with the quantities of good that they have agreed upon. If they do not, enforcement is required. In any case, from the start, the question is *how* they came upon agreeing on some exchange rate? This question calls upon the idea of "value"—especially for later readers and those coming after classical political economists have in turn dealt with the issue.

Reading Aristotle's *Nicomachean Ethics*, Menger connected Book V (on "justice") and Books VIII and IX (on "friendship"/"partnership") with respect to this issue that was *not* directly (or consciously) questioned by Aristotle: the *origin of value* (see Campagnolo and Lagueux, 2004). The ranking by Aristotle of different kinds of "friendship" shows how he formulated its forms, the lowest form being a "conscientiously useful partnership". That provided Menger with enough hints to uncover the mechanism ruling the exchange process. How mutual *subjective* valuation of goods meet and eventually match each other, how some price range emerges from within that process, how partners thus "make" a price (instead of being mere "price-takers" in what would become the generally accepted view in modern economics under standard assumptions of market competition), all these elements were thoroughly annotated by Menger. They undoubtedly influenced his representation of the exchange process as a dual partnership at first, as a whole market system at a second stage. The order in which those issues are coped with in his 1871 *Grundsätze* is precisely the same and manuscript annotations added *after publication* are also significant in that respect: rather than saying the reading of Aristotle intervened *before* or *after* Menger wrote his masterwork, it is more sensible to insist that that reading accompanied the whole process of reflection.[4]

Among major ideas present in Aristotle's works, Menger read that individuals are "price-*makers*" rather than "price-*takers*" in the sense that their subjective evaluation comes first, whatever the framework of the exchange (dual, multilateral, competitive atomistic frame). This would be central to the school Menger was later reckoned as the founder thereof, the so-called "Austrian school". Rather than a "principle" of marginal substitution rate that would authorize but equilibrium prices—leading to a mathematically exactly determined market equilibrium (according to views formulated by Jevons and reworked by Marshall, compatible with Classical thought), or even to a *general* equilibrium scheme (as in the Walrasian scheme)—Menger would insist on the *individualistic* dynamic process.

This process leads partners to reach a price *range* as they seek to satisfy their needs in trading a given good (cows for horses in the example developed in his 1871 *Grundsätze der Volkswitschaftslehre*) (Menger 1871, pp. 63-69, German ed.; and Dingwall and Hoselitz 1976, pp. 183-186 English tr.). To satisfy a given desire consists first in feeling a *need* and then in identifying alternative possible solutions to that need .This is a purely subjective process that rules out that need might be *objectively* determined. Evaluation—upon which the start of the exchange process depends—is thus entirely *subjective*. It provides the conditions (including time and limited knowledge, or unavoidable partial ignorance) for an individual to become convinced that he/she would benefit from engaging in trade. In becoming friends/partners "useful to each other", human individuals engage in economic actions (they are what Menger calls, in German, "*wirtschaftenden Menschen*").

Thus gets formed a basis for the mechanism found both in Menger and in Aristotle, for which Menger was *glad*—annotations leave no doubt—to see his own views in conformity with the Ancient philosopher's insights. In that sense, the use of archival material proves, once and for all, that Menger may be said to be "Aristotelian".[5] But exploration should go more deeply than whether Menger was Aristotelian: the is-

sue is what the marginalist theory of value takes from its linkage to Aristotelian methodological principles, what part in post-classical economics has to do with it. In particular, what significance the *individual* takes in reading Aristotle. With regard to Menger, we identify the Ancient as a major classical philosophy source for grounding Austrian economics and for reasons that may first surprise us.

MENGERIAN INDIVIDUALISTIC METHODOLOGICAL CLAIM MADE EXPLICIT ALONG ARISTOTELIAN LINES

Such an assessment appears paradoxical since the way the Aristotelian creed was commonly interpreted in Menger's times was to regard Aristotelianism as a major supporting doctrine for *collective entities* and since the *political* element was thus given priority with respect to economic reasoning within the subject matter of *political* economy proper. Members of the German Historical School promptly defined the modern national community (that their own *National-ökonomie* was studying) on the basis of the ancient Greek City, the πόλις. Ancient Greece, Aristotle were taken to present evidence for such reading. In the *Nicomachean Ethics*, for instance, those authors stressed that Aristotle regarded as necessary to maintain order and adherence within the community (κοινωνία), an essential fact that make citizens have some reason to live in common (κοινή).[6] Menger's analysis of "justice" and fairness in exchange in general, and trade in particular, was peculiar and had been completely overlooked. Conversely, it was insisted that both kinds of "justice" (corrective and distributive) are necessary to obtain perpetuation of the community:

> [...] in the interchange of services Justice in the form of Reciprocity is the bond that maintains the association: reciprocity, that is, on the basis of proportion, not on the basis of equality. The very existence of the state depends on proportionate reciprocity […] and it is the exchange that binds them [men] together.[7]

Indeed, continuity in the community as a whole was also Aristotle's aim. Menger acknowledged both. But the reason why Historicists insisted upon this only undoubtedly lay in the fact that Aristotle defined the 'utmost good' as the good of the *whole City in its entirety*. What Historicists disregarded is the fact that Aristotle based that view upon a preliminary study of *individual* behavior and the substantial *subjective* nature of individuals. That is precisely why "ethics" is the necessary introduction to politics, as Aristotle made explicit in Book I of the *Nicomachean Ethics* as in his other writings about ethics.[8]

Aristotle had put the studies of politics as coming *after* those on ethics, thus showing that the field of ethics (and economic matters that we saw embedded within it) act indeed as a "propedeutics" to higher theoretical matters to be "contemplated" (or, as said in ancient Greek, to make "theorems" of: *theorema,* θεώρημα). Some training is needed for further reflection of that sort, and it therefore comes later in the propedeutics. But it is *first* in heuristic order and reveals individual behavior as a basis for the rest of the socio-political behavioral matters, which are thus shown as the basis for all knowledge about 'life in the city' and the 'good life':

> […] We ought to make an attempt to determine at all events in outline what exactly this Supreme Good is, and of which of the theoretical or practical sciences it is the object. Now it would be agreed that it must be the object of the most authoritative of the sciences—some science which is pre-eminently a master craft. But such is manifestly the science of Politics […] ; and we observe that even the most highly esteemed of the faculties, such as strategy, domestic economy, oratory, are subordinate to the political science.[9]

The *Politics* is consequently the next step in a general analysis of the human behaviour. Rather than considering *first* a possibly delusive collective entity, without resorting to some behavior explaining how exchange works, Menger followed Aristotle in the order he brings the matter to study: human behavior in the individual, then a dual partnership, later on a more populated environment. Yet, the most famous definition according to which Aristotle concerned the human being as a political animal must also be resituated in context. Menger quoted Aristotle:

> From these things therefore it is clear that the city-state is a natural growth, and that man is by nature a political animal, and a man that is by nature and not merely by fortune citiless is either low in the scale of humanity or above it […] And why man is a political animal in a greater measure than any bee or any gregarious animal is clear (Aristotle 1962, 1253a7-10, pp. 9-11).[10]

Before Menger, these famous lines had most often been interpreted as indicating that the human being was an ontological part of the community (the Greek city or the German

nation) and oriented towards the realization of the utmost good (Ibid.,1252a1),[11] essentially as the good that should come *before all* the rest is the good of the collective.

What interpretation should prevail? The issue was a major dispute. Menger's opponents raised it as an obstacle in his attempt to renew the science of economics. Indeed, this point was decisive in the academic world still at the end of the nineteenth century. It was usual to resort to Ancient philosophy to prove one's point: the huge progress in philological studies by German-speaking academics had given a new impulse to the use of Ancient philosophy, altogether with a shift favored by the influential Catholic Church in Austria proper. It is therefore no wonder that Menger dedicated to that matter a whole appendix (*Anhang* VII) of his 1883 *Investigations into the Method of the Social Sciences, and of Political Economy in particular*, entitled "On the Opinion Attributed to Aristotle, that the Phenomenon of the State be originally given with the Existence of Mankind Itself" (Menger 1970).

The Mengerian methodology that was later labeled "methodological individualism" is related to his new interpretation of Aristotle and the new notions that Menger provided thereof: such an origin has to be acknowledged in a consistent manner and that shows within the contents of this Appendix. Menger's confrontation with Historicism was the stronger as he answered their attacks in identifying how they were confused—and not only regarding Aristotle but also on assimilating his own theory with another doctrine, the classical *homo economicus*. Menger retorted without resorting to *that* creed, leaving aside Classical political economists and found in Aristotle elements for his own new line of reasoning: he started from individual behavior so as to gradually reach, step by step, the phenomenon of the *spontaneous* emergence of larger institutions, whose development Menger again explained by decisions made by individuals—and these are not assumed as mere components but as the key to demonstrate reactions of any "collective" which the Historicists were fancying moving on its own as such (*an sich und für sich*, so to speak their language).

Menger's approach later to be called "methodological individualism" was already in bud even if the term is not Menger's (and will rather be found in works by later members of the "Austrian school" such as Wieser or Schumpeter we already mentioned). The word was lacking in Aristotle's texts as well, though for other reasons concerning the the Greek language. Also note that Menger labeled "individual" ("*individuell*") what was located to space and time, events that happened in some given context. The term itself thus qualified *historical* facts and corresponded to what we would regard as "singular" events, happening only once, here and there—precisely the material that was used successively by Roscher for his inductive "parallelism-building" method and by Schmoller for his comparative analysis through variants and differences between phenomena. Conversely, in Menger, knowledge of facts belonging to the historical facet of economics, are simply not part of its *theory*. And, as far as theory is concerned, "*individuellen Erscheinungen*" shall not be considered as such, but as consisting in what a general analysis of elementary facts brings in on the basis of individualistic methodology.

INDIVIDUALIST CLAIMS, INDUCTION AND DEDUCTION, OBSERVATIONAL OR APRIORISTIC ANALYSIS

Along his confrontation with the German Historicists, Menger rebuked the term "Volks-*wirtschaftslehre*" as such—as a matter of fact, his archives prove that he even wished to modify the title of his 1871 *Principles of Political Economy* (*Grundsätze der Volkswirtschaftslehre*) into *Pure theoretical Economics* (*Reine theoretische Wirtschaftslehre*).[12] Menger wanted to prove the validity of his own views against his enemies.

Changing the course of his theoretical investigations, he undertook first of all to justify his methodological claims. He thus wrote and published in 1883 his *Untersuchungen über die Methode der Socialwissenschaften und der Politischen Oekonomie insbesondere* and in English *Investigations into the Method of the Social Sciences with Special Reference to Economics*. Therein, Menger only spoke of "atomism" (*Atomismus*)—he did not coin the term "methodological individualism"). Although using the calque from the English usual wording, he did not mean to re-enact doctrines of the Classical economists of the nineteenth century. By "atomism", Menger does not signify at all either what we, after disputes held place on the adequate lexicon, regard an "atomistic" approach in the sense of hyper-rationalism, which Hayek would later call "false individualism". Whether Menger chose the best word to call his approach or not has to do with the fact that the word "methodological individualism" anyhow came after his disciples decided to use a different one from that "atomism". To relate to "social atomism" would be erroneous, while Menger's idea belong to what Hayek would later call "true individualism". Yet, we decide not to use vocabulary that is both anachronistic here and also keeps a hue of implicit value judgment "true" or "false" that Menger did not apply to individualism. Rather, Menger intended to

bring out his own views as new against widespread "collectivistic" views. In order to do so, he started from the Ancient classical philosopher of Stagire. By commenting Aristotle's text, Menger proved his opponents' views were wrong in the very place where they thought they could set ground, putting forth Aristotle's definition of a human being as a "political animal".

The claim that has become so famous in the history of Aristotelian scholarship is found in the first lines of Aristotle's *Politics*. There, it appears to support the idea that the collective would come *first*, since human beings are designated as 'animal' forms of life characterized by their *political* essence. Naturally that life trait is shared by some insects, like bees. And the idea found its way in the comments of other readers of Aristotle, like famously in the case of Karl Marx, who insists on how and why even the worst human architect remains superior to the most able of the bees (namely, that human beings conceive first of a scheme in his/her own mind before and independently from performing the task).

In the *Generation of animals*, Aristotle wrote:

> Such appears to be the truth about the generation of bees, judging from theory and from what are believed to be the facts about them; the facts, however, have not yet been sufficiently grasped; if ever they are, then credit must be given rather to observation than to theories, and to theories only if what they affirm agrees with the observed facts. A further indication that bees are produced without copulation is the fact that the brood appears small in the cells of the comb, whereas, whenever insects are generated by copulation, the parents remain united for a long time but produce quickly something of the nature of a scolex and of a considerable size (Aristotle 1984, III, 10, 760b).[13]

Aristotle arguably gave more credit to observation than to theory as regards the study exemplified here of how bees reproduce—but that does *not* mean that generally speaking theory comes *after* observation. This excerpt does *not* question the principles set forth in the *Posterior Analytics* and Menger would indeed most certainly agree that observation is more adequate than aprioristic pure analysis so as to discover the modalities of how bees reproduce! This matter of common sense, more than of different methods, requires experiments and their intensive practice in natural sciences, because the field is so foreign to the human mind. Aristotle did not speak of testing theories, and both authors valued equally induction. Menger himself stressed his closeness with Aristotle on that very point:

> The conclusion that the phenomenon C follows the phenomena A and B *in general* (that is, in all cases, even those not observed!), or that the phenomena under discussion here are *in general* coexistent, transcends experience, the point of view of strict empiricism. From the standpoint of [induction] it is not *strictly* warranted. Aristotle recognized this correctly when he denied the strictly scientific character of induction (Menger 1985 [1883], p. 57).

We hold that thinkers indeed share one and the same approach regarding testing theories, their divergence appearing as Menger *only* (but what a change!) opened up a new field for research that did not (and could not, given Aristotle's premises) exist within the theoretical part of Aristotelian science.

From the *ontological*, *heuristic* and even *chronological* points of view, the City (πολίς) does not merely come first, and individuals only second in every aspect as they should only be regarded as "parts making up the whole" yet bearing no sense whatsoever if (or once) cut from the whole body collective. That line directly inspired by the vulgarized representation of German idealism from the beginning of the nineteenth century, was mistaken. Besides, it could also be shown (but we shall not venture therein now) that Hegel's saying about the "beautiful whole" ("*schöne Totalität*") phrase was unduly separated from his speculative form of philosophy of history and what the latter entailed. Historicists were indeed *empirically* convinced that the Greek city did not exist through its citizens. But Menger did not reject observational claims any more than Aristotle did: both acknowledged them. Menger added the pure theoretical analysis from the notion of *individual* on top. Menger saw in the Historicists' only *nonsense*. And he wrote it, again in Appendix VII: "impossible to sustain, simply nonsensical" (Menger 1883/1963, p. 267).[14]

BACK TO MENGER ON ARISTOTLE'S 'HUMAN BEING AS A POLITICAL ANIMAL' PHRASE

First, Menger indicted vulgar interpreters for[15] cutting the sentence off the rest of the text of the *Politics*. Facing hostility from his colleagues academics, he would not reproach them with using a type of argument that proves nothing but stubbornness in following ancient texts, but conversely re-read

those texts (because they deserve it) in the light of a clarified interpretation, *closer* to the meaning that the Ancient himself had conveyed. Menger's opponents would be left with nothing to resort to else than this text, so Menger was indeed challenging them—and convincing his reader—that if he succeeded, his claim was proven.

Appendix VII of the *Untersuchungen* consists in this comment and, indeed, is that demonstration. Menger had a translation of the text by Aristotle (a whole page or so) in German from the original Ancient Greek. Menger voluntarily paraphrases Aristotle, who did *not ever* deny *by any means* the possibility that un-civilized mankind may indeed have existed, not only *before the Greeks* themselves, but even before the kingdoms of the "Barbarians" (i.e. non-Greek populations). Within this uncivilized condition a tendency was gradually displayed to socialize, which had reached the point of state-building only when they passed from tribal organizations to real kingdoms. The idea of Aristotle that Menger likes to quote is thereofre not only that "man [that is, a human being, ἀνθρωπος] is a "political animal [ζωον πολιτικόν]" but that human beings can only be so *after* a stage, which is *preliminary* to civilization. Therefore, Aristotle did *not* demonstrate that human beings necessarily always lived within the frame of a state—rather the contrary. Subsequently, it is *not* demonstrated in Aristotle that the state be chronologically *prior*, or at least as old in time, as mankind—rather the contrary (Menger 1883/1963, pp. 269-70).[16]

Menger showed that the "holist" interpretation and creed could not be given in good faith in the light of the text by Aristotle. Although Menger did not evoke the contemporary context directly at this stage of his demonstration, it was clear for readers of his times that there lay in the background an issue of influence, in the first half of the nineteenth century, of Romantic philhellenic currents. A "*renaissance*" of German national identity was strongly identified to some dreamed-of 'city-nationalism' of the Ancient Greeks. In the second half of the nineteenth century, the Pangermanists took over such feelings to embody them in the concept of *Volk*, thus made to serve purposes less speculative than political.[17]

An argument is taken from there to debase the tole of the individual. Conversely, the comment made on the full exact quotation from Aristotle's *Politics* shows that the order chosen by Aristotle is conform to *chronology*, but also to the methodology that was not foreign to Aristotle. Menger does not pronounce on *ontology* in Greek thought but surely *methodologically* places individual human beings first, then families, groups of those (or tribes) and last in emerging, the state—Aristotle describes that indeed and rather the contrary from he was said to have told.

Back to the fundamentals of the Greek representation of the world (*Weltansschauung*), human beings first freed themselves from the Cyclopes. Even they had built themselves and their small families, incipient comunities from individual action. Of course, such mythological times are impossible to know for sure by human beings: that is why Aristotle referred his audience to Homer's poems, which he cited (and Menger as well):

> And this is what Homer means: *And each one giveth law / To sons and eke to spouses*—for his Cyclopes live in scattered families; and that is the way in which people used to live in early times (Menger 1883/1963, p. 269 from Aristotle (1932, p. 9, I, 1252b23).[18]

Menger's contradictors would put the argument forth that this view is more rational than mythological, and more *theoretically based* than *historically proven*, but is not this precisely Menger's claim? To think of a human being *without* thinking of that human being's community is not merely impossible. And what Aristotle meant with the "ζωον πολιτικόν" phrase is not that a concept of human being without the concept of state would be void, but that the former naturally (as in 'animal', referring to some natural evolution of things) brings to the latter. There are men without the socio-political environment of that kind if it can be granted that there is no mankind as such without the socio-political environment of that kind.

As a matter of fact, some sentences in Aristotle's text support the view that, once the state exists, it then becomes necessary to envisage each and every human being according to the role played in and for the whole community. The metaphorical image of the limbs and the organs of the physical body apply to the political body—and were indeed to engender a very lasting tradition of "organicism". Yet this does not prove 1°) that elements necessary to discuss how is organized and functions that body are not individuals, after all and 2°) that "uncivilized man might not be thought of without resorting to the state and, moreover, that the emergence of the state may of all necessity be as ancient as that of human beings either: a view that Aristotle never ever supported". What is indeed the case is that "the human being *in the Greek sense* of the term, the civilized human being cannot be older than the state" (Ibid, p. 269-70),[19] but that human beings may evolve and have intercourse, even partnerships before that moment.

Human beings simply existed and traded, in a state as primitive as can be imagined, *before* any *Kultur-Menschen* lived in a regulated or "civilized" community. Again: as primitive as one may wish to imagine these circumstances, the reasoning about exchange was already necessarily prevailing. Indeed, even before a *human* world happened to exist, as early as some *reason* was imparted to some reasonable beings, they would act according to the rules that make the process exchange an understandable process. In other words, the language that renders trade intelligible makes the world simpler and scientists wiser: such truth applies even before any state came into existence because the relationships between human beings, seen as partners-in-trade or "economic agents" to use more modern parlance, do not refer to any existing state but *are indispensable in order to understand the very emergence of communities as such*.

Prior to any state, whatever primitive condition may be imagined, as soon as some barter exists, the conditions for sociable exchange are set. If and when *Cyclopes* traded goods, they followed the same process—although, of course, not with the same items, not the same merchandise and not the same payments systems—as later Greek citizens, contemporary to Aristotle, did, and as *we*, suggests Menger, modern members of a civil society, still do. The concept of trade and the language appropriate to it become autonomous—that life of their own in the realm of ideas is the universal tool that was sought and indicated as soon as Aristotle's early texts in the history of human philosophy and mankind's understanding of their common fate as far as the satisfaction of needs and the production and trade of material goods are concerned. The conditions of its realization in the concrete everyday world entirely depends upon the conditions of that world—and that truly is a matter for historians to deal with. But the process itself essentially reproduces the same causal links: if some "essentialism" is to be reckoned in Menger's causal realism, then it appears here blatantly—as it does not depend upon any given time and location, people and institutions.[20]

It is rather the contrary: civilization develops precisely from there. Institutions emerge and grow, and spontaneous self-organization of mankind make sense, explaining how states, money and all institutions appeared.[21] Menger developed that aspect in Book III of his own *Untersuchungen*: the origins of that thinking is to be found in—or, at least, is in conformity with—his analysis of Aristotle. The argument once opposed to Menger's reasoning now turns in its favor.

FROM ARISTOTLE, AND ON TO MENGER'S OWN INDIVIDUALISTIC ANALYTICAL FRAMEWORK

Menger's reflection related methodological and chronological facets of the same issue: how to decide what comes first for analysis. Ontological analysis may follow the same path as well, but Menger did not *need* it to be so, and mostly refrained from such philosophical positioning in his notes, and absolutely in his published writings. It is implicitly assumed that economists may indeed suspend judgment upon that aspect. That will show again the diffierence with the Historicists, who *cannot* decide for their own cause if they have neither the tools of logical reasoning, nor the basis of the Ancient philosopher's texts. The matter whether to ground each and every approach of human society upon individuals may better be left undecided—in any case, it cannot be solved in the way Historicists wanted to. Conversely, from the standpoint of methodological analysis *in the realm of economic exchange*, *individualism* now appears as the only relevant stand. In that perspective, historical elements may also in turn be summoned *in favor* of the individualistic frame of theory so formulated.

Indeed, as early as his 1871 *Grundsätze* Menger displayed many historical elements so as to illustrate his thoughts, from material that he had collected from the same material that Historicists would use: narratives by explorers, etc. One may find these in his Library (roughly one third of the 20,000 volumes kept therein), but they were made to fit a frame openly and directly opposed to "empirical" naïve historicism.

Menger put forth the relationships between individuals as they would build slef-conscious interest and trade material goods and services to guarantee they cover their own needs. This is the success of this procedure that explains and ensures that the community would in turn, as a consequence, be "cemented", provided that fairness in trade, or "*justice*" be upheld. It is precisely *because* Aristotle's opinion starts from individual behavior that the analysis of Book V on justice within the community makes sense. Partnership as described in Books VIII and IX can similarly be applied in the sense of a preliminary stage, within the field of *ethics*, before reaching the political level: what would better show that the *city*, the utmost good towards which everything should tend, comes only *secondary*.

Aristotle indeed insisted on the fact that, without such an ultimate goal, the *meaning* of the elementary activities could

not remain identical. Yet, this does *not* mean either that such activities from outside the city could not exist, nor that they could not provide the adequate conceptual tools so as to understand *subsequent* events. The Aristotelian frame is *not* a collective frame, but definitely an *individualistic* one. And in Menger's eyes this is proven enough by the texts he quotes at length in Appendix VII of his *Investigations*. There, in his *Untersuchungen*, Menger proves that Aristotle established a process through which the state comes into being from the gradual built-up of families, clans, tribes, in a conglomerate. Clearly this parallels the way money gets created, begins to circulate and ultimately pervades all, which was described in the last chapter of his 1871 *Grundsätze*. The state finds its source in individuals, just like money does. These individuals already gathered together while the state itself did not exist yet! The 1883 *Untersuchungen* in turn is meant to show this very clearly—again, although the word *individual* (*individuell*) is applied by Menger only to historical time-space conditions, singular events so to speak: *Singularerscheinungen*.

In the end, individual behavior *explains* both economic phenomena that one may observe *and* their historical setting, the list of events that *illustrate* some general truth once the latter can be demonstrated *independently* from these observations. Families exist as a first process of coming together, based on a quite natural relationship, and *before* any state, only later then within a state. Intentional views and results are individual and collective planning is never an explanatory factor in itself[22]: it is rather what has to be explained. How it obtained into a state is a result of natural tendencies and activities that show that the state is *itself* but such a result—and no *a-priori* essence (ibid, p. 268).[23]

The individualistic analytical frame is therefore both consistent in the methodological field—and validated by Aristotle's text: Menger asked for no more. General analysis of individual behavior provided him with the basic methodology that he needed, both to discard Historicism *and* to differentiate oneself from classical political economy, whose *homo economicus* appeared indeed flawed to him (partly for its psychological grounds—in utilitarianism, Benthamite or otherwise, partly for the unwise use made of it by partisans of classical free-trade theories). Because they had not paid enough attention to Aristotle's careful phrasing, Menger's opponents could be proven wrong. It seemed to Menger that they had been quite unskillful and failed to conform not only to the words of the "great philosopher" (as Menger respectfully calls Aristotle in the. *Untersuchungen*), but also to sane human understanding and faculty of reasoning that teaches us all that a complex entity, a whole, simply *cannot* be as old as the elements within it, that it is necessary that its own genesis and coming into being be liable to their own prior existence (ibid, p. 270).[24]

Through their assertions, the Historicists wished in fact to prove too much (namely, the ontological superiority of the state) and they failed to demonstrate their point enough (the point of economics being to show how exchange is merely *possible*). The conclusion to be gotten is that it may be wiser to leave ontological matters aside altogether when dealing with a matter that is methodological—actually, Menger was participating in the rise of what we now call modern "epistemology", which was then labelled in Germany as *Erkenntnislehre* and bore remnants of past doctrines of *Naturphilosophie* and outdated methodological claims.

Menger finally proved a better philosopher in consciously coping with philosophical texts, refusing to take a stand, while many German erudites naively vulgarized a poor philosophy. Menger showed no mercy for the mistakes of the latter, and the polemical debate on methodology (the *Methodenstreit*) displayed considerable acrimony on both sides. But Menger had shown that he could side with Aristotle, which was precisely where he had been challenged. His tactics had been superior, only because his reading had been more cautious, whereas his opponents *wrongly* understood the Stagirite, *wrongly* used the "*schöne Totalität*" so to speak Hegelian excellent phrase and mistook *anthropological* statements and speculative philosophy for use in their positive discourse. They missed the true causes of simple trade when ambitioning to describe the evolution of mankind. Menger stood for what could today be labelled as "causal realism" in an Aristotelian frame and supported by logical reasoning.

CONCLUSION IN THE FORM OF A MENGERIAN RIGOROUS METHODOLOGICAL INDIVIDUALISM

In his "*Die aristotelische Werttheorie in ihren Beziehungen zu den Lehren der moderner Psychologenschule*" (1905), Oskar Kraus would claim to defend his views. He criticized a so-called "Hegelian way", yet not to much avail, since what he indicted had more to do with blind historicism than Hegelian philosophy. Kraus also rehashed how close Menger and Aristotle were. His conclusion was quite right: "Aristotle indeed approached that theory so close that, from his theory to that of the modern "psychological school" the bridge [to Menger] could be crossed with a light step".

But Menger could quite understandably *not* support (and not need the support) of those who came like Kraus with half-witted arguments. Firstly, because a theory of value grounded on marginal utility, born from subjectively felt needs, was what Menger offered, not Aristotle *per se* (See Campagnolo and Lagueux, 2004; Previous quote from Kraus, 1905: 590).[25] Secondly, because by *Psychologenschule*, Kraus used another misnaming as he meant the Austrian school that Menger was later called the founder (Campagnolo 2008). Thirdly, because one may think that unfortunately, the bridge was *too* light to cross in Kraus' case, while indeed there was much work and much reason to see Menger as a most accurate commentator of Aristotle. Kraus and his likes were unwisely supporting their arguments, while potentially favorable to Menger's views, they could serve him badly. Facts show that Menger became aware since when Kraus had sent a separate copy (a "*Sonderdruck*") of his article, Menger annotated it not seldom unkindly (see Campagnolo 2002).[26] It was too obvious how Kraus "reconstructed" a theory that he claimed to find in Aristotle, missing the point that was Menger's: reading Aristotle closely but elaborating one's own new theory. Out of Aristotle to a new world of his days, Menger pointed what remained scattered (although *fundamental*) elements in the Ancient thought to build a modern epistemological framework.

Let me conclude by retelling then Menger's rigorous methodological individualism, fed from views in various sources, among which we especially recalled here the Aristotelian one[27] The framework would be adopted and adpated in many directions, including 1°) a theory of individual information and data processing, 2°) a theory of the emergence of institutions, that was itself consciously brought about for the most in what Menger states in Book III of his 1883 *Investigations*: *spontaneous order*, like *methodological individualism*, was a term coined later (the former by Friedrich Hayek) but if Menger's heirs could turn his insights to their advantage and form most of their own theories around his, the reason is that all the ingredients had somehow been spelled out then, in the elements put forth in the *Grundsätze* and the *Untersuchungen*.

Among those causalism and realism, mostly based upon Aristotelian creeds, are specific to his view of the world of science. They may not easily allow for mathematization, for instance. But the mathematization of the discipline was *not* a major factor of improvement to Menger's eyes: it could even lead to mistaken views and a well-understood notion of utility (*Nutz*) should not get assimilated with some mathematized theory of pleasure in the tradition of Bentham—and Jevons. Things could be otherwise with modelization, especially step-by-step modelization, but that obviously pertook to a different era. It would thus be almost pointless to discuss the extent of Menger's own mathematical training.[28] On the one hand, mathematics made sense to Menger if they could contribute to clarity—not conceal it, he noticed when annotating the volume *Zur Theorie des Preises* by Auspitz and Lieben (wherein he judged concepts were defined unproperly and equations covered clear notions for untrained readers.[29] On the other hand, the fact that mathematics—especially those in Menger's time—are particularly apt to describe static circumstances, but *not* dynamic processes was deeply hindering the heuristic value of the tool for Menger. It is rather more helpful to speak of factors that *must*, in Menger's eyes, enter economic analysis (time and limited knowledge, that is: ignorance) while showing that equilibrium schemes fail to take into account what he deemed as the reality of individual agents.

This nature or 'essence' (*das Wesen*) of the indvidual may not be fully ontologically acknowledged, it is the purest form of a full-fledged methodological tool that would engross the all realm of social sciences from then on. Ideas of "the economy as a whole" conducted to imagine properties of collective entities that were not what economics was seeking in Menger's definition. The organization of society being complex, complexity could come only as an extension of a proper analysis of ultimate components of economic activity. The idea is simply devoid of contents that supposes a collective entity acts like *one* individual, whereas only individuals ever interact—at least, and *as far as economic analysis is concerned*, the basis of economic analysis consists *by construction of a pure economic theory* necessarily only of *Privatwirtschaften* for Menger.

Other pretense concerned with "collective decision", from pauperism issues tending towards social welfare, to reform enhancing collectivization, are fruits of an analysis that does something else than what is pretended and that does, in Menger's eyes, in the name of either naïve, or erroneous claims (or both naïve and wrong): Schmoller and his disciples illustrate that path when reckoning "society" (*Gesellschaft*) or "the people', das *Volk*, as the subject of economic action, as "the" economic agent. The title of the last appendix of Menger's 1883 *Investigations* makes clear Menger thinks it is a duty to denounce such false pretense and the names under which they are presented (all entangled with what Menger deprecated as the "so-called ethical direction in economics": "*Ueber die so genannte 'ethische' Richtung der Politischen Oekonomie*"). A plurality is made of ultimate ele-

ments Its acting as one bodily entity is a delusory tool for science, however good it may be for other purpose, like political building of a nation (the German *Machtsstaat*, which Menger, as a Viennese, regrets indeed). A plurality is *not* what pure economic theory reckons as its object.

And were some 'noble mind's generosity' at stake, this anyhow does not make for logical ethics: Aristotle is a guide more certain. Did not Hegel as well discard some "kind souls" who forget what makes knowledge and firmness both valid for souls and for values, including monetary values : the accurate evaluation *ex ante* of the interests of agents, including economic interests, which can be known only subjectively if freedom is not to be ousted from society. Indeed, thereabout Aristotle, Hegel and Menger seem in line to such kind of evaluation, that is also called "pricing" in contexts where prices are determined *within* a process of exchange—and there is no way around that truth if individuals are price-makers, that is in contexts where 'pure economics' makes sense. Which is simply what *science* can do.[30]

NOTES

1 Stein claimed to follow Hegel. But precisely (as Marx himself said) Stein may have misunderstood the speculative contents of his reading. To put it in an nutshell: in Hegel, the essence of a phenomenon is *never* some hidden principle at work "*underneath*" (or "*behind*", or "*above*") a so-called "realm of appearances", some concealed force that one should exhume. Again, for those not well acquainted with Hegel's thought (and therefore easily victims of some most common misreadings): "behind-the-scenes" notions make no sense in the Hegelian system, the *Geist* (spirit) is something utterly different from its misrepresentation; it is a speculative notion. And the essence (*das Wesen*) of a phenomenon consists in the *whole* totality of its appearances, interrelated and belonging to the same order. In other words, ontologically speaking: there are *no* different orders.

2 Historian of philosophy Bernard Bourgeois was providing a refuttal of the point made by Eric Weil in his *Hegel et l'État*, where Weil insisted that the counsellors of the prince sought to obtain detailed positioning on the part of the prince, siding with a class in particular, while offering a wide spectrum of possible intervention policies. Bourgeois recalls that, in Hegel's reasoning, that was simply *out of the question*.

3 Collected in Weber (1990). For the readers of French, this letter by Liefmann was translated into French and annotated by Campagnolo and Grossein 2005a, 2000b.

4 As did all students in the Austro-Hungarian Empire, Menger studied the Aristotelian corpus *in the original Greek* as well as in German translation, and his latest notebooks show that he was still re-reading it in his old age. See Campagnolo (2002).

5 An abundant literature deals with this issue—it would be long to quote again here, but the debate is assessed and literature explored in works listed in Campagnolo (2010/2013), chapter 7 and the bibliography thereof.

6 In the passage already quoted from Ross' (1925) translation: "Now this unit is in truth demand, which holds all things together" (1133a26-27) appears that notion of what is common (κοίνος).

7 Aristotle Ross (1925) translation of Aristotle's *Nicomachean Ethics* (1132b31), p. 281. The passage was stressed by Menger in the copy he owned of Aristotle (1856) *Nikomakische Ethik*, p. 145.

8 Such as the *Magna Ethica* and the *Eudemian Ethics*, which we do not study here (to be sure, these volumes are not in the Menger Library, and it does not appear that Menger used them in his notes).

9 Aristotle Ross (1925) translation of Aristotle's *Nicomachean Ethics* (1094a25-30), pp. 5-7. The passage was stressed by Menger in the copy he owned of Aristotle (1856) *Nikomakische Ethik,* p. 16.

10 This passage we shall deal with subsequently was heavily stressed by Menger in the volume by Aristotle that he owned.

11 "Every state is as we see a sort of partnership, and every partnership is formed with a view to some good (since all the actions of all mankind are done with a view to what they think to be good). It is therefore evident that, while all partnerships aim at some good, the partnership that is the most supreme of all and includes all the others does so most of all, and aims at the most supreme of all goods; and this is the partnership entitled the state, the political association" (Aristotle 1932, p. 3.).

12 That is clear as Menger crossed out the title of his *opus* on the copy he owned of his book, sent by his Viennese publisher Wilhelm Braumüller. That can be seen in his Library now kept at Hitotsubashi University.

13 *Generation of Animals*.

14 Our translation.

15 Permit us to notice: just like in the case of Hegel, to whom Menger by no means refers.

16 We restitute the paraphrase as it goes, though we summarize it. Greek terms are of course in Menger's edition.

17 We refer the reader to chapter 2 of (Campagnolo, 2010) where premises of the "sources of German Political Economy as a Building-Block of National Identity" are dealt with.

18 Menger C., *op. cit*., *ibid*, p. 269, from Aristotle, *Politics*, I, 1252b23, tr. H. Rackham, *op. cit*., p. 9.

19 Our translation from Menger's phrasing. The "uncivilized human being" or rather "pre-civilized" (*Urkultur-mensch*) is in contrast with the "civilized" one ("*Cultur-mensch*") that Historicists said they could think of without connecting it to the state: "*Der Cultur-Mensch ist ohne Staat nicht denkbar*", *ibid*. What Menger reckoned is *only* that the latter is true of the *already Greek* human being: "*der Culturmensch nicht älter als der Staat sein könne*".

20 But cannot unfortunately be based upon a similar demonstration from the archives, as the *Topics* and the volumes by Aristotle that support his logical canon are *not* in the catalogue of Menger's Library as it has been kept in either Japan or in the United States.

21 Given the fact that Friedrich Hayek was much inspired by those views, as an heir to Menger, but that he also added his own ideas, the common representation today has been much influenced by later thinking than Menger's. Through legitimizing the method that starts with the individual, Menger stated the non-necessary feature of the relationship linking together state to human being. That sufficed for his demonstration. A more global position *hostile* to institutions and "social constructs" was *not* his purpose, as the *Untersuchungen* show, contrarily to his later followers. Menger insisted that all institutions were not purposely and "conscientiously" born, but that spontaneity in the emergence of some institutions does not mean that social intents by human beings be unworthy or useless, or even necessarily self-destructing or counter-productive. That latter idea belongs to others, whom Menger's ideas indeed inspired but who added their own views to his—and maybe forgot to read and interpret Aristotle as cautiously as Menger had done.

22 Even more so when loudly presented as "planning for freedom" by the bearers of power—a term that would later be used by another heir of Menger, Ludwig von Mises, to denounce its delusion.

23 Here, we paraphrase Menger 's exposition for the sake of brevity.

24 Again, we provide the reader here with paraphrase of Menger's terms.

25 Our translation from German.

26 In this essay ("Une source philosophique de la pensée économique de Carl Menger"), Kraus is shown to have served also with equally interest and clumsiness Menger's disciples, Böhm-Bawerk and Wieser.

27 For more detailed aspects of Menger's philosophical sources, see (Campagnolo 2010, part 3) and for quite exhaustive references to the literature on thatb topic, see the bibliography in the same volume.

28 Limited, according to his son, the mathematician Karl Menger, although his father Menger had worked in the stock exchange and was used to manipulating figures, as it would show when he was to counsel the monetary reform of the Austrian Empire, the *Valutareform* of the 1890s. Hayek insisted on that latter fact, in his Introduction to his edition of the *Collected Works* (*Gesammelte Werke*), while Menger's son was direct about it and judged his father's aptitudes in that field poor—but one must then add than it was half-a-century later and in a context quite different, when the son coordinated his own *Mathematisches Kolloquium* in Vienna.

29 Notes on the volume by Auspitz & Lieben, *Zur Theorie des Preises*, 1887, copy owned by Menger, p. 2 and p. 5. The book is often regarded as a predecessor to the "theorem of the envelope" later discovered, but with major lacks, like, for instance, the fact that the use of the *ceteris paribus* clause was absolutely not justified by the authors. Altogether, it was unsatisfying, and Menger was clear about his own view.

30 This essay is based upon Campagnolo's analysis 2010. For more on the way this book situates the work of Carl Menger "at the Great Crossroads" of economic thought in the 1900s, see Nenovsky (2011).

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Metaphysical Models of Man in Economics

JACK BIRNER

Department of Sociology and Social Research
Università di Trento/University College Maastricht

Email jack.birner@unitn.it
Web: https://www5.unitn.it/People/en/Web/Persona/PER0003666#INFO

Bio-sketch: Jack Birner's fields of research are in economics (in particular the theory of money); the history of economic thought; cognitive science; and the philosophy of social science. Birner is the author of *The Cambridge Controversies in Capital Theory: A Study in the Logic of Theory Development* (Routledge 2001).

Abstract: The metaphysical models of man that economic theories presuppose often contain indications for constructing a more complete map of causal relationships that take into account both individual and structural or collective causes. This is illustrated in a discussion of the theories of five important economists.

Keywords: Metaphysical research programmes, causal completeness, heuristic power.

I. INTRODUCTION

One of the distinctions the philosophy of science used to make is that between context of discovery and context of justification. That was very helpful and it still is. In the philosophy of the social sciences another difference used to be widely accepted, that between methodological and ontological individualism. In the heigh-day of the debates on methodological individualism, following John Watkins' publications on the topic (for instance Watkins 1952 and 1957), that distinction seemed useful, too. At the philosophical level, ontological individualism is a nominalist approach to the social realm, which is conceived of as consisting of individual agents. According to this view, social institutions do not have a separate existence from these individuals. This does not imply, however, that the latter cannot exert any causal influence. How to model individual and collective or structural causality is one of the central topics in discussions on methodological individualism. For methodological holism this problem, if it is recognised as such at all, is at the most secondary. Collective entities are seen as exerting direct causal influence on other social wholes and individuals. This alternative and opposed explanatory strategy to methodological individualism is rooted in a particular metaphysics or ontology which has been called essentialism by Karl Popper (see Di Iorio 2015). Popper in *The Open Society and Its Enemies* and *The Poverty of Historicism* and Friedrich von Hayek in *The Road to Serfdom* and *The Counter-Revolution of Science* elaborate the link between these explanatory theories and collectivistic social and political philosophies.

In the twentieth century the influence of logical positivism had created an intellectual climate in which, even after the Second World War, metaphysics was almost taboo for philosophers of science. This is unfortunate because metaphysics is often a source of explanatory inspiration. This has been argued forcefully by Popper. He talks about metaphysical research programmes, by which he means sets of ideas that do not constitute falsifiable and hence scientific theories yet may have great heuristic power (Popper 1974). One of the examples Popper gives is the theory of evolution.[1] Now, encouraged, so to speak, by this particular positive use of metaphysics, I make the following proposal. Instead of opposing methodological individualism with methodological holism and rejecting the latter because of its links with ontological holism, it is more fruitful to investigate whether or not a particular explanation in the social realm is causally complete. Collective phenomena are the intended or unintended consequences of the interactions between individuals, so in order to explain them we need laws of individual behaviour. But this is not enough. In order to be able to interact with one another, individuals need a structure of interaction, which is part of the set of social institutions. Explanations of

collective phenomena that fail to pay attention to this structure are causally incomplete, as is the opposite strategy of explaining collective phenomena without paying attention to the behaviour of individuals (see also Di Iorio, 2016). I have recently addressed this matter elsewhere (Birner 2015).

What I will try to illustrate here is that the heuristic power of theories about individual human beings and their environment, no matter whether they are scientific or metaphysical, lies in the indications these theories provide for a more complete causal map of collective phenomena. I will discuss some metaphysical theories underlying different economic theories all of which respect the principles of methodological individualism. These different metaphysics are theories of human behaviour or "models of man" (the title of a book by Herbert Simon) that are implicitly or explicitly presupposed by some different economic theories. They boost their heuristic power. I will discuss five economists whose theories are sufficiently similar to justify a comparison and sufficiently different so as to raise a number of interesting questions about economics. Three of them, Friedrich von Hayek, Herbert Simon and Gary Becker, have been awarded the Nobel prize for economics. The other two, Adam Smith and William Stanley Jevons, would certainly have been Nobel laureates if the Central Bank of Sweden had taken the initiative for that prize two centuries earlier.[2]

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Economics and philosophy

As is almost always the case with discussions of economic theories, philosophical questions are not far away. They comprise both methodology, i.e., the questions about the methods of doing economics and the place of economics amongst the other social sciences, and metaphysics, which in this case concerns the question of what sort of human being is presupposed by various economic theories. Metaphysics is the set of unfalsifiable theories about what there is (ontology) and what there should be (ethics). I will not say much about ethics[3] but will limit myself to a brief discussion of "factual" metaphysics in economics.

Ever since William Stanley Jevons, Carl Menger and Léon Walras, the three authors who are generally considered to be the independent discoverers of the maximisation of individual utility as the driving force in economic affairs, economics is generally considered to be the science of choice, and of rational choice in particular. The radical character of choice, the idea that human beings are condemned to choose, is what main stream modern economics shares with the philosophy of existentialism of Jean-Paul Sartre. Of course, Sartre does not sustain that human beings always choose *rationally*, but he emphasises that they cannot evade the necessity of choice: even the act of not choosing is the result of a choice. Human beings are always entirely responsible for whatever they do. The ultimate choice an individual can make is to stop choosing, i.e., commit suicide.[4] The idea that human beings choose rationally is taken to its extreme consequences by Gary Becker, the last of the authors that I discuss. Becker says, for instance, in terms that are reminiscent of Sartre, that "most (if not all) deaths are to some extent suicides…." (Becker 1976, p. 10). That is because an individual could always have chosen to abstain from smoking, drinking alcohol or otherwise dangerous behaviour or to devote all of his resources to the care for his health.

But before discussing the radical idea that all human action involves rational choice,[5] held by one of the School of Chicago's most prominent representatives, I will review a number of other metaphysical models of man in economics. We begin with Adam Smith.

Adam Smith: man between self-interest and sympathy — economics as the science of wealth accumulation

Before 1870, economics ("political economy") was basically macroeconomics and it studied the productive and monetary mechanisms involved in economic growth.[6] Adam Smith would have been very surprised at the idea of economics as the science of choice, even though he strongly believed in the beneficial consequences of human freedom. What he concentrates on instead in his economics is the division of labour. The division of labour allows a society to reach a degree of specialisation that enables it to produce goods and services much more efficiently than a (hypothetical) primitive society where everybody provides for all of his own needs. The division of labour, the pursuit of self interest and exchange on national and international markets are the factors that explain the accumulation of wealth.

Economists generally consider Adam Smith to be the founder of their discipline, for which they refer to *The Wealth of Nations* (*WoN*). They are fond of quoting the following passage that it has become famous: "It is not from the benevolence of the butcher, the brewer of the that we expect our dinner, but from their regard to their own interest" (Smith 1776, p. 13). The pursuit of self interest, conclude most economists, is the core of Smith's theory of human ac-

tion. Had they started reading a couple of lines earlier, they would have found the following:

> In civilised society he [man] is at all times in need of the cooperation and assistance of great multitudes, while his life is scarce sufficient to gain the friendship of a few persons…[M]an has almost constant occasion for the help of his brethren, and it is vain for him to expect it from their benevolence only. He will be more likely to prevail if he can interest their self-love in his favour, and show them that it is in their advantage to do for him what he requires of them…(Smith 1776, pp. 12-3).

This shows a very different picture of man from the one economists have distilled from *WoN*; human beings try to convince their fellows of the importance of cooperation and the most successful way of doing so is to show that it is in someone's interest to cooperate.

The term "civilised society" is a reference to the other book by Smith that has survived, *The Theory of Moral Sentiments*. It was published seventeen years before *WoN*, and that is perhaps the reason why most economists ignore its existence. For Smith the two books are complementary: the one is incomplete without the other. And indeed, the very first sentence of *TMS* corrects the impression that an isolated reading of *WoN* may leave, viz., that man is only motivated by the pursuit of self-interest:

> How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it (Smith 1759, p. 47).

The link between the arguments of the two books is particularly clear in Part II, Section II of *TMS*, with the title "Of Justice and Beneficence." In chapter 3 Smith writes:

> Society may subsist among different men, as among different merchants, from a sense of its utility, without any mutual love or affection; and though no man in it should owe any obligation, or be bound by gratitude to any other, it may still be upheld by a mercenary exchange of good offices according to an agreed valuation. Society, however, cannot subsist among those who are at all times ready to hurt and injure one another. …Society may subsist, though not in the most comfortable state, without beneficence; but the prevalence of injustice must utterly destroy it" (Smith 1759, pp. 166-67).

"As among different merchants", "sense of utility", "without love or mutual affection", "mercenary exchange", all of these are references to the political economy of *WoN*. The passage clearly indicates the complementarity of the two books: while the exclusive pursuit of self-interest does not necessarily lead to the dissolution of society, it is not enough to establish and maintain a civilised society, one in which all or most men are guided by their sense of justice. For that to be the case it is necessary that man dispose over "sympathy", i.e., the capacity to see the world from someone else's point of view. In terms that have been used much later by the philosopher John Rawls, Smith invokes the "impartial spectator" as the ideal (and idealised) human being who represents the capacity of sympathy *par excellence*; it is a theoretical construct that represents the collective conscience (in the moral sense) of society. The dictates of this conscience attenuate the passions, only one of which is self-interest.

For Smith economics is part of moral philosophy, the subject in which held a chair at the university of Glasgow. Moral philosophy comprehends natural theology, natural ethics, natural jurisprudence and policy. *The Theory of Moral Sentiments* covers natural ethics, and policy is the science of the statesman, which includes political economy: *WoN* and *TMS* are part of a larger system of thought. The "natural" of the various subjects that are part of moral philosophy refer to the natural-law tradition of John Locke, to which Smith, too, belongs.

For modern readers, natural theology comes a bit as a surprise, but we ought not to forget that even at the end of the 18th century it was very risky for a Western thinker to create the impression that he did not believe in God. Smith's good friend David Hume paid a high price for this. Smith mentions the Deity in several passages of *TMS*, but nothing of the book's argument is lost if these are omitted. Both Smith and Hume belong to an innovative tradition that prepared the way for a philosophy in which God was no longer the center of everything.[7]

And indeed, *WoN* has an internal dynamics of its own, one that caused economics to become an independent scientific discipline. Let us see what Smith says about the subject:

> Political economy, considered as a branch of the science of a statesman or legislator, proposes two distinct objects: first, to provide a plentiful revenue or subsis-

> tence for the people, or more properly to enable them to provide such a revenue or subsistence for themselves; and secondly, to supply the state or commonwealth with a revenue sufficient for the public services. It proposes to enrich both the people and the sovereign (Smith 1776, Introduction to Book IV).

Forty years after the first edition of *WoN*, with the publication of David Ricardo's *Principles of Political Economy and Taxation,* the transition from economics as part of moral philosophy to the status of an independent scientific discipline had been completed. As a member of parliament Ricardo tried to forge the factual arguments with which to justify his political convictions. By that time economics had become the analysis of the forces of production and distribution as the scientific underpinning of economic policy. It adopted Newton's method as its scientific canon. This is most apparent in the work of another classical economist, Jean-Baptiste Say.

When the first impact of Newtonian natural philosophy was over, the time seemed ripe for a reflection on the distinction between what today would be called the social sciences and natural science. This added another dimension to political economy. John Stuart Mill took over from the German tradition of thought the idea that social science differs from natural science in that the former deals with mental phenomena. Mill translated the German *Geisteswissenschaften*, the non-natural sciences, by *moral sciences.* Psychology, which had undergone some important developments in the last quarter of the 19th century, became a source of inspiration for economists.[8] These same economists, however, wanted to keep economics a scientific discipline that was independent from psychology and other sciences of man.

Smith's model of man

So what is Smith's "model of man?" It is more complex than that of man as a rational utility maximiser that we find in modern economics textbooks. Man tries to improve his own position and that of his relatives and friends by seeking to benefit from exchanges in which he attempts to convince his partners in exchange that it is in their interest, too, to trade goods and services. In addition, human behaviour is guided by the sense of justice, i.e., the conviction that one should try to avoid harming one's fellow men. This sense of justice in its turn is based on man's capacity to put himself in the place of his fellows, a capacity that Smith calls sympathy, plus the pleasure that man derives from seeing his fellow-men happy. Sympathy and justice are what elevates a crude and rude society that is exclusively based on the pursuit of self-interest to the status of a civil society.

William Stanley Jevons: man as a pleasure seeker—economics as the science of exchange

The attempt to turn economics into an independent science is particularly clear in the work of Jevons: "it is … obvious that economics … rest[s] upon the laws of human enjoyment; and … if those laws are developed by no other science, they must be developed by economists." (Jevons 1871, p. 102). The work of Jevons and his fellow marginal revolutionaries constitutes a clean break with classical economists such as Smith and Ricardo: they base the whole of economics on the theory of human choice. The best illustration of this revolutionary development is provided by a confrontation of the classical with the neoclassical theories of value. For the classical economists, value is an inherent quality of a good, the amount of which is determined by factors on the production side. The best-known example is Smith's (and others', such as Marx') labour theory of value: the value of a good is determined by the amount of labour that has gone into its production. Against this objective theory of value, so close to common sense, the neoclassical economists propose a rather counterintuitive subjective value theory: the value of a good is determined by the utility that human beings subjectively attribute to it. Man takes the central place that used to be occupied by the forces of production. Jevons himself understates the idea that value depends only on utility as a "somewhat novel opinion." (Jevons 1871, p. 77).

This radical change in perspective should not, however, obscure the continuity with classical economics that is constituted by economics' concern with collective phenomena; the study of individual man may have become the foundation of economics but its purpose is to explain the emergence of prices and the mechanisms of exchange. That makes it still necessary to *reconstruct* the metaphysics that underlies, or is presupposed by, neoclassical economics. The marginal revolution marks a clean break with the explanation of value by classical economics. Yet, given the influence that Adam Smith still exerted a hundred years after the publication of *WoN*, Jevons could not avoid addressing the relationship between economics and ethics. Following Jeremy Bentham, he writes that he sees no fundamental difference between the calculus of pleasure in economics and the pursuit of justice in ethics. There is at the most a hierarchical difference; economics studies man in his attempts to satisfy the more ba-

sic needs, ethics is concerned with needs of a higher order. What Jevons is really saying here, even though his message is implicit, is that he has unified the motivations of human behaviour distinguished by Adam Smith: pursuit of self-interest, which is the domain of economics, and the basic drive of the pursuit of justice and the faculty of sympathy, "which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it." (Smith 1759, p. 47, already quoted above).

One aspect of Jevons' economics which distinguishes it from its classical predecessors is that he presents it as a mathematical science. The reason, according to him, is that economics deals with quantities. Jevons was convinced that, in order to be a real science, economics should use the mathematical method, which had produced such outstanding progress in the natural sciences (as a first-class logician and philosopher of science Jevons knew what he was talking about). The difference lies in the actual *application* of mathematics; the *ideal* of adopting the methods of the natural sciences is what we find in classical economics, too.

The third major distinguishing characteristic of Jevons' economic theory is that it takes as its main problem the maximisation of pleasure:

> Pleasure and pain are undoubtedly the ultimate objects of the calculus of economics. To satisfy our wants to the utmost with the least effort—to produce the greatest amount of what is desirable at the expense of the least that is undesirable—in other words, *to maximise pleasure*, is the problem of economics (Jevons 1871, p. 101, italics in original).

This fundamental idea of man as a pleasure maximiser is ideally suited to the mathematical treatment of the calculus that is used physics.

In the third chapter, "Theory of Utility," we find everything that is still part of modern textbooks of microeconomics. Apart from the model of man as a maximiser of utility, Jevons presents decreasing marginal utility as a general law: "the degree of utility varies with the quantity of commodity, and ultimately decreases as that quantity decreases." (Jevons 1871, p. 111, italics deleted). The law, however, is not so general as not to allow of exceptions: "the more refined and intellectual our needs become, the less are they capable of satiety" (Jevons 1871, p. 112).

The theory of utility maximisation and the law of decreasing utility form the basis on which the theories of demand, supply and exchange are constructed. Exchange takes place because individual preferences are not homogeneous and producers and consumers try to maximise their utility. My total pleasure increases if I can exchange a couple of units of a good that do not add much to my pleasure against a good that I like better and of which I have less, and hence has a greater marginal utility. The problem is finding an exchange partner who is in a contrary (or rather, complementary) position. That problem has been solved by the existence of markets, which allow us to engage in multilateral exchange operations involving many different goods.

Jevons shows that his theory of exchange is formally identical with statical mechanics: an exchange equilibrium, i.e., a situation in which none of the parties concerned has an incentive to continue trading goods because they have reached an exact balance between marginal costs and marginal benefits, can be described with the same formalism that is used in mechanics to characterise the static equilibrium of the lever. It presupposes the existence of friction-free physical processes, which has its counterpart in Jevons' description of exchange as free of costs. In reality, exchange is not without costs, and Jevons enumerates a number of factors that enter on the cost side of the exchange equations. In modern times these costs have been rediscovered and elaborated into a theory of institutions by Robert Coase and Oliver Williamson under the name of transaction costs.[9]

So, following the example of the natural sciences, Jevons proposes a highly idealised economic theory. The "law of one price," for instance, that is part of microeconomics still today, is an idealising law: "in the same open market, at any one moment, there cannot be two prices for the same kind of article." (Jevons 1871, p. 137, italics deleted). Here we see at work an implicit "ceteris paribus" proviso, which is often considered typical of neoclassical economics. In the following sentence Jevons states: "Such differences as may practically occur arise from extraneous circumstances, such as the defective credit of the purchasers, their imperfect knowledge of the market, and so on." (Jevons 1871, p. 137). This passage indicates that Jevons bases his theory on a number of idealisations, of which the possession of perfect knowledge by the economic agents is perhaps the most important. Modern neoclassical economics has inherited this presupposition directly from Jevons, without, however, always remembering that is an idealisation and not a realistic description of reality. This is exactly the point where later authors such as Hayek and Simon part with the neoclassical tradition.

Jevons himself is very much aware of the distance between his idealising theory and descriptions of reality:

> Of course, laws, which assume a continuity of variation are inapplicable where continuous variation is impossible. Economists can never be free from difficulties unless they will distinguish between a theory and the *application of a theory*. Because, in retail trade, in English or Dutch auction, or other modes of traffic, we cannot at once observe the operation of the laws of supply and demand, it is not in the least to be supposed that those laws are false" (Jevons 1871, pp. 148-9, italics in original).

Man in his pleasure-maximising activities is also guided by the future. In fact, Jevons insists upon the importance of expectations, without, however, describing their role in detail. That is an aspect of economic theory that was elaborated by the economists of the Austrian School, whose founder, Carl Menger, was already mentioned and an important representative of which is the subject of the next section.

Jevons' model of man

But before describing Hayek's economics, let me summarise the metaphysics of man that underlies Jevons' economics. Man's behaviour is guided by his attempts to maximise his pleasure (or utility) with the least possible sacrifice. In other words, he follows those roads towards the satisfaction of his subjective needs that involves the highest possible positive difference between pleasure or utility and "negative pleasure." This behaviour can be described, if we abstract from complicating factors in reality such as the absence of perfect knowledge, by a theory that "may be described as the mechanics of utility and self-interest." (Jevons 1871, p. 90, italics deleted). It is important to notice that Jevons does not say that man actually calculates rationally all the positive and negative utilities involved in each choice and each act of exchange; the rational character lies in the idealising theory describing this behaviour. In reality, human action, because it is also guided by expectations, is subject to the uncertainties of the future, and takes place in an environment with many "imperfections," the most important of which is the lack of complete knowledge.

Friedrich von Hayek: man as an irrational and fallible chooser—economics as the science of coordination

There is no doubt that Hayek (Nobel prize 1974) is a political economist in the sense of Ricardo. From very early in his career he embraces the principles of classical liberalism and picks the economic problems that he studies in the light of that doctrine. By emphasising the role of perceptions, expectations, and subjective valuations, Hayek also qualifies as a moral scientist in the sense of Mill. He also devotes much of his work to the examination of the methodological consequences and the differences with the natural sciences of this position. The result is an impressive list of publications on pure and applied economic analysis. Hayek tries to find a scientific explanation for moral rules and gives scientific arguments for political or moral positions. In this Hayek is exemplary: he tries to make as much progress as possible by scientific, or rather, critical means, in fields that have suffered from ideological immovable *parti pris* for too long, legal, political and social philosophy.

Even though he accepts rational choice theory, or the pure logic of choice, as he calls it, Hayek is very critical of neoclassical economics. Hayek rejects the standard neoclassical analysis of markets as being static and tautological. Static, because it provides a classification of various types of market that are defined in terms of static conditions, such as the number of sellers or purchasers and the shape of the demand and supply curves. And tautological, because it makes a number of assumptions that deprive its models of empirical content. As far as the latter aspect is concerned, Hayek singles out the assumptions of perfect competition and perfect information. The neoclassical assumption of perfect competition describes a situation in which goods and sellers or producers are completely homogeneous and the price is given. This characterises the *absence* of any competition. The assumption of perfect information is one of the conditions for of market equilibrium. Here Hayek's criticism is that equilibrium is *defined* as the state in which all buyers and sellers have perfect information.

The concept of equilibrium is central to Hayek's alternative explanation of the way in which markets work. The basic unit of analysis is the planning individual. The idea of a plan logically presupposes time. Hayek defines equilibrium as the correspondence between the expectations on which the individual bases his plans and the informational input which serves as feedback. When planning his behaviour, the individual applies the pure logic of choice to his own preferences and his perception of the future. An economic system is composed of a multitude of such perceiving, planning and utility maximising individuals who interact and communicate with one another.[10] The system is in equilibrium if the plans of all individuals are compatible with one another. Markets are the social institutions that allow individuals to exchange goods and services using prices as their guidelines.

The interaction on markets takes place via a communication structure that transmits price information efficiently and rapidly because the fields of perception of the individuals are partially overlapping. Competition is a crucial element in the spreading of information; it consists of a process in which individuals actively seek to discover new and so far untried opportunities. Hayek emphasises the role of learning and knowledge by saying that the division of knowledge and its coordination are more fundamental than the division of labour. Indeed, markets have arisen, and have survived, in an evolutionary process because they responded to the need for coordinating dispersed knowledge. They are the social institutions which create the high degree of availability of knowledge to everyone that is characteristic of developed economies. Their functioning relies on an efficient communication structure. The inclusion of the structure of communication in the analytical framework is very unusual in economics, particularly at the time when Hayek wrote.[11]

As I have observed, Hayek's criticism of traditional equilibrium theory is that it is circular: "Correct foresight is ... not, as it has sometimes been understood, a precondition which must exist in order that equilibrium may be arrived at. It is rather the defining characteristic of a state of equilibrium" (Hayek 1937, p. 42).[12] This may be reformulated as follows. The assumption of correct foresight implies that individuals have full access to all available knowledge about the future. In other words, there are no gaps or other imperfections in the intertemporal communication structure. For their current exchange relationships the assumption of perfect information implies a similar perfection of the present communication structure. Neither is the case in reality. So, the perfect information assumption relegates the standard neoclassical analysis at the most to the status of a limiting case, or idealising model. On the other hand, markets and competition are considered to be crucial in creating an efficient structure of communication. Neoclassical analysis has little or nothing to say about this. Hayek does: "The whole acts as one market, not because any of its members survey the whole field, but because their limited individual fields of vision sufficiently overlap so that through many intermediaries the relevant information is communicated to all" (Hayek 1945a, p. 86).

When he wrote this, Hayek was already moving from economics to a more general theory and philosophy of society. For understanding his development from a technical economist to a philosopher of society and for gaining insight in the underlying metaphysics of human action, "Individualism: True and False" (*ITF*) (Hayek 1945) is an important article. In *ITF* Hayek works out the consequences of the theory of society of the philosophers of the Scottish Enlightenment, such as Smith and Hume, its individualist methodology:

> This argument [of the Scottish philosophers] is directed against the properly collectivist theories of society which pretend to be able directly to comprehend social wholes like society, etc., as entities *sui generis* which exist independently of the individuals which compose them (Hayek 1945, p. 6).

This is different from the *so-called* individualism of the Cartesian school, which is usually referred to as rationalism. This is why Hayek calls the true individualism of the Scottish Enlightenment anti-rationalism.

> The antirationalistic approach, which regards man not as a highly rational and intelligent but as a very irrational and fallible being, whose individual errors are corrected only in the course of a social process, and which aims to make the best of a very imperfect material, is probably the most characteristic feature of English individualism (Hayek 1945, pp. 8-9).[13]

This insight is due to Bernard Mandeville. The main differences between the pseudo-individualism of the rationalistic or engineering tradition on the one hand and the true individualism of the Scots are that "true individualism is the only theory which can claim to make the formation of spontaneous social products intelligible" and "believes … that, if left free, men will often achieve more than individual human reason could design or foresee (Hayek 1945, pp. 10-11). This has consequences for political philosophy:

> The great concern of the great individualist writers was indeed to find a set of institutions by which man could be induced, by his own choice and from the motives which determined his ordinary conduct, to contribute as much as possible to the need of all others (...) (Hayek 1945, pp. 12-13).

Hayek emphasises the anti-rationalistic character of this philosophy, which is:

> a view which in general rates rather low the place which reason plays in human affairs, which contends that man has achieved what he has in spite of the fact that he is only partly guided by reason, and that his

> individual reason is very limited and imperfect... One might even say that the former is the product of an acute consciousness of the limitations of the individual mind which induces an attitude of humility toward the impersonal and anonymous social process by which individuals help to create things greater than they know (...). (Hayek 1945, p. 8).

The great discovery of the classical economists is that:

> many of the institutions on which human achievements rest have arisen and are functioning without a designing and directing mind (...) and that the spontaneous collaboration of free men often creates things which are greater than their individual minds can ever fully comprehend (Hayek 1945, p. 7).

Hayek's model of man

So what is the model of man, the metaphysics of human action,[14] that is presupposed by Hayek? In his economics man is a planner, i.e., he takes into account expected future events and circumstances. He tries to achieve an internal equilibrium within his plan, which means that he applies the calculus of utility maximisation, or the pure logic of choice, to distribute the present and expected future means at his disposal in such a way that he has no incentive to alter his plan. The informational input of the pure logic of choice consists of man's knowledge of his own preferences and of the perceived current external circumstances and the expected future ones. An important part of the external circumstances consists of the plans and actions by other individuals. Since these change continuously, human beings have to continuously adapt their plans.

As each and every individual can only perceive his immediate environment, each plan is based on partial, incomplete information: individual man is irrational in the sense of not disposing over all relevant knowledge and information. Rationality "with a capital R" (Hayek 1945, p. 8) only exists at the system level, provided the spontaneous coordinating forces of the market are left to do their work—assisted by an adequate legal, political and more generally institutional framework. The basic problem that is solved by each socio-political system is how all these individual bits and pieces of knowledge are coordinated, and the system that succeeds best in doing so is to be preferred to all others. For Hayek this is the liberal market society, in which each individual has the maximal freedom to use his capacities as he sees fit. This is also to the benefit of all others. The process that stimulates the discovery of new knowledge is that of competition.[15]

The idea of irrational individuals whose behaviour nevertheless leads to regularities at the level of the economy has recently been confirmed by experimental economics (Cp. Smith 1994, p. 118 and Terna 2000).

Herbert Simon: man as a satisficer—economics as the science of bounded rationality

Of the five authors discussed in this chapter, the one who comes closest to realising Mill's ideal of economics as a moral science is Herbert Simon (Nobel prize 1978). Hayek, of course, took very seriously the idea that in explaining human behaviour what counts is not so much the way the world *is* objectively as the way individuals *think* it is: the data of the social sciences are the opinions of the agents.[16] For Hayek this is a methodological principle which he borrows from Carl Menger and which he used initially to construct his theory of the business cycle. That theory says, very briefly, that in a modern, credit-based economy variations in the amount of money can never be exactly in proportion to changes in the real exchange rates between goods. The consequence is that individuals, who base their decisions on what they can *perceive*, i.e., money prices allocate their resources not in accordance with real scarcities. Their savings and investment plans are therefore mistaken, and this causes economic growth to proceed from booms to recessions. It is only in a recession that individuals find out the hard way that their plans cannot be realised. The fact that individuals base their decisions, apart from their perceptions, on the infallible pure logic of choice, does not change this.

Herbert Simon arrived at his decision making model in a very different way. After developing, during World War II, linear programming, which is designed to coordinate decision within an organisation, he started studying the way in which organisations really behave. That was very different from the procedures recommended by linear programming. This aroused his curiosity about the way in which humans solve problems in reality. He built on work by, among other pioneers, A.D. de Groot, who studied the reasoning processes employed by chess players.[17] The result was a book that almost half a century later is still the classical reference in problem solving theory: *Human Problem Solving*, co-authored with Alan Newell. That publication inspired an enormous amount of empirical research into how humans take decisions in reality. Simon himself made important contri-

butions to this empirical research. His two main results are the following. First, it is physically and mentally impossible for a real human being to execute all the calculations that are needed to arrive at an optimal decision: time is one of the scarce factors and therefore humans stop when they have reached a result that they are satisfied with. A "pure logic of choice" exists but it is not the decision rule that real people use. Second, they cannot take into consideration *all* the relevant factors. That is because there are too many of them, and, more fundamentally, what is or is not a relevant factor is not objectively given. It depends on people's ideas or "theories" about the world. So, in order to understand individual decision processes we have to know how people form their "theories".

What Simon proposes is a more general model of man than we can find in his predecessors. Man is not so much a decision maker as a problem solver. That this is a more general model can easily been seen when we answer the question: what problem does he solve? Adam Smith's answer is: the problem of convincing one's fellow man that it is in his best interest to cooperate, and this problem can be solved because we humans have the faculty of sympathy. Jevons' (and Becker's, as we shall see) answer is: the problem how to achieve the most pleasure with the least sacrifice. Hayek's answer is: how to realise one's plan. For Simon, taking economic decisions is just one example of problem solving, one that concerns the achievement of the best possible allocation of one's resources.

It is precisely this "best possible" that is the object of Simon's research. Instead of the unrealistic idea of main stream neoclassical economists that the best possible is equivalent to the most, Simon knows from empirical research that this is almost never the case. First of all, for him, the typical individual is irrational in Hayek's sense that he can never take into consideration all the knowledge needed to arrive at a "globally" or absolutely optimal decision. What constitutes the necessary knowledge and information depends on the individual with his particular mental make-up, in his particular situation, and with his particular history. In order to solve a problem, people have to create a model of the problem situation. Simon calls this process *framing*. The way in which a problem is framed or mentally represented has a decisive influence on how it is solved and on what consequences the solution has for behaviour. A well-known example is that of a lottery. Mathematically speaking, if the chance of winning 1000 euros with a lottery ticket that costs 1 euro is 20 % this is equivalent to a chance of losing of 80%. Extensive empirical research has demonstrated that if you describe the lottery in terms of the chance of winning, people buy more lottery tickets than when you describe it in the mathematically equivalent terms of an 80% probability of losing.18 In case this example looks a bit frivolous, let me mention another. If your doctor reads in an article in a professional journal that the chance of curing a particular tumor with treatment A is 30% and in a different article that treatment B has a 60% chance of failure, he will prescribe cure A. This may cost you your life, since B has a 10% higher probability of curing you. Instead, the decision model of neoclassical economists presupposes that individuals react neutrally to formally equivalent alternative descriptions of a decision situation; after all, they are supposed to be perfectly rational—which as a matter of fact they are not.

This perfect rationality also comprises the idea that an individual will go through all the necessary calculations before arriving at the optimal alternative. This is the second aspect in which Simon's model of human behaviour differs from both Hayek's and neoclassical economics. *All* calculations, even if they are made on a limited subset of all information, are quite a lot. So many, indeed, that by the time we have arrived at the solution we are either dead or the data (including our preferences) have changed. Or—equally lethally—if we arrive at two equivalent solutions, we, like Buridan's ass, do not know what to do.

In order to put Simon's criticism into perspective, let me briefly discuss an article by Spiro Latsis. In his "Situational determinism in economics of 1972 Latsis argues against the neoclassical decision model that *if* all relevant factors are given and *if* individuals choose perfectly rationally, they have no freedom of choice: there is only one correct outcome. Whereas this criticism is valid as far as it goes, Simon's (and partly Hayek's) criticism goes further. Simon (like Hayek) argues that all relevant factors are not given but are selected. Now a neoclassical economist could reply (as does Becker, as we will see) that the selection process itself is not costless and that therefore the rational choice model can be used to describe that, too. But even if this were true, then Simon's second criticism would apply: this would only aggravate the decision process, since the individual would have to make even more calculations—for which he has neither the mental capacity nor the time.

Types of rationality

A way to understand how Simon's theory differs from neoclassical economics is provided by his own distinction of dif-

ferent types rationality. The first distinction is that between global and bounded rationality.

> Global rationality, the rationality of neoclassical economics, assumes that the decision maker has a comprehensive, consistent utility function, knows all the alternatives that are available for choice, can compute the expected value of utility associated with each alternative, and chooses the alternative that maximises expected utility. Bounded rationality, a rationality that is consistent with our knowledge of actual human choice behavior, assumes that the decision maker must search for alternatives, has egregiously incomplete and inaccurate knowledge about the consequences of actions, and chooses actions that are satisfactory (attain targets while satisfying constraints) (Simon 1997, p. 17).

The second distinction is between substantive and procedural rationality.

> The former is concerned only with finding what action maximises utility in the given situation, hence is concerned with analyzing the situation but not the decision maker. It is a theory of decision environments (and utility functions), but not of decision makers. Procedural rationality is concerned with *how* the decision maker generates alternatives of action and compares them. It necessarily rests on a theory of human cognition (ibid.).
>
> How the two pairs are related is explained next:
>
> Global rationality is substantive—it responds to the actual, objective characteristics of the decision situation [cp. Latsis' single-exit model]. But is only feasible if the situation is sufficiently simple so that human decision makers can apprehend the objective solution. In the more complicated situations (most situations of practical interest) human bounded rationality requires that we understand the decision procedures if we are to understand behavior. A theory of bounded rationality is necessarily a theory of procedural rationality (Simon 1997, p. 19).

Simon's model of man

So what is Simon's model of man or metaphysics of human action that underlies his economics? Man is always involved in problem solving,[19] which means that he actively (even though mostly unconsciously) imposes order—his order—on complex reality. This framing process provides him with the elements for solving the problem, whether it be an emotional or an economic one. Typically, the number of alternatives, even though they have been drastically reduced in the framing process, is great and a complete analysis of the problem is beyond the mental (and physical—lack of time) reach of man. He therefore stops once he has reached a solution that he finds acceptable or satisfactory. An implication of this model—one that has not been made explicit by Simon—is that this leaves human beings the opportunity to pursue many objectives—solve many problems—even at the same time. This also leaves him with the possibility of choice, one that according to Latsis the neoclassical model excludes. In order to describe the behaviour in solving that problem, Simon's model applies at a higher level, apparently leading to an infinite regress of choice problems (and levels). This is consistent with Sartre's idea that man is condemned to choose.

Gary Becker: human behaviour as led by costs and benefits—economics as the science of optimising behavior

The work of Gary Becker (Nobel prize 1992) is a consistent elaboration and generalisation of Jevons' idea that man consistently tries to reach the highest level of utility with the least expense of disutility. In principle, there is no domain of human behaviour that cannot fruitfully be explained as a consequence of a cost-benefit analysis: the choice of marriage partners, the number of children a couple decides to have, racial and sexual discrimination, altruism, crime and punishment, etc. Like Jevons, he often refers to Bentham, who had applied his "calculus of pleasure and pain" or hedonistic calculus to all social phenomena.

Jeremy Bentham's philosophy is based on the greatest happiness principle, universal egoism and the artificial identification of one's interests with those of others. Together with Hume's associationist psychology, these principles supported an all-encompassing system of thought, which also includes ethics (that which does not maximise the greatest happiness is morally wrong). Bentham used his system to propose a rational approach to all social phenomena. For instance, he proposed, in his *Panopticon*, a system of prison reform that would reduce the cost of prisons to society while the punishment of criminals was proportional to the seriousness of the crime and to the cost of withholding a potentially useful member of society from the social production process. Just

one example to illustrate the sort of conclusions Bentham arrived at. He explained the ineffectiveness of capital punishment to reduce the crime rate as follows. Most criminals at the time came from the poorer classes of society, many of whose members had no reasonable prospect of earning an honest living. If a poor person has the choice between stealing and starving, the prospect that, if caught and convicted, he will be hanged has no great deterrent power; by not stealing he would have died anyway. Theft, moreover, has the advantage of leaving a certain probability of not getting caught and surviving whereas remaining honest without having a source of revenue signifies certain death. If, on the other hand, crimes are punished with reclusion in a prison where the criminal is taught skills that may help him to earn an honest living, he is less likely to become a burden to society after he has been released.

What Becker does, is to consistently elaborate Bentham's programme, using the techniques and concepts of modern neoclassical economics. The central concept in his analysis is that of opportunity cost. The opportunity cost of an action consist of the all the benefits that I have to forego if I undertake that action. For instance, if I decide to go skiing this afternoon, I cannot read the book that I have recently bought, go walk the dog, sit in a bar and chat with friends, etc. A rational decision on which of these actions to undertake is based on the calculation of the relative costs and benefits of all alternatives. While this may seem feasible in case these alternatives have a market price, the example shows that this is often not the case. That is why Becker introduces the *household production function*. A household (which may consist of one or more individuals) derives its utility of all the "goods" that it may produce with the help of market goods and services and its own time, using the "technology" available (which comprises both the household's own specific skills and the technology that may be found or purchased outside the household). The limits, or budget constraints, on the maximum amount that can be produced are the maximum available time and the household's income. Applying the usual microeconomic utility-maximising calculus, this leads to the decision rule that, in order to maximise utility, the ratio of any two commodities should equal the ratio of their marginal costs. The term "shadow prices" refers to the fact that the cost of producing one additional unit (the marginal cost) of a good involves not only prices of market goods but also of the household's time, which is a non-market good, and its productivity.

Becker started his career as a sociologist and began to analyse problems that were traditionally dealt with by sociologists with the instruments of economics. He thus discovered that "the economic approach is uniquely powerful because it can integrate a wide range of human behaviour" (Becker 1976, p. 5). What is this economic approach?

> [E]veryone recognises that the economic approach assumes maximising behaviour more explicitly and extensively than other approaches do…. Moreover, the economic approach assumes the existence of markets that with varying degrees of efficiency coordinate the actions of different participants … so that their behaviour becomes mutually consistent. Since economists generally have had little to contribute, especially in recent times, to the understanding of how preferences are formed, preferences are assumed not to change substantially over time, nor to be very different between wealthy and poor persons in different societies and cultures. Prices and other market instruments allocate the scarce resources within a society and thereby constrain the desires of participants and coordinate their actions. In the economic approach, these market instruments perform most, if not all, of the functions assigned to "structure" in sociological theories (Becker 1976, p. 5).

Since these are the characteristic features of standard neoclassical economics, what is it that surprised so many commentators of Becker's work initially? It is the fact that he seeks a deeper level at which preferences are stable, that he takes as the fundamental unit of analysis the household, which are considered not to be passive consumers but active productive units:

> The preferences that are assumed to be stable do not refer to market goods and services, like oranges, automobiles, or medical care, but to underlying objects of choice that are produced by each household using market goods and services, their own time, and other inputs. These preferences are defined over fundamental aspects of life, such as health, prestige, sensual pleasure, benevolence, or envy (ibid.).

Becker explicitly excludes the assumption of complete information from his set of basic assumptions; the optimal amount of information is an *explanandum* instead of part of the *explanans*. How much information a household will seek is the outcome of its assessments of the expected costs and benefits involved.

Opportunity costs were already mentioned above. Their centrality in Becker's economics is made particularly clear in the following passage, where they assumes the status of a methodological principle:[20]

> When an apparently profitable opportunity to a firm, a worker, or household is not exploited, the economic approach does not take refuge in assertions about irrationality, contentment with wealth already required, or convenient ad hoc shifts in values (i.e., preferences). Rather it postulates the existence of costs, monetary of psychic, of taking advantage of these opportunities that eliminate their profitability—costs that may not easily be "seen" by "outsiders" (Becker 1976, p. 7).

Becker also makes it clear that his economic approach does not assume that all decisions are made consciously.

Over the years, Becker has applied his economic approach to problems that range from fertility, education and the use of time to crime, marriage and social interactions. Now what sort of results does it produce? I will give just one example, taken from Becker's earliest publication in this field: the analysis of racial and other discrimination. Blacks and whites in the USA are considered to be two "countries" who trade with one another. Each group has two factors of production, labour and capital, in different proportions. This makes the problem of discrimination susceptible to an application of the standard neoclassical theory of international trade. An important theorem of that theory is that, in case two countries have different comparative advantages, they can both improve their wealth by trading the commodities they produce. That means that barriers to trade are to the disadvantage of both trading partners. So, if whites discriminate against blacks (for instance on the labour market), not only do they harm the position of blacks, they also prevent themselves to fully benefit from their comparative advantages. If, as Becker observes, blacks retaliate by discriminating against whites, they only make their own situation worse, as this further reduces the opportunities to increase their wealth using their comparative advantages.

In all its simplicity this analysis is both revealing and useful. Becker assumes that discrimination is not the result of social circumstances but a preference of individuals. What he is actually saying is: if you want to discriminate, that is your choice. But are you prepared to pay the price for it? He does not give a moral judgment on discrimination; he just shows what economic implications it has. By putting a price tag on discrimination, he makes an important contribution to what has always been considered a purely moral argument to which the answers were given in purely moralistic or ideological terms. Introducing the economic approach into the moral domain helps to make moral discussions better informed and more rational. For instance, if we take the preference for non-integration (or discrimination) of different ethnic groups as given, by using Becker's analytical apparatus we may try to define the optimal amount of discrimination. Before the reader jumps to the moralistic conclusion that this is an unacceptable "economisation" of a social or moral problem, let me draw the parallel with what we may call the social problem. The social problem is how a great number of individuals may peacefully live together. This involves reaching an intricate set of compromises with one's fellow men: I like to cook meat on my barbecue but my neighbour does not like the smoke this causes. On the other hand, he takes great pleasure in the tall fruit trees on the border with my garden, while I regret that they take away the sun from my lawn. Conceptually, this problem could be made more tractable by applying an economic analysis; conversely, if both my neighbour and me are satisfied with the existing arrangements, we may conclude that we have both reached an equilibrium between the costs and benefits of our neighbourhood.[21]

So what we see here is that, apart from the question of the explanatory value of the economic approach, it has the great benefit to provide the instruments with which to make political and moral discussions more rational.

Becker's model of man

Even though Becker emphasises the fertility of the technical apparatus of economics in shedding light on all human behaviour, (which is why he prefers to speak of the economic *approach*), his economics presupposes a clearly defined theory of human action. He summarises it as follows: "all human behaviour can be viewed as involving participants who maximise their utility from a stable set of preferences and accumulate an optimal amount of information and other inputs from a variety of markets" (Becker 1976, p. 14). As he has pointed out, this does not mean that they always do so consciously nor that all human behaviour is fully reducible to utility maximisation. For instance, the formation of preferences falls outside the scope of economics and economists should consult psychologist in order to know more about it. Becker also makes it explicit that other non-economic variables influence human behaviour—but always through their action on preferences and production possibilities.

So what results from the economics of Becker is a model of man as a social being—usually part of a household—with a stable and autonomous set of preferences who is actively involved in producing goods and services that maximise his well-being. The fact that his behaviour can be explained and predicted with the utility-maximising model does not necessarily imply that he consciously calculates all the expected costs and benefits—in the most general sense—of his behaviour. Standing at the crossroads between markets, where costs are made visible and quantified by prices, and spheres of action where costs are less visible, not clearly quantified but nevertheless present (the opportunity costs to which only shadow prices can be imputed), man tries to find his way in life in such a way that his choices reflect an equilibrium between the intensity and hierarchy of his preferences and the sacrifices that he is willing to make in order to satisfy his wants. Conversely, Becker's model of man can be read as framework that interprets human action as the outcome of conscious or unconscious choices but never as the result of irrational decisions. In the final analysis, Becker's idea of the human condition is identical to Sartre's: man is always engaged in choice and is fully responsible for the consequences of his actions.

III. CONCLUSION

The five authors whom I have discussed use five different models of man. Adam Smith has a theory that considers human action as driven both by the pursuit of interest and by the innate desire for justice. For Jevons, man is motivated by the desire to attain the most pleasure with the least possible sacrifices, which he tries to attain, in ideal conditions, by balancing the two rationally. Hayek sees man as a very irrational in the sense of under-informed planner for the future who bases his decisions on the way he perceives the world subjectively but who nevertheless follows the same decision model as Jevons'. For Simon, man is both irrational in Hayek's sense and in the sense of almost never being capable of carrying out all calculations needed to arrive at a rational decision. Becker turns against this, trying to reinstall the rational-choice model not only in economics but in the other social sciences as well. In all this, one should take account of the main problems these authors were trying to solve in their economics. Smith looked for an answer to the question what causes economic growth, Jevons wanted to unify all of economics by founding it on the theory of individual pleasure maximisation, Hayek wanted to explain—as did Smith in *The Theory of Moral Sentiments*—why the apparently anarchical pursuit of individual purposes by many millions of human beings does not result in utter chaos, Simon looked for a realistic explanation of human choice, and Becker wanted to extend the rational choice model to all human phenomena.

What these metaphysics of human action have in common is that man, by his behaviour—no matter how it is modelled—constructs himself and his environment, the latter mostly as an unintended consequence of his individual actions (an idea that we find in Adam Smith and later in Hayek). This is similar to one of the main elements of Sartre's existentialism. The concept of radical choice of that philosophy can be found most consistently in Becker's economics, where everything, nothing excluded, is subject to rational choice. In that sense Chicago-School economics is the most existentialist of all five individualistic metaphysics. Another idea of Sartre's is that man "projects" himself, by which he means that we all, by choosing, construct our lives. Man as a planner is the basis of Hayek's economics, and it is worked out in his later social thought into the idea of path-dependency. Re-translated into philosophical terms this means that each of us, by making the choices that we have, create an individual, unique and unalterable personal history that is an ineluctable part of the set of influences on our current and future behaviour. This indicates a limit to Sartre's concept of radical choice: we cannot choose to undo our history (although we may choose to ignore it or falsify it).[22] The economist who differs most from existentialism is Simon, for whom the psychological make-up of man limits the possibilities of choice. Between Jevons and Sartre there seem to be few if any possibilities of comparison (although one could say that Jevons limits the choice set to those thing that bring us pleasure, or that he substitutes the pursuit of pleasure as the ultimate motive for human behaviour for Sartre's choice).

As we have seen, this story of economics is also the story of the relationship between economics and the other sciences of man. Adam Smith was one of the first to "liberate" economics systematically from its general philosophical framework, laying the foundations for economics as a scientific discipline in its own right. Jevons is one of the three authors who completed the marginal revolution, which consisted in founding economics on a theory of subjective choice. Contrary to what might be expected, though, he did not look for these foundations in psychology[23] but emphasised that economics was the only discipline that could deal with hedonistic behaviour.

The reaction to these and other attempts to give economics a prominent place in the landscape of the sciences of man

came from France, where Durkheim started his research programme to create sociology as an autonomous discipline. He was criticised by Hayek, who, in the elaboration of his economics into a general science of man and society maintained that the right kind of economics, the one based on the individualistic tradition of the Scottish moral philosophers, was the one and only discipline capable of dealing with the explanation of coordination and social stability (Birner & Ege 1999). Whereas Hayek—somewhat inconsistently[24]—defends the monopoly of economics in explaining collective phenomena and advocates a strict separation between psychology and economics, Simon's programme is a cordial invitation to both disciplines to contribute to economics:

> [w]ith bounded rationality we need both a sociology and a psychology of the decision maker to predict behavior—a sociology to tell us what information is likely to be available in memory at the time of decision and what needs and wants are likely to be prominent, and a psychology to tell us how the decision will be represented and how elaborate are the calculations that the decision maker can and will carry out in order to make a choice (Simon 1997, p. 18).

Again, we see that the methodological question of the relationship between the social sciences and the methodological *and* ontological questions of the status of man are intimately related to one another.

Finally, Becker not only revived the hard-core individualistic rational-choice theory that is the corner stone of neoclassical economics, he also applied it to all human and social phenomena. This "imperialism of economics", as it has been called (i.e., Radnitzky & Bernholz 1987), now has to vie with the more reductionist "psychologistic" approach by Simon and others.

Which metaphysical research programme, if any,[25] will "win" is hard to say. But let me conclude on a very hypothetical note, one that illustrates the possible use of the metaphysics of individuals for the social sciences. Let us just assume that a systematic comparison has been organised between the Chicago approach and bounded-rationality economics. Let us suppose, moreover, that according to generally accepted criteria[26] the confrontation has ended in a draw. In this (admittedly very hypothetical) case, an examination of the ontology that is implied by the two research programmes would be called for. I suggest that, in case the empirical results are the same, we should prefer the programme with the more realistic, richer and more suggestive and fruitful model of man or metaphysical theory of human action.

How difficult such a choice may be is illustrated by the fact that laboratory experiments and computer simulations have demonstrated that, in order to reach predictions about the functioning of markets one does not need to have the "rich" models of man as an intelligent, fully informed and perfectly rational chooser. The same regularities at the collective level (supply and demand, the convergence to one price etc.) that are arrived at by the "rich" models of, for example, Jevons and Becker, can be produced utilising very stupid and irrational individuals modelled on the computer or created in the laboratory.[27] Just on the strength of this little piece of evidence, should we prefer the "excess content" of Chicago economics as ontologically more satisfying? That might be too rash a decision. Hayek, who emphasises individual man's irrationality, draws very important conclusions from this for the social and political system. It must be one in which no individual has the opportunity to impose his irrational preferences on all the others. But that is what Becker thinks a free market will do anyway. So, which theory should we prefer? A discussion of this problem would require another, much longer treatment, for which this is neither the place nor the time.

NOTES

1 Which he considered a metaphysical research programme until he judged it to be a falsifiable and hence scientific theory.

2 The truth conditions of counterfactuals are problematic and that is no different for this particular one.

3 There is much confusion, particularly in welfare economics, about ethical questions. I will limit myself to one brief comment. Many authors (such as Mark Blaug) sustain that the concept of Pareto optimality is an ethical concept. They confuse the definition of a Pareto-optimal situation (no-one can be made better off without someone else being made worse off) with the question whether or not such a situation is desirable. A careful analysis shows that many supposedly ethical judgments in economics are conditional statements of the form: *if* you want to achieve X, *then* do Y. These judgments are often enthymematic, i.e., the if-part is suppressed. This, added to the fact that the consequent is often formulated as "you should do Y" has contributed to the confusion.

4 Sartre wrote well before the truth about places like Guantanamo, where prisoners are kept from ending their lives, became known.

5 And of the primacy of economic solutions to social and political problems. In the 1980s, more than one government in South America called students of Friedman, the "Chicago boys", to help put a stop to rampant inflation and general social instability.

6 It is often thought that macroeconomics was created in 1936, when John Maynard Keynes published his *General Theory of Employment, Interest and Money*. That idea is mistaken.

7 For a brilliant discussion of the revolutionary character of the idea of a universe without God and of the intellectual changes in the 17th century leading up to it, see Israel 2001.

8 As witnessed, for example, by Francis Ysidro Edgeworth's *Mathematical Psychics,* published in 1881.

9 The basic idea is that markets and firms are alternative solutions to the problem of how to reduce transaction costs.

10 Hayek defends a non-atomistic individualism. Cp. Hayek 1949.

11 Hayek is the first economist to do so after Marshall. Cp. Hayek 1937.

12 Cp. also Hayek 1937: 46: "The statement that, if people know everything, they are in equilibrium is true simply because that is how we define equilibrium."

13 This is very similar to Popper's approach to social science. Watkins has coined the fortunate term "negative utilitarianism" for this.

14 In this context, "human action" may lead the reader to think of the book with that title that was published by one of Hayek's masters, Ludwig von Mises. While adopting many of Mises' economic ideas, Hayek was critical of the tautological character Mises claimed for economic theory. As against Mises, Hayek defended the empirical character of economics in his "Economics and Knowledge" of 1937.

15 Later, Hayek elaborates this idea of competition into an evolutionary theory of society. Cp. Birner 2001.

16 Cp. his "The Facts of the Social Sciences" in Hayek 1949.

17 De Groot 1946. One of its results was that chess masters do not consider all the possible moves out of the enormous but finite number of possible moves. They consider only a subset of these, and select and evaluate that subset much faster than less advanced players.

18 Lottery organisers—many of them governments—have known this all along. They always and only advertise how many people have won how much money. They never tell you how many have lost how much.

19 That is exactly what Karl Popper says, too. Cp. Popper 1972: 244.

20 He himself speaks of a postulate that completes or closes his system in a way analogous to the principle of conservation of energy in physics.

21 This conclusion may seem tautological. Becker speaks of the "almost tautological" character of the closure principle of introducing costs (Becker 1976, p. 7). Hayek had addressed the question whether economic explanations are tautological in his 1937 in reaction to Ludwig von Mises. I will let this interesting problem rest.

22 In an attempt to reduce cognitive dissonance, for example.

23 The idea that economics should be given an autonomous position was very much alive in the 1870s. Carl Menger, for instance, stressed the importance of subjective perceptions in choice much more than his fellow marginal revolutionaries. Yet he, too, did not advocate a reduction of economics to psychology. This independence of economics from psychology was later elaborated by Hayek. Cp. his *The Counter Revolution of Science*. This work was inspired by his own earlier research in the theory of mind and the psychology of perception, so that we may conclude that "he knew what he was talking about."

24 As I argue, for instance, in Birner 1996 and 1998. Hayek's insistence on the important of local knowledge and the position of the individual in the communication and interaction structure of society leads naturally to the demand to describe that structure, as is done in network sociology.

25 It is of course possible that they turn out to be complementary.

26 The idea that these exist makes my case even more hypothetical, as anyone who has followed the debates in the philosophy of science of the last 30 years will confirm.

27 Becker himself observes that the downward sloping demand curve can be derived without resorting to rational choice; the budget constraint is sufficient. Cp. Becker 1962.

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Cognitive Biases: Between Nature and Culture

GÉRALD BRONNER

Paris-Diderot University
French Academy of Technologies (Académie des technologies)
LIED, Bâtiment Lamarck B
35 rue Hélène Brion
75013 Paris
France

Email: gerald.bronner@univ-paris-diderot.fr
Web: http://www.lied-pieri.univ-paris-diderot.fr/spip.php?article72&lang=fr

Bio-sketch: Gérald Bronner is Full Professor of Sociology at Paris-Diderot University and a member of the Académie des technologies. He works on collective belief, rationality, cognitive biases, and the relationship between cognitive science and interpretative sociology. Professor Bronner is the author of several books and has won the Premio Amalfi prize and the Prix de la Revue des Deux Mondes. He has published two books in English *Belief and Misbelief: Asymmetry on the Internet* (Wiley, 2013) and *The Future of Collective Beliefs* (Bardwell Press, 2011).

Abstract: This paper explains the results of a quantitative survey on the links between the level of education and resistance to cognitive errors. Does a university education protect us from inferential divergence? Does it enable us to have a better level of awareness of the lines of reasoning we use implicitly? Does the type of studies play a role? These are important questions because they allow us to question the generally naturalist acceptance of the notion of cognitive bias as posited by orthodox error psychology. The results from this survey of 1559 people are ambiguous and should be interpreted with caution but they still tend to weaken the ambitions of overly strong naturalism or culturalism.

Keywords: methodological individualism, cognitive biases, education, natutalism, culturalism

I. INTRODUCTION

Methodological individualism is based on the assumption that there is a universal rationality that usually finds expression in terms of ordinary psychology. This universal rationality is considered to be characterized by two dimensions. The first is that of instrumental rationality, which according to the classical view originally proposed by Aristotle, assumes that an individual is rational if he or she uses the most efficient means to achieve a specific goal. The second is that of cognitive rationality that, according to Boudon (1999, pp. 148-149), requires the consistency between the propositions of a theory or the consistency between the reasons that are the presuppositions of a belief as well their validity and their consistency with the reality. These two dimensions of rationality are considered to be cognitive invariants of human mind and are supposed to allow us to understand, in Weber sense, relevant social practices that belong to cultures very different from ours. *In my opinion, if sociology is regarded as the approach that focuses on how social variables and cognitive invariants are related, cognitive invariants cannot be reduced to the self-interest principle or the logical consistency principle that outline what methodological individidualism means by rationality. Cognitive invariants must also be considered to be connected to common heuristics.* This article attempts to clarify the relationship between methodological individualism and the crucial issue of cognitive biases.

II. SOME MATERIAL FOR A DEFINITION OF COGNITIVE BIAS

In the 1970s, two Israeli psychologists, Amos Tversky and Daniel Kahneman, ran a set of experiments at the University of Jerusalem which went down in research history. These highly ingenious experiments were amusing and easy to carry out—the experimenters mostly just presented appar-

ently harmless and straightforward problem statements that looked a lot like the *Monty Hall* problem or the sort of problems we used to have fun solving in the school playground.[1] But this did not prevent these experiments from being very useful for an ambitious scientific project because their inventors aimed to shed light on how human thought processes work and thus answer the fundamental question "Is Man rational?" By answering this question, the two psychologists aimed to formulate an essentially *normative* conception of rationality for this type of conception was an orthodox way of thinking[2] in the psychology of decision making at the time. It was based on the hypothesis that individual reasoning can be effectively modelled using the rules of the maximisation of desired utility. For example, according to Kelley (1967) or Peterson and Beach (1967) human reasoning can be described using the norm from theories on statistics and probabilities. Edwards (1968) considers that natural logical more or less follows the recommendations set out in Bayes' theorem. And yet Tversky and Kahneman work undoubtedly shows up the limits of that kind of approach.[3]

Tversky and Kahneman are certainly not the first to have worked on this kind of problem4 but they indisputably played an essential role in the development of cognitive psychology. Their work inspired hundreds of other similar works which all aimed to map a cartography of cognitive errors and intuition which are responsible for leading us into that kind of error. During the decades between the modern day and the era in which these psychologists' experiments were carried out, all these researchers contributed to writing one of the most important pages in the history of 20th century humanities.

As many commentators have pointed out,5 the thesis that most of these researchers constantly posit (Kahneman, Slovic, and Tversky 1984; Nisbett and Ross 1980; Bar-Hillel 1980; Stich 1985; Joule and Beauvois 2002; Hogarth 1980; Oaksford and Chater 1993) is that human thought is not *rational*. This idea is on the back cover of a book which will remain one of the major publications from this school of thinking—"*Judgment under uncertainty: heuristics and biases*":

> The blemished portrait of human capabilities that emerges from this work thus stands in sharp contrast to the highly favourable image of 'rational man'". This is also clear in the striking and oft-used image of *a needle in a haystack* referring to lost rationality in human cognition (Fiske and Taylor 1984; Baron and Byrne, 1987).

There are numerous terms used to refer to this type of error in reasoning in literature on this subject—cognitive bias, mental tunnel, cognitive illusion, mental short-circuit, cognitive error etc. Leaving aside the latter term, which I prefer for this reason, these terms refer to an aspect of these psychologists' theory—they often consider a cognitive omission to be a reflex activity which is a point I will return to later. When they propose a definition, they characterise it as "the consequence of people limited ability to take account of and process all the information which is potentially available" (Ajzen and Kruglanski 1983) which is in fact more of a symptom than an actual definition as such. By default *cognitive biases* in their most typical form are still defined by making a distinction between them and emotional or motivational biases (Nisbet and Ross 1980).

Emotional biases derive from affective involvement which influences our reasoning and may lead to the wrong conclusions being drawn. As for motivational biases, the vested interests of an individual influence his or her beliefs and reasoning. McGuire (1960) showed, for example, that individuals tend to consider a desirable event more likely to happen.

Cognitive errors were defined in a more positive vein by Garder (1997, p. 2) as "the gap between the way we make assumptions about information and the way we should do so to make sure those assumptions are valid". In general, works on cognitive error assume there are reliable pre-established inferential validity criteria6 with which to compare subjects' judgements. When these judgements do not comply with these criteria then we call this cognitive *error*.

III. A NATURALIST POSITION

Certain problems invented by these error psychologists show how certain false and yet attractive solutions can have an effect on the way people think. I shall give examples of these below.

There are types of problems which provoke quasi-mechanical, predictable and residual replies and obviously this is a subject of some fascination for any thinkers interested in cognition phenomena, in itself an enigmatic situation. Researchers like Tversky and Kahneman and many of those who followed in their footsteps have provided *naturalist* explanations for this puzzling question. Naturalism qualifies the thesis by which mental contents are the consequence of biological and therefore natural activity. This biological activity is, of course, that of the brain and more specifically is now thought to be that of the neurons. In their view, cognitive error is therefore seen as the sign that *natural mecha-*

nisms control our thoughts. For this reason, they therefore consider reasoning errors as "reflex activities".

I consider that the majority of works on cognitive error psychology can be put in the naturalist field which generally views errors of reasoning as the mechanical consequence of the existence of bias which appears to be essentially biological in origin. The advantage of this position is that it provides an immediate reply to the problem of the character (if not collective then at least shared) of cognitive omission. Errors of this kind are common—as these authors are keen to explain—because the way our brain is organised means we possess "structures" which lead us to move away from the norm of what is true. This is also why the more robust minds can also make these kinds of errors and the biological grounding of errors further explains why we are sometimes reluctant to accept the truth.

These psychologists therefore consider that these errors are part of the biological and universal baggage of humankind. This is all the more true when considering the founding principles of *evolutionist psychology*. Cosmides and Tooby (1992), are important representatives of this school of thought which claims that psychology is a branch of biology and should therefore study how the way in which the brain processes information produces human behaviour. On this point Pinker (2000, p. 29) says: "The mind is what the brain does; specifically, the brain processes information, and thinking is a kind of computation. The mind is organized into modules or mental organs, each with a specialized design that makes it an expert in one arena of interaction with the world. The modules' basic logic is specified by our genetic program".

Thus evolutionist psychology defends the theory of assertive *innatism* considering that the way our minds work is part of our genetic heritage even when making errors of systematic reasoning. This school of thought believes that the reasoning processes which characterise human thought are the consequence of natural selection and concludes that the human mind "mental reflexes" cannot be fundamentally counter-productive or at least have not always been so. Why? Because natural selection has been doing its work for millions of years according to Darwinian logic but has still not managed to produce "elegant machines" capable of solving the persistent problems thrown up by their ecological and social environment. In other words, although cognitive biases have lost their functionality and seem to be errors of reasoning for modern man, they were still of use to our prehistoric ancestors. In fact these authors even consider the opposite to be the case—that our long-lost predecessors needed to take quick decisions and make sense of their environment and could therefore not afford the luxury of lines of reasoning which may be objectively valid but take up a lot of time and mental energy. Anyone who was not biologically equipped with the aptitude to give up on the whole idea of formal logic was simply wiped out by natural selection. In this way, cognitive biases became the biological norm for humankind because they were a selective advantage in the past. Today, although this selective advantage may well be seen as a flaw of the mind, it nonetheless remains universal. As long as these residual effects of the past do not act as obstacles to reproduction and saving the species, there is no reason for them to disappear. Nature mechanisms preserve many things in us which are not always useful. A well known example would be our appendix but there is also our appetite for sugar. During the Pleistocene, our ancestors no doubt benefited from their taste for eating sugary things by stocking rapidly available biological energy. This is less useful in our modern-day society where sugar can be mass-produced and in fact is harmful for our health. The same kind of mechanism leads to the continuing survival of ways of thinking which lead us into error in our reasoning.

Evolutionist psychology proposal is fascinating because it provides an answer to the enigma at hand by taking into account the predictable, residual and universal nature of cognitive error. As this is seen as part of our genetic heritage from our prehistoric ancestors, it is easier to understand that it occurs on such a predictable basis and also that we can get rid of it. Equally it is thus easy to understand that our intuition—often our most deeply-felt conviction—can be in strong opposition to the conclusions of mathematical calculations or formal logic.

IV. THE ORIGINS OF COGNITIVE BIASES

Once the ideas of orthodox cognitive error psychology have been taken into account, we may then move on to an important question because taking note of the results obtained by these programmes and accepting the interpretations thereof are two different operations. Can these errors be either positively or negatively correlated with an individual social characteristics?

This question echoes some of the criticisms the philosopher Jonathan Cohen (1981) from Oxford University made concerning research into cognitive error psychology and more specifically the conclusions drawn on human rationality.

Cohen explains that the cognitive psychologists who ran these experiments could not seriously expect ordinary individuals to brilliantly solve problems which could really only be solved by people with skills in statistical and probability theory. The cognitive errors made by the layman are more to do with educational rather than cognitive deficiencies.

At first sight, this argument may seem inadmissible. In an article called "Belief in the law of small numbers" which predated Cohen text having been published in 1971, Tversky and Kahneman showed in some detail that statistics specialists could make the same cognitive omissions as a layman (see Mittrof 1974 or Eddy 1984). They related an experiment they carried out at a conference for the mathematic psychology group of the American psychology association. They asked 84 conference attendees to answer the following question: "Suppose you have run an experiment on 20 subjects and have obtained a significant result which confirms your theory. You now have cause to test an additional group of 10 subjects. What do you think the probability is that the results will be significant in a test separately for this group?"

Only 9 respondents gave replies between 0.4 and 0.6 (around 0.48). Most of those asked gave estimations closer to 0.85. The first reply is of course much more reasonable which suggests that knowing about formal logic and probability theory does not stop people being influenced by erroneous intuition.

Both laymen and researchers can therefore display problems with cognition which are not just linked to their education.[7] However I still consider that this does not reply conclusively to Cohen question. Tversky, Kahneman, Mittrof and Eddy, to cite just a few of the researchers who have looked into this question, may have shown that a certain level of education does not definitely prevent people from making cognitive errors but we still do not know whether our education level increases our resistance to insidious errors in reasoning.

Basically the only sure conclusion that we can draw from the above remarks is that we are *all* subject to errors and not that we are all *equally* likely to make errors.

In general, none of the experiments on cognitive biases have ever given 100% erroneous replies. Is it possible to identify those who give into the temptation of misleading evidence on a sociological basis? And more particularly, to go back to a part of the debate initiated by Cohen, does the level of studies have any influence on the likelihood of us making cognitive errors?

V. THE SURVEY

I thought it would be useful to run a survey on this question to contribute to the debate. My research can also probably be criticised but it seems to avoid two of the most important pitfalls pointed out by critics of the cognitive psychologists' experiments namely problems with representativity and the significance of the results obtained. Indeed this research was generally carried out on groups of under 150 people who were also mostly students. The weakness of the population sample which was also too homogenous prevents there being an effective reply to the question we are asking on the sole basis of previous surveys. For this reason, I considered it would be interesting to carry out quantitative and qualitative research which would both revisit certain classic problems of error psychology and add a few new elements.

The idea was to give a questionnaire in person to 1559 subjects with varied questions on the level of studies, type and subject of studies, age, gender etc and six problems likely to induce cognitive errors.

These problems were read slowly by the researchers and simultaneously by the respondents (each of whom had a copy of the questions). They were only instructed to think about a problem when they said they had understood the terms of that problem. The problem statements were rewritten several times when the questionnaire was being put together to make sure they were as simple to understand as possible. A hundred respondents passed "mock" questionnaires to help us improve the questionnaire. The survey started in December 2002 and finished in May 2003.8 Once the respondents had understood the problems they were given 30 seconds to solve them (except for problems based on intuitive calculations for which they had 10 and 5 seconds).

I decided not to use a quota-based method as this is not the best tool for replying to the question asked. I could have chosen the population sample to reflect the level of education percentages found in the French population as a whole but each sub-group would have statistically weakened the correlation measurement. The aim was not to attempt to take a kind of photograph of cognitive errors among the French population but rather to provide answers about the link between the level of studies and cognitive error. For this reason I opted to use stratified sampling. *The sample was stratified according to the level of education. Half the respondents did not have the French high school diploma, i.e. the "baccalaureat"* (775 people)*, and the other half had "baccalaureat" plus a diploma from three years of further education* (784 people).

This meant that we intentionally excluded the third and fourth education levels from the INSEE categories so that we could compare two relatively homogenous groups quantitatively (just under eight hundred people in the two groups) but which were very different qualitatively given their statistical character (the first did not have the French "baccalaureat" while the second had done at least three years in further education after obtaining their " baccalaureat").

Finally, although this questionnaire was designed to provide answers to the question of whether there may be a correlation between the level of studies and cognitive error, I also looked for other types of correlations even though their statistical significance may be presumed to be fairly weak. For example, the type of studies (literary, scientific etc.), the time since finishing studies, gender etc. all seemed interesting exploratory questions to ask and then measure in a crossed sort with the error rates.

I could not study all the biases which cognitive psychologists have highlighted so I made sure I paid particular attention to three types of errors in my questionnaire namely those linked to the *representativeness heuristic,* the *availability heuristic* and the *anchoring heuristic*.[9]

Here are the six problems we gave the 1559 people who agreed to answer the questionnaire, the results of which are presented herein. The first three are directly inspired by the work of Tversky and Khaneman.

The first problem (hereafter referred to as problem A) (Tversky and Kahneman 1972) brings the representativeness heuristic into play. The problem statement was as follows:

> A town has two maternity wards. The first is bigger with an average of 45 births a day while the other has an average of 15 births a day. Each day when 60% or more boys are born in the wards, they note this event with a cross in a notebook. At the end of a year, which maternity ward would have the most crosses in its notebook?
>
> The small maternity ward? The bigger maternity ward? Or would they be equal? *Respondents had 30 seconds to answer.*

The answer to this problem was the first reply, the small maternity ward. I will go into this in further detail below.

> The second problem (problem B) was designed by Tversky and Kahneman (1973) who considered that it involves the anchoring heuristic.[10] The problem involves a simple calculation which is interrupted. The respondents are asked to estimate the final result of the multiplication 1 x 2 x 3 x 4 x 5 x 6 x 7 x 8 and to respect the left-to-right order. After five seconds, the "examiner" says "I am going to interrupt you here. I know you probably haven't finished your calculation but I would like you to guess the final result now."

In these circumstances, it is hard for anyone to finish the calculation and get the right result—40,320.

The third problem (problem C) is also a classic frequency estimation question (Tversky and Kahneman, 1973)[11] and is underpinned by the availability heuristic.[12]

It was presented as follows:

> In your opinion: Are there more words in the French language which begin the with the letter "A" or are there more words in the French language whose second letter is the letter "A"? *Respondents had 30 seconds to answer.*

I should point out at this point that despite the psychologists' opinion to the contrary, this problem actually led to few respondents giving the wrong answer and many guessed that the French language has more words whose second letter is A than words which begin with A. I imagine that the results are more interesting for the English language.

I also added three other problems to these famous problems from psychology literature. I created two of the three problems myself.

The next three problems involve symmetrical questions of intuition of complex calculation which cannot be done mentally. The idea is to estimate average variation rates which requires the use of an nth root.

Problem D was presented as follows:

> Let us suppose that an object costs 5000 euros and that there is a constant inflation rate (price rises) of 10% over 20 ans. How much would this object cost at the end of this period (after 20 years)? *Respondents were given 10 seconds to reply.*
>
> Answer: 33,248 euros.[13]

While problem E—symmetrical to problem D—went as follows:

> After having read the following problem, try and reply intuitively. If you invested 1500 euros on a savings account for thirty years with a constant instant rate over the whole period and if at the end of this period the sum of 1500 euros had ended up as 15,000 euros, what would you estimate (as a percentage) the annual interest rate you got to be? *Respondents were given 10 seconds to reply.*
>
> Answer: ≈ 8%[14]

The last problem (problem F) was the so-called double-faced problem which is expressed as follows:[15]

> Let us suppose you are invited to play the following game: here are two cards, one is red on both sides, the other is red on one side and white on the other. I draw one of these cards at random and place it on a table. The side showing is red. In your opinion,
>
> It is more likely to be the red-white card
> It is more likely to be the red-red card
> Or are both possibilities equally likely?
> Respondents had 30 seconds to answer.

In the stated conditions, the red-red card is more likely (66% chance) to be the card drawn at random.

We considered answers which were reasonably close to the right answer to be correct particularly for the calculation estimation problems. For example for problem B, all answers between 35,000 and 45,000 were considered correct.[16]

Error rates for these problems ranged from 22% to 95%,[17] which was a good range of situations for the purposes of our interpretation.

Three categories of information were gathered for each of the problems. Firstly we recorded the respondents' answers. Secondly we asked them about their capacity to explain the reasoning that led them to answer the way they did (I called this *verbalisation*) and finally for the two logic problems (A and F; the question did not apply to the other problems) we asked the respondents if they agreed with the answer given by the examiner.

VI. RESULTS

a) Agreement with the correct answer given

I shall begin with this point because it is relatively easy to interpret. The two problems involved are the maternity ward (which I will give more details about below) and double-faced cards problems. The answer to the first seemed a bit harder to accept than the second because a quarter of respondents who were wrong did not see why that was the case when given the answer while under 17% said this about the answer to the cards problem.

We noted that this level of acceptance of the right answers to the problems was not significantly statistically linked18 (chi2 = 1.42, ddl = 2, 1-p = 50.75%) to age (chi2 = 6.11, ddl = 4, 1-p = 80.89%), level of studies (chi2 = 4.48, ddl = 4, 1-p = 65.46%), type of studies (chi2 = 5.56, ddl = 10, 1-p = 14.93%), whether respondents came from urban or rural areas (chi2 = 6.11, ddl = 4, 1-p = 80.89%) or whether they had stopped their studies a long time (chi2 = 4.61, ddl = 6, 1-p = 40.52%) etc.

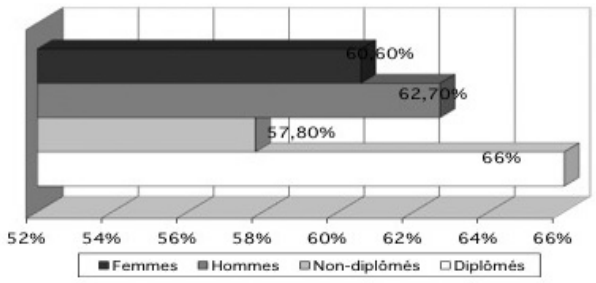
b) Verbalisation

Things were very different for verbalisation. For each problem, respondents were asked to explain why they had replied in the way they had. Certain respondents were interviewed, which made up the qualitative part of this research, but in the immense majority of cases, the examiner just noted whether or not verbalisation had occurred. This was considered to be the case when subjects did not claim to have replied through pure intuition, chance or if they remained silent or claimed not to know.

The simple arithmetic average of verbalisation for all of the problems was 62%. This result is interesting because it suggests that even when implicit rationality led to error it may have produced a reply which respondents may have initially claimed to be based on intuition but turned out to be due to reasoning when they thought about the process which led them to answer in that manner. This idea is given further credence by the fact that certain problems were found to be more easily explainable than others. This was particularly the case with the logic-based problems for which there was a verbalisation rate of nearly 69% while the calculation-based problems' verbalisation rate was close to 56%. This is hardly surprising given that the former problems are founded more on implicit reasoning than the latter.

The most interesting point of note is that this verbalisation reveals significant statistical links particularly the correlation with the level of studies (chi2 = 9.57, ddl = 2, 1-p = 99.16%). Statistically respondents with educational qualifications were more able to give verbal explanations of their reasoning than the respondents who I shall refer to (even if the name is not entirely exact) as without educational qualifications. Is this because of better levels of linguistic expression or a more refined awareness of the inferential processes involved? This study did not provide an answer to this question. However it did reveal that the simple arithmetic average of the verbalisation of those without educational qualifications was 57.8% while for those WITH qualifications the average was 66%. The largest differences were recorded for the logic problems, particularly the problem with the cards and the one on frequency estimation concerning the French language (problem C). The smallest differences were recorded for problems based on intuitive calculation (problems B, D and E) but generally, for all the problems the verbalisation rate was higher for those with educational qualifications than for those without.

Conversely no significant statistical link was found between the level of verbalisation and the type of studies of our respondents (chi2 = 4.52, ddl = 5, 1-p = 52.31%). Those with a qualification in pure science did not verbalise more or less than those who had studied more literary subjects or the social sciences for example. Similarly verbalisation was not found to be linked to the gender of respondents. Depending on the problem concerned, women or men may have verbalised a little more but the differences were negligible. The simple arithmetic average for verbalisation was 62.7% for men and 60.6% for women.



c) Errors and levels of studies

I shall now come to the key question of this section—is there an identifiable statistical link between the level of studies and the error rate? With no further suspense, I will immediately answer by revealing that this kind of correlation could be found but I should add that it only applied to certain types of errors. The link is not an immediately evident one but it nonetheless exists.

Let us begin with the problems where the difference was small or non-existent. This was the case for the two problem statements on the average variation rate (problems D and E). The first of these problems (D) involved estimating the final price of an object initially worth 5000 euros after a period of 20 years with a constant 10% inflation rate. The exact answer to this problem is nigh impossible to calculate mentally especially given that respondents only had 10 seconds to do so and that a rather complex algebraic operation is required.

The error rate for this problem was actually the highest recorded in our study because all categories together, only 3.88% of respondents managed a reply within the range close to the right answer—33,248 euros. 83% of individuals in our study sample underestimated the result, often by quite a way.

Problem E was symmetric to problem D which is why it was put at the end of the questionnaire. The error rate was also high for this problem—only 7.4% of our respondents gave answers between 7 and 9% (the right reply ≈ 8%).

For these two problems with high error rates, no significant difference was found between those with and those without educational qualifications. This is understandable insofar as these problems require an objective manner of proceeding rather than mental calculation which therefore means that respondents were on relatively equal footing because it was not a question of pure brain power.

Things were different for the other problems. The most intriguing thing for me was probably the results of the classic maternity wards problem (problem A). Here are the replies in the original survey run by the psychologists in 1972:

Large maternity ward	12	24%
Small maternity ward	10	20%
The two wards are equal	28	56%

The right answer got the least replies in Tversky and Kahneman experiment (which was confirmed in the survey): The small maternity ward has the most chance of holding the record of days with 60% and more births of boys during a whole year. This is because the larger the sample (the large maternity ward in this case), the better the chances of coming closer to the canonical average (*50% boys, 50% girls*). With a smaller sample (the small maternity ward), there is

a higher chance of the answer being different from this average.

For the rates of errors and of correct answers, there was hardly any difference between those with or without educational qualifications. 73.8% of those with educational qualifications were wrong compared to 74% of those without. However closer study of this point revealed one significant difference namely that there was more than one way of getting this problem wrong. Some respondents answered that both wards would be equal at the end of the year (this involved the representativeness heuristic) while others thought the larger maternity ward had more chance of winning the contest. In the first case, answers were based on a paralogistic conception of chance in which the random dimension is seen as homogenous and impartial (which is only the case for a large amount of occurrences) while in the second case, people think that the higher the number of occurrences, the more chance there is of an unlikely result occurring as if one were trying one luck at a difficult game and therefore that the big maternity ward would win the contest. In our survey, the former error was made by more respondents with educational qualifications and the latter error by those without qualifications. Over 51.1% of those with educational qualifications said the two maternity wards would be equal as opposed to 40% of those without qualifications whereas 34% of those without a qualification thought the big maternity ward would win while as opposed to 22.7% of qualified respondents.

For the following problem (problem B), the error rates were found to be significantly linked to whether respondents were with or without educational qualifications (chi2 = 7.58, ddl = 2, 1-p = 97.74%). The calculation involved is not complex but the time allotted for it prevented most respondents from getting the right answer apart from a few calculation prodigies (there were some in our survey). The respondents therefore tended to base their guesses on the provisional result obtained and were therefore victims of what cognitive psychologists call the anchoring heuristic. Given the procedure used to solve the problem, individuals were generally found to totally ignore geometric (or exponential) progressions and this was more the case with the educationally unqualified than the qualified. 95% of the former did not get the answer for 88.9% of the latter. The following result is probably even more revealing—among those who *did* get the right answer, 72% were educationally qualified.

The same was found with the problem involving the letter A. 18.7% of educationally qualified respondents wrongly thought there were more words beginning with the letter A in the French language than words whose second letter is A while 24.7% of the educationally unqualified gave that reply.

Whether the error rates for the whole of our sample population were high or low, the factor of the level of studies was found to have an influence. This link was even more significant statistically for the last problem (problem F), the one involving the cards.

Only 42.25% of our respondents got the correct red-red answer. However 52.2% of the educationally qualified answered wrongly as compared with the 63.7% of educationally unqualified respondents. This was the highest difference between the two categories (chi2 = 21.88, ddl = 2, 1-p = 99.99%) in our study.

d) Errors and the type of studies

We shall now discuss the impact of the type of studies on the proportion of errors respondents made. Unlike with verbalisation, we found that the former could indeed have an influence on the latter even if it is less pronounced than with the level of studies. As expected the type of studies factor had little significant effect on the average variation problems (for example, problem D: chi2 = 1.00, ddl = 2, 1-p = 39.42%) for the reasons discussed earlier. Those from a scientific background did not particularly better than those with more literary studies, for example.

Nor was there much influence on the maternity wards problem including in the distribution of errors between the two possible solutions. However "pure" scientists were less subject to the anchoring heuristic which had an effect on answers to the problem on multiplying 1 x 2 x 3 x 4 x 5 x 6 x 7 x 8 as only 79.5% of them were influenced by it compared with 93.5% of those with a literary background and 91.1% of those qualified in the humanities and social sciences. It is not impossible that their knowledge of mathematical language makes them more sensitive to geometric acceleration phenomena, albeit to a limited extent.

In parallel, and perhaps for symmetrical reasons, those from a literary background had a lower error rate (12.4%) than the "pure" scientists (18.9%) for the question on the frequency of words beginning with the letter A in the French language.

However, the scientists came out on top for the cards problem with 45.8% getting it wrong as compared with 53.8% of those with a literary background and 54% from the humanities and social sciences.

Overall however, we found that the *type* of studies had little influence (we divided respondents into the categories

"pure scientists", "literature/languages", "artistic", "humanities and social sciences" and "technical") with only the pure scientists distinguishing themselves from the other categories on just two of the problems. These results should also be interpreted with caution given that the number of respondents concerned is much smaller than when comparing replies on the basis of the level of studies or of gender for example.

e) The difficult question of gender

I considered the influence of gender on cognitive errors a delicate question but not without interest. Firstly we found that proportionally women made more errors than men on all the problems except for the letter A question. The first reservation that springs to mind is that this may be a structural effect insofar as women have a lower level of studies than men all generations together. Consequently it is possible that the differences between men and women in our survey may simply be down to an unequal distribution of educational qualifications. Furthermore when women do have educational qualifications they are more often in a literary subject rather than in sciences which could also explain why they did better on the letter A problem and less well with the cards problem. We have already seen that the types of studies had an influence on the error rates for these two problems.

To some extent the first argument can be accepted because our population sample was made up of 46.4% men without the "baccalaureat" and 53.6% of men with the "baccalaureat" and at least three years of further education. The reverse was true for women with 52% of our female respondents not having their "baccalaureat" and 48% with the "baccalaureat" and at least three years of further education.

It should however be noted that certain problems for which the error rate was no different for the educationally qualified and the educationally unqualified, such as the maternity ward question for example, *did* show a difference in error rate between men and women. A significant dependency (chi2 = 5.12, ddl = 1, 1-p = 97.63%) linking error and gender in this problem was found. Men were wrong in 72.4% of cases while the women got the wrong answer in 77.4% of cases. The same was found with the problem involving calculating an interest rate.

The last finding is the most troubling. I wished to see if there was a gender difference in error rates for just the educationally unqualified respondents. This of course eliminated the question of a difference caused by studies. The idea was to compare the respective answers of men and women without the "baccalaureat" to the cards problem for which, as we have seen, there was the highest level of discrimination between the educationally qualified and unqualified. If a gender difference in the error rates was linked to the level of studies, we would not have found a difference between both genders without the "baccalaureat" for this problem. However the opposite was the case—here too women gave more wrong answers that men, with 66.5% of women getting the answer wrong compared with 60.9% of the men in this category.

Therefore our findings show that the level of studies is quite probably not the only factor which may influence the likelihood of cognitive errors.

VI: CONCLUSION

The findings of this study no doubt provisional in nature and may perhaps be contested,19 if only because they are a little inconvenient in nature. However the possible real significance of these findings does make uncomfortable reading. Certain observers would no doubt be happy to read that this study suggests cognitive errors are not spread out through the population in as homogenous a fashion as a certain tradition of cognitive psychology had previously suggested. This would be an extremely strong argument against naturalism which considers that mental contents and cognitive biases are the consequence of biological determinism. However the idea of this paper is not to claim Cohen is right and Tversky and Kahneman are wrong. We should indeed bear in mind that even though the level of studies seems to be a discriminatory factor influencing cognitive errors, these errors contaminate our minds on a very general basis as this survey shows even more clearly. Furthermore even high-level scientific studies do not protect our ways of reasoning from the influence of "biases" which lead to us making cognitive errors.

Finally, we also need to bear in mind that the differences found between respondents with different levels of education are hardly spectacular and hardly ever exceed ten percentage points. It is also possible to discern a slight influence of social background on our capacity to analyse and deliberate which is in itself surprising given the important differences in educational qualifications in our population sample.

Therefore the idea of the half-full and half-empty glass seems the most suitable to describe how each person will react to the findings even though drinking the contents of that glass nonetheless seems essential.

NOTES

1 Try to answer the following question for example: *A woman has two children. One is a boy. What is the probability the other is a girl?* If you answer 50% and not 66.6% (which is the right answer) then you have just experienced the kind of mental phenomena which particularly interest Tversky and Kahneman.

2 On this point, the decade-by-decade description by Marcus and Zajonc (1985) of how the idea of rationality in psychology has developed is of interest.

3 By 1969, Tversky had already highlighted the descriptive weak points of the axiom of transitivity, for example.

4 We could cite numerous thinkers such as Aristotle, Cicero, Bacon, Malebranche, Descards, Condorcet among others who attempted to formalise ways of reasoning correctly by questioning evidence criteria and the attractive traps of sophism. In this context, a special place needs to be reserved for John Stuart Mill (1843) and we should also consider the contributions of Vilfredo Pareto *Trattato di sociologia generale*, Daniel Bernouilli solution for the St. Petersburg paradox in 1738 and Allais views (1953) on the model of relational choice. However, quite frankly all these contributions are just forerunners for the research carried out by Amos Tversky and Daniel Kahneman at the end of the twentieth century. Tversky and Kahneman recognise the work of their predecessors Paul Meehl (1954), and his research into the comparison between clinical predictions and statistics; Ward Edwards and his introduction, in psychology, to studies on subjective probability in the context of the bayesian paradigm; Herbert Simon (1957) and his programme for the study of reasoning strategies programme; Jerome Bruner (1957) who was among the first to provide an empirical illustration of this programme; Fritz Heider (1944) and pioneering work on the ordinary perception of causality.

5 For example Gardner (1993, p. 410): "Empirical research into reasoning carried out over the last thirty years has generally called into question the idea that humans—even the most sophisticated among them—proceed rationally and are even less likely to involve logical calculations in their reasoning" or Lewicka (1989, p. 269): "To say that they state that human cognition does not comply with the ideal of rationality would be a euphemism".

6 Some contest these "sure criteria" including Ajen and Kruglanski. Certain of Gigerenzer remarks (1991a, 1991b, 1993) can also be interpreted in this way.

7 This kind of conclusion could also be drawn regarding the study of the *Monty Hall* and "unwilling" Nobel prize winners which I discussed (Bronner 2007).

8 I would like to thank the 2002/2003 multidisciplinary degree students from the University of Nancy 2 without whose help this study could not have been carried out and also F. Mansuy who entered the data into the computer.

9 I did not choose these heuristics on an arbitrary basis—they were the three heuristics studied in the most depth by Tverksy and Kahneman.

10 The anchoring heuristic error is the tendency to base an estimation on a value which is already known and which may lead to error in some cases.

11 In fact it was the French version proposed by Lindsay Norman (1980).

12 The availability error is the tendency of individuals to estimate a probability or frequency based on the ease with which we are able to remember examples whose *type* seems to illustrate the event which is the object of estimation in a given problem.

13 $0{,}1 = \sqrt[20]{s / 5000} — 1 \Leftrightarrow s = (1{,}683)^{20}$

14 $tx = \sqrt[30]{s (15000 / 1500)} - 1$

15 For an analysis of this problem see Osherson (1990) or Bar-Hillel and Falk (1982).

16 Also, for reasons I will not go into here, the order the problems were done in was: D, A, B, C, E and F.

17 This also came to light in the 100 first "mock" questionnaires.

18 The Khi-square test was used throughout this quantitative survey.

19 However they correspond to the findings of previous studies as Boudon pointed out)2002) by referring to international comparative surveys on very different questions which nonetheless highlight the correlation between the level of education and the perception of the complexity of certain situations. Lazarsfeld (1993) showed that the main victims of Orson Welles famous radio hoax about the earth being invaded by aliens were people with a low level of education. However, among these Lazarsfeld pointed out that manual workers (with low levels of education then) with a diagnostic activity in their work were not more likely to adopt beliefs than their more educated. This last point is crucial as it suggests that the level of studies is less important in

this context than the type of intellectual activities in a person working life. This point would merit being the object of further research.

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Nation States, Statistical Groups, Individuals, and Other Groups

PAUL DUMOUCHEL

Graduate School of Core Ethics and Frontier Sciences
Ritsumeikan University
56-1 Toji-in Kitamachi
Kita-ku
Kyoto
Japan 603-8577

Email: dumouchp@ce.ritsumei.ac.jp
Web: http://www.ritsumei.ac.jp/acd/gr/gsce/s/pd01/index-e.htm

Bio-Sketch: Paul Dumouchel is Professor of philosophy at the Graduate School of Core Ethics and Frontier Sciences, Ritsumeikan University. He edited *Nationalisme et multiculturalisme en Asie* (L'Harmattan, 2010) and with Rieko Gotoh co-edited *Against Injustice the New Economics of Amartya Sen* (Cambridge University Press, 2009) and *Social Bonds as Freedom* (Berghahn Books, 2015). His other recent books include *Le sacrifice inutile essai sur la violence politique* (Flammarion, 2011), *Economia dell'invidia* (Transeuropa, 2011), *The Ambivalence of Scarcity and Other Essays* (Michigan State University Press, 2014) and *The Barren Sacrifice* (Michigan State University Press, 2015). Along with Luisa Damiano he is co-author of *Vivre avec les robots* (Seuil, 2016).

Abstract: This paper enquires into the complex ontology of groups. Methodological individualists suggests that groups can be reduced to the aggregation of individual actions. However, all groups are not, so to speak, born equal in relation to individual action. In particular I distinguish between two types of groups: what I call "natural groups" and "statistical groups". I analyze the different relationship which both types of group entertain with modern nation-states, as well as with different types of theories of justice. Central to my argument is the idea that different types of groups reflect the various ways in which we understand and divide the population and that the ontology of groups has fundamental epistemological and political dimensions.

According to Max Weber's original understanding of methodological individualism, "for the subjective interpretation of action in sociological work [these] collectives [states, associations, business corporations, foundations, etc.] must be treated as *solely* the resultants and modes of organization of the particular acts of individual persons, since these alone can be treated as agents in a course of subjectively understandable action" (Weber 1978). Or in the more modern language used by Joseph Heath (2005), methodological individualism privileges action theoretic level explanations This methodological choice which puts individual action at the center of the explanation does not rule out the importance of collectives, nor does it imply that these phenomena will always reflect the intentions of intentional agents, but it does suggest that in a sense groups do not exist; that they can be considered as, or reduced to the complex aggregation of individual actions. This paper enquires into the complexity of group ontology and how it affect social phenomena and policies.

It addresses the issues of various ways in which we divide the world and of group formation, in relation to questions of social justice and social policies, and more basically, with regard to how we understand social phenomena. The precise focus of the paper is the way in which we organize and divide human populations into different sub-groups: identity groups, vulnerable groups, ethnic groups, age groups, genders, minority groups and so on. These different groups form sub-sets of a total population. They are the main targets of social policies and constitute some of the central objects of our reflections in social justice theories. Thus, minority cultural groups or the 'least advantaged' constitute, so to speak, the 'moral persons' who lay claims to social justice, for example, residents (citizens or non-citizens) of foreign origin, single parents households, person aged more than 65,

African-Americans, foreign workers, cultural or linguistic minorities, etc. These are the type of 'objects' we talk about when we discuss issues in social justice. These groups also constitute the 'realities' that we feel we need to take into account when we devise social policies. The question I wish to address is not so much that of the nature and identity of these groups, for example, who are they and where do they come from? Rather, it is that of the way in which such groupings are constructed, or 'discovered'. How does this way of dividing the (social) world come about? What interests me is not the history and sociology of social groups, but their ontology, and the epistemology of the ways in which the average person as well as theories of justice and social policies classify and categorize human populations.[1] What types of objects are these divisions and associations? How do we come to know about them? These questions are both epistemological and political. To ask about them is to inquire into the epistemological dimension of politics.

In particular I am interested in the difference between two types of partitioning of a population, one that may be defined as 'natural' partitions and the other as statistical partitions. Both types of categorizations may lead to group formation, and especially to the creation of *autonomous groups*. However the type of autonomous groups, their characteristics and in particular their 'resilience', vary depending on whether or not the group emerged from a 'natural' partition of the population. Interestingly groups that occupy a special place in liberal theories of justice are usually constructed through statistical partitioning, while multicultural theories of justice are generally concerned with 'natural' partitions of the population. In conclusion I suggest that there is a kind of normal spontaneous agreement, a form of conceptual consistency between modern States, that hold the monopoly of legitimate violence, and statistical groups, and that such States have a much harder time dealing with groups that arise from natural partitions of the population, something which was not the case for example in traditional and even in modern (i.e. 19th century) empires.

THE 'NATURAL' PARTITIONING OF A POPULATION

First take any human population. How is it given? Through what process did it come to existence? How are its limits established? How were its borders determined? At this point we will not inquire into these questions. (Though we may have to come back to these issues since it is possible (likely?) that the process through which the original population was given, is not entirely different from some of the processes that allow us to identify or to create different sub-groups within that population).[2] To start let us just take the population as given. Given a population, I call a 'natural' partition of that population any division of the population that is evident for members of that population. For example, among any normal population of human beings the divisions into male and female, adult and children, young and old constitute natural partitions of the population. The same applies to the distinction between members of the (more or less extended) family unit and those who do not belong to the family unit. This division also constitutes a 'natural' partition of the population. These partitions of the population are not 'natural' in the sense that they are naturally determined, even though that is often claimed to be the case. In fact, they are not so determined, or at least not entirely, but are essentially social and cultural constructions. I call them 'natural' because they are evident to members of the larger population, as well as to members of the sub-population to which they correspond. They are readily recognized by all as constituting an important aspect of the world in which they live and are perceived by everyone either as given to them from birth, like the parent child relation, or at least as given to them from the outside, not only independently of their will, but in such a way that members of a natural partition of the population cannot exit the 'natural category' to which they belong.[3] 'Natural' partitions of the population are natural in the sense that they are based on evident perceptions shared by all, both those who are inside and those who are situated outside of the partition.

Thus 'natural' partitions of a population rest on the every day epistemology of average agents. It may be objected that the characteristics of persons which are evident to some individuals are not necessarily evident to everyone else. This is certainly the case. The term 'evident' as I use it here should therefore be understood as being 'relevance relative'. That is to say, which divisions of the population its members will recognize as 'natural' depends on the circumstances holding at that time within that population. Among certain populations the separation between slaves and free persons or between individuals of different ethnic or racial origins will be construed as 'natural partitions' of the population. At other times, and in other populations, such categorizations will not be viewed as natural in anyway whatsoever and in some cases they will not even be seen as a division. The same applies to divisions of the population according to religious, social or even political affiliation. What is evident and how it is evident may be quite different and often highly uncertain

from a purely epistemic point of view. For example, during the period when the various areas of Baghdad were being violently segregated between Shiites and Sunnis, Sunni insurgents often claimed that it was easy to recognize a Shiite by the way he or she walked.

It follows, as was suggested earlier, that there is very little that is 'natural' about 'natural partitions' of a population. These divisions and segregation are not 'natural' because they are grounded in nature, in biology or in some way inscribed in the structure of the universe. To the opposite they are culturally relative and interest relative, what makes them 'natural' is that they are spontaneous divisions that are evident to everyone, that is to say, to every member of the population in question. The fact that this evidence is 'relevance relative' implies that the 'naturalness' of the partitions of a larger population is a question of degree and of context. In any context, some partitions are more 'natural' than others. For example, it seems more 'natural' to divide the population of a bilingual university into speakers of one or the other languages, rather than on the basis of the height of students or the length of their hair, in spite of the fact these characteristics are just as 'evident'.

'Natural' partitions of a population are everyday epistemological tools. They reflect circumstances that are common to many members of the population and usually rest on relatively salient characteristics of individuals. In consequence, multiple 'natural partitions' of any population can coexist at any time. For example, in Japan I am a mature, non-Japanese, male, but I am also an English speaker and which characteristic is relevant will depend on the context. 'Natural' partitions of a population, divide that population, they 'organize' it. However partitioning is not the same thing as group formation, it merely is an epistemic operation. Rather, 'natural' partitions lay the ground for 'spontaneous' group formation in the sense that they reveal lines of separation that are evident for everyone. Groups that tend to reproduce those divisions, like linguistic or ethnic groups, also appear 'natural'. However, 'natural partitions' of the population neither immediately, nor necessarily lead to group formation.

'Natural' partitions of the population constitute a principle of organization that can be used whenever 'others', that is new unknown individuals are encountered. What I mean is that when individuals belonging to no known 'natural' partition of the population are encountered, the simple fact that they do not fit into any recognized category constitutes a 'natural' partition of the population. They are categorized as strangers, foreigners, aliens, barbarians, etc. This allows, in principle, for an exhaustive categorization of all members of the population.

THE STATISTICAL PARTITIONING OF A POPULATION

What is a statistical partition of a population? John Rawls in his *A Theory of Justice* (1971) claims that inequalities are only justified if they are to the advantage of all, and in particular to the advantage of the *least advantaged*. He immediately reminds us that principles of justice do not apply "to particular individuals who may be identified by their proper names" but to "representative persons holding the various social positions, or offices, or whatever established by the basic structure" of society (Rawls 1971, p. 64). Thus principles of (social) justice do not apply to Niu, to Noah or to Paul as such. They only apply to them inasmuch as they occupy certain social 'positions' or 'offices'; that is to say, inasmuch as they have particular social characteristics, for example inasmuch as they are professors, students, foreigners, immigrants, and so on. Principles of justice apply to persons, irrespective of who they are, of which particular individual they are and of what social or religious group they belong to because otherwise these principles of justice would fail to be universal. This means that principles of justice should apply independently of a person's position relative to most 'natural partitions', because 'natural partitions' of the population are what provides the social identity of different individuals. They are fundamental to determine that a person is this or that particular person, rather than simply 'an individual'. They specify a list of particular qualities which together determine, or mostly determine, the person's identity.

Who is, or who are then the *least advantaged* if they cannot be named? Imagine, for example, that you are asked to determine who are the least advantaged in Canada today. One, particularly simple (and likely inadequate) way of doing this in a market economy is to look at people's income. The least advantaged then will be those whose income is below a certain threshold. One belongs to the 'least advantaged' then if one has an income that is less than X. Alternatively, you may consider that income alone is an insufficient indicator of the relative advantages and disadvantages that determine individuals as more or less advantaged. Therefore you decide to take into account other variables. For example, life expectancy at birth, number of years of education, gender, different types of financial or cultural assets, etc. In any case, whether you chose a more complex or a simpler method, in the end you will come up with a collection of individuals, a

sub-set of the total population that is constructed on the basis of given criteria of choice. The 'least advantaged' then will be elements of that sub-set of the total Canadian population that is defined by the rule which allows us to construct that set: in the simplest case individuals whose revenue is inferior to X. This is a statistical partition of a population.

In what sense is such a division of the population statistical? Statistics, as the name suggests, are related to States. This is not simply an etymological curiosity. As many historians have documented the development of finer mathematical techniques characteristic of modern statistics went hand in hand with the national and international standardization of weights and measures, as well as with the establishment of national bureaus of statistics and the nationwide collection of data on numerous aspects of social life: birth and mortality rates, numbers of marriages, suicides, crimes, the volume of trade, employment distribution and so on (See for example Desrosières in note 1; also Datson 1988; Hacking 1990; Stigler 1986). All these things were made possible by the modern State, for counting social realities is not a purely mathematical exercise; it also requires power, resources and a properly disciplined population, all of which are only to be found in well policed states. Furthermore, you can only add, subtract, or compare what is to some extent alike. Gathering statistics rested on a process of homogenization of the population that is inseparable from the rise of modern States (Rae 2002).

Rawls, as well as most other advocates of theories of social justice, simply take for granted (why would they do otherwise) the existence of modern States and of the technical apparatus that allows us to determine, for example, who are the *least advantaged*. Such a partitioning of the population is statistical first of all because this way of dividing a population is only possible thanks to social tools that are part and parcel of the modern State's apparatus and thanks to mathematical techniques whose development is inseparable from the rise of the modern State.

There is a second reason, an epistemological reason, that justifies qualifying such partitioning of the population as 'statistical'. One of the goals of statistics is to render visible what, so to speak, either cannot be seen or usually cannot be seen by the naked eye. For example, the average age of those who are unemployed, the ethnic origin of employees in different trades and occupations, the correlation between average income, years of education, and life expectancy, the percentage of women in higher education, all these things that are not clearly seen by the 'naked social eye', statistics reveal. Unlike 'natural partitions' statistical partitions are usually 'invisible' to individual social agents. Even though everyone may agree that in an unequal society it is a logical truth that some must be least advantaged, who these individuals are is not necessarily evident. Furthermore, the relevance of statistical partitions of the population is not evident to all in the way that 'natural' partitions are evident. In the case of 'natural' partitions that evidence I argued earlier is 'relevance relative', and the greater the relevance of a partition the more it is viewed as 'natural'. In the case of statistical partitions just as the partition itself is not evident, not readily visible, its relevance is not shared by all. For example, mortality tables may be of great interest to life insurance companies, but they leave most of us rather indifferent. No one (or only few?) would think of organizing social life on the basis of categories of individuals divided by life expectancy, such a way of organizing our social world, unlike a social organization according to national, linguistic, or gender differences or according to age groups, would in no way appear 'natural'. The relevance of a statistical partition to some individual social agents taken severally may be great, but this importance is not clear to others and often it is not even clear to those who are concerned by it.

STATISTICAL PARTITIONS AND GROUPS

The way in which we partition the world, in 'natural' or in statistical partitions, has consequences for the types of groups that can be 'built' on the basis of these partitions. These consequences may to some extent be described as sociological, but they can probably best be viewed as ontological. They concern the nature of the different types of groups that one or the other form of partitioning may sustain. They also pertain to the way in which different groups *exist*, they pertain to the *mode of existence* of different types of groups.

Statistical partitions are subsets of the population and as such they can immediately be viewed as groups or as collections of individuals. However, unlike subsets that result from 'natural' partitioning of a population, there is a sense in which such statistical groups only exist as a result of collecting the statistical data to which they correspond. Their existence nonetheless is not purely mathematical as they are the result of the jointly statistical and political operation that determines the sub-set of individuals which constitutes the collection. Individuals, members or elements, of the sub-set have an independent existence, but the group itself, for example, the *least advantaged* defined by a given criterion or procedure only exists as a result of the operation that deter-

mines who they actually are, for example, those whose income is inferior to X.

Take a different example: single parent households. In many countries persons who live in single parent households are the target of special social policies. Where these policies exist, members of single parent households form a group, a sub-set of the total national population, a collection of individuals that is singled out for particular treatment on the part of social agencies. This collection only exists as the target of such policies through the operation that defines the necessary characteristics for individuals to qualify as members of a 'single parent household'. It may be that members of that group also share other common characteristics, for example, they all belong to a certain age bracket or happen to mostly live in cities. These individuals however do not *need* to satisfy any of these other characteristics in order to be part of that collection; they may be young or old, rich or poor, male or female, of different religious or ethnic origin, etc. All of these other characteristics are irrelevant as far determining whether or not they belong to the 'single parent household' collection. Therefore, even when statistical groups also constitute 'sociological' groups, or classes, defined by characteristics that are by widely shared by their members, like education level or the income of the parents, most often these other social characters will also corresponds to statistical partitions. They will be characteristics that generally are invisible to the 'naked social eye'.

The way that statistical groups are constructed (invented or created) entails that individuals who belong to them do not need to know each other, or to be related to each other, in any other way than that of, for example, living in single parent household or having an income that is inferior to X. These groups are statistical because the only thing that holds them together as a group is the rule that defines this particular collection of persons as that group, irrespective of who these individuals may happen to be or of any and all social relations that may exist between them. The rule that defines statistical groups as groups is external to the group. Not only in the sense that it is given to the group, that is also true of the criteria that defines 'natural partitions', but in the sense that it cannot be perceived by the members of this particular subset, or utilized by them to form an autonomous group. In order for that to be possible the statistical group first has to be (generally directly) instituted by being statistically defined by a power that is external to the collection.

An extreme, and particularly tragic, but in many ways revealing example of this political and methodological procedure is the group of all-Cambodians-who-wear-glasses. In Cambodia during the Pol Pot's regime, those who wore glasses were singled out for particularly harsh treatment. Wearing glasses was seen by the Khmers Rouge as a sign of bourgeois and intellectual tendencies, therefore those who wore glasses clearly needed to have their ways reformed. Question: does the group of glass wearing Cambodians exist? In a sense it does, as a mathematical subset of the Cambodian population, just as the group of all Cambodians who are more than 2 meters tall and just as that of the *least advantaged* exists. However until one of those groups is targeted by a specific policy there is a sense in which it only exists virtually. If you prefer, it only exists mathematically but not socially. Once it becomes defined by a social procedure the group gains a different type of existence. At that point it becomes possible to number its elements, to imprison them, to reduce their food ration, or to make them eligible for welfare and financial help. Considered as a social group, rather than as a simple mathematical class, the group of all Cambodians wearing glasses or the *least advantaged* does not exist otherwise than as the result of the operation that constitutes its members as objects of a particular State policy. As a group it does not have any existence independent from the State policy that determines it from outside the group itself. The individual members of these groups exist independently, but statistical groups themselves do not have any social existence exterior or prior to the operation that constitutes them as a group.

In fact once a State has sufficiently homogenized its population, statistical groups can emerge without the direct intervention of the State, granted that the State allows individuals access to tools that permit these groups to become 'visible' and their members thus to gain knowledge of each other. Once such a group becomes visible, either as a result of having been directly defined and instituted by the State's power, or by some other instance, it can give rise to an autonomous group. Such a group arises when individuals who form the statistical group recognize each others as member of the group, realize that they share common interests and create institutions, for example, newspapers, clubs, associations that allow them to defend these interests and to act in common.

AUTONOMOUS GROUPS

Unlike statistical groups, some groups actively distinguish themselves from the larger social environment. A political party, a religion, an association, a terrorist network are examples of such groups. These groups are autonomous in

that they accomplish by themselves the operation that distinguishes them from the rest of the population. This is not a claim concerning the origin of the group. For example, a professional group may exist as the result of a charter that was granted by the State to certain individuals, the army, or a paramilitary force come to existence through an explicit act of the government. As mentioned above, any statistical group can, in principle, give rise to an autonomous group. Such groups actively distinguish themselves from the larger population. They have rules, which they administer by themselves, which determine, among other things who is and who is not a member of the group. Interrelations between members of the groups are different from the relations members entertain with non-members. If all members of an autonomous group do not necessarily know each other, they usually can recognize each other as members of the group, and therefore actively distinguish themselves from non-members. Finally, autonomous groups are poles of cohesive and collective action. Members of autonomous groups can refer to themselves as "we" and they can engage in coordinated shared activities. That is why autonomous groups like the army or some other administrative service that have been created by a different and superior authority (the State), can, and often do, escape the control of that authority.

Statistical groups inasmuch as they only exist through the operation that defines them, never manifest this kind of independence. Individuals may be disqualified as members of a statistical group, because they fail to qualify, or because of some action they did, but statistical groups themselves do not act. They do not actively distinguish themselves from their environment, but are defined from the outside through an operation that alone sustains their existence. However, statistical groups can 'give rise' to autonomous groups through institutions that organize some elements of a statistical groups into members of an association, a party or a movement. I say 'give rise to' rather than 'transform itself into' an autonomous group, because the autonomous group will never exactly correspond to the statistical group. The reason why this is so, is because an autonomous group that arises from a statistical group will always be a voluntary association, while the statistical group out of which it emerges, by definition is not a voluntary association.

We can distinguish two types of autonomous groups, voluntary association and involuntary association. Statistical partitions of the population only give rise to voluntary association autonomous groups, while natural partitions of the population usually support involuntary association autonomous groups. In this case the way in which a person comes to join the autonomous group may, but need not be independent of his or her will, but the most important characteristic of involuntary association autonomous groups is that individuals cannot willfully exit the group. Many times leaving the group is simply not an option. For example, in many traditional societies division by gender[4], a natural partitioning of the population, also leads to the formation of autonomous groups. Men and women form groups that accomplish different task and act collectively for certain purposes. Men hunt, fish, collect fruit, and engage in warfare. Women tend gardens, prepare and cook food and raise children. These are autonomous groups inasmuch as they actively distinguish themselves from their social environment, and can act coherently as a group. They are not however voluntary association, not only because one does not chose to be born man or woman, but mainly because one cannot escape from the obligations and privileges associated with one's gender.

To the contrary my Austrian economist friend who for a long time belonged to the *Austrian Association for Slowing down Time*, a voluntary association for those who wish to be less in a hurry, had no difficulty leaving the association and adopting a different set of behavior. All voluntary associations constitute, at least minimally autonomous groups, and, in principle, it is possible to devise a voluntary association that attempts to match any division of a global population, whether it is a natural or a statistical partition of that population. However, voluntary association autonomous groups suffer from a particular weakness compare to involuntary association autonomous groups: the fact precisely that they are voluntary associations! That is to say, their continued existence rests on the explicit agreement of those who form the group. That is why the only means for a voluntary association to be sustainable in the long run is to transform itself into an involuntary autonomous association, something which happens when the exit cost becomes prohibitively expensive.

Natural partitions of the population usually give rise to involuntary autonomous associations simply because of the evidence of the criteria on which they rest, its social visibility prevents agents from escaping the partition. Because the criteria that defines a natural partition of the population is socially evident, it is extremely difficult to hide the relevant characteristic or, so to speak, to 'cheat', to pretend that one is not 'one of them'. For example, most people cannot successfully pretend that they belong to a language group that is different from the one in which they were born, and even those who can succeed, usually can only do so for some time and with some people only, not with everyone; sooner or lat-

er they will make mistakes that reveal their different origin. The main consequence of this difference between involuntary association autonomous groups and voluntary association autonomous groups, is that voluntary associations are much more fragile and, for the State, much easier to dissolve than involuntary associations autonomous groups.

GROUPS AND (SOCIAL) JUSTICE

As suggested earlier by Rawls's quotation from *A Theory of Justice*, liberal theories of justice tend to construe the targets of social interventions as statistical groups. It is to such groups that principles of justice apply, that is to say, to individuals in virtue of the various social positions or offices that they occupy and not to persons that can be identified on the basis of their proper name, or of natural partitions of the population. This is not entirely surprising given liberal theories of justice are individualistic theories according to which only individual human beings, or aspects of their life, can be intrinsically good or valuable. Such theories are consistent with the fact that statistical groups, in a sense are not really groups, but collections of individuals, sub-sets of the total population.

Members of statistical groups do not have a shared history. They do not have common rules, or any way of saying 'we' when they refer to themselves, apart from the procedure that determines them as elements of that collection, as in "we are those who receive welfare checks" or "we are those who were not born on the national territory". This inability to act as a group can only be remedied if the statistical group can give rise to a voluntary association autonomous group that takes upon itself to speak for the members of the statistical group. However as mentioned earlier, the statistical group and the voluntary association will never coincide perfectly and this will always raise issues of legitimacy: who can speak for the members of the statistical groups? There is a sense then in which statistical groups can be defined as 'transparent groups'. That is to say, they tend to disappear as groups in the eye of the procedure that collects them into a group, only remain visible the individuals that are the elements of the collection. This transparency of statistical groups can be illustrated with the help of the Rawlsian concept of a 'representative person' which we encountered earlier. A representative person is anyone who satisfies the particular criteria that define the sub-set of individuals which interests us, for example the least advantaged, determined by an income lower than X. The group has 'disappeared' from Rawls's text and all that remains is the abstract concept of a representative person. However it would be wrong to consider that statistical groups are not groups at all, that they are not groups in any sense whatsoever, and that they entirely disappear in the procedure that determines their individual members for special treatment. For it is as members of such groups, as unemployed, or as head of a single parent household, that persons are entitled to financial aid, to fiscal advantages, or to health care benefits, and not as particular individuals who can be identified by their proper name. These groups are real, because they can become the target, the object of particular actions or policies which are directed to them as groups, rather than towards the specific individuals who make them up.[5]

To the opposite, the objects of (and the agents active in) multicultural policies and multicultural theories of justice most often are involuntary association autonomous groups, or at least members of natural partitions of the population. Ethnic groups, cultural, linguistic and religious minorities usually correspond to division of the general population that are evident (and to a large extent that seem relevant) to all. The fact that they are rooted in natural partitions of the population constitutes both an advantage and a disadvantage for such groups. An advantage because as poles of initiatives involuntary autonomous groups can put forward claims and do not need to wait for the state to define them as deserving or requiring special treatment. A disadvantage because given that they are involuntary associations autonomous groups, they inevitably challenge the authority of the State, in a way statistical groups and voluntary association autonomous groups necessarily do not, for the very simple reason that these latter groups depend on the State for their very existence.

There is, in fact, a spontaneous convergence and agreement between modern nation-states, characterized by the monopoly of legitimate violence, and statistical groups. It is not only liberal theories of justice and liberal democratic states that find it easier to deal with statistical groups, but also all modern nation-states that rest on the monopoly of legitimate violence, because statistical groups, not only do not imply any allegiance other than to the State, but further can only exists, can only become socially visible through the agency of the state, or at least with its permission.

This convergence can be illustrated it seems by some recent changes that took place in Chinese society. Yunxiang Yan (2009) in *The Individualization of Chinese Society* shows how in the last few years the rise of consumerism in China has led to the protection of some individual rights, in particular of the rights of consumers[6] Recent consumerism, Yan

argues, constitutes an expression of the development of individualism. While before 1990, buying big consumer items often required the economic power of a social network involving extended kinship, today's consumer market is driven by the preferences and desires of individuals who have to a large extent broken free of this dependence on groups and natural partitions of the population. One consequence of this individualization, is that being the victim of a fraud, or of having bought a faulty or fake product from now on is essentially being a member of a statistical group. Those who have bought a fake or defective product do not share anything in common apart from the fact that they have bought a fake or defective product, and they do not represent anyone else than themselves. In order to join the China Consumer Association or any other Chinese consumer protection group all you need to do is to want to, these are voluntary association, but it is probable that many of those who want to become members also belong to the statistical partition defined by these dubious commercial practices. Interestingly enough, argues Yan, not only did the Chinese government not oppose the development of consumer protection groups, but actually encouraged their creation. When later on it came under sufficient pressure from them, the Chinese government promulgated laws protecting consumers and institutionalized the services offered by consumer protection groups which had spontaneously emerged from the burgeoning Chinese civil society.

The attitude of the Chinese government toward these consumer protection groups who were openly critical of the government and who publicly argued in favor of new regulation is very interesting. While the Chinese government is generally highly sensitive of many forms of criticisms, to which it often reacts strongly, in this case it actually encouraged it! Why? Of course there may be some evident economic reasons at work here, but these economic reasons do not explain why in this case criticizing current policies was considered legitimate and even encouraged. From an economic point of view repressing the criticism and modifying the regulation would have been just as efficient and more in line with what we has often been the Chinese government's response to criticism since 1989. Furthermore the Chinese Communist Party has been ready to suffer important economic drawback when it felt that the political stakes were high enough, as it did after the Tiananmen Square crisis. Why then were the protests of consumer groups encouraged and respected while those of ethnic minorities, like Tibetans or Uyghurs, and those of religious groups generally repressed and silenced? Part of the answer, I suspect is that unhappy consumers form a statistical group, while ethnic and religious groups correspond to natural partitions of the populations which modern states always see as threatening.

Modern states have an affinity with statistical groups because, as we have seen, such groups do not exist as groups otherwise than as a result of the operation of the state. Statistical groups also satisfy the ideal that there should not be any 'intermediary groups' between the state and individuals. In the absence of the operation that institutes a statistical group there are only individuals. The state in consequence can create or 'erase' a statistical group simply by changing its policy and will only have to face the opposition or reaction of a collection of individuals, not that of a group.

NOTES

1 As Desrosières (1998) shows clearly in this context, the political and epistemological aspect of social categorizations are inseparable: political decisions made methodological innovations relevant and theoretical discoveries inspired new politics.

2 For an analysis of the relation between States and groups that is more complete and general see Dumouchel 2015.

3 This inability to exit is to be understood as a social impossibility rather than an intrinsic incapacity. For example, it is logically possible to change one's class affiliation or one's religion, or even today one's gender, but there are many social situations where no matter what you do you will remain a kulak or a Christian all your life. In such cases being a kulak or a Christian constitutes a natural partition of the population.

4 Division of a population by gender is often referred to in ethnology as 'sexual division of labour'.

5 This criteria is to some extent similar to that put forward by Ian Hacking some years ago concerning the existence of non-observable entities in physics. See Hacking 1983).

6 See especially chapter 9 "The Politics of Consumerism", pp. 207-241.

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