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THE MIND-BODY PROBLEM AND SOCIAL EVOLUTION

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This paper is in part an adapted version of a paper that I have presented in various versions in various places and to different audiences since 1995. It is far from a finished product, and it has not been published. The section on group selection is adapted from a paper presented at the 1998 ASSA meeting in New York. That section is even less of a finished product. I decided to include it anyway, as it addresses a topic that has attracted much attention lately.

1. Introduction

One of the problems of the evolutionary approach to social science is how to explain the relationship between individuals and social institutions, and particularly the role of conscious and creative acts of individuals. It seems obvious that a theory of social evolution cannot do without a theory about the role of the human mind in the world. This is particularly true of the transfer of knowledge and culture. The human mind itself is a product of evolution. Consequently, every evolutionary theory has to pronounce itself on the links between the human mind and its biological and social environment.

In philosophy, human knowledge in an evolutionary perspective is the domain of what has become known as evolutionary epistemology. This is a recent discipline, though not quite as recent as one of its most important exponents suggests. Konrad Lorenz presents his *Beyond the Mirror* (Lorenz 1973) as the first attempt towards a natural history of human knowledge. However, there are at least two earlier attempts, curiously enough by two fellow Austrians: *The Sensory Order* by Friedrich Hayek (SO, Hayek 1952) and *Objective Knowledge* by Karl Popper (OK, Popper 1972). Both address the problem of human knowledge as an evolutionary phenomenon. There are more similarities. Popper and Hayek share an active interest in psychology, epistemology and methodology (and more in particular the methodology of the social sciences), the theory of social institutions (including human language), and political philosophy. Underlying the differences and the parallels between Popper and Hayek are their mind-body theories. They are quite different and these differences have far-reaching consequences for the rest of their thought, including that on social and cultural evolution. That is what I will concentrate on most in this paper. The tools of the paper are in part those of intellectual historiography, and the main characters of the story are Hayek and Popper. But the problems (and the solutions proposed) are more general.

Popper's interest in evolution and biology starts around 1960 (as Bartley 1976 mentions), so rather late in his career. He develops his three-worlds epistemology contemporaneously with his evolutionary epistemology. In the case of Hayek, the chronology is different. Evolutionary ideas appear at the very beginning of his intellectual career. They are part of his cognitive psychology, which dates from 1920. They subsequently (and somewhat paradoxically; see Birner 1999) disappear, only to re-emerge when he was preparing *Sensory Order* for publication (the book was published in 1952), so starting around 1945. As a young man, Popper, too, was interested in psychology. But unlike Hayek, he assigns a different place to psychology in the whole of his own work and in epistemology in general, as we shall see.

Evolutionary research in social science has developed on different levels of aggregation or analysis. For instance, in the neo-institutionalist tradition, Richard Nelson's and Sidney Winter's theory focuses on changes on the level of industries, while Oliver Williamson's approach chooses the human individual as the basic level of analysis.¹ The issue of the right level of analysis is regaining a central place in scientific discussions.² Although this may seem to be of no more than methodological interest, it turns out that it is crucial to the content of social theories as well, as it involves the role of human individuals, their knowledge, and their behaviour. The most elementary level (at least for methodological individualists) on which the problem can be studied,

¹ For a discussion, see Vromen 1994.

² An illustration: at a session of an IIASA workshop at Laxenburg Castle, in Austria, some participants brought up the matter of the exact meaning of "routine" in Nelson's and Winter's work. The questions concentrated mostly on the aggregation levels where routines are located. Fourteen years after the publication of their book, the two authors failed to give a satisfactory, answer.

is that of the relation between body and mind. It is there that mental and physical environments interact (at least for non-Hegelians and other collectivists). We shall see that this is one of the points that deeply divides Popper and Hayek. Not only are these differences the consequences of different philosophical ideas, they themselves have important consequences for the evolutionary approach to social science.

The paper is organized as follows. I first discuss a number of similarities between the methodological and social-philosophical ideas of Hayek and Popper. I then proceed to discuss their theories of evolution. There, the differences between them will become apparent. I will argue that these differences are due to their different approaches to the mind-body problem. Next, I will argue that Popper and Hayek, though they have common roots in the works of Kant and Hume, have taken different roads from there, and that these differences have far-reaching consequences for all their ideas, including those on knowledge and evolution. Before drawing some (too few, too hasty) conclusions, I discuss of the relationship between one of the most important products of the human mind, science, and evolutionary theories of society.

2. Against obscurantism

Popper and Hayek share the same methodological ideas about the status of the theory of evolution. In their early work, they do not consider it to be a scientific theory, but rather a general framework which enables us to understand systematically the emergence, the selection and the survival of physical and behavioural characteristics. Later, they both change their minds in the sense that they consider evolutionary theory to be scientific, even though they continue to deny the existence of laws of evolution. This idea about biological evolution carries over into Popper's and Hayek's concepts of the nature of explanation in social science. Both are opposed to approaches based on the supposed existence of historical laws. One can find Popper's anti-historicist critique in his *The Open Society and Its Enemies* (Popper 1945) and *The Poverty of Historicism* (Popper 1957), while the most important work by Hayek on this subject is *The Counter-Revolution of Science* (Hayek 1955). Popper's main intellectual enemies are Plato and Hegel, while Hayek's are Comte and Saint Simon. What Popper and Hayek put in the place of historical laws of social development is the concept of institutions as unintended consequences of individual actions.

Their anti-historicism is closely related to their criticism of relativism. Hayek's *Counter-Revolution of Science (CRS)* criticizes all doctrines that are not based on the method of rational reconstructions in accordance with the so-called method of composition (p. 90). This method offers at least some guarantees of objectivity in the sense that theories can be submitted to empirical tests. The "true individualism" proposed by Hayek (cp. Hayek 1945a) is based on the recognition of the limited powers of the individual mind. It is this which enables Hayek's approach to avoid the epistemological conceit that is typical of collectivism (*CRS*, p. 91). He argues (*CRS* p. 90) that if the truth of propositions is no longer discovered by observation and argument, but is made to depend on the social position or class of those who express them; or on the instinct of a particular people; and if, more in particular, in social science the way in which social categories are defined is only ruled by intuition, there will be no limit to the possibility of the abuse of reason.³

Both authors apply their methodological criticism to practical and political problems. Popper does so beginning with the two above mentioned works, Hayek in a series of publications, the most

³ Retranslated into English, the title of the German edition is *Abuse and decadence of reason*.

important of which are *The Road to Serfdom* (Hayek 1944), followed by *The Constitution of Liberty* (Hayek 1960) and the three volumes of *Law, Legislation and Liberty (LLL)* (Hayek 1973, 1976, 1979). It seems likely that he was influenced by Popper's *Open Society* when he wrote *The Road to Serfdom*. The historicism which Hayek criticizes is a type of theory of evolution (or rather a theory of development).

The belief in the limitations of our knowledge is a cornerstone of the methodology of both authors. In *Die beiden Grundprobleme der Erkenntnistheorie (DBG)* (Popper 1979), Popper quotes Socrates: "I know that I know almost nothing". Popper translates this concept into his social philosophy of "piecemeal engineering", the idea that social institutions can be changed only a little at a time. It is through the feedback of the effects of very partial changes, and in a practical rather than a theoretical way, that we will learn to understand the possibilities of social change and to minimize the risk of destroying the complex and fragile framework of society. According to Popper, this helps us to avoid the sin of cognitive arrogance (to use a Hayekian term) that characterizes inductivist methodologies.

In Hayek's work, too, the limited scope of human knowledge is one of the the important unifying themes, from *The Road to Serfdom* and "Individualism: True and False" (Hayek 1945a) to his last work, *The Fatal Conceit* (Hayek 1988). Both make this idea one of the foundations of their methodologies. Popper's falsificationism is well-known. But Hayek, too, seems to advocate falsificationism. For instance, the first chapter of *Monetary Theory of the Trade Cycle* (Hayek 1933), which is devoted to methodology, leaves the reader with the impression of a falsificationism *avant-la-lettre*:

"The dependence of statistical research on pre-existing theoretical explanation hardly needs further emphasis. [I]t must look to theory for guidance in selecting and delimiting the phenomena to be investigated. The oft-repeated assertion that statistical examination of the Trade Cycle should be undertaken without any theoretical prejudice is therefore always based on self-deception." (p. 38)

The reader is reminded that the first edition of this work, in German, was published in 1929, and thus precedes Popper's *Logik der Forschung* by some five years.⁴ The idea of Hayek as a falsificationist finds further support in Hayek's memoirs (collected in *Hayek on Hayek*, Kresge & Wenar 1994, particularly pp. 49 and 52). He recalls an experience which was very similar to Popper's, when he encountered the ad-hoc evasion of falsifications by Marxists and psychoanalysts. This notwithstanding, I will argue later on that there are profound differences. But before going into that, let us first have a look at the ideas about evolution that we find in both authors.

3. Hayek's theory of social evolution

Hayek develops his evolutionary theory in "Notes on the Evolution of Systems of Rules of

4 Other passages reinforce the impression of Hayek as a falsificationist: "It is ... only in a negative sense that it is possible to verify a theory by statistics." (p. 34). Again, on the same page: "[statistics] cannot be expected to confirm the theory in a positive sense (...) since it would presuppose an assertion of necessary interconnections, such as statistics cannot make." On the following page, Hayek continues: "There is no reason to be surprised, therefore, that although nearly all modern Trade Cycle theories use statistical material as corroboration, it is only where a given theory fails to explain all the observed phenomena that this statistical evidence can be used to judge its merits." (p. 35).

Conduct” (Hayek 1967, henceforth “Notes”) in *Law, Legislation and Liberty* and in his last book, *The Fatal Conceit* (Hayek 1988, henceforth *FC*). Since this last book is most often referred to by commentators, I will for the moment limit myself to a brief summary of what can be found there. There are three kinds of evolution in human affairs: genetic evolution, which produces instincts and instinctive behaviour, the evolution of rational thought, and cultural evolution. The last type is located between the first two, in time, logically, and psychologically. Instinctive behaviour is sufficient for the co-ordination of the actions of individuals within small primitive groups, the members of which have common perceptions and objectives, and are motivated by the instinct of solidarity. On the other hand, within the developed and “abstract” society (or, which is the same, the “extended order”), which is too complex to be fully understood by the human mind, co-ordination is ensured by abstract rules that have developed gradually. These rules govern private property, honesty, contracts, exchange, commerce, competition, profit, and the protection of privacy. Those rules are transferred by tradition, learning, and imitation (*FC*, p. 12). There is a continuous tension between the rules governing individual behaviour and those governing the functioning of social institutions. The formation of supra-individual models or systems of co-ordination have forced individuals to change their natural or instinctive reactions (*FC*, p. 13). Indeed, they try to oppose these systems. “Disliking these constraints so much, we can hardly be said to have selected them; rather these constraints selected us: they enable us to survive.” (*FC*, p. 14).⁵ The institutions that emerge, are the result of certain individuals stumbling upon solutions to particular problems in a process of competition. Indeed, competition as a process of discovery is part of every type of evolution (*FC*, P. 19).

Hayek repeatedly emphasizes the importance of imitation in the transfer process. However, each type of environment (or developmental stage of society) requires its own type of rules, and following the rules that are adapted to one type of environment in another, may lead to disaster. “If we were to apply the unmodified, uncurbed rules of the micro-cosmos ... to the macro-cosmos (our wider civilisation)...we would destroy it. Yet if we were always to apply the rules of the extended order to our intimate groupings, we would crush them.” (*FC*, p. 18).⁶

The fact that rules become more and more adapted to the survival of the social order is due to the continuous experimentation that takes place through the confrontations between different orders. The primacy of the social order can also be found in Hayek’s idea of the human mind as the product, and not the producer, of cultural evolution. The mind works by imitation rather than by understanding or reason, and is mainly transmitted within the family (*FC*, p. 23; in fact, Hayek speaks of “the transmission of the mind”). The mind not only consists of knowledge that can be put to the test, nor of individual interpretations of reality, but rather of the capacity to suppress instincts.

On pages 25-6 of *FC*, Hayek compares social and biological evolution. In biological evolution, acquired features cannot be inherited. In a social environment, however, they can be transmitted by instruction. What produces cultural evolution is the transmission of behaviour patterns, and

⁵ See the comments by Witt 1995 and Shearmur 1995. For a similar criticism see below.

⁶ The question what number of individuals would constitute the boundary between the primitive group and the extended order finds an interesting answer in Robin Dunbar’s *Grooming, Gossip and the Evolution of Language* (Dunbar, 1996). He shows that the number of social contacts, and so the extent of the group, that can be managed by a single individual depends on the relation between the neocortex and the rest of the brain. Basing himself upon studies of primates, Dunbar shows that this relation leads to a value of about 150 individuals for humans. Later on I will return to the relation between this subject and the function of language.

information, not only from parents to offspring, but also from innumerable other ancestors. Its Lamarckian character makes cultural evolution much faster than biological evolution. Finally, cultural evolution largely (sic!) works through the selection of groups. We will discuss group selection later.

4. Popper's "early" theory of evolution

In what follows, I will make a distinction between two versions of Popper's theory of evolution. Though I will refer to them as his "early" and his "late" theories, it is difficult to find a hard chronological distinction in Popper's work. That is due to the fact that he often waits very long before publishing his work, and that he continues to revise and extend publications when they are republished. Anyway, what I mean by Popper's early evolutionary theory is what can be found in *Objective Knowledge* (first published in 1972). The earliest systematic appearance of his "late" theory is probably his Darwin lecture of 1977.⁷ In the paragraph on group selection it will become clear why I think the distinction is important.

The explicit starting point of Popper's evolutionary epistemology (a term coined by Donald Campbell) is his theory about the place of the human mind in the world. He conceives of it as a more general theory than a theory about the relationships between mind and body. In order to make this clear, Popper introduces the distinction between Descartes' problem and Compton's problem (see the next paragraph). The second motivation for this distinction lies in Popper's ideas on determinism and indeterminism. Popper calls physical determinism "a nightmare" because it cannot accommodate creativity. If true, the doctrine of determinism is incoherent because it must explain all our reactions as effects of merely physical conditions. However, this reaction includes those which to us appear to be beliefs that are based on arguments (*OK*, p. 224). But what raises the most exciting problem of all is the confrontation between the idea of the existence of abstract and non-physical entities and a theory of evolution.

"For if we accept a theory of evolution (such as Darwin's) then even if we remain sceptical about the theory that life emerged from inorganic matter we can hardly deny that there must have been a time when abstract and non-physical entities, such as reasons and arguments and scientific knowledge, and abstract rules, such as rule for building railways or bulldozers or sputniks, or, say, rules of grammar or of counterpoint, did not exist, or at any rate had no effect upon the physical universe. It is difficult to understand how the physical universe could produce abstract entities such as rules, and could then come under the influence of these rules, such that these rules in their turn could exert very palpable effects upon the physical universe." (*OK*, p. 225)

Popper adopts physical indeterminism, saying that what we need is a theory of "plastic controls", something between determinism and total indeterminism or chance. Popper calls this problem of the influence of the content or the meaning of abstract entities *Compton's problem*. He considers this problem to be more important than the mind-body problem, the one he calls *Descartes' problem*: how can mental states influence and control the physical movements of our limbs (*OK*, p. 231). In order to solve these two problems, Popper presents a new theory of evolution, one, moreover, that succeeds in combining freedom with control in a chapter of *OK* which bears the

⁷ That the distinction is not very hard is demonstrated by the fact that the idea of ecological niches, which I will argue is typical of Popper's "later" theory, makes its appearance in chapter 5 of *Objective Knowledge*, "Of Clouds and Clocks", which was written in 1965. However, for my thesis on the origin of this concept, which I present in the section on group selection, this does not make a difference.

title “Of Clouds and Clocks”.

Popper’s solution of Compton’s problem makes use of Karl Bühler’s theory of the evolution of the functions of language. According to Bühler, in the development of the human species, the first function of language to emerge is that of the expression of subjective states of consciousness. The function which develops afterwards is signaling, while the third function to evolve is that of description. Popper adds a fourth function, which cannot exist without the others: argumentation. Popper’s solution to Compton’s problem is (*OK* pp. 240-41) that the higher functions of language have evolved under the pressure of the need of gaining a better control of the lower functions, and of the need to adaptation to the environment, thanks not only to new physical instruments, but also to new theories. Abstract contents and meanings and higher functions have evolved at the same time. They help us to control our environment in a “plastic” way because they are adaptable. In other words, our theories do not *force* us to do anything, they just *enable* us to gain a better control of the environment.

In *Objective Knowledge* Popper presents his evolutionary theory in the following theses (*OK*, pp. 244-4):

1. Every living being is involved in a continuous process of problem-solving.
2. These problems are objective in the sense that they can exist even in absence of a conscious counterpart.
3. The solution of problems follows the method of trial and error-elimination.
4. Error-elimination may consist of the complete removal of failures or of the evolution of controls involved in changing or suppressing unsuccessful organs, behaviour forms, or hypotheses.
5. The ontogenetic development of the single organism partly reproduces the phylogenetic development, including the development of the system of controls.
6. The single organism itself is a spearhead of evolution in that it is a tentative solution to the problem of survival. Thus, it is related to its phylum as the actions of the single organism are related to that organism.
7. Evolution follows the sequence problems, solutions, error-elimination, towards new problems: $P \rightarrow S \rightarrow EE \rightarrow P' \rightarrow \text{etc.}$
8. Rather than only one solution, usually several contemporaneous solutions are involved in this process.
9. This model can be compared with neo-Darwinism, where the problem is survival, and the tentative solutions are many: the variations or mutations.
10. Popper’s model is different from neo-Darwinism in that not every problem is necessarily a problem of survival.
11. The difference between P and P’ shows that problems often turn into new problems. Evolution is creative (“emergent evolution”).
12. In Popper’s model the mechanisms of feedback and control may operate without killing the organism. Our hypotheses may die in our stead. In fact, the higher speed of social evolution is due to conscious efforts devoted to criticize hypotheses. Notice that according to Popper, social evolution is Darwinian and not Lamarckian. (See *The Self and Its Brain – SIB*, Popper & Eccles 1977, p. 459). Every living being consists of a hierarchical system of adaptable controls. As Popper puts it: clouds controlling clouds. Popper presents his theory of conscience as inter-active control as a solution to the problem body-mind.

5. When does a theory qualify as a theory of evolution?

Popper's theory of evolution is more general, detailed and systematic than Hayek's. I will therefore use it as a point of departure for comparing both. This will involve a summary of Hayek's other work on evolution as well, with the exception of "Notes", which will be discussed toward the end of this paper. Popper argues – correctly – that any theory of evolution must be capable of explaining three phenomena: the source of variations (mutations) and the level on which they arise; the process of selection and the units or entities upon which it operates; moreover, for an evolutionary theory to be Darwinian, it must distinguish between, the retention of features which help survival (replication) and the units which survive, or the level on which this process can be analyzed.

Variation

Hayek discusses variation in his economic work between the 1940s and '60s under the heading of competition. But he offers no explanation. Indeed, in "Individualism: True and False" (Hayek 1945a, p. 15) Hayek speaks of the unlimited variety of talents and capacities of human beings as a fundamental supposition. Instead of explaining variation, as Popper does, Hayek presupposes its existence. Contrary to what one might have expected, he does not explain variation in terms of, for instance, the path-dependent evolution of different individual minds. In the *Constitution of Liberty* of 1960 the source of variation in individual behaviour is the individual who, at his own cost and risk, experiments with new forms of behaviour. This corresponds to an idea which, according to Bartley (Bartley 1976, p. 479-80), is generally accepted in biology. The idea is that structural changes are always the result of preceding changes in behaviour. It is one of the presuppositions in *CL* (1960). Hayek leaves the explanation of variation in a rudimentary state.

Selection

According to Popper, the most important idea of Darwinism is that of random variation.⁸ The random character of variation is consistent with Popper's indeterminism and anti-justificationism, and his opposition to the existence of a logic of discovery (paradoxically the title of his magnum opus). Discovery is at the most accessible to psychological inquiry. The only concession he makes on the point of the logic of discovery is in his theory of the correspondence principle, i.e. the idea that science makes progress and develops by means of generalizations which are partly corroborated by previous theories.

According to Hayek, what causes the selection of rules of behaviour are the contributions to the social order which an individual makes by following these rules. So, selection depends (at least partially) on the valuation by others members of the same social order. In his later work, the selection criterion is the number of people which a certain order can keep alive. The feature of social Darwinism that he criticizes most is precisely the idea that individuals are the units of selection (*LLLI*, p. 23). For Hayek, the group is the unit of selection in the process of social evolution. This may seem to contradict the methodological individualism that is one of the main tenets of Hayek's work before 1960. I agree with the suggestion that there is no such inconsistency provided variation and selection are seen as operating on the level of rules:⁹ individuals may invent new rules, social institutions may consist of sets of such rules, and these institutions may survive or be eliminated. However, this risks being circular. If order can be defined as a certain

⁸ See *OK*, p. 242: "The neo-Darwinist theory of evolution...is restated by pointing out that its "mutation" may be interpreted as more or less accidental trial-and-error gambits..."

⁹ See Vromen 1994.

set of rules (which is consistent with an unpublished manuscript of Hayek's, "Systems within Systems", about which more will be said later), describing the change of an order in terms of a change of one or more of the rules constituting it, is a tautology and does not describe a causal process.

But there is another sense in which the analysis in terms of rules does not solve the problem. In the case of a single individual a rule is something different from a rule, or a set of rules, in the sense of a social convention. In yet another sense one may speak of selection at the level of a group. For a rule to survive, that is to be reproduced, it is necessary that a sufficient number of individuals follow that rule. There must be a sufficient "mass", and perhaps also a particular distribution, of individuals, who follow a particular rule. For instance, a rule which is imposed by all primary school teachers is more likely to survive than one imposed by university professors.¹⁰

According to Hayek, cultural selection takes place through Lamarckian instruction and involves the emergence of institutions. But he does not describe the mechanism in any detail. According to Popper, on the other hand, the process is Darwinian and may involve conscious decisions taken by individuals. Selection works through explicit criticism by individuals.

I have already discussed the mechanisms which, according to Hayek, guarantee transfer and retention: tradition, learning, and imitation. By tradition Hayek seems to mean the social rules or the institutions that have survived selection in the past. He provides very little clarification of the role of learning or nature of learning. Popper's work is more illuminating here: "There are three senses of the verb "to learn" which have been insufficiently distinguished by learning theorists: "to discover", "to imitate", "to make habitual"." (OK 149). Hayek only recognizes the last two meanings at the level of the individual. After *The Constitution of Liberty* (CL, 1960), discovery is presented as an exclusively social process. The fact that Hayek focuses more and more on imitation in his later work, confirms the idea that he sees the individual as a passive rather than an active element in the process of transferring knowledge.

Transfer and retention

For Popper, transfer and retention involve an active role of the individual. The hypotheses which have survived attempted falsifications are retained, but never accepted definitively. While in Hayek's perspective the heritage of the past becomes ever more strongly established as time goes by, according to Popper no part of our knowledge can be immunized, neither against criticism nor oblivion. This is even the case with that part of our knowledge which has proved to be stable and which figures in Popper's discussion of the correspondence principle (see OK, Chapter 5; see also Post 1971).¹¹ Notice that, according to Popper, the opposition between Darwinism and Lamarckism coincides with the distinction between selection and instruction, and has its parallel in the contrast between falsificationism and inductivism.

We can summarize the two evolutionary theories as follows:

¹⁰ See Kaufmann's comment on Sewall Wright's theory in *The Origins of Order* (Kaufmann 1993, p. 10), and Witt 1995.

¹¹ This principle is the only feature in Popper's evolutionary thought that may be said to show Lamarckian features.

	variation:	selection:	retention, transfer:
Hayek:	<i>competition</i> <i>CL: discovery</i> <i>of new rules</i>	<i>competition</i> <i>between groups</i>	<i>tradition, imitation,</i> <i>learning</i>
units:	<i>rules</i>	<i>groups</i>	<i>rules</i>
Popper:	<i>“mostly” random</i>	<i>criticism</i>	<i>corroboration</i>
units:	<i>hypotheses</i>	<i>hypotheses</i>	<i>hypotheses</i>

6. The place of the human mind in the world

As I observed above, the mind-body problem occupies a prominent place in the work of both authors. Hayek discusses it in terms of the relation between the sensory and physical orders (“one of the most intriguing problem of philosophy.” - Hayek 1982, p. 291). In the physical order, events seem similar or different to the extent that they produce similar or different external effects. In the sensory order, events are classified according to their sensorial properties. Hayek concludes that it is impossible to answer the question whether the two worlds exist as “objectively” different worlds. The word “existence” even has no meaning in this context (Hayek 1982). This is contrary to what Popper says.

The differences between the two evolutionary theories are due to the different ideas Popper and Hayek have about the place of man, or rather, of the human mind, in the social world. (We will see later that all their other differences find their origin here, too.) In order to maintain the objective position of knowledge and the role of criticism, Popper needs an independent position of the mind, and, moreover, an intermediary level between objective ideas and the physical world. That is why he introduces worlds 1, 2 and 3. For Hayek, the human mind belongs to the domain of social evolution (see *LLL*, p. 43; *ITF*). In his system, the mind does not succeed in freeing itself from that constraint. Although from here it is still a long way to the mind-body problem, let me repeat at this point that every difference between Hayek and Popper is due exactly to their different solutions to that problem. I will give the argument below. Let us start by examining what differences there are between the ideas of Popper and Hayek.

As we have seen already, Popper distinguishes two problems: Descartes’ problem, or the mind-body problem, and Compton’s problem, which he considers to be more fundamental. The latter concerns the influence that abstract entities have on the physical world. Remember that in “Of Clouds and Clocks” Popper poses the question as follows: “what we want is to understand how such non-physical things as purposes, deliberations, plans, decisions, theories, intentions, and values, can play a part in bringing about physical changes in the physical world.” (par. XI, emphasis deleted). This may seem to be the same problem that Hayek raises in *SO*. However, that conclusion would be wrong. Hayek addresses only Descartes’ problem:

“Our task is (...) to show in what sense it is possible that within parts of the macrocosm a microcosm may be formed which reproduces certain aspects of the macrocosm and through this will enable the substructure of which it forms part to behave in a manner which will assist its continued existence.” (*SO*, 5.78)

Hayek's formulation speaks neither of purposes, nor of plans, intentions etc. It is completely consistent with physicalism, and even with determinism.

7. The influence of Kant and Hume

The differences (and I mean *all* the differences) between Popper and Hayek hail from their different solutions to Kant's and Hume's problems. But let us start with what they share. They agree with Kant's general observation that human knowledge has some elements which "precede" empirical knowledge. Knowledge is impossible without abstract categories and theories. Popper and Hayek fill this in differently. One of the "philosophical consequences" of *SO* is the idea of the similarity of minds as a condition for interaction and understanding (both on the object and meta-level). We may say that, on the social and methodological level, Hayek gives an interpretation which is both empirical and a priori, in the manner of Leibniz' monadology. There is a pre-established order which enables us to observe the social world: the structure of our mind is similar to that of the objects we study.

"If everything that we can express (state, communicate) is intelligible to others only because their mental structure is governed by the same rules as ours, it would seem that these rules can never be communicated. This seems to imply that in one sense we always know not only more than we can deliberately state but also more than we can be aware of or deliberately test; and that much that we successfully do depends on presuppositions which are outside the range of what we can either state or reflect upon. This application to all conscious thought of what seems obviously true of verbal statements seems to follow from the fact that such thought must, if we are not to be led into infinite regress, be assumed to be directed by rules which in turn cannot be conscious" (Hayek 1963, pp. 60-1 ; a note refers to *SO* and to Gödel).

Notice that from the fact that we know more than what we are consciously aware of, it does not follow that we cannot criticize activities that are based on implicit knowledge (this is basically Popper's criticism of the "myth of the framework"). Notice also that, for Hayek, the role of the social sciences only consist of construction or classification according to the compositive method. This is consistent with instrumentalism rather than realism.

One of the important differences between Popper and Hayek lies in their ideas about what we can *do* with our knowledge. According to Popper, our knowledge consists of hypotheses that may be false. For Hayek they are the unquestionable basis not only of our ideas but also of our behaviour. According to Popper, by continuously changing our point of view and our theoretical perspective, we will be able, at least in principle, to "cover" the whole world. For Hayek on the other hand, there is always a blind spot, and it is always the same: our own mind. Notice that for Hayek the fact that certain types of knowledge are implicit, apparently means that these cannot be discussed critically. That leads to the problems that Bartley discussed in his *Retreat to Commitment* (Bartley 1984). At this point, it is useful to distinguish between two different meanings of "implicit knowledge". One is that of knowledge that underlies our behaviour without our being aware of it. Yet, this knowledge is in principle susceptible to explanation (by the social sciences). The other is that of knowledge that underlies our behaviour without our being aware of it and without it being susceptible, in principle, to explanation. This would be the blind spot that does not change with changes of perspective. Bartley denies that this type of knowledge, or principle, exists.

As to Hume's influence on Popper and Hayek, we may observe that Hume's thought lies at the

beginning of two different roads. Whereas Popper follows the path of scepticism and anti-inductivism, Hayek takes the empiricist and conservative direction. Nevertheless, they largely use the same vehicles. At the beginning of both their careers it was psychology, Karl Bühler's in the case Popper, and the psychology of more physiologically-orientated authors in the case of Hayek. The direction taken by Popper leads him to the idea that our knowledge consists of hypotheses which we can actively and consciously try to improve. The path followed by Hayek leads to passivism and a conservatism which considers the individual to be reactive rather than active. While logically speaking determinism and inductivism are separate doctrines, they form a natural alliance. That is because inductivism provides the most direct causal explanation of the formation of beliefs (and knowledge). In the same way, there is a natural alliance between indeterminism and falsificationism. Bartley 1978, p. 709, approvingly quotes Watkins' identification (in the latter's contribution to the Schilpp volumes devoted to Popper) of anti-inductivism and anti-determinism as the two central elements of Popper's thought. Popper explicitly distances himself from the conclusions which Hayek (and others) draw from Hume's scepticism, accusing him of being a disappointed inductivist.

“And as to Hume, his irrationalism was based, exclusively, upon his correct finding that induction is impossible - exactly as Polanyi's anti-rationalism. But this perfectly correct finding has no anti-rationalist consequences - except if you are (as Hume and Polanyi) a disappointed inductivist.” (Letter of Popper to Hayek, 11 November 1958)

The anti-rationalism which Popper ascribes to Hayek must be understood as applying to the level of the individual. After all, Hayek defends Rationality (“with a capital R”) as a uniquely social phenomenon. For him society is a kind of super-computer.

8. Psychology and the theory of knowledge

In *DBG* (a collection of manuscripts from 1930 to 1933) Popper devotes a paragraph to the possibility of a cognitive deductive psychology (II,4). He clearly says that he is in favour of a strict separation between psychology and epistemology (“Die strenge Trennung zwischen der Tatsachenfragen der Erkenntnisfindung von den Geltungsfragen der Erkenntnistheorie”, p. 19). This is the contrary of Hayek's approach in *SO*, whose last chapter has the title “Philosophical Consequences”. There it seems that his own theory leads him into confusion. Let me explain. Hayek distinguishes between classes formed by *implicit* links, that express themselves in our discrimination of sensory qualities, and classes defined by *explicit* relationships. The latter replace the former following the disconfirmation of our expectations (*SO*, (8.15). That distinction is the basis of Hayek's idea that part of our knowledge is not controlled by experience, and that as our knowledge becomes more and more removed from sensory qualities that are immediately given, a growing part of our knowledge is sedimented in definitions. Therefore, that knowledge is necessarily true (*SO*, 8.19). This idea is confirmed in the next paragraph, where Hayek speaks of the progressively tautological character of our knowledge. Paradoxically, Hayek, who takes his point of departure in an empiricist theory of the Humean kind, lets himself be diverted by his own elaboration of the same theory to the point of arriving at distinctively anti-empirical conclusions.¹²

¹² About his position vis-à-vis empiricism Hayek says that, rather than criticizing it from the outside, he has led it to its logical conclusion: “in so far as we have been led into opposition to some of the theses traditionally associated with empiricism, we have been led to their rejection not from an opposite point of view, but on the contrary, by a more consistent and radical application of its basic idea. Precisely because all our knowledge, including the initial order of our different sensory experiences of the world, is due to experience, it must contain elements which cannot be contradicted by experience.” (*SO* 8.27)

What is true for psychology is also true for science in general, as he writes in paragraph 8.24. Science tends necessarily towards an end state in which all knowledge is represented by definitions of its objects. The problems of the theory of social evolution in Hayek's later work - and especially his failure to describe clearly the selection mechanism - seem to have their roots here. All this, already incoherent in itself, is also inconsistent with the scientific realism that Hayek proposes in the same paragraphs. Cp. *SO* 8.28 where he says:

“we must assume the existence of an objective world (or better, of an objective order of the events which we experience in their phenomenal order) towards the recognition of which the phenomenal order is only a first approximation. The task of science is thus to try and approach ever more closely a reproduction of this objective order - a task which it can perform only by replacing the sensory order of events by a new and different classification.”

So there is a tension between classification as the goal of knowledge, and this realism. He himself seems to feel this tension. Immediately following this passage he specifies what he means by objective order. By objective order Hayek means that it is possible to construct a more consistent image of events in the world (*SO*, 8.29).¹³ And even though he is somewhat ambiguous about this, he returns to a non-realist position in the following paragraphs. The ideal of science is not to obtain a complete and faithful description of phenomena (as it is for positivism), but it consists of a continuous search for new classes. A search, that is, for ““constructs” which are so defined that general propositions about the behaviour of the elements are universally true.” (*SO* 8.31). The terms of these definitions are the relations among these elements. If they were in terms of sense impressions, they could not transcend subjectivism.¹⁴ Hayek's hesitating between instrumentalism and subjectivism on the one hand, and realism on the other, is the more surprising as he contemporaneously upholds an epistemological approach which seems to be evolutionary. At least, he discusses the selection of representations of the environment . Only those which are meaningful, will be retained.

Hayek's thesis of the similarity of minds as a necessary condition for social life and social science - being a variant of the introspection doctrine - gives rise to the suspicion that, in the end, Hayek is a justificationist. How reliable our knowledge is, depends on the method by which it is obtained. Hayek shares this justificationism with Menger (cf. Birner 1990). For Popper, on the contrary, one of the elements that makes his epistemology an evolutionary, and even a Darwinian epistemology, is random variation (which is consistent with his indeterminism). That contrasts strongly with Hayek's insistence on tradition, imitation, and the dependence of rules of behaviour from the social and institutional framework. In conclusion, we may observe that Hayek's epistemological naturalism leads him to his methodological anti-naturalism

9. Epistemology and the knowing subject

Popper explicitly invokes the existence of a “world-3” of objective contents of our thoughts. According to Popper, this hypothesis, together with his idea of plastic controls (i.e. physical indeterminism), enables him to solve Compton's problem. In Hayek, on the other hand, every time

¹³ This gives rise to the suspicion that Hayek's (implicit) truth theory is the coherence theory.

¹⁴ Apparently, the introduction of relations among the elements makes definitions more than subjective. This is strange, because the way in which the relations are defined can also be subjective.

one would expect to find this objective aspect, it is lacking, beginning with *SO*. Instead of Popper's methodological optimism, which is connected with the idea that we can change social institutions, Hayek stresses the limits of our knowledge even more than Popper does. There is a connection between Hayek's defence of the positive qualities of the spontaneous order and his methodological scepticism. This is consistent with the idea that the acquisition of knowledge in an evolutionary framework is an open-ended process, rather than one that leads to one unique system of scientific classifications. However, that is not what one finds in *CRS*, where classifications are the ulterior categories, not of explanation (since explanation is not the goal of social science), but of "the activity of the social sciences". Nor does one find this idea of a unique end state in "The Facts of the Social Sciences" (Hayek 1943), where Hayek exaggerates his subjectivism to the point of becoming inconsistent with his own theory of the business cycle.¹⁵ But it can be found in the last chapter of *Sensory Order*, where he, remarkably enough, says that such a definitive classification exists. On this latter point, Hayek makes a jump, at is were, from the subjectivism of the classification system, which evolves during the history of the individual, to the objectivity and immutability of the final system of classifications. In this way, he saves the realist epistemology which is implicit in his thought (compare his criticism of relativism in *CRS*). In all other cases, he does not go beyond a dualism which coincides with Popper's first two worlds (that is, the world of physical objects, and that of states of consciousness). This is confirmed by what Hayek says in *SO*: "we shall never be able to bridge the gap between physical and mental phenomena" (*SO* 8.45), and "we shall permanently have to be content with a dualistic view of the world" (*SO* 8.47). And although he says this in a discussion of reductionism (as a matter of fact, the paragraph is called "Dualism and materialism"), he does not make any effort to present a theory about the interaction between body and mind. What he offers instead is a theory that we may call "causal and uni-directional". Mental and physical phenomena are different even though they are produced by the same mechanism. This, according to Hayek, is the only non-materialistic theory (*SO* 8.43). He defends himself against the accusation of epiphenomenalism, which he calls a "double-aspect theory" (*SO* 8.44). He admits that his psychological theory implies the rejection of a dualism between the forces governing the human mind and those governing the physical world (*SO* 8.46). As was observed above, Hayek's dualism is a practical one (*SO* 8.47, 8.87) in the sense that there are no objective differences between mental and physical phenomena; yet, the limitations of our mind force us to refer to mental categories when we explain mental phenomena.

The idea of non-intentional consequences is crucial for Popper's world-3 and its objectivity (see, for instance, *OK* p. 136). The same idea is one of the foundations of Hayek's social theory. But in his work there is no analogue to Popper's world-3. What we find instead is the idea of rationality as a social phenomenon, of knowledge as the result of past experience, and of implicit rules and social institutions. While for Popper the development of science is a social process, this is one among several other aspects. The most important aspect of science is the objectivity of world-3: "we.... owe to the third world especially our rationality...." (*OK* 147). What the social framework contributes is intersubjective criticism, and criticism means: to examine the objective consequences of the ideas which belong to, and constitute, the world-3. In Hayek, on the contrary, objective knowledge (in the two senses of having non-intentional consequences, and being inheritable) completely coincides with the social aspect of knowledge; rationality is only a social phenomenon. That, at least, is the image we find in the writings that are explicitly concerned with the subject. In his work of the 1950s and 1960s, the individual (and by consequence his knowledge) plays a more central part. This critical spirit is present in *CRS*, especially in the

¹⁵ See Birner 2001a.

passages that are explicitly anti-relativistic, and also in *CL*. In Hayek's later work, the active, innovative and critical individual gives way to conservative elements on the supra-individual level of traditions and social institutions. After a relatively brief absence, reason as a social phenomenon (the basis of the true individualism of Hayek 1945a) resumes its place in his work.

Reading *OK* helps us to deepen our understanding of the fundamental differences between Popper and Hayek. Popper identifies any epistemology that has no place for world-3 with subjectivism. He speaks of "the neglect of the third world -and consequently a subjectivist epistemology..." (*OK* 140, emphasis added). If we apply this to Hayek, we have Popper's criticism of Hayek in a nutshell: Hayek's empiricism leads to epistemological subjectivism. This is confirmed by our analysis of Hayek's works of the 1930s and the 1940s works on the methodology of social science and on subjectivism. Hayek is a Humean pure-sang also in the sense that he shares Hume's belief that induction is logically impossible but at the same time psychologically necessary. His cognitive psychology, and above all the philosophical consequences he draws from confirm this. Let us confront this with Popper's observation in *OK*: "The growth of knowledge - or learning process - is not a repetitive or a cumulative process but one of error-elimination. It is Darwinian selection, rather than Lamarckian instruction." (*OK*, 144). Hayek even follows Hume to the extent that he considers reason to be subordinate to morality:

"the fatal conceit: the idea that ability to acquire skills stems from reason. For it is the other way around: our reason is as much the result of an evolutionary process as is our morality. It stems however from a somewhat separate development, so that one should never suppose that our reason is in a higher critical position and that only those moral rules are valid that reason endorses" (*Fatal Conceit*, p. 21).

This precedence of morality over reason stands in stark contrast with Popper's ideas, and with Popper's stress on human creativity that we find in *OK*: "Life proceeds ...from old problems to new and undreamt-of problems. And this process - that of invention and selection - contains in itself a rational theory of emergence." (*OK*, 146).

10. Popper's criticism of Hayek

Since the end of the Second World War, Popper and Hayek were colleagues at the London School of Economics (in fact, Hayek had Popper called to the chair of philosophy of science). They were in close contact, and ever since the late 1940s they were close personal friends. Considering their shared interest in matters psychological and philosophical, it would have been natural if Popper had referred, in *The Self and its Brain*, to Hayek's *Sensory Order*. He fails to do so. Yet, as we have seen, he cannot possibly agree with Hayek's psychology and epistemology. Perhaps Popper did not want to criticize his friend in public.¹⁶ What is Popper's criticism? The introduction to *Hayek on Hayek* (p. 28) gives us a clue. Hayek mentions an objection which Popper raised to *The Sensory Order* to the extent that it is based upon a *causal theory of perception*. And indeed, we find this criticism in a letter that Popper wrote to Hayek on 2 December 1952:

"I am not sure whether one could describe your theory as a causal theory of the sensory order. I think, indeed, that one can. But then, it would also be the sketch of a causal theory of the mind.

¹⁶ Yet according to Hacohen, during the 1940's Popper clearly criticizes what he considers the traces of historicism in Hayek. Cp. Hacohen 1995, p. 93.

But I think I can show that a causal theory of the mind cannot be true (although I cannot show this of the sensory order; more precisely, I think I can show the impossibility of a causal theory of the human language (although I cannot show the impossibility of a causal theory of perception).

I am writing a paper on the impossibility of a causal theory of the human language, and its bearing upon the body-mind problem, which must be finished in ten days.” (emphasis deleted)

The paper to which Popper refers is “Language and the Body-Mind Problem”, published in the *Proceedings of the XIth Congress of Philosophy*, 7, North-Holland, pp. 101-7.¹⁷ Later, he discusses the same problem in *The Self and Its Brain*, on pp. 57 ff. I will here concentrate on this later publication. This is what Popper says:

“However, when the radical physicalist and the radical behaviourist turn to the analysis of human language, they cannot get beyond the first two functions (see my [1953(a)]). The physicalist will try to give a physical explanation - a CAUSAL explanation [capitals added] - of language phenomena. This is equivalent to interpreting language as expressive of the state of the speaker, and therefore as having the expressive function alone. The behaviourist, on the other hand, will concern himself also with the social aspect of language -but this will be taken, essentially, as the way in which speakers respond to one another’s “verbal behaviour”. This amounts to seeing language as expression and communication.¹⁸

But the consequences of this are disastrous. For if language is seen as a merely expression and communication, then one neglects all that is characteristic of human language in contradistinction to animal language: its ability to make true and false statements, and to produce valid and invalid arguments. This, in its turn, has the consequence that the physicalist is prevented from accounting for the difference between propaganda, verbal intimidation and rational arguments.” (*SIB*, p. 58)

By physicalism and materialism Popper means the same doctrine. It is this doctrine that Popper has in mind when he calls Hayek’s theory of perception causal and hints that the corresponding theory of mind is causal, too. More precisely, he is thinking of the variant which in *SIB* he calls the identity theory. And while Popper admits that the identity theory is perfectly consistent and may even be true (*SIB* p. 56), the combination of that theory with Darwinism is false and subject to the same difficulties as epiphenomenalism.

Why is *The Sensory Order* an identity theory? Hayek maintains that it is impossible to reduce the sensory order to the physical order. As we have seen, in the physical order, events are similar or different to the extent that they produce similar or different external effects. In the sensory order, events are classified according to their sensory properties. Notice again the conclusions Hayek draws in the same article: it is impossible to answer the question if there are two different worlds which exist “objectively”; the word “existence” even has no meaning in this context. This allows us to conclude that the theory of *SO* is actually a variant of the identity theory.¹⁹ And indeed, in

¹⁷ Also in *Conjectures and Refutations*.

¹⁸ In the light of Hayek’s objective, the construction of a non-behaviourist theory, this is particularly striking. I will return to this below, in para. 11.

¹⁹ A causal theory of perception is inductive or “bottom-up” in the sense that sensory impressions cause neural

SO (on p. 191) Hayek says that the two ways of describing mental phenomena, in physical terms, are two alternative ways of describing the same phenomena. He admits that the dualism he upholds is practical, but that the order is one. He even puts forward a rather sophisticated argument to support this. It is based on his own theory of mind. But that does not change the fact that Hayek's mind-body theory is an identity theory. The argument (which will not be discussed here at any length) can be found in chapter 8 of *SO*. Its core is that every instrument of classification must have a higher degree of complexity than that which it classifies. As the mind is such an instrument, in order to describe - and for Hayek that amounts to classifying - itself, it must be more complex than itself. This is clearly impossible.

Let us return to Hayek's evolutionism of the mind. The theory of *The Sensory Order* is clearly evolutionary. For Popper's criticism to apply, it must be Darwinian. And, indeed, it is, if, following Popper, we understand by Darwinism the explanation of adaptation and survival. Cp. the passage from *SO* already quoted above: "Our task is (..) to show in what sense it is possible that within parts of the macrocosm a microcosm may be formed which reproduces certain aspects of the macrocosm and through this will enable the substructure of which it forms part to behave in a manner which will assist its continued existence." (*SO*, 5.78)

Although Popper never criticizes Hayek in his publications, we have been able to reconstruct some of his criticism. Likewise, one can try to find what some of Hayek's criticism of Popper is. This requires even more of an effort. In the discussion that follows "The Sensory Order after 25 Years", we find a critical comment. After declaring that he has been a Popperian *avant-la-lettre* in methodology, and that he never stopped being so, Hayek says that Popper has yet to convince him of the later development in his (Popper's) thought, such as "his neutral epistemology and his use of the three Platonian worlds". In Hayek's other published work we do not find any specific critical reactions to Popper's thought. But there exists an unfinished manuscript by Hayek called "Within System and about Systems; A Statement of Some Problems of a Theory of Communication", which contains important clues. Hayek mentions this manuscript in "The Sensory Order after 25 Years":

"in the first few years after I had finished the text of the book [*SO*], I made an effort to complete its formulations of the theory in one respect. I had then endeavoured to elaborate the crucial concept of "systems within systems" but found it so excruciatingly difficult that in the end, I abandoned the longish but unfinished paper that apparently nobody I tried it upon could understand" (Hayek 1982, p. 290)

The paper discusses the different functions of language that Karl Bühler distinguishes. The manuscript breaks off in the middle of an argument which serves to support the descriptive function of language in the framework of a causal theory of systems. In that passage, the system that Hayek discusses stands for the human mind. As we have seen, Hayek says that he put so much effort into the ms. It seems therefore reasonable to assume that the abrupt end is not due to accidental, external circumstances, but to his incapability to explain the higher functions of language within his own theory – *exactly as Popper predicts!* My conclusion is that Hayek's "Systems" manuscript is a direct reaction to Popper's criticism that he, Hayek has a causal theory of mind, and that such a theory has no place for the function of language as a vehicle of true and

activities, instead of being "top-down" in the sense that mind actively sorts and collects sensory impressions. The former model is consistent with models of neural works which were inspired by *Sensory Order*.

false proposition, and as a tool of criticism.²⁰

11. Group selection

But the matter does not end there. In 1961 or 1962, Hayek gave an address to the British Academy that was published in its *Proceedings* of 1963. Its title is “Rules, Perception and Intelligibility” (also published in Hayek’s *Studies*²¹). In a letter of 18 July 1962, Popper showers Hayek with compliments (“the first pages, which greatly impressed me”; “your very beautiful paper”, “I am greatly impressed by this paper”).²² Popper is particularly full of praise of the last section, with the title “Supra-conscious Rules and the Explanation of Mind”,²³ which is mostly an elaboration of the “Systems” manuscript.²⁴ The main message of that section is that “[i]f everything we can express (state, communicate) is intelligible to others only because their mental structure is governed by the same rules as ours, it would seem that these rules themselves can never be communicated.” (“Rules”, pp. 60-1). Despite his praise, it is on this point that Popper shows himself to be critical, saying that the unconscious frame of assumptions “can become conscious, especially if it is challenged and criticized; it is criticizable in principle . otherwise we end in relativism (and in Mannheim’s Total Ideology!).” That Popper nevertheless seems very lenient towards Hayek on this point – especially in view of his – Popper’s – criticism of the “myth of the framework”, is a bit surprising, but I do not want to dwell on this. For the purpose of this paper, what is more interesting is the following.

“Rules” is a description of how human perception and behaviour is guided by rules, how these rules are learned and communicated, and to what extent these processes involve an implicit or tacit framework. In Hayek’s *Studies* it is immediately followed by “Notes on the Evolution of Systems of Rules of Conduct”, with the subtitle “The Interplay between Rules of Individual Conduct and the Social Order of Action”. Whereas the former chapter discusses the *function* of rules, the emphasis in the latter is on their *evolution* . It is there that Hayek first introduces the idea of group selection. Now, in further correspondence between Popper and Hayek in the early 1960s, one of the topics is the relationship between abstract society and concrete groups.²⁵ During the 1960s,

20 Apart from these criticisms and rather implicit reactions, there are some occasions on which each author tries to incorporate some of the other’s ideas in his system. It is striking that this inevitably produces tensions. For instance, when Popper in his article about the methodology of the social sciences (“The Status of the Rationality Principle” of 1967), lets himself be influenced by Hayek, he comes up with a theory that is full of elements that are alien to the rest of his system.

²⁰ But neither is it consistent with Hayek’s thought; for although Popper introduces a model of rationality which owes a lot to the theory of rational choice that underlies economics (including Hayek’s economics), he formulates it in terms of the rationality of the individual. When Popper published this essay, the published version of Hayek’s theory of rationality as a social phenomenon was more than twenty years old. Likewise, when Hayek tries to introduce Popperian elements in his system, such as realism and falsificationism, this creates tensions, and the result is an incoherent mix. In the above, I have already put forward the argument about the tension between realism and instrumentalism in Hayek’s theory of science

21 Hayek 1967a. The chapter will be referred to as “Rules”.

22 That Popper is also critical of paper may perhaps be deduced from his advice to Hayek to make the text of the paper independent from *SO*, relegating any references to the footnotes.

23 “Section 9 is the best, in my opinion. It is really exciting.”

24 As is apparent, for instance, from the last paragraph. There, Hayek says that, in order for two causal systems to communicate their perceptions and actions to one another, they need to have a common set of rules that cannot be communicated. This is exactly what he had tried to explain in the ms.

25 A piece of circumstantial (historical) evidence of Popper’s and Hayek’s close interaction in this period is that fact that Popper dedicates *Conjectures and Refutations* (1963) to Hayek, while Hayek dedicates *Studies* (1967) to Popper.

Popper started to revise his ideas on evolution, which resulted in his apparent abandoning of methodological individualism in favour of “downward causation”, which he attributes to Donald Campbell (cp., for instance, “Natural Selection and the Emergence of Mind”, Popper’s Darwin lecture of 1977). At first glance that may seem curious, since group selection appears to be in violation with methodological individualism (to which both Popper and Hayek subscribed in their early work).

But before going into Popper’s later theory of evolution, it is useful to examine why Hayek introduced group selection in the first place. The answer can be found in a note by Hayek to an unpublished manuscript with the title “The origins and effects of our morals: a problem for science”.²⁶ The note reads as follows:

“A chapter in the draft of a book on cultural evolution [Hayek probably refers to *FC*] threatened to explode in the process of revision ... till I found the key to mastering the unmanageable complexity of the process by making the starting point a fact I had already established in an earlier chapter Namely that cultural evolution, *unlike Darwinian evolution*, rests almost entirely on group selection instead of the selection of individuals. What has sometimes been called a “collective mind” group [sic] is nothing but the common morals of its members, something very different from and autonomous of the mind proper though of course in constant interaction with it.” (italics added).

My conjecture about Popper’s adaptation of his own theory of evolution and his adoption of downward causation is the following. Hayek’s concept of group selection set Popper thinking again about evolution. Popper tries to incorporate group selection in his own, Darwinian, theory of evolution, transforming it into a theory of the emergence and selective influence of ecological niches.²⁷ In doing so, Popper improves upon Hayek in that he demonstrates that group selection, even in the cultural domain, has no need of Lamarckian instruction. But Popper does not limit himself to a criticism of Lamarckism; in his later theory he also tries to repair what he considers to be defects of neo-Darwinism. He mentions the following. Neo-Darwinism offers no theory about the mix between hereditary stability and variability. Popper also criticizes the idea that of evolutionary ascent, viz., that in the course of evolution higher life forms survive. Popper’s criticism is that higher forms of life are not always more adapted than more primitive organisms, and he mentions overspecialized organisms in a changing environment as a counterexample. A further criticism is that if adaptedness is defined as the ability to survive, the theory becomes tautologous.

Popper’s solution consists of the following elements:

1. The instruments of individuals for problem solving are comportmental schemes which they try to adapt. These schemes are more important than anatomical variations. Mutations can only be successful if they fit into a behavioural scheme that already exists.
2. The individuals are the “instruments” of the species just like types of behaviour are the instruments of individuals.
3. Not all problems are problems of survival (an idea he had already adopted).
4. The emergence of behavioural novelty, including “behavioural monsters”, involves

²⁶ Box 96/126 of the Hayek Archives at the Hoover Institution of War, Revolution and Peace, Stanford

²⁷ Without attracting much attention. The ideas discussed here can be found mainly in Popper 1994, which contains a series of lectures he gave in 1969. If my argument is correct, then Popper underwent a rather rapid development in his thought on evolution, which took place during the 1960s. Popper’s development has its parallel in biology, although there, too, the idea has hardly gained foothold. Cp. Hertel 1997.

- (random) changes in the aims or preferences of individual organisms.
5. These always precede anatomical changes.
 6. Successful behavioural novelty creates new ecological niches; these act as units of selection.
 7. New ecological niches are examples of emergent evolution.
 8. Evolution does not proceed from primitive to superior or higher organisms, but from less to more complex ones. This is the major prediction of evolutionary theory.

Popper transforms Hayek's concept of group selection into a theory about the emergence and the selective power of ecological niches. Their origin lies in changes in behavioural patterns that are the answers to random variations in the aims or preferences of an individual organism. If the new forms of behaviour are successful, i.e., if they contribute to the survival of the organism, they may give rise to a *tradition*, which Popper defines as the long-term stability of behaviour patterns in the presence of alternatives. He contrasts this with *genetic entrenchment*, which he defines as the long-term stability of behaviour patterns without alternatives being present. If a tradition becomes the spearhead of genetic entrenchment, the organisms risk becoming extinct if a change in the environment occurs. Popper formulates the prediction that every genetic entrenchment becomes lethal in time (Popper 1994, p. 61), a prediction that can be transferred to the domain of social evolution. For instance, now that the alternatives to the market economy are rapidly disappearing, if a change in the environment occurs to which the market is not the answer, serious problems may arise (it would be premature to put this in terms of lethality).

Let us now briefly confront Popper's and Hayek's theories of evolution by confronting corresponding concepts, bearing in mind that Popper offers a general theory of evolution whereas Hayek limits himself to cultural evolution.

Popper	Hayek
Behavioural schemes	Rules
Random change in aims or preferences	Instruction
Ecological niche	Group
Evolution towards more complexity	<i>Idem</i>

Popper speaks of (his adapted) neo-Darwinism "simulating" Lamarckism. The expression is part of Popper's philosophy of science, and more in particular to his theory of the correspondence principle. The idea is the following. Progress in science is cumulative in the sense that more recent successful theories incorporate the true elements of earlier theories. If, moreover, the new theory can also explain why the old one was mistaken where it was mistaken, Popper speaks of a correspondence relation between the two theories. Often, the old theory, even though wrong, continues to be used for special cases (for example, Newtonian mechanics continues to be used for many applications, even though quantum mechanics is the better theory). That is why Popper speaks of the new theory simulating the old one: it produces in part the same results, even though it postulates another causal mechanism, one, moreover, that is capable of explaining phenomena the old theory cannot explain. The most conspicuous phenomenon in the case of social evolution that Popper's adapted neo-Darwinism "simulates" with respect to a Lamarckian explanation is the speed of cultural evolution.

More in particular, the advantages of Popper's approach over Hayek's are the following: In keeping with his own principle of the unity of explanation, Popper shows that biological evolution is not fundamentally different from cultural evolution. Popper's theory can account for rapid evolution without having to resort to Lamarckism. It accounts for world-3 and hence it is applicable to the evolution of the environment of conscious beings. It gives a plausible content to the concept of group selection, one, moreover, that does not violate methodological individualism.²⁸ In addition, it accounts for variation, something Hayek never explains. Finally, Popper gives a more general content to Hayek's idea that following rules that are appropriate for one particular social environment in a different setting may harm survival.²⁹

12. Self-reference as a problem for theories of cultural evolution

It is but a small step from the problem of the place of the human mind in reality ("Compton's problem") to that of science, technology, and values in society. According to Popper, there are two reasons for engaging in scientific research. One is purely epistemological: our desire to know. The other is the hope of improving the human condition by changing social institutions. We may say that Popper sees an opposition between individual rationality and social irrationality, in the sense that social phenomena are unforeseen consequences of individual actions. For Hayek, too, social phenomena are unintended consequences. However, in Hayek's thought the opposition is between individual irrationality and social rationality. For Hayek the set of social institutions are the bearers of rationality, whereas for Popper rationality is located in the individual and in the social process of science. According to Hayek, the rules which govern the functioning of society are mostly implicit. If we know them, we may be tempted to change them, which is dangerous. If we do not know them, we run the risk of destroying the grown order by not observing the underlying implicit rules. Either way, we have to recognize and accept that we must not change the institutions which have developed spontaneously. This is the main conclusion to which Hayek's work in social science leads. But then, of what use is social science? For the later Hayek, the only role that social science has in society is that of defending the status quo. This is very different from what the earlier Hayek says explicitly about social science and relativism. Compare the passage on p. 90 of *CRS*, already quoted above, where he defends the necessity of tests and objective criticism in order to avoid falling back into relativism. This passage can be read as a criticism by Hayek of his own later position. If it is true, as Hayek says, that his work on the methodology of social science led him back to theory of *SO*, and it influenced his theory of society, then this influence has been conservative. Hayek's rediscovery of his own psychological theory revived his conservatism.³⁰

28 Lindenberg published (in Dutch) a two-phase model of explanation which accounts for the emergence of collective effects (including unintended effects) which is consistent with methodological individualism. Cp. Lindenberg 1976. For reasons unknown to me, he later abandoned the model.

29 Cp. the passage in *FC*, p. 18, quoted in section 3.

³⁰ The manuscript of 1920 shows a principle of mental conservatism which seems to be quite powerful: "Die Vorstellung dass dies darauf beruht, dass auch scheinbar entschwundene Kenntnisse weiterwirken, dass also nichts, gar nichts, dass wir einmal erfahren haben, ganz verloren geht, ist überaus ermutigend." (p. 29)

For Popper our ideas are entities on which we can perform operations outside the world. Cp. Popper's reference to Einstein in *OK* to the extent that "his pencil is more intelligent than he". The human mind occupies a position independent from the world in which it exists. For Hayek it is almost the opposite: "our pencil" is always less intelligent than the social world it describes, a world that is a sort of super-computer. This makes the position of Hayek's theory itself paradoxical. If it is the product of the same social process that it describes, it is no longer able to criticize this process from the outside. Yet in order to justify its claim of being true, Hayek's theory must be independent from the world it describes. If Hayek cannot justify his theory by having recourse to the social world, there is only one possibility left: the status of that theory is that of a vision, or an ideology.

Hayek shares this visionary character with Marx. In the end, Hayek has no rational or coherent argument for preferring his own position to any other, and notably to socialism. His arguments that the market order is the best system according to a couple of criteria which he is not capable of justifying in any other way than by a moral argument is thus no more than a subjective belief. This is paradoxical twice over. First, because according to Hayek's theory the mind is not independent from the world. And second, because Hayek says that his is a *scientific* criticism to socialism, so, presumably a criticism based on an objective theory. But in the end he is forced to make this theory "objective" by introducing a criterion from the outside (which is, moreover, a statistical criterion or an end-state criterion³¹). Less paradoxical is that this subjugation of science to morality is perfectly consistent with Hume's thought, one of Hayek's most important sources of inspiration.

In the end, Hayek's defence of the market order relies on propaganda instead of rational argument. This had already been foreseen, in general terms, by Popper. In the lengthy passage, quoted above in section 11, Popper predicts that one of the consequences of the physicalist theory of the human mind is that the physicalist "is prevented from accounting for the difference between propaganda, verbal intimidation, and rational argument."(*SIB*, p.58).³²

13. Some conclusions

What can we learn from the confrontation between Popper's and Hayek's systems of ideas? I will indicate, too briefly, incompletely and sketchily, just a few answers.

In order for a theory of cultural evolution to account for the role of human knowledge without falling into contradictions must be indeterministic and non-materialistic. Popper's theory of "behavioural monsters" that create ecological niches which subsequently act as units of selection is an interesting attempt that may be adapted to the domain of social and cultural evolution. The mechanism would be, very briefly, that the rational response of individuals to changes in their

³¹ Hayek criticizes "end-state criteria" in *LLL*.

³² Hayek does not have anything like a fully-fledged theory of language. He follows Menger in using language as an example of a phenomenon which emerges as an unintended effect of individual actions. On the other hand, in response to Popper, he tries (but fails) to construct an explanation of the higher functions of language in his "Within Systems about System", which was discussed above, in para 13.

Another significant aspect of Hayek's failure to find a place for the higher functions of language is that it is consistent with his argument about the difference between the primitive group and the extended order. In the book that I already quoted above in note n. 6, Dunbar argues that human language has evolved to enable the human species to control individuals, and to co-ordinate the actions in groups that supersede the limit of control of 150 members which our brain-capacity imposes. In this context of control and co-ordination, the only functions Dunbar discusses are the exchange of information - which includes the function of expression - and communication (see Dunbar 1996, especially p. 78-9). Thus, the consistency between Hayek's theory of the social order and his "theory" of human language receives confirmation from an unexpected quarter.

goals and preferences may lead to new institutions which may or may not prove to be able to be stable.

If we translate Popper's theory of evolution to the social domain, I think that he has indicated that it is possible to construct an evolutionary theory that can account for the interaction between individuals and their institutional environment; that rapid change in social evolution does not need Lamarckian instruction; that group selection can be given a sound and non-tautologous content; and that our ontological conviction that ideas matter can find a place in such a theory.

If the contents of the human mind, its functioning and deliberate interventions guided by it do not make a difference to social evolution on the macro level, this has to be demonstrated. The mechanisms by which individual actions create unintended consequences must be specified. (Pietro Terna³³ is engaged in a research project that examines whether, and to what extent, the mental structure of individuals makes a difference for collective effects. He uses computer simulations. But it is good to keep in mind that he limits himself to one very particular collective effect, price formation.) This is the as yet largely unexplored domain of social amplifiers.

Bibliography

- W. Arts, S. Lindenberg & R. Wippler (eds.) 1976, *Gedrag en Structuur. De relevantie van microtheorieën voor de verklaring van macroverschijnselen*, special issue of *Mens en Maatschappij*, Universitaire Pers Rotterdam
- G. Ballot e G. Weisbuch (eds.) 2000, *Applications of Simulation to Social Sciences*. Paris, Hermes Science Publications
- W.W. Bartley III 1976, "Critical Study. The Philosophy of Karl Popper. Part I: Biology & Evolutionary Epistemology", *Philosophia*, Vol.6. Nos. 3-4, pp. 463-494
- W.W. Bartley III 1978, "Critical Study. The philosophy of Karl Popper. Part II. Consciousness and Physics. Quantum Mechanics, Probability, Indeterminism, The Body-Mind Problem", *Philosophia*, pp. 675-716
- W.W. Bartley III 1984 (1962), *The Retreat to Commitment*, Open Court
- J. Birner 1990 "A roundabout solution to a fundamental problem in Menger's methodology and beyond", *History of Political Economy*
- J. Birner 1999, "The Surprising Place of Psychology in the Work of F.A. Hayek", *History of Economic Ideas*
- J. Birner (2001), *The Cambridge Controversies in Capital Theory. A Study in the Logic of Theory Development*, Routledge
- J. Birner (2001a), *F.A. Hayek's Research Programme*, Routledge
- J. Birner & R. van Zijp 1994, *Hayek, Co-ordination and Evolution; His Legacy in Philosophy, Politics, Economics, and the History of Ideas*, Routledge
- R. Dunbar 1966, *Grooming, Gossip and the Evolution of Language*, Faber and Faber
- M.H. Hacohen 1995, "The Poverty of Historicism in Context: Karl Popper and Interwar Vienna", History of Economic Thought Workshop (unpublished essay)
- F.A. Hayek 1933, *Monetary Theory and Trade Cycle*, Kelley 1975 (Translation of *Geldtheorie und Konjunkturtheorie*, Hölder-Pichler-Tempsky 1929)
- F.A. Hayek 1943, "The facts of the Social Sciences", in Hayek 1949
- F.A. 1945a, "Individualism: True and False" (ITF), in Hayek 1949
- F.A. Hayek 1946, "The Meaning of Competition", in Hayek 1949

33 Cp. For instance Terna 2000.

- F.A. Hayek 1947, “Free Enterprise” and Competitive Order”, in Hayek 1949
- F.A. Hayek 1949, *Individualism and Economic Order*, Routledge and Kegan Paul
- F.A. Hayek 1952, *The Sensory Order. An Inquiry into the foundations of Theoretical Psychology* (SO), Chicago University Press
- F.A. Hayek 1955, *The Counterrevolution of Science* (CRS), The Free Press
- F.A. Hayek 1960, *The Constitution of Liberty* (CL), Routledge & Kegan Paul
- F.A. Hayek 1963, “Rules, Perception and Intelligibility”, in Hayek 1967a
- F.A. Hayek 1965, “Kinds of Rationalism”, in Hayek 1967a
- F.A. Hayek 1967, “Notes on the Evolution of Systems of Rules of Conduct” in Hayek 1967a
- Hayek, F.A. (1967a) *Studies in Philosophy, Politics and Economics*, Chicago, IL, University of Chicago Press.
- F.A. Hayek 1968, “Competition as a Discovery Procedure”, in Hayek 1978
- F.A. Hayek 1973, *Law, Legislation and Liberty*. Vol. II, *The Mirage of Social Justice* (LLL-II), Routledge & Kegan Paul
- F.A. Hayek 1978, *New Studies in Philosophy, Politics, Economics, and the History of Ideas*, Routledge & Kegan Paul
- F.A. Hayek 1979, *Law, Legislation and Liberty*. Vol. III, *The Political Order of a Free People* (LLL-III), Routledge & Kegan Paul
- F.A. Hayek 1982, “The Sensory Order After 25 Years”, in Weimer & Palermo 1982
- F.A. Hayek 1988, *The Fatal Conceit*, Routledge
- R. Hertel 1997, “Was kann die Evolutionsbiologie zur Diskussion der Ethik beitragen?”, in Wills 1997
- S. Kauffman 1993, *The Origins of Order; Self-Organization and Selection in Evolution*, Oxford University Press
- S. Kresge & L. Wenar (eds.) 1994, *Hayek on Hayek: An Autobiographical Dialogue*, Routledge
- S. Lindenberg 1976, “De structuur van theorieën van collectieve verschijnselen”, in Arts, Lindenberg & Wippler 1976
- K. Lorenz 1973, *Die Rückseite des Spiegels; Versuch einer Naturgeschichte menschlichen Erkennens*, Piper
- D. Miller (ed.) 1983, *A Pocket Popper*, Fontana Paperbacks (also published as *Popper Selections*, ed by David Miller, Princeton University Press)
- R.R. Nelson & S.G. Winter 1982, *An Evolutionary Theory of Economic Change*, Harvard University Press
- K.R. Popper 1934, *Die Logik der Forschung*, English trans. *The Logic of Scientific Discovery*, Hutchison 1959
- K.R. Popper 1967, “The Rationality Principle” in Miller 1983
- K.R. Popper 1974 (1959), *The Logic of Scientific Discovery*, Hutchison
- K.R. Popper 1972 (1957), *The Poverty of Historicism*, Routledge
- K.R. Popper 1973 (1945), *The Open Society and its Enemies*, Routledge
- K.R. Popper 1973a (1972), *Objective Knowledge; An Evolutionary Approach* (OK), Clarendon Press
- K.R. Popper 1974 (1963), *Conjectures and Refutations*, Routledge & Kegan Paul
- K.R. Popper 1979, *Die beiden Grundprobleme der Erkenntnistheorie*, Mohr, Tübingen (DBG)
- K.R. Popper 1994, *Knowledge and the Body-Mind Problem. In defence of interaction*, Routledge
- K.R. Popper & J.J. Eccles 1977, *The Self and Its Brain* (SIB), Springer International
- H.R. Post 1971, “Correspondence, Invariance and Heuristics: in Praise of Conservative Induction”, *Studies in the History and Philosophy of Science*
- J. Shearmur 1995, “Hayek and the case for Markets”, in Birner & van Zijp 1995

- P. Terna 2000, "Mind No-Mind Dilemma in Agents for Social Science Simulations", in Ballot & Weisbuch 2000
- J. Vromen 1994, *Evolution and Efficiency; An Inquiry into the Foundations of "New Institutional Economics"*, Ph.D. thesis, University of Amsterdam
- W.B. Weimar & D.S. Palermo 1982, *Cognition and the Symbolic Process*, Lawrence Erlbaum, Hillsdale N.J.
- J-P. Wills (Hrsg.) 1997, *Anthropologie und Ethik. Biologische, sozialwissenschaftliche und philosophische Überlegungen*, Francke Verlag
- U. Witt 1995, "The Theory of Social Evolution: Hayek's Unfinished Legacy" in Birner & van Zijp 1995