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*The unity of knowledge
An Interdisciplinary Project*

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I. Introduction

The unity of knowledge is one of the grand ideas of intellectual history and the history of scientific thought. The unity of the world as a unity of the history of nature and mankind is reflected in the constantly growing amount of different sciences that reflect this underlying unity. We are now in one of those exhilarating periods when common research and common discussions productively link natural sciences to the social sciences and humanities. This can be understood only by an interdisciplinary scientific approach that overcomes traditional barriers between different disciplines. Integration of such disciplines and recently developed interdisciplinary links between such disciplines allow the investigation of the world of ecology and evolution, thereby extending to the natural and social sciences. In the following sections, I will outline an important part of this modern thought by describing the crucial inter-related elements that are not just peripheral, but integral parts of how to understand the unity of the world; thereby revealing the interdisciplinary relations of sciences and humanities.

In various periods, scientists and theorists have been especially eager to find a way, a code or a master discipline (conducting science) that would enable easy crossing from one domain of knowledge to another. Up until the mid-19th century, the so-called classical philosophies, for example the philosophies of Descartes, Spinoza, Kant, Schelling and Hegel, lead the way of such a master discipline. But when the “ship of the philosophers”¹ started to go down after a long but rather successful journey through three centuries, attempts were made to replace philosophy by other so-called conducting sciences like physics, biology and recently computer science. But there are some thinkers who want to save philosophy by transforming it into a philosophy of science. In order to do so, they strive to re-establish philosophy as the master discipline at the expense of the growing and thriving natural and social sciences.

Has a transformation of *philosophy* as “love of wisdom” to actual knowledge taken place? Has such a transformation made philosophy obsolete? E.O. Wilson remarks, “We have the common goal of turning as much philosophy as possible into science.” (E. O. Wilson, 1998, p.12) The epochal changes in the history of science since the nineteenth century – beginning with the groundbreaking theoretical works of Darwin and Marx and the subsequent development of a broad and complex concept of knowledge, dealing not only with individual parts of the world but also with their interconnectivity – confirm the above mentioned assumption that philosophy is a “shrinking dominion.”(ibid. p.12) E. O. Wilson attempts to drive philosophy out of its genuine fields and to replace it with a

¹Sebastian Brant, *Das Narrenschiff* (1494; *The Ship of Fools*), the most famous German literary work of the 15th century.

particular science or a theory of sciences. He enthrones biology as the conducting science which allows the unification of sciences and humanities. Wilson considers this union (“consilience”), appropriately named socio-biology, the greatest and most important scientific project of the 21st century.

On the surface this is indeed a vehement attack against philosophy, however it induces to think about a special revival of philosophy. On the one hand, Wilson’s project is to be appreciated, but on the other hand it is to be criticized as being too one-sided. Wilson’s explanation of the unity of the world is – against his own intention and unconsciously for him – carried out at the expense of some natural, socioeconomic and cultural parts of the world.

As one science among others philosophy would be superfluous. Therefore modern philosophers must accept the challenge to take over the task of coping with the unity of the natural and social cultural world in order to realize Wilson’s project in a way rather different from the one the bio-sociologist has propagated.

Philosophy, entrusted with this new task, plays a role which is totally different from the one it has played in the past. Philosophy is not the dominator or final arbiter of the meaning of different single sciences any more. With the insistence that the world is more than just anybody’s or someone’s totalizing idea alone, philosophy must now play the role of a mediator. Its main task is to integrate the different sciences in order to gain a deeper and broader knowledge of the world. In this new position, supposing that there is a need for something like philosophical foundations of sciences, philosophy will receive a more scientific character by evolving from a “love of wisdom” to a theory of sciences.

With this comes again philosophers’ general misunderstanding of the position philosophy has amongst the single sciences. It happened that some philosophers claim for their philosophies to have genuine philosophical qualities different from all scientific qualities. They suppose that their kind of unification of sciences and humanities allows a better understanding of the world by detecting qualities which are especially characteristic for the world as unit of its natural and socio-cultural parts. As the sciences are conceptually unified and their degree of integration and interaction increased, the basic understanding of the world is actually both deepened and broadened. But from this it does not follow that the philosophy of science has a special quality in contrast to other kinds of unifications of the single sciences, endowing it with exclusive access to the unity of the world which goes beyond the knowledge collectively achieved by all sciences. All the knowledge about the world as the unity of its natural and sociocultural parts is provided by the distinct sciences and does not exist somewhere else, not at all in ideological forms of an independent existing philosophy, which claims to be endowed with exclusive knowledge qualities for the sake of function as a kind of master discipline.

While striving to accomplish a unification of sciences and humanities for the purpose of a broader and deeper insight in the world, modern philosophy must

strictly avoid acting at the expense of the sciences and humanities. Proponents of such modern philosophy have to induce and stimulate other scientists and theorists to participate in the unification process. Only then will they be able to contribute their already achieved knowledge which is necessary to understand better the unity of the world. Whether a philosophy of science is able to critically examine the assumptions underlying scientific inquiry, crucially depends on actual valid knowledge from some key sciences. It hereby becomes obvious that the philosophy of science is fundamentally a common work of scientists and theorists who realize their own position within the network of sciences and have acquired the corresponding abilities for “crossing the boundaries.” They are doing this not at least by grasping more and more procedures and results of other sciences.

II

The Unity of Natural and Sociocultural History as a Base for the Unity of All Sciences and Humanities

What reality is and what of it is reflected in classical philosophy or in science and humanities? All areas or parts of the world which are each the subject of the respective spiritual enterprises are interconnected in the real world and in principle independent of the distinct researchers. Natural history dates back to some 15 billion years before the development of human beings started approximately 7 million years ago with the gradual separation from a monkey like animal that clambered through the canopy of great tropical forests. One has to consider that more than six million years had to pass before the modern human in the shape of “*homo sapiens sapiens*” had arisen about 200,000 thousand years ago. Since the time in which biological evolution has extended to sociocultural history, both historical processes (that of nature and of mankind) are overlapping each other and mutual influencing one another. As the world is existing and developing as a unification of both the historical natural world and historical socio-cultural world, humans have developed not only as “natural” and “thinking” beings but as, **natural, social and thinking** beings.

Dealing with one part of the so characterized world means to also deal with the entire unity, because there is no part which is independent from all other integral and interconnected parts of the world. It should be noted that all parts are both to a certain extent different and to a certain degree independent from one another. This is a fact which analytically justifies their separate treatment as different subjects of the respective different sciences and humanities. On the other hand, every part has features that result from the natural and sociocultural interactive

processes whose interdependent parts are mutually influencing one another. These parts are in fact so interdependent that their individual characteristics are determined by the characteristics of others. Every part is therefore deeper and broader understood by the respective sciences or humanities, if the subject of inquiries is not limited to a single part, but rather extends to consider the unity of the world.

For the purpose of a short preliminary summary, the explanations made above might suffice to see that the unity of the world as the unification of natural and sociocultural history is the base for the unity of all sciences and humanities.

III

The Transformation of the Double-sided Unity of Nature and Nurture in the Double-sided Contrast of “Nature” and “Spirit”

Important parts of the history of nature and mankind which essentially contribute to the unity of this history are incomplete, misunderstood, or remain undiscovered. The consequence of this is that both sides which are insufficiently understood get separated from each other. This insufficient way to consider the interaction process which constitutes the unity of the world find its expression in the way in which this unity, composed of natural and human history, is understood. Both sides are characterized by their respective dynamic processes consisting of the evolution of inorganic and organic nature and of history of humans who are involved in social technical processes. These dynamic processes are changing each side by producing the respective special qualities and features. After being produced these new qualities and features become a precondition for further activities. The new qualities and features have a changing effect on the respective new activities providing the opportunity for producing again other new qualities and features on both sides of the world and so on. This continuous transformation (turn over) of result in precondition and of precondition in result characterizes fundamentally the historical specific interaction processes between natural and human world.

A general deep rooted and fundamental characteristic which is peculiar to all shapes of the contrasts is given by the fact that philosophers and scientists understand the unity of history of nature and humanity in the dualistic form of the unity of the contrasts of “nature” and “spirit,” of “matter” and “mind,” of “body” and “soul,” of “brain” and “consciousness,” of “genes” and “memes” etc.

This is the consequence of one of the most decisive mistakes theorists are making in the fields of their research. They neglect or misinterpret those parts of the world which are – like societal labour, for example - crucial for achieving an

adequate understanding of the interaction processes. Theorists reduce the three main parts – nature, social relations and spiritual activities – in two parts by unconsciously suppressing the social relations. Social relations are not comprehended as what they actually are and are therefore dissolved in natural processes or spiritual mental actions of humans. By eliminating the social part, humans are not actually understood as natural social and thinking beings, but rather only as natural and thinking beings.²

The sharpest form in which a philosopher has confirmed this procedure has been created by Descartes who, compelled by certain socioeconomic conditions, has divided the world into two independent parts: in nature as an “extended thing” and in human as a “thinking thing”. All decisive problems regarding theory and praxis are to be solved in the context of the contradictory relations between “nature” and “spirit” respectively between “body” and “soul”. Social relations are replaced by technical and moral issues both regulated and dominated by a geometrical mathematical thinking.

That such an elimination of social relations is practised until today seems peculiar in face of the existence of a social science which deals expressively with the social part of the world. But social scientists divide like Descartes the social reality into two parts consisting of technical-instrumental actions organized, regulated and controlled by a human mind using technical (physical, mathematical) logical principles and of communicative actions organized, regulated and controlled by a human mind using interpersonal religious, moral and ethical principles. Doing this Philosophers and theorists are totally misunderstanding what societal labour is in which, although in another more reasonable way, both the dimension of technology and the dimension of social communicative behaviour are bound together. There are social relations as for example internal cooperation, which are directly connected to the technological organized productive processes and there are social relations as for example between owners of money and commodities or capitalists and wage labourers which are more or less directly connected to those nature changing production processes. Both kinds of a social relation, no matter how narrowly they are connected to the real immediate production are constitutive parts of societal labour. And the production and reproduction of all these kinds of social relations especially the fundamental one between capitalist and wage labourers is utterly more important for understanding of human nature than the fact that material or immaterial products are produced and reproduced. The philosophers and theorists eliminate the social relations of societal labour by dissolving them in spiritual intellectual actions to which they credit the ability to create and to regulate and guide all kind of human relations.

² *Continuously in philosophy, the nature of humans is (following this dualistic reduction) grasped in terms of “zoon politicon”, “zoon logicon echon”, “animal rationale”, “tool making animal” etc.*

Based on the proof that philosophers and scientists do have a misconception about societal labour, it is to show why they understand the unity of the world as a unity of the history of the natural and sociocultural world in a form of the unity of a contrast³ of both these parts. Furthermore, they attribute this contrast of the above mentioned form of a contrast of “nature” and “spirit” of “matter” and “mind”, of “body” and “soul” and so on.

That nature and nurture⁴ are mutually influencing each other means nothing else than each of the two sides has its qualities and features whose origins stems from the other side. The natural world is composed of one part which has been neither touched nor changed by humans and another part which has been changed via humans social cultural actions like societal labour. This includes the human body which is shaped by the interaction of biological evolution and sociocultural history. On the one hand, the human world is composed of a part which is given within nature and thus is unchanged. This again includes the human body which remains always a natural organism despite the changes caused socialculturally. On the other hand, the human world is composed of a part with pure social relations and mental and linguistic actions which result from social relations. This does not mean that these pure sociocultural entities exist independently of the natural entities. Not at all, the way in which qualities are pure sociocultural is to a certain extent determined by the natural conditions. Social relations and thinking are both determined and constrained by the fact that humans have an organic body being endowed central nervous system that includes the brain.

The interaction process between the natural and human world is the cause for the natural world containing a part of the human world and the human world containing a part of the natural world. In this sense it is possible to say each side of the world is to a certain degree composed of both. The unity of the world does not aimlessly float somewhere beyond the realm of the natural and human world, but is rather exclusively existing within both parts of the world; each of them being double sided.

Regarding the structure of the contrast, one can summarize the explanations as follows: The unity of the world as a double sided unity of natural and human history has been transformed into the contrast of “nature” and “spirit”, of “matter” and “mind”, of “body” and “soul” and so on. This contrast is double

³ *Instead of the unity of the contrast, it suffices to speak only of the contrast. Both sides of a contrast do not solely exist independently of each other, but they are instead interactive processes that are necessarily related and connected to each other. Contrast means that both of its parts are to a certain extent independent of each other yet simultaneously necessarily related and connected to each other. The extent to which both parts of the world are independent of each other depends on to what extent both are each distortedly and incompletely comprehended.*

⁴ *Particularly within the realm of scientific explanations, the meaning of “nurture” is not restricted to upbringing or nourishing but is used in the broader sense of social cultural world or of human history.*

sided as well as the underlying distorted and incompletely grasped unity. But the contrast is an outward dualistic substitute for what the unity actually is, mainly because the philosophers have eliminated the social relations by dissolving them either in nature (rough materialism) or in spirit (idealism). Misunderstanding the unity of natural and human history as the unity of the contrast between “nature” and “spirit”, etc. consists principally of the following momentous mistakes:

- Not to see which parts of the world are contributing to the development of humans as natural social and thinking beings;
- A distorted incomplete knowledge of these parts in combination with the unawareness about the transformation of results in preconditions and of preconditions in results.

IV

Descartes. Classical Philosophy as the all Sciences and Humanities Integrating Master Discipline-Discussion of Topics Crucial to an Understanding of the Unity of the World

The different forms of philosophies and theories are determined by the solution of the problem of how to resolve those contrasts by making one of the both sides to an instance which has the more or less irrational, but powerful ability to unify history of nature and history of mankind. Depending on whether the philosophers choose a “natural” or a “spiritual entity” as the both sides unifying substance, they receive a more “idealistic” or a more “materialistic” form of philosophies or theories.

It is not a question of good will to create or not to create the contrast of “nature” and “spirit”. Concerning its form and its sharpness the understanding of the unity of the world in the outward form of the dualistic contrast depends on the extent to which certain historical social-cultural circumstances have been developed by which philosophers are unconsciously compelled to comprehend only partially and distortedly the interaction processes between the natural and the social-economic world.

To make us familiar with this problem and the attempts to solve it we are in the process of interpreting philosophies, which are cornerstones in the history of philosophy because of the typical ways in which they comprehend the unity of natural and human history. By studying some important philosophies and sciences, we must find deeper insights into the interrelationship of biological and social cultural history, allowing us to understand philosophies and sciences in a way which enables also to understand more and more how some sciences like computer science are connected to the other sciences.

In the following some important topics are listed, which should be discussed. Indeed these topics together with other still following ones form a collection, representing a kind of prolegomenon to future work.

1. Introduction in the **grounding structure of philosophies**. The subject of Philosophy is the unit of the world as a unit of the contrast of “nature” and “spirit”, of “matter” and “mind” of “body” and “soul” etc. The “double sided contrast” of nature and spirit is the basis for the fact that philosophies from Descartes on until today are to be distinguished in idealism and materialism as well as in a mixture of both. There is a need for general reflections of how to escape this contrast or in other words, how to overcome this contrast by explaining the basis by which the philosophers more or less unconsciously are urged to create it as a false alternative.
2. Descartes creates the sharpest form of the contrast of “nature” and “spirit” in the history of Philosophy. Descartes is, like Schelling suggested, the “beginner” of modern European philosophy during a time which is **socio-economically determined by the beginning of modern capitalist society**.
3. On the basis of several reports about the “**six meditations**” one can expose and analyse the **grounding structure of Descartes’ philosophy** depending on the way in which he thinks of the interactions between “nature and spirit”. The structure of the contrast of both parts of the world is determined by the way in which Descartes discerns two kinds of interactions, the one being external and the other being internal to the world. The contrast of nature and spirit is given for Descartes with his supposition that the world is sharply divided in nature as “res extensa” (extended thing) and human as “res cogitans” (thinking thing).
4. A detailed interpretation of the **interaction external to the world** has to be given from the aspect of how Descartes is founding and **justifying his philosophical knowledge** in the form of a system of metaphysics as the only adequate scientific presentation of the world.
5. **The philosophies especially from Descartes via Kant to Hegel are characterized by both the external interaction between God and the world and the internal interaction between humans and nature**. Both interactions are interwoven with each other and mutually influencing. Why and in which way is the interaction between nature and spirit external to the world to be compared with the Christian idea that the world is created by an intellectual omnipotent spirit called God? The more both interactions are interwoven and interpenetrating each other the more the divine creative production is absorbed by the interaction internal to the world.
 - a. The interaction process between natural and human world as it is carried out by humans is crucially determined by their social

relations. **Involved in this economic social process, humans are changing and shaping nature and by doing this changing themselves.** This process is understood incompletely and distortedly, mainly because of an elimination of social relations. It is reduced to a technical instrumental process which is insufficient for explaining what human mind is and how it works in a way that humans could develop the ability to understand in principle the natural and social cultural world.

- b. A basis for a forthcoming more detailed interpretation of how Descartes understands the interaction internal to the world is given in the following paragraphs.
- c. Descartes understands the **pineal gland**, which is an organ placed within the brain, as a **bodily, physical, chemical interface enabling the interaction between the natural and intellectual part of humans.** God as the external and the pineal gland as the internal entity are each a strange mystical kind of interface enabling the causal mechanistic interaction between nature and spirit so that both interfaces are characterised as a “wooden iron”. This is a metaphorically paraphrase expressing the unfathomable mixture of both the natural and spiritual part of the world. Modern theorists dealing with the interaction of brain and mind are entangled in the contrast of “nature” and “spirit” too and therefore producing also “wooden irons” however, in comparison to Descartes, in a more complex and sophisticated way.
- d. What does **Descartes** think of **society** as one part of the world which is decisively contributing to the interaction between natural and human world? **Descartes explains society in terms of technology and medicine on the one hand and in terms of affects and morale on the other hand.** In both parts of society humans are acting as rational and conscious beings who are exerting a geometric mathematical way of thinking related to Descartes causal mechanistic worldview.
- e. **In all kinds of interactions within the world Descartes has eliminated the social relations which do not contribute anything to the explanation of how humans are able to understand nature in face of the total separateness of natural and human world.** Descartes applies only the epistemological principles and methods he has explained in the “six meditations” within the scope of the metaphysics. **Both parts of the world are entirely considered by him within the realm of a priory supposed causal-mechanistic principles.**
- f. **Descartes founded his explanation of knowledge on his metaphysical assumptions that God producing in the same time both parts of the world is the guarantor for the human’s ability**

to understand adequately nature. Nature is in a causal mechanical way so structured that it is congruent with the structure of the human spirit executing and applying causal mechanistic principles. **Thus Descartes has understood the unity of the world in form of a contrast which is double sided in the sense that the mathematical geometrical principles are the essentials of the human spirit as well as of nature.** As extended thing nature is totally different from spirit but its causal mechanistic structure is an incorporation of the spiritual essentials consisting of geometrical mathematical principles. Contrary to his own opinion Descartes has discovered the mathematical logical principles by observing at least the practical technical production which is just that part of societal labour in which humans are directly interacting with nature. Humans change nature for the purpose of creating products which are nothing else than transformed pieces of nature. Humans are able to interact with nature in this way because they have discovered and analysed its laws and have applied them to construct the respective technical devices. Scientific knowledge and its technological use are essentially determined by nature because they are generated within the interaction with nature which is changeable and transformable by humans as far as they have got knowledge of it e.g. of its laws. **The stage, which scientific and technical knowledge has reached in the practical interaction with nature during Descartes lifetime, is just characterized by geometrical mathematical thinking corresponding to the assumption that nature is determined by a causal mechanistic structure. Being in this way determined by the surrounding nature, the divine and human spirit, as Descartes both has presented, reveal the double-sided character of both.** The human spirit being the product of Gods creation of the whole world is the essence of the human world and in the same time predestined for understanding nature. With this the human spirit can be considered as double-sided. From the point of view of metaphysics the human body is a genuine part of the surrounding non human nature and accordingly determined by the causal mechanistic structure which is to be explained by a mathematical geometrical way of thinking. But Descartes ultimately has also to accept, that the body is not so separated from spirit as he initially thought. The human body is equal to the animal body but in the same time different, because it is in such a way structured that it has got the ability to interact with the human spirit by means of the pineal gland as a special organ in the human brain.

The cursory interpretation of Descartes philosophy⁵ shows that the way in which he is dealing with societal labour by only grasping the technological part of it at the expense of the social one is already sufficient to pave the way for an explanation why and how he shapes a historical specific form of the double sided contrast of “nature” and “spirit”. Descartes was not aware of the double sided structure of the contrast he has created, because he could not understand his own inquiries of societal labour let alone what far-reaching consequences such inquiries have to attain the ability to understand the unity of the world.

The reasons for which Descartes and Spinoza have created the contrast are the same as today and are evidence of the incomplete and insufficient understanding of what the real interaction between the natural and human world is. But there is an important difference which may be presented here as follows: Philosophers, living before the middle of the nineteenth century, were not able in a historically justifying way to figure out in which way one has to understand the interaction as the basis for an understanding of the unit of the world without creating the fatale contrast. The knowledge of natural and social cultural world depends on the stage which the interaction, determined crucially by its social cultural part, has reached in its historical development. This decisive stage has been reached in the middle of the nineteenth century in form of a full developed capitalist society. That is why during this time the economical social conditions for the insight in the real history of nature and nurture were given as the necessary basis for the insight in the unity of both historical processes. The researchers CH. Lyell,⁶ W.A. Russel⁷, Ch. Darwin, G.Mendel⁸ and K. Marx have developed

⁵ There exists already a more detailed interpretation of Descarte’s philosophy. After having finished this interpretation I will integrate it in a later version of this information paper.

⁶ *Lyell*, Sir Charles (1797–1875), Scottish geologist. His textbook *Principles of Geology* (1830–3) influenced a generation of geologists and held that the earth's features were shaped over a long period of time by natural processes, thus clearing the way for Darwin's theory of evolution.

⁷ *Wallace*, Alfred Russel (1823-1913), born Jan. 8, 1823, Usk, Monmouthshire, Wales died Nov. 7, 1913, Broadstone, Dorset, Eng. British humanist, naturalist, geographer, and social critic. He became a public figure in England during the second half of the 19th century, known for his courageous views on scientific, social, and spiritualist subjects. His formulation of the theory of evolution by natural selection, which predated Charles Darwin's published contributions, is his most outstanding legacy, but it was just one of many controversial issues he studied and wrote about during his lifetime. Wallace's wide-ranging interests—from socialism to spiritualism, from island biogeography to life on Mars, from evolution to land nationalization—stemmed from his profound concern with the moral, social, and political values of human life.

⁸ *Mendel*, Gregor Johann (1822-1884), original name (until 1843) Johann Mendel born July 22, 1822, Heinzendorf, Austria died Jan. 6, 1884, Brünn, Austria-Hungary [now Brno, Czech

theories enabling for the first time in history of mankind not only to understand history as a historical event-story, but as an actual development, permanently changing the natural and socio-cultural world. The way was free only now to escape the defective contrast of “nature” and ”spirit” and to explain it as an obsolete substitute for the actual interaction between the natural and the human world.

Modern theorists are blaming and criticizing Descartes for the unscientific way in which he has created a rough dualism based on the existence of God as an omnipotent substance. In spite of highly developed insights into biological and social-cultural development, these theorists are not yet able to understand completely and adequately enough the interactions between natural and human world and to create other kinds of dualistic substitutes for these interactions.

The philosophers investigate on the one hand the different parts of the world and on the other hand they deal with other philosophers and scientists who for their part have also to investigated those parts of the world as well as argue with other philosophers and scientists etc. To the extent to which the natural and especially the economical social world is changing and developing, the knowledge about these parts of the world and their interconnections develops. Philosophers present in their intellectual enterprises various stages in the sequence of the development of the natural and human world. This has found its expression in a sequence of distinct forms of the contrast of nature and spirit. The contrast became increasingly complex by combining the interaction processes being external and internal to the world. In the course of the real development of natural and social cultural world including a tremendous increase of labour productivity and natural sciences, philosophers have more and more grasped from the real actual interaction processes within the world. The more external and internal interactions got interlinked, the more the internal interaction process became crucial and dominant. Nowadays we have the chance to get to know what until the middle of the 19th century was outside the reach of all philosophers from Descartes to Hegel, e.g. from Descartes divine spiritual substance to Hegels absolute spiritual subject.

To acquire knowledge of biological evolution and economic social-cultural development is an indispensable prerequisite for explaining how far classical philosophers and modern scientists and theorists understand the unity of the

Republic] Austrian botanist and plant experimenter, the first to lay the mathematical foundation of the science of genetics, in what came to be called Mendelism.

But it is also certain that he had begun his experiments before Darwin's first book was published and before the essential role assigned to heredity as the basis of evolutionary change had been widely recognized.

world by constructing the dualistic contrast of nature and spirit, of “brain” and “mind”, of “gene” and “memes”, etc. The ability to overcome the contrast is not a question of good will or of bare declaration, but only of how deep and broad the knowledge of the interactive processes between natural and economic socio-cultural world actually is.

The now following topics complete the topics already discussed above. The topics discussed below are also accompanied and supported by respective reports presented by members of the seminar. The reports are both partly already presented and must be presented in the current semester and in the next semesters. As mentioned above they belong to a collection of reports which is a kind of prolegomenon to future work of a radically interdisciplinary sort, which give rise to bridge the great divide in understanding the unity of the world.

1. General survey about biological evolution independent of humans. And about the mechanism of biological evolution.
 - a. **“The theory of evolution is one of the fundamental keystones of modern biological theory.** Natural selection was the fundamental concept in his explanation. Genetics, a science born in the 20th century, reveals in detail how natural selection works and led to the development of the modern theory of evolution. Since the 1960s a related scientific discipline, molecular biology, has advanced enormously knowledge of biological evolution and has made it possible to investigate detailed problems that seemed completely out of reach a few years earlier.” (Britannica, 2003)
 - b. We should start with researches on **biological evolution** with a general survey by familiarising us with such meaningful issues like the followings: Common Misconceptions, Microevolution, Genetic Variation, Evolution within a Lineage, Natural Selection, Sexual Selection, Genetic Drift, Mutation, Recombination, Gene Flow, Macroevolution, Mechanisms of Macroevolution, Speciation and increasing of biological diversity, Extinction and Decreasing. Punctuated Equilibrium; A brief history of evolutionary thought: Charles Darwin: The Origin of Species, natural selection; Gregor Mendel, Father of genetics; Sir Ronald Fisher, The genetic theory of Natural Selection; Crick and Watson, Discovery of deoxyribonucleic acid;
 - c. There are mainly two reasons for a continual discussion with the biological evolution: **The understanding of the processing interrelationship between biological evolution and economic-social cultural history as an indispensable matter of decisive significance for the very understanding of the historical development of human beings as natural, social and thinking beings. The design of algorithms or distributed problem-solving devices inspired by problem solving organic structures, by self-**

organisation in biological systems including the collective behaviour of social insect colonies and other animal societies.
(See more in detail: section VI.)

2. Due to a current occasion (for example activities of defenders of the creationism, a report in German journal "Spiegel", etc.) one could discuss the intelligent-design-opinion from the following two aspects: Firstly: **Is the intelligent-design-opinion an expression of a dualism of mind and matter?** (It is about a pseudo-scientific substitute for creationism.) Secondly: "Information is coded in the genes and the DNA is a genetic program, which is made by natural selection. "Is this opinion an intelligent- design- opinion? Is this opinion made by analogy to informatics something like a theory of preformation, now discarded, that an embryo develops from a complete miniature version (homunculus) of the organism? (For being able to answer completely the last two questions we need more knowledge about the processing relationships between genotype and phenotype.(about the creation and developing of genes as parts of the DNA, about the regulative mechanisms within the cell, about mRNA, tRNA, transcription, translation, embryology, epigenesis etc.) **Problem solving structures** inside and outside the areas of human activities **in connection with an investigation on the occurrence of semantics and the role which it plays.** (See to this: section VI
3. Overview (general survey) about the **interrelationship between biological and social cultural history.** What characterizes the unity of the world since the emergence of humans in the course of biological and social-cultural evolution? The goal is to become familiar with the connection between biological and social cultural evolution. It is to reveal the abstract general structure of the double sided unity of the world and to show why and how this unity is understood by theorists in form of the respective contrast. At the crudest level the most sophisticated **brain-state analysis** conceivable can neither usefully translate a complex thought or a human action, nor explain complex social structures and behaviours, which are, just the opposite, essentially contributing decisive parts to the development of brain and the emergence of mind. Philosophers however, now challenge this boundary, seeing at least a continuous epistemology between the scientific and humanistic. Approaching the problem from the side of natural science, philosophers of science now see it as more interpretive and contingent than has usually been supposed. Rather the resurgence of natural science represents an ontological and epistemological breakthrough, which renders suspect the hard boundaries among disciplines. It represents a new vision of unity based on an ecological and evolutionary framework. We need to know how the evolutionary theory would help us also regarding the field of computer science in their research programs in their specialized disciplinary practice. On the other hand, anthropologists, sociologists, economists, and

others who have already adopted evolutionary science would benefit from collaboration with computer science.

- Overview (general survey) about **societal labour** as the essential natural-social interaction process between the natural and human world. One of the first tasks is to make all participants of the project familiar with social labour especially under the point of view what is to be needed to know about it for getting a first understanding of the role which it plays for realizing the "unity-of-knowledge-project". Here arises the confrontation with a great challenge, because such a new understanding of the social-economical world taking societal labour as the basis shows unexpected traits and characteristics. Before attaining a deeper and broader knowledge of social labour one needs a reasonable way to make experiences about the importance of it as starting point for an understanding of the different interactive processes between nature and humans. To make the first steps for reaching this goal one should study the way in which the most important scientists and philosophers, representing different stages of the development of capitalist society, have tried to explain the unit of the world in terms of God, nature, society, spirit etc.
- Beginning with the philosophies of Descartes and Spinoza we will pursue some crucial steps in the development of philosophy from **Descartes via Kant to Hegel** on the one hand and from **Darwin and Marx to modern theorists living in the twentieth and twenty first century on the other hand**. Emphasizing the role of societal labour, the evolutionary and historical processes have to be considered under the aspect of how they are mutual overlapping and mutual influencing each other. Societal labour has to be understood as the totally secularized form of all mythical forms of production executed by the divine Creators of the world.
- **Hegel developed his philosophy of the absolute spirit as such a divine creator by studying expressively and intensively societal labour**. He studied the classical economists Stewart, Smith and Ricardo to recognize what modern civil society is in terms of labour, work, money etc. On the one hand societal labour has been a kind of model for the interaction between absolute spirit and the world and on the other hand societal labour, as far as Hegel could understand it, became an integral part of all forms of interactions that the absolute spirit executed. By integrating societal labour in the life-processes of the absolute spirit, i.e. in the interaction processes between him and the world as well as between the human spirit and nature, Hegel created the fully developed shape of all interactions, which he and his predecessors have created and already understood in terms of production. Within the realm of classical philosophy Hegel has created the fully developed and most complex shape of the double sided contrast of "nature" and "spirit".

- **Kant as the German counterpart of Descartes** has like the latter nearly totally neglected the economical social area dominated by societal labour and therefore created the contrast of “nature” and “spirit”, although in another form, but in the corresponding sharpness. This has found its expression in the following three independent works: “Critique of Theoretical Reason”, dealing with nature within the scope of Newton’s physics, the “Critique of Practical Reason” dealing with civil society in terms of moral and “Critique of Judgment” dealing with cultural forms of production envisaging a way in which nature and society are to be unified.
 - **With this it becomes evident that Fichte, Schelling and Hegel referring to Spinoza have made the start to overcome the contrast of nature and spirit on Kant’s “Critic of Judgement.”** In works of art the subjectivity of the artist and objectivity of nature are mutually interwoven and interpenetrating each other. In form of a work of art the artist and with him all humans are considering themselves as organic unifications of nature and spirit. The successors of Kant suggested that an absolute subject is producing and reproducing nature and human spirit as different worldly forms of itself being incorporated in the respective different forms of the natural and human world. If both the natural world and the human world are different incorporations of the divine spirit or even to a certain degree of human spirit, then obviously all sciences and humanities are each in a particular way a philosophy in the shape of a “science of spirit”. In this sense classical philosophies are **master disciplines** containing and absorbing all natural sciences, social sciences and humanities.
 - General survey about the **historical stage of the interaction between natural and human world during Descartes’ lifetime.** What are the socio-economic conditions determined by the beginning of the development of capitalist society which urge Descartes not only to create the already discussed sharp contrast of nature and spirit but also to comprehend the world in terms of geometrical mathematics? **Descartes creates the sharpest form of the contrast of nature and spirit in the history** of philosophy. Descartes is in Schelling’s opinion the “**beginner**” of modern European Philosophy during a time which is regarding the social-economic situation determined by transition from feudalism to capitalist society. Why are for Descartes humans are nothing else than thinking things and nature nothing more than a machine which is totally ruled by the mechanisms of a clockwork? Descartes has had a preference for something like cyborgs and robots. Appropriate to this predilection Descartes possessed an automatically acting doll.
4. The fundamental structure of Descartes philosophy under the aspect of **self-organisation**: deconstruction and reconstruction as scientific tools and methods of processing complexity. It would be reasonable to give an introductory explanation of what self-organisation is in different research

fields, especially in computer science by considering and discussing the possibilities of integrating methodical procedures and results of other sciences (for example: self-organisation in biological and economical social systems). This topic should be the subject of a special workshop just like it is described below under item VI.

5. Nature as “extending thing” and human as “thinking thing”
 - How does Descartes understand human as a thinking thing (substance with different intellectual capacities or more or less spiritual activities and properties like sensory perception, imagination ideas)?
 - How does Descartes understand correspondingly to the thinking thing nature as an extending thing (substance with different sensory and geometrical physical properties)?
 - How does Descartes understand the interdisciplinary unity of all single sciences? (i.e. philosophy as a master discipline)
6. We should give a summary of Descartes philosophy with respect to the interaction between biological evolution and economic socio-cultural history and with respect to discussions about the further already proposed topics.

V

Spinoza

Information about the Continuation of the Work as a Continuation of all Above Mentioned Topics

V.1

Descartes, Spinoza and Their Successors

Before a brief explanation⁹ is given of Spinoza’s philosophy it is important to mention that all topics mentioned above will be tackled again. We continue to get a deeper and broader knowledge of the actual interaction between nature and society, between biological evolution and social-cultural development.

Consequently we can hope to make progress towards a better understanding of both kinds of histories by revealing how a philosopher explains the unity of the world in a certain distorted way and how by comparison with the philosophies of Descartes and Spinoza this unity is explained by different sciences and humanities: Theory of biological evolution, history of mankind, interaction in which both are mutually influencing and interpenetrating etc..

⁹ Will be continued.

After having explained the relation between Descartes' and Spinoza's philosophies both created in the beginning of the capitalist society in Holland, England and France one can understand why this relation has its counterpart in the relation between the philosophy of Kant, created by him in the beginning of the capitalist society in Germany and the philosophies of his successors Fichte, Schelling and Hegel. Especially Schelling and Hegel who have expressively declared that like Spinoza have created a philosophy to overcome the "contrast" of "nature" and "spirit" characterizing Descartes philosophy, they have each created a philosophy to overcome this contrast, which characterizes Kant's philosophy.

Kant's philosophy will be the next one we want to deal with in the course of the project. We will continue to investigate and to try to understand all the topics and problems on the respective higher level we already know of the discussion with Descartes' and Spinoza's philosophy.

One of the most important tasks will be to follow the way in which the philosophies are vitally characterized by the attempts to explain the unit of the world e.g. the unit of "body and mind" in **terms of production**. From Descartes to Hegel the production has – whether it is responsible for the extra-worldly or inner-worldly interaction – always divine character. In this sense all philosophers are "Christian creationists", who suppose that the world has been created in all eternity or about six thousands years ago by God. Starting with Descartes' philosophy we have to consider that the production as a divine creative process is transformed by the fact that it is needed more and more to explain the inner worldly interactions between body and mind. The divine production always plays a double role. First it is responsible for the originally totally original creation of nature and mankind and then it is responsible for the interactions between body and mind within the world. Because the divine creation of the world is more and more entangled in the inner worldly interactive processes, one could say it suffers more secularization the nearer it comes to what societal labour is.

This secularization can be comprehended as a continuous approach to the part of the world which is actually the interactive process essentially determined and dominated by societal labour. In the history of philosophy Hegel has developed the most complex unity of the external and internal interaction between nature and spirit. All what the absolute spirit knows about itself as the unity of the world, it has captured by pursuing the inner worldly interactive processes in which it is resolving step by step the different forms of the contradiction of nature and spirit. In face of the fact that God in the form of the absolute spirit is the subject of all kinds of interactions between the natural and human world, Hegel regards his philosophy as a kind of service to god ("Gottesdienst"), or in other words as a kind of religious ceremony. Nevertheless within the realm of

philosophy as “love to wisdom” being entangled in the contrast of “nature” and “spirit” Hegel has brought the secularisation of the creative divine production to full completion.

After more or less respective detailed overviews of the philosophies of Fichte and Schelling, Hegel’s philosophy will be the next one we want to deal with in the course of the project. We will continue to investigate and to try to understand all the topics and problems on the respective higher level we already know of the discussion with Descartes’, Spinoza’s and Kant’s philosophy.

V.2

Brief Sketch of Spinoza’s Philosophy

Spinoza’s philosophy can be understood as the counter-outline to Descartes’ philosophy. Spinoza thought that he could overcome Descartes dualistic world-view by abolishing the separateness of God and world and the separateness of nature as extended thing and humans as thinking things. With respect to the fundamental problem of developing the interaction process immanent in the world, Spinoza has made an important step towards a solution of this problem. Spinoza tried to bring together the external interaction between God as the absolute infinite spirit and the world on the one side and the internal interaction between nature and the finite spirit of human beings on the other side. Spinoza integrates the spiritual and natural world in a unique substance consisting of nature. A substance is something that is unique and depends on nothing else than on its own existence. The Substance is eternal, infinite, existing independently determined by itself and exists both freely and necessarily. Within the creative activity of nature being God, freedom and necessity are two sides of the same coin.

Spinoza establishes two areas of natural reality, which he calls “*natura naturans*” and “*natura naturata*.” The first one is given with the substance itself and its infinite attributes extension and thinking, the second one is given with the modes, which consist of all single things and events composed of body and mind. Between both these areas of reality there does not exist any relationship let alone interaction. The only thing one can say is that the first area is present in the second, but one cannot say why and in which way this has been achieved. Spinoza recommends considering the world “*sub specie eternitatis*”. Doing this one considers the world as a totality of modes which each consists of body and mind appropriate to the assumption that they are modifications of the attributes of the substance. Spinoza emphasises continuously the fundamental meaning of the productive activity of the substance, which as “*natura naturans*” continuously creates the “*natura naturata*” consisting of single things and events. But as such the creative force of the divine substance remains an unfathomable mystery, which escapes all attempts to get hold of it.

The former external and internal interactions are changed into two different states of nature itself, which is, being identical with God, as well an active creative nature (“*natura naturans*”) as a passive, created, shaped nature (“*natura naturata*”). Instead of really abolishing the contrast of nature and spirit, Spinoza recreates Descartes’ dualism within nature without making a difference to Descartes assumption that extension and spirit are totally different and totally separated from each other. There is no dialectical interaction between them in the sense of a mutual influence and interweaving, which is why the philosophy of Spinoza is well characterized as a psycho-physical parallelism which includes a kind of hylozoism. Everything in nature from stones on up to animals and finally up to humans has, although in different degrees, a body and a soul, at the same time.

At the first glance one can say Spinoza creates an exclusively existing internal interaction by changing God as a spiritual being, which exists outside of the nature, into nature as a spiritual being, which “exists inside of the nature.” The difference between God as spirit and nature is replaced by a difference within nature. Both sides of the world – nature and spirit – are really incompatible each other. This is unconsciously expressed by Spinoza, whenever he describes the creative nature as “God” and the created nature as “nature”. Nature consists of both sides, but the fact that they are really incompatible is acknowledged by Spinoza himself because of the “physical psychological parallelism”, which means that both sides are independent from each other. Although they are different parts of nature, Spinoza excludes any relation between the physical, material and the psychological spiritual sides. He supposes that they mutually do not influence themselves because they are neither cause nor effect for each other.

God has thanks to his creative property to be “*natura naturans*” and thanks to his both infinite attributes extension and thinking done something, which remains forever an unfathomable mystery. But this has in Spinoza’s opinion the result that for understanding what the world is, one must look at every single inorganic and organic thing from the aspect of extension and thinking. From the aspect of extension the world reveals its bodily physical mode of being, whereas from the aspect of thinking the world reveals its mental spiritual mode of being.

Spinoza circumscribes the unfathomable divine creation with the relation of cause and effect supposing that the unique substance of God is the cause of nature. Independent of these metaphysical preconditions the relation of cause and effect is an ontological principle and must be understood as such as a mode of real creation or production. The fact that something like the creation of the world by God is inexplicable in terms of cause and effect leads to the identification of metaphysical reality and logical relation or in other words to a conflation of causes and reasons. Leibniz, who also equated causes with reasons,

demanded that there must be a reason for whatever exists and happens. Thus one of Leibniz fundamental principles was that of “sufficient reason”: “Nothing happens without a sufficient reason.” He conflated the ontological principle of causality with the rule or procedure to establish a logical reason for our beliefs and actions. The causes can really change the world, while the reasons are not real events and can only be either logically correct or invalid. The truth of the mathematical sentences does not date from the experience, it is a priori certain.

The conflation of the metaphysical reality and logical relation and the conflation of causes and reasons is the basis for Descartes’ and Spinoza’s comprehension of all relationships within the world in terms of geometrical mathematics.

We do not abstract a mathematical theorem from experience by calculating for example the total of angles of hundred or thousands triangles, but the mathematical theorem receives immediately, due to the logical evidence (proof), the character of necessity. It is a priori for certain.

That apriority Descartes and Spinoza transformed in a metaphysical apriority and – appropriate to the model of geometry and mathematics – they derived the world-system by means of logical thinking from definitions and fundamental theorems. If one understood the complete order of nature with a full clarity, then one would find everything just as necessary as all theorems of mathematics. Therefore Spinoza deductively derives all things, progressing step by step, by a chain of conclusions. For Plato as well as for Descartes and Spinoza knowledge dating from experience is inferior to knowledge dating immediately from thinking (spirit). Only ideas, which have the human thinking as their only origin, are clear and distinct. The only knowledge that is accepted by the empiricists is after Descartes and Spinoza inevitably confused and inadequate.

V.3

The Project Providing a Guideline of Independent Research

The contrast of nature and spirit is characterized by separation as well as by unification of these both parts of the world at the same time. The dualistic separation coerces the philosophers into the way in which they understand the unification: this one is dominated, organized and regulated either by a creative spiritual power or by a creative natural power. More precisely it is to say that the chosen creative power is a mixture between spirit and nature with the dominance of the spirit – as in Descartes philosophy – or a mixture of spirit and nature with the dominance of nature – as in Spinoza’s philosophy. Hereby are given the bare bones of the way philosophers understand the unity of the world within the scope of the contrast of “nature” and “spirit”. Descartes and Spinoza are the proponents of the idealistic and materialistic worldview representative for all the

philosophies and theories up today but in a distinctive way for the classical philosophy beginning with the philosophy of Descartes in the 17th century and ending with the philosophy of Hegel in the first third of the 19th century.

After having investigated Descartes' and Spinoza's philosophy a decisive stage is reached on which the participants of the project have received a first knowledge about the double sided contrast of "nature" and "spirit" as the structure which characterizes fundamentally and completely all philosophies and all scientific enterprises attempting to replace philosophy by grasping the unity of natural and human history. Researchers and students know on the basis of the above discussed topics why and in which way philosophic and scientific enterprises are more idealistic or more materialistic with each depending on the respective insight in natural and human history. Hereby they have spun a thread where they will be able to work on their own at the problems they have with the following issues: with the understanding of the unity as basis for the understanding of the unification of sciences and humanities, with the role which computer science plays for this unification and last but not least with the uncertainty to figure out how to squeeze much more benefit from the interdisciplinary context compared to the traditional approach.

VI

Special Workshops to Handpicked Topics

A profound knowledge of self-organisation in biological and economic social systems is useful for most of the researches made by researchers and students. The aim of the project concerning the following topics is to explain and present a few models of natural-social and human-social problem solving structures and how they can be transformed respectively into useful artificial social-intelligence devices. The explanations already given from section I. up to section V shows that the topics being treated here are also more or less detailed genuine subjects of the normal discussions.

1.) Readings, Lectures and Discussions about Self-Organisation and Problem Solving Structures in Biological Systems.

For the following explanations concerning self-organisation it is of great importance to see the difference between modelling and designing: Modelling is very different from designing an artificial system, because in modelling one tries to uncover what actually happens in the natural and social economic systems- for example an insect colony or the capitalist society, whereas in designing one

tries to apply the knowledge one has acquired by building the models in the real world to the structuring of systems one has to build in virtual world.

The growing interest of many researchers and the potential usefulness of explicitly connecting the functioning principles of social animal colonies or design principles of artificial systems were also important factors in the decision to carry out the seminar. The approach is similar to other approaches that imitate the way “nature” (that is, physical or biological systems) solve problems. That is why we extend the approach to include any attempt to design algorithms or distributed problem-solving devices inspired by self-organisation in biological systems including the collective behaviour of social insect colonies and other animal societies (e.g. “swarm theory”).

2.) Readings, Lectures and Discussions about Self-Organisation in Modern Capitalist Society

Another possible, and apparently very important and promising, pathway consists of studying self-organisation in economical social systems – here especially the capitalist society. The characteristic features and particularities of the modern society are summarised by understanding it as a **social economical system**, which is a historically specific kind of “**self-organisation**”, although it is produced and reproduced by the actions of humans. The way in which modern capitalist society is such a system does not allow us to confuse it with organic systems in nature but because of certain explainable reasons it is possible and useful to compare it with a biological organism. (Further details to this see below.) In which way are the social economic structures of capitalist society – partly unconsciously for humans – solving problems? The knowledge about the way in which social economical structures – even partly endowed with semantic features – solve problems, can be useful to solve problems arising by designing artificial systems. Studying problem solving structures either in the area of nature or society offers alternative ways of designing “intelligent” systems, in which autonomy, emergence, and distributed functioning replace control, pre-programming, and centralisation.

3.) Capitalist Society and “Multi-Agent Systems”

The capitalist society is a **multi-agent system** determined by a multitude of interconnected and interwoven structures, the relationship between these structures and the actions of human agents. The way in which this relationship – mainly determined by the partly unknown structures – is organised and formed determines the way in which the individual actions are in a socially general way coordinated and organised.

We have to distinguish human agents from non-human agents. Without recognising the existence of both kinds of agents and without knowing what

really are non-human agents a correct and completely understanding of capitalist society as an organic whole characterised by self organisation will remain a futile attempt.

The existence of non-human agents is remarkable, because the features of the non-human agents normally are those of human agents as natural, social and thinking beings. It is as astonishingly as it is difficult to understand that there are **social relations** between the non-human agents like commodities, money, capital, etc. which, similar to social relations between human agents, are unconsciously for the humans characterised by the creation of different kinds of semantics. Different entities get an economical social meaning in different ways by the intermediation of social relations, in addition to that what they are independently of those social relations. Humans are creating social relations between themselves, and also between themselves and – what is crucial for capitalist society – between things. A normal thing like a product with normal material or immaterial properties is satisfying human desires. A product gets the meaning of commodity or of money because of the fact that humans have created the exchange as a social relation between the products. Before humans behaved consciously to products as commodities and money, those products have got – unconsciously for the humans – already these economical social meanings due to their social relation created in form of exchange by the humans. Concerning commodities and money humans know some aspects needed for practising the exchanges, but what both actual are as the basis for the functioning of the exchanges they do not know. Being engaged in social relations things can get a social economical meaning or a social economic property different from all properties they have outside of such an economical social relation.

One has to start with getting an in-depth insight firstly into the respective economical social structures, which are unconsciously-consciously created by human actors, secondly into the semantic features of these structures including social relations, and thirdly into the actions of human actors related to those structures. An economical social reality is produced and reproduced by the actions of human beings. By creating problem solving structures humans have unconsciously created structures characterised by nonhuman economical social agents like value, money and capital etc. It is to explain how these two different kinds of agents are connected to one another in the economical social process in which the human agents are unconsciously-consciously acting in such a way that they are producing and reproducing an economical social system which is characterised by self-organisation.

Without understanding what these structures are and in which way they are interconnected with the actions of humans, and without knowing what parts of the structures are lying outside, and what parts of the structures are lying inside the realm of knowledge of the human agents, one fails to understand the modern economical social reality, let alone the ability to master its scientific

representation. The character of self-organisation is based on the fact that human beings do not know a large part of the structures so that they are unconsciously determined by these structures even while willingly and consciously carrying out their actions. Determined by these structures being independent of human agents in the above explained way, the social laws have the special character of structure-movement-laws and are backing the actions of the human agents in a similar or comparably way as natural laws are backing processes and actions in nature. Because human agents are consciously and unconsciously producing and reproducing the economical social structures of capitalist society, this one has gathered a momentum of its own how it is typical for self-organisation in complex biological systems in nature.

To capture the difference between the various self-organisations in the respective biological or economical social systems one has to study intensively the relations between the structures and the actions of the non-human and human actors. Doing this is not only important with regard to the evaluation of the differences between natural and economical social systems of self-organisation, but especially with regard to different ways in which modern theorists like H. Maturana, N. Luhmann and others give explications of economical social systems by creating diffuse mixtures of both kinds of systems.

The natural organic character of capitalist society is taken by A. Smith for example as well as an eternal valid fact as it remains unknown for all humans, either for scientists or for economical social agents. A. Smith called this unexplored internal structure of capitalist society, which is hidden behind the economical social relations and events on its surface, the “**invisible hand**”. With regard to self-organisations in the natural and economical social world, it is of great importance to compare the character of self-organisation of the capitalist society with self-organisations in the natural world.

4.) Processing Complexity and the Problem of its Scientific Presentation

Self-organisation in an economical social system being in the same time a multi-agent system provides models for designing the respective systems determined by both the **self-organisation** and the behaviour of **multiple agents**. The capitalist society is of high **complexity**, which is a big challenge for every scientific presentation. Which features characterise a social (biological) system determined by self-organisation? What does the complexity consist of? Features characterising complexity are generally spoken given with the fact that all parts are mutually influencing, one being mutually precondition as well as result in the same time etc. By which particular method of the scientific presentation it is possible to solve the contradiction between the complexity of a self-organising system and the **linearity of its scientific representation?**

The methodological procedure paraphrased with “processing complexity” is that of Marx’s “Capital” and once by him described as the method of going upwards from abstract onto the complex. Descartes already has propagated this methodical procedure as the only suitable one to present the very knowledge of the human and the natural world. Descartes recommends splitting large problems into smaller ones and than to argue from the simple to the complex. What is simple is not the opposite of what is complicated, but rather what is simple is less complex because the economical social reality as a cohesive whole is complex in the above indicated way.

This method regarding complex systems can be understood as a continuous oscillation between research and attempts of scientific presentations: After having finished this oscillation between research and the respective scientific presentations, the researcher should have found the most abstract elements to begin with an adequate scientific presentation of the complex.

From the aspect of processing complexity one has to get a reliable insight into societal labour especially in its historical specific form given with the capitalist society. Therefore the contrast of value and use value of commodities is to be studied, as well as the double sided contrast between price bearing commodities and money and the capital being the processing contrast between commodities and money.

5.) The "Brain in a Vat" Hypothesis. The Matrix. Descartes Philosophy and a Popular Misconception of Biological Evolution and Social Cultural History

It has come to be known as the "**brain in a vat**" hypothesis, and one powerful formulation of the idea is presented by the philosopher Jonathan Dancy:

"You do not know that you are not a brain, suspended in a vat full of liquid in a laboratory, and wired to a computer which is feeding you your current experiences under the control of some ingenious technician scientist (benevolent or malevolent according to taste). For if you were such a brain, then, provided that the scientist is successful, nothing in your experience could possibly reveal that you were; for your experience is ex hypothesi identical with that of something which is not a brain in a vat. Since you have only your own experience to appeal to, and that experience is the same in either situation, nothing can reveal to you which situation is the actual one." (Introduction to Contemporary Epistemology, 10)

The "brain in a vat" hypothesis shed light on the character of Descartes philosophy as well as on the interaction of biological evolution and social cultural history. Many contemporary philosophers discuss this hypothesis in terms of constructivism by referring to the respective scenario described in the movie **The Matrix**. By the same way we are in the process to explain why the unity of the world is presented by the philosophers in the incomplete and distorted dualistic form of the contrast of "nature" and "spirit, we will explain why all epistemological conceptions relying on the "brain in the vat" hypothesis turn out to be a popular misconception.