

František Ochrana

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**Methodology  
of Social Sciences**

KAROLINUM

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František Ochrana

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# Introduction

Science is a logical instrument based on our rational explanations of observed phenomena. Science can be likened to an optical device through which we look at an inspected object. The result of the examination is a scientific statement regarding the examined issue. The overall testimony of science regarding the world is called the “scientific image of the world.” Part of this statement is also a statement on social reality. This statement is the result of an examination conducted by social sciences.

Original science which emerged within ancient society was of a syncretic nature. Natural and social research issues were of the same character and testimonies of ancient science were similarly not separated. Science in turn underwent a complex evolution (Bernal, 1960) when it gradually separated into the individual scientific branches. With the advent of modern times and during the period of the Enlightenment, the understanding of natural and social reality developed proportionally to about the same extent. The late 19th and early 20th centuries, however, marked a turning point regarding the knowledge of scientific issues. The revolution in natural sciences gave birth to new scientific knowledge, new scientific branches and new scientific procedures (Kuhn, 1997). Within the development of natural and social sciences, a clear “discrepancy gradually emerged.” What were the causes of this separation between the natural and social sciences? Do these causes arise due to the objective nature of the different types of reality under study, or are they rather of an epistemological nature? Whatever the case is, seeking answers to the aforementioned issues falls within the methodology of science.

The methodology of science is of a crucial importance for the building of science as a whole as well as for the forming of the different scientific branches. That is, it seeks (among other things) to find out what is the nature of the “scientific image of the world,” what is the substance of

the “scientific law,” what methods and procedures could and should be used within scientific research. In the field of social sciences, these issues are also associated with the question of the nature of clarifying statements that social sciences provide. Are the statements of social sciences similar to the explanations from natural sciences, or is it rather a revelation of the meaning and understanding of social phenomena based on a clarification of the system of rules? Is social cognition by its nature a causal explanation (Hempel) and is it rather an interpretation (Winch)?

All these are questions of the methodological nature that show the way towards the answer with respect to the character of the resulting scientific statement based on the examined issues, and based on what the given scientific statement provides evidence. This publication attempts to look for the answers to these questions and to establish possible grounds for their solutions. I would like to thank Prof. PhDr. Vladimír Čechák, CSc. and Prof. PhDr. Miroslav Krč, CSc. for the review of this study and for their comments and suggestions towards further research.

# 1. Specification of the Issue. The Subject of Social Sciences. The Issue of Commensurability and Incommensurability of Social and Natural Sciences

Every science, if it should be called as such, has to possess certain attributes that define it as a scientific system. These attributes include, in particular, the examined object for which the given branch of science differs from other sciences, its own scientific methods and procedures that are specific just to the given scientific discipline, functions which this branch of science fulfils, and formulated “scientific laws” that are characteristic to the given scientific discipline. In addition to these specific features, each branch of science also has its general characteristics that distinguish science from the other forms of cognition of the outside world. These include first and foremost the logical consistency and accuracy of scientific statements that exist in the form of a relatively coherent system of logically harmonised testimonies. An essential feature is also the objectivity of scientific statements that correspond to the attained level of knowledge about the investigated subject.

## 1.1 The Subject of Social Sciences

The research subject of social sciences is society as social reality. Social reality is a specific form of existence that has evolved from nature. In this sense, a society is intrinsically connected to nature. A society is “surrounded” by nature, lives in a particular geographic environment and at the same time also affects nature through its activity. Nature and society thus comprise two mutually interacting subsystems.

On the other hand, social reality is, from the perspective of scientific abstraction and specification, such a distinct form of being that society is a relatively independent *social* system, significantly different from both non-living natural systems and living non-social (e.g. biological) systems.

The essential difference is primarily the ability of a *social* individual to *rationally* think, to make decisions, to set up their own objectives in the form of intended, expected (anticipated) outcomes of conscious activity<sup>1</sup>.

Both of these facets of the issue have a significant impact on the methodological approaches within social examination, as shown by the “history of methodology.” To the extent that we take into account only the evolution side of the “separation” of a society from nature, the issue of the scientific explanation of social reality appears analogous to examination by the natural sciences. To the Vienna Circle members, the constitution of a social science (sociology) is an issue of the application of physicalism and, in principle, there is the possibility of a uniform science (see Neurath, 1931, 1934, 2006). A similar methodological position is also held by Hempel. As long as there are certain laws in nature, the same also applies to the realm of social reality (Hempel, 1942, 2006). The task of social sciences is, in turn, to be able to detect these laws<sup>2</sup>, to define them and through a scientific explanation, to get know how to explicate the substance of a scientific issue<sup>3</sup>.

However, if we hold the opinion that social reality is so very different from a being of nature, we come to a different methodological approach, as elaborated by Dilthey (1967) and Winch (2004). Within this methodological approach a society is (when compared to nature) understood as being a qualitatively different form of existence. That is, people act with a certain purpose (Brentano, 1993; Husserl, 1995, 1996), whereas in nature we do not encounter intentionality. Figuratively speaking, in nature only “blind unconscious forces” operate.

Within a society, people act as rational beings endowed with consciousness. The social world is a world of norms and values that motivate human activity. People create rules that are regulators of their actions.

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- 1 The subject is therefore endowed with an ability to act and decide, which fact the contemporary theory explains in part “purely rationally” (Neumann and Morgenstern, 1994) and in part prospectively (Kahneman and Twersky, 1979).
  - 2 It does not matter what “kind” of social reality it is; the significance is the idea of a “social law” in the sense of existence of a “factual law.” An example of such an approach within the domain of political science is given by Novák (2013) in his upcoming study *From the so-called “sociological laws” by Maurice Duverger towards two models of democracy*.
  - 3 In this context, there begs to be mentioned the Marxist idea of the “social (or societal) law” begs to be mentioned. According to Marx (see *Theses on Feuerbach* as well as *Capital, Volume I*), cognition of objective laws allows to *practically* transform the society to be practically transformed. Marx set himself apart from the previous social theory by means of his radicalism by request for a revolutionary change of the present-day society. Within the eleventh thesis (see *Thesis on Feuerbach*), he writes that “philosophers have only diversely *interpreted* the world, but the aim is to *change it*” (Marx, 1958: p. 19).

Society itself is also, in turn, the result of this acting. Outwardly it appears as social reality whose examination – or “understanding” – calls for the use of a different methodological approach than when studying nature. The key feature of social sciences is then to “understand” history and social reality.

As is obvious from the brief outline of the different methodological approaches, the whole issue becomes considerably complicated, so much that, as M. Scheller puts it, “opinions on the *substance and origin of a mankind* were at no epoch so much uncertain, vague and confused as they are in our time” (Scheller, 2003, p. 120).

Although both of the above-mentioned approaches to the study of social reality differ, they may agree that the subject under examination by social sciences is social reality. The disagreement arises, however, when establishing the question “what is the nature of social reality?” Is it the reality that is “only” a result of evolution and nature and therefore society comprises “integral unity,” or are nature and a society comprised of fundamentally different forms of existence? The answer to this question is serious enough that within the presented publication we shall gradually attempt to seek a more detailed answer to it.

## 1.2 The Issue of So-called Commensurability and Incommensurability, Respectively, Social and Natural Sciences

The core of the dispute we have labelled the “issue of commensurability and incommensurability, respectively, of social and natural sciences” express by the words of H. White, who draws attention to the issue of the relationship between natural and historical sciences within contemporary theory. He states: “Magnificent achievements of science in our time not only inspired humanitarian scholars to establish the science of society which would be similar to the science of nature, but also sharpened their hostility towards history” (White, 2010: p. 42). The essence of this issue rests in the dispute over the nature of so-called commensurability and incommensurability, respectively, social and natural sciences.

The issue is further complicated by the fact that some scientists themselves while engaged in the examination of society are averse to the scientific disciplines that do not use “exact”<sup>4</sup> scientific procedures

4 In this context it is fair to mention one problem related to the definition of the term “exactness of a scientific inquiry” as it was pointed to me by one of the opponents to this book,

and methods. Those scientists who conduct their research within certain domains of social reality and use procedures similar to those adopted by natural scientists are reluctant towards the procedures and scientific disciplines that do not adopt such procedures in their investigations of social reality.

This dispute is aptly expressed by White in the example of history and other fields of science: “A significant number of philosophers agree that history is either some sort of a third-class science, to which social sciences have the same relationship as once was had by natural history through natural sciences, or a sort of a second-rate art, whose epistemological value is highly questionable and aesthetically uncertain. These philosophers seem to have concluded that if there is something like a hierarchy of sciences, then history falls somewhere between Aristotelian physics and Linneian biology – and therefore it is of some value to collectors of exotic world views and fallen mythologies, but there is no way it may contribute to the establishment of the “common world” which, according to Cassirer, finds its daily confirmation in science” (White, 2010: p. 43).

Also in this case, the essence of the dispute represents the issue of commensurability and incommensurability, respectively, of social and natural sciences. The substance of the solution to the problem of commensurability or incommensurability of social and natural sciences rests in the quest for an answer to the question whether it is possible to consider both types (classes) of sciences as “the same kind of a scientific cognition” supported in scientific research by identical methodological foundations, and, in principle, if it is possible (and desirable) to use the same methods for examination of social reality, or whether this is, in principle, impossible. By commensurability of natural and social sciences it is understood that both “kinds of sciences” are only subsets of the same “family of scientific cognition of examined reality” (in principle attainable “unified science”). In such a case, natural and social sciences are commensurable, the fact of which is also reflected in their adoption of

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Prof. Čechák. Natural scientists and so-called exactly-founded social scientists, who refer to themselves as “exact social scientists”, label by the term “exactness” only those scientific procedures that are based on quantification and procedures which can be measured. However, the scope of the term “exactness” does not become exhausted by this definition. Into the set of elements constituting the extension of “exactness” belong also those procedures that do not necessarily use only quantification procedures. We therefore may ask proponents of the (basically positivist) “exactness” whether, for example, procedures such as logic (e.g. logical inference) cannot be considered accurate (“exact”) procedures only because they do not use measurements the way natural sciences do? To “exact” scientists, the problem seems to be different. See e.g. the study aptly titled *Econometrics – exact or social science?* (Višek, 2013).

a common tool for explaining scientific problems, which is the scientific explanation.

However, if we compare the real situation in the approaches and methods used in natural and social sciences, we find that social sciences lag behind natural sciences, particularly in terms of the use of exact methods. Is this really so? If so, then social sciences lag behind natural sciences by a full century. While over the period of the constitution of Newtonian physics, social sciences managed to “keep up” with natural sciences, during the era of Einsteinian physics they have failed to do so<sup>5</sup>.

However, if we assume that social sciences are, in their research subject, *significantly* different from natural reality because the social reality is characterised by intentionality in actions, then we may understand (illuminate) social phenomena through the form of understanding related to the meaning (Winch) as opposed to the form of causal explanation (Hempel). In such a case, social sciences are incommensurate with natural sciences. Therefore we cannot apply “exact” methods to them which are typical for the field of natural research and rather we make use of specific methods that are, on the other hand, inapplicable within the study of nature, because in nature, phenomena do not occur that require exposing the intentions of the acting agents.

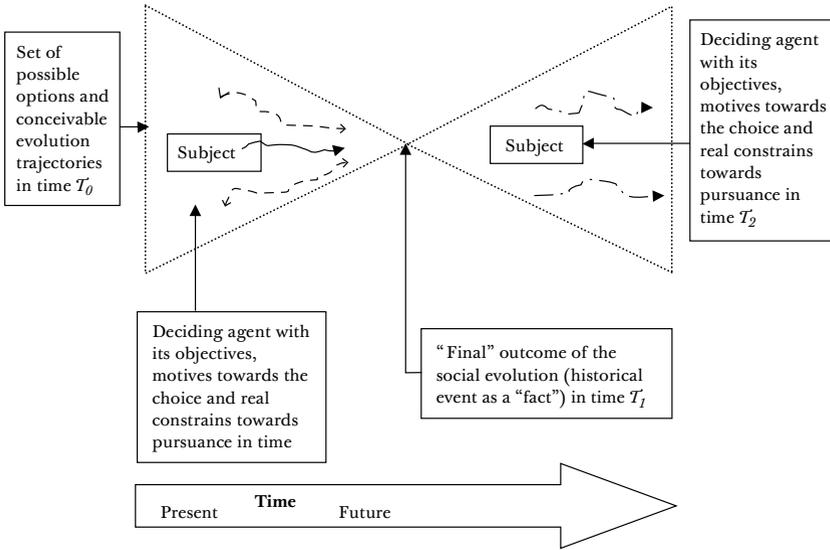
In this sense, the efforts of social scientists to “catch up” with natural sciences – especially through the implementation of “exact,” formalised methods – represent an endeavour destined to fail. This limitation has its objective causes inherent in the very essence of social reality. In the words of N. Hartmann, himself a seeker of new ways of ontology, the starting point for the solution may be exposure of the “being of events” (Hartmann, 1976: p. 71), when we explore social reality as a dynamic system (Haken).

### 1.3 The Subject as a Deciding Agent

Generally speaking, the research subject of social sciences is social reality. Although social reality is a result of the activity of subjects, outwardly the society acts as an objective determinateness. People are at a given time and place born into a certain society, live in it and find it as a world that

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5 Thus proclaimed lagging of social sciences behind natural sciences has a negative impact on the administration and funding of science, when e.g. within competition for public resources towards funding of scientific research are social science projects by so-called exact-based decision makers pushed out at the periphery of priorities.



**Figure 1:** Deciding agent.

Source: Author.

is “given to them.” Thus we say that social reality is, with respect to the given subject, an objective factor of its life that affects its being.

However, the human being is, on the other hand, a deciding agent (Heidegger, 2002) who at the given *historical time* decides through its actions. The essence of the issue is graphically illustrated by Figure 1.

The subject appears in the role of an agent surrounded by certain, given outward conditions. These also include the results of previous events. Past (having already occurred) events affect current events and these in turn affect the set of future trajectories and trends of social evolution. The given social conditions create a primary social framework for the actions of the subject in the relevant (present) time  $T_0$ . Time represents the attribute of being of the presently existing (contemporary) social era. A set of conceivable options with certain recognised (as well as unrecognised) evolution trajectories “open” ahead of the subject as a part of social reality, which are characteristic for the given period of time (time  $T_0$ ). The given evolution trajectories represent the potentially conceivable evolution tendencies of a social movement, impacted by the framework of social, natural, and other conditions<sup>6</sup>.

<sup>6</sup> These in turn may in the domain of theory materialise e.g. in the form of visions. See e.g. Potůček et al. (2000).

The deciding agent, who enters social events through its actions, intentions, objectives and motives, finds these as being independent factors of social evolution. Conceivable evolution trajectories, therefore, fall within the domain of independent existence. They are potential directions of future evolution that the acting and deciding agent “finds” as objectively given preconditions and limits to social evolution.

Evolutionarily taken, conceivable evolution trajectories are the result of past evolution, the “summary” of intentional and unintentional actions of various agents and the result of a number of effects and restrictive (social, natural) conditions. Social evolution thus takes place along the line “past – present – future” (Dunn, 2004). The criterion for segmentation is the perspective of (historical) time, when within the examination of social reality we seek to answer the questions of “when and where the given event originated?”

“Past” is all that has already taken place before the present. It is such a “form” of social reality that “passed away” into the flow of time and into “history.” There is nothing that could be changed in the past, since it had already happened, it had irrevocably and irreversibly occurred. It is in itself a kind of an “ontological substance” about which we can express within a social (or historical) examination either by non-normative or normative conclusions.

From the perspective of the conceivable trajectories of social evolution, presence is something in which one of conceivable evolutionary trends that just “resulted” at the time  $T_1$  becomes social reality. This fact is indicated in Figure 1 as the point marked as “final” outcome of social evolution. At that given moment the given historical event becomes reality. At the level of social theory we label this fact by the term “social fact” (or “historical fact”). The term “social fact” (“historical fact”) in turn expresses the actuality that the given event has become a social reality, in which something has been witnessed.

The present moment  $T_1$  opens a “new field of options” in front of the subject, when the subject as an active agent takes part in social events through its projects, intentions, objectives and motives with respect to the real limits towards pursuance of its activity at time  $T_2$ .

In front of the subject as a deciding agent thus opens up A set of future “conceivable worlds,” therefore, opens up in front of the subject as a deciding agent (Leibnitz, 1970; Kripke, 1980). “Conceivable world” is understood a conceivable state of the world as a theoretical “representation” of various modes of states of the world to which the various social theories and disciplines of social sciences speak (with regard to the specif-

ics of their own subjects) either non-normatively (“what will happen?”) or normatively (“what should happen?”).

## 1.4 The Decision-making of a Subject under Various Information Conditions

The decision-making of a subject is affected by numerous factors (Winkler, 2007). One of them is the quality of information and the possibility of its use for the decision-making support of the given subject (Armstrong, 2001). The subject may decide under various information conditions (Terek, 2007), as is transparently shown in Table 1, and also this decision-making may be undertaken within various domains of social reality, such as e.g. economy (Friedman and Friedman, 1992) or politics (see e.g. Ordeshook, 1989).

The first option, related to a relatively restricted set of decision-making issues, takes place when deciding under conditions of certainty. The

**Table 1:** Decision made by a subject (“conceivable world”) with regard to the quality of information

Type of choice as a decision by the subject under conditions of	Content	Example of auxiliary scientific methods
Certainty	The subject decides under conditions of certainty.	Deterministic methods
Risk	Deciding agent knows states of the world $S_i$ and probabilities $P_i$ of states of the world $S_i$ .	E.g. some methods of game theory, based on the idea of “risk.”
Indeterminateness	For conceivable states of the world we do not know the probabilities of occurrences of states of the world.	E.g. some methods of game theory, based on the idea of “indeterminateness.”
Uncertainty	The probability $P_i$ for the state of the world $S_i$ is not known. There is not complete information on the distribution of random variables $V_i$ . We only know some of their parameters (mean values).	Game theory, multi-criteria decision-making, theory of “fuzzy” sets.

Source: Author.

deciding agent has enough information to make a decision with confidence. Given the particular nature of a social problem, the agent looks for such a solution  $x_r$  that is either a maximisation ( $\max f(x_r)$ ) or minimisation ( $\min f(x_r)$ ) solution from the available set  $X$  of all possible solutions. The choice may, in turn, be formally expressed as follows:

We choose such  $x_r \in X$  that  $f(x_r) = \max f(x_r)$  or  $f(x_r) = \min f(x_r)$ ;  $x_r \in X$ .

For solving optimisation problems under conditions of certainty there are various methods to choose from. For example, in praxis the method of linear programming is often used.

Most social problems, however, do not demonstrate the attributes of definiteness (certainty). The deciding agent therefore decides under conditions of risk, indeterminateness and uncertainty (see e.g. Tversky and Kahneman, 1974; Raiffa and Schlaifer, 2000; Winkler, 1994).

In decision-making under risk, the deciding agent is faced with a choice of several options. At the same time it holds true that the outcome of his/her choice (e.g. political decision on how to reform, balance of the state budget, tax rate modification, etc.) results in a specific outcome. A rationally contemplating subject who knows the conceivable states of the world and can estimate the probability of occurrences of events chooses such a variant that maximises the *average* result. For this purpose we may as an auxiliary means adopt the tools of game theory.

Since in decision-making under conditions of risk it holds true that we know the states of the world  $S_i$ , we know the probability  $P_i$  of the states of the world  $S_i$  and we know the variants  $V_i$  that lead to the states of the world  $S_i$  under the probability  $P_i$  under which states of the world occur, the relationship exists:

$$\sum_{i=1}^n P_i = 1$$

Provided  $P_i = 1$  or  $P_i = 0$ , this would relate to decision-making under the conditions of certainty (definiteness). In praxis we may adopt such an approach e.g. in domains such as public policy when deciding the choice of a variant of policy implementation or when deciding upon the choice of a variant of an investment project.

As long as decisions are taken under the conditions of indeterminateness, we assume, like previously, that there is a rationally deciding subject. However, when the subject chooses under different information conditions, we label this as "indeterminateness." Under these conditions, for states of the world  $S_i$  the decision-making agent does not know their corresponding probabilities  $P_i$ . The essence of his/her choice lies in the

fact that the agent *rationally* chooses such an option that maximises the average result. Many decision-making social problems share the character of deciding under indeterminateness. The decision-making of public administration bodies might serve as a good example of this, such as when these subjects know in what states of the world will be, but they do not know the likelihood of an occurrence of these events, which is shown in more detail by (Ochrana, 2007).

When deciding under the conditions of indeterminateness, there is only incomplete information available for deciding upon the selection of a particular variant. For the state of the world  $S_i$  the corresponding probability  $P_i$  is not known. There is incomplete information on the distribution of random variables  $V_i$ ; we know only some of their parameters (mean values). The values of the selection criteria are affected by random variables. A rationally behaving subject chooses such an option that maximises the mean values of the parameters.

In conclusion to this brief analysis, it is fitting to emphasise that methods and procedures of deciding under certainty, risk and indeterminateness are described in detail and formalised in myriad expert literature (see e.g. Allais, 1953; Arrow, 1971; Baláž, 2009; Ellsberg, 1961; Hicks, 1979; Keynes, 1926; Neumann and Morgenstern, 1944; Winkler, 1982). Therefore, we refrain from a more detailed analysis since it goes beyond the scope of this publication.

## 1.5 “Conceivable worlds” in social sciences

The subject of social sciences is to examine some “parts” of social reality. Social reality is compared to other “non-social” sciences (where an element of this set is, for example, natural science) characterised in that it is the result of both intentional and unintentional human activities. Sociologists, political scientists, historians, etc. in their exploration likewise ask the question “what would happen, if?” (Dunn, 2004).

Within the quest for answers to such questions, in their deliberations they construct epistemically conceivable worlds (Kolman, 2005; Kripke, 1980; Quine, 2005). The term “epistemically conceivable world” contains “what could have happened or what should have happened?” (e.g. view of a historian), “what can be or what should be?” (e.g. view of a political scientist). The basis for deliberations on the construction of epistemically conceivable worlds is the real current state of the world or an event that has already occurred in the past.

Within the construction of conceivable worlds, we thus assume the knowledge of (either present or past) social reality. The starting point for understanding is some true fact (facts), i.e. an event (events) for which we relatively reliably know that they happened in exactly the same way in which they truly occurred. For example, if a historian investigating modern history knows that the first president of Czechoslovakia following the political coup in 1989 was Václav Havel, then the statement “the first president of Czechoslovakia after the political coup in 1989 was Václav Havel” must be true. From the perspective of the construction of conceivable worlds, the set of considerations splits into two sets of epistemic worlds, namely those in which the first post-November president is Václav Havel (epistemically true world) and a set of epistemic worlds that are false, because it claims something that is not true, namely that “the first president of Czechoslovakia after the political coup in 1989 was not Václav Havel.”

Therefore this set of considerations, based on a negation of the statement “the first president of Czechoslovakia after the political coup in 1989 was Václav Havel,” forms an ontically empty set. Thus, the said statement does not reflect the true reality. From the viewpoint of epistemology, this relates to a set of inconceivable worlds. Therefore, as long as social scientists produce constructs of epistemically conceivable worlds, they always start with a *real* fact. This way, their testimony significantly differs from all other pseudo-theories that base their statements on unverified and fictitious assertions. Using the name of the book by Hacking (Hacking, 2006), we ask the question: “*The social construction – however, of what?*”

Epistemically conceivable worlds thus form variants (or alternatives, respectively) to the real (current or past) state of the world (society). This means that none of the considered (epistemic) conceivable worlds are excluded as a conceivable variant of the current world. Such epistemically conceivable states of the world (of the future direction of the Czechoslovak state in 1992) could have been, for example, states where Václav Havel did not abdicate, but using his social authority rather spoke against the break-up of Czechoslovakia (the state  $S_1$ ) or the state  $S_2$ , when Václav Havel abdicated and no longer wished to hold the position of president, or the state  $S_3$ , when he became the president of the Czech Republic, or yet another state  $S_i$  that falls within the set of epistemically conceivable states of the world where Václav Havel becomes the founder of a new political party.

Scientists pursuing social examination in turn construct such states of the world  $S_i$  as conceivable states of the world and in the context of

adopted methodology they either simply note the given possibility or appraise it using normative positions in a sense of “shame this did not happen...” or, contrariwise, “it is only too well that this or that did not happen.”

The essence of a scientific testimony on conceivable states of the world is that it is *not a subjectivist construct* but instead such a conceptual image of the social reality that is consistent with the requirements of scientific evidence. Scientific testimonies represent *potentially conceivable future states of the world* falling into a set of realistically conceivable (ontically admissible) states of the world in this consistent theoretical system of constructs. All identified and defined conceivable states of the world thus form a “fan” (set) of options from which, nevertheless, within the real being (ontic world) only one option may be transformed into the current state  $S_a$ , respectively, only one takes the form of the state  $S_h$ . The analysed problem of “conceivable worlds in social sciences” may be graphically represented as follows (Figure 2).

Level of social reality (ontic world) – and its potentially conceivable states											
Ontically (realistically) conceivable states						Ontically (realistically) inconceivable states					
$S_1$	$S_2$	$S_3$	$S_4$	$S_5$	$S_6$	$S_7$	$S_8$	$S_9$	$S_{10}$	...	$S_n$
$S_a$ (resp. $S_h$ ) as the actual state											
↓						↓					
Epistemically conceivable worlds $SEMi$ (conceivable states of a society delineated by social sciences)						Epistemically inconceivable worlds $SENi$ (unscientific fiction, unscientific theories)					
<b>Epistemic level (world of ideas that gives evidence on conceivable, respectively inconceivable, states of the world)</b>											

**Figure 2:** Conceivable worlds within a scientific testimony

Source: Author.

As evident from Figure 2, we discriminate the ontic level of conceivable states of the world. It is the level of a social reality that is “pregnant”