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The Problem of the Laws of Nature in *Tractatus Logico-Philosophicus*

Abstract: The general goal of this article is to evaluate Wittgenstein's solutions to philosophical problems of causality and the law of nature constructed in *Tractatus Logico-Philosophicus*; this goal will be pursued in three distinct stages. *First*, I will focus on eliminating traditional concepts of causality and necessity; the austrian philosopher does not recommend eliminating the concept of causality from everyday speech or thinking about the world; the common language is fine, being fully logically ordered. As we shall see, Wittgenstein's aim was to eliminate the necessitarian view of causality and, implicitly, the idea of causal necessity. *Second*, I will identify the type of approach proposed by Wittgenstein in the problem of the laws of nature. For this purpose, I will review the most important kinds of approaches to the law of nature in contemporary philosophy – the necessitarian, regularist, structural, and instrumentalist approaches - and then I will conclude that, even if there are elements that converge towards a structural solution in the problem of the laws of nature, however, Wittgenstein's position is an instrumentalist one. *Third*, I will evaluate Wittgenstein's solution to the problem of the laws of science. I will argue that the general principles of science, such as the principle of causality, are understood by Wittgenstein as indications for the construction of first-order laws, proposed by a certain system of natural sciences. Consequently, a meaningful proposition constructed according to the principles of a certain system in the natural sciences will take on a certain form of representation, peculiar to that system. Therefore, Wittgenstein, proposing a minimalist way of understanding the laws of science, had a modest influence on philosophers who focused on this subject in the philosophy of the twentieth century.

Keywords: Wittgenstein, causality, natural necessity, laws of nature, laws of science, instrumentalism, regularism, structural laws

1. Introduction

After the first pages, any reader of the *Tractatus Logical-Philosophicus* (TLP) is put in a position to try to understand what the world is for Wittgenstein. Interpreting propositions such as "The world is the totality of facts, not of things" (TLP 1.1) and "The facts in logical space are the world" (TLP 1.13), we understand that Wittgenstein does not consider the world as a physical reality or as a reality that is described and explained by the natural sciences. The world of *Tractatus* causes great perplexities in the mind of a physicist, but also in the mind of a simple man, guided by common sense. The greatest source of perplexity is that, in Wittgenstein's world, facts are not causally connected; therefore, a change in one fact does not necessarily determine the change in another. "Each item can be the case or not the case while everything else remains the same." (TLP 1.21) The appearance or disappearance of a fact is not an event guided by the laws of nature, but is one determined exclusively by logical necessity; a fact that exists is only the actualization of a logical possibility, an event independent of the interaction with other facts or of the will of a self. The autonomy of each fact would make a physicist's cognitive efforts useless because he would wake up in front of a world made of thousand pieces without an empirically determinable connection between them, a world without causal connections, a world in which the possibility of explanations and scientific predictions is called into question. In this world, the work of the physicist would be reduced to the construction of structural models for isolated facts. Or, this is not the world traditionally assumed by the natural sciences. This was not the world assumed by classical metaphysics until the appearance of the *Tractatus*. However, the task of science would be to construct propositions that model the states of facts of this world.

For Wittgenstein, the problems of epistemology (those raised by the possibility of scientific knowledge of the world, those related to the possibility of constructing the natural sciences, the knowledge of natural necessity, causality, and the laws of nature) seem rather accidental, without too much importance for the main purpose of the research. This is especially true if we take into account the hypothesis that the world in the *Tractatus* is one derived from the logic of language and the philosopher's confession that the fundamental intention of the *Tractatus* was an ethical one. However, as Wittgenstein believed since 1913, philosophy is the theory of the logical form of all scientific propositions (not just the theory of the logical form of fundamental laws). As a type of activity,

philosophy will always be above or below science, but never on the same level as science. (Flonta 2012, 73) Interpreters always insist on the last part of this thought, that philosophy is qualitatively distinct from science, but seem to forget its first part, that the main task of philosophy, after the young Wittgenstein, was to establish the logical conditions of possibility of propositions belonging to the natural sciences, from simple scientifical descriptions to the fundamental laws.

Wittgenstein moves away from science when it is packaged in alienated, pathological forms. Science becomes an illegitimate epistemic activity when it prescribes theorizing models for philosophy or when, in diluted, popularized, seemingly philosophical forms, it offers recipes for solving life's problems, predictions about the dynamics of history, or the illusion of knowing facts. In other words, the problem for Wittgenstein is related to the idea that any difficulty would have a scientific solution; he condemns *scientism*, not *science*. At the same time, philosophy is repugnant to Wittgenstein when it becomes a hollow verbal practice and formulates nonsense that does not clarify anything about things he should be silent about. The philosopher tells us in the *Tractatus* that the only types of meaningful propositions that can be true are those of the natural sciences. "The totality of true propositions is the whole of natural science (or the whole corpus of the natural sciences)." (4.11) Even if *Tractatus* is not a critical assessment of the possibilities of knowledge, yet, epistemically speaking, Wittgenstein gives the highest possible dignity to the natural sciences. That's right, the philosopher believes, that even if all scientific problems were answered, our life problems would not be affected at all. (6.52) This verdict does not diminish in any way the dignity of science but clarifies the fact that the problems that are felt to be important in life by a contingent being in a contingent world, but which still exist, cannot be solved by knowing the facts. Identifying the conditions for the validity of science's propositions, Wittgenstein suggests that we should not have unjustified expectations from science. Likewise, we should not have unjustified expectations from so-called philosophical theories either; metaphysical philosophy does not possess mechanisms for detecting and stopping the production of nonsense. The idea that meaningful discourse is limited to facts should play the role of a stopping clause for philosophers.

No doubt, Wittgenstein gives natural sciences a high epistemic dignity. In this case, it means that his discussions of natural necessity, necessary connection, induction, causality, the laws of science, and the laws of nature should have their place in any philosophical discussion

about *Tractatus*. In addition, these discussions were for the philosopher an excellent opportunity to eliminate a large amount of metaphysical nonsense. The general intention of this article – to discuss and evaluate how Wittgenstein understands the ideas of causality and the law of nature in *Tractatus* – will be pursued in three distinct stages: (1) the elimination of traditional concepts of causality and necessity; (2) identifying the type of approach proposed by Wittgenstein in the matter of the laws of nature; (3) the presentation and evaluation of the Wittgensteinian solution to the problem of the laws of science. Let's go through these steps one by one.

2. Rejection of natural necessity and causality in *Tractatus Logico-Philosophicus*

Relevant propositions for how Wittgenstein treats the issue of causality, natural necessity, and laws, closely related issues, are in TLP 5.133–5.1362 and TLP 6.32–6.3611. We start with the discussion about the elimination of the traditional concepts of causality and necessity because these concepts have traditionally been behind the thought of the possibility of the laws of nature. Thus, Wittgenstein states that:

> "There is no possible way of making an inference from the existence of one situation to the existence of another, entirely different situation." (TLP 5.135)
> "There is no causal nexus to justify such an inference." (TLP 5.136)
> "We *cannot* infer the events of the future from those of the present. Superstition is nothing but belief in the causal nexus." (TLP 5.1361)

On closer inspection, we find that the philosopher does not recommend eliminating the concept of causality from everyday speech or thinking about the world; the common language is fine, being fully logically ordered. (TPL 5.5563) What is in question is not the common thinking or use of language, but a certain metaphysical way of thinking that, raising causality to the level of a universal reality, provided a deterministic explanatory picture of the world (as Schopenhauer does, for example). Therefore, Wittgenstein intends to clarify, delimit and eliminate some philosophical superstitions that have a metaphysical load that is difficult to justify, eliminating an inappropriate way of using language and thinking. The philosopher has in view only the causality that presupposes the existence of a necessary connection between cause and effect. As Chon Tejedor points out, Wittgenstein intends to eliminate the necessitarian vision of causality and, implicitly, the idea of causal

necessity. More clearly, the necessitarian perspective on causality argues that with the existence of certain laws of nature, some relations of necessary implication arise between certain possible states. (Tejedor 2015, 97) This perspective can be expressed by the formula:

$$l = > [q => p]$$

That is, the law of nature *l* materially entail that *q* entail materially *p*. As Chon Tejedor points out, "in this view, laws of nature *ground* the relations of material entailment between possible states and thereby *justify* inferences between them: in particular, causal laws justify inferences from causes to effects." (Tejedor 2015, 97) Traditional philosophers saw causal necessity as a kind of necessity, not one that derives from the symbolic, verifunctional aspects of propositions, but one that derives from the fact that certain laws of nature exist and are active in the world. In other words, *l* in the above formula cannot be replaced by any sentence, but only by a special one that claims to capture a necessary relationship between facts.

But, according to Wittgenstein, the relations between states of affairs are only internal, logical relations, their possibilities being able to be made visible with the help of truth tables. Truth functions and truth tables express relationships between propositional forms, forms that can be replaced with different propositions (with different meanings, but bearing the same verifunctional relationships between them). (TLP 5.24) Therefore, $l \rightarrow [q \rightarrow p]$ should remain applicable for whatever the meanings of *l*, *q*, and *p*. (TLP 5.4 and TLP 5.41) But, as we have seen, this is not true for $l => [q => p]$, where *l* can only be replaced by the so-called law of nature. As Chon Tejedor points out, "in this formula the application of operations also depends on the non-symbolic aspects of the senses of propositions and on whether certain facts obtain in reality (i.e. whether or not the relevant law of nature obtains)." (Tejedor 2015, 98) For Wittgenstein, however, it would be absurd to consider non-symbolic aspects when considering the relations between propositions: the usual implication applies to any three connected propositions, but the material implication applies only if it is a law of nature that guarantees a material connection between *q* and *p*. Therefore, according to TLP 5.24, we can only opt for the usual implication; it cannot be inferred in any way from the existence of a state of affairs from the existence of another state of affairs, completely different from the first (TLP 5.135), but we can formulate a compound proposition which refers to different states of affairs to see, with the help of truth tables, how they relate internally. According to Chon Tejedor, the proposition "The only necessity that

exists is *logical* necessity" (TLP 6.37) should be understood in a deflationary manner, to remind us that we are engaged in a practice that involves uniformly applying logical operations, the fact that we are engaged in this specific symbolic practice. (Tejedor 2015, 99)

3. Wittgensteinian approach to the laws of nature / the laws of science

The philosophical literature devoted to the problem of the laws of nature identifies four major approaches to this subject: the necessitarian approach, the regularist approach, the structural approach, and the instrumentalist approach to laws of science.[1] The necessitarian approach treats the laws of science as propositions that express a certain physical necessity, an intermediary between logical necessity and contingency; the laws of science would have such property because they would express relations between universals or relations or that engage the essential properties or dispositions of physical phenomena. By rejecting the existence of physical necessity, Wittgenstein implicitly rejects the possibility that the laws of science express in any particular way a physical or natural necessity.

The regularist approach treats the laws of nature as mere regularities in the evolution and development of natural processes, without them being understood as being related in one way or another to what the necessitarians call physical necessity. For regularists, there are simply regularities of nature that can be found in scientific practice, but which should not be justified by the appeal to metaphysical assumptions. Regularities are perceptible on an empirical and experimental level, the principle of induction functioning as a constitutive instrument in establishing the laws of science. But along with the idea of necessary causal connection, Wittgenstein also rejects the principle of induction. (TLP 6.31, 6.363-6.37) From his point of view, the principle of induction has no logical basis, but only a psychological one; it can only help us to build hypotheses, but not gain definite knowledge. The hypothesis that tomorrow the sun will rise, being a state of expectation, a psychological state, is a fact; it is a state of things of this world. But as there is no constraint according to which something must happen because something

[1] A "map" of philosophical approaches to the concept of law of nature was made by Friedel Weinert, in the study "Laws of Nature - Laws of Science", published in Friedel Weinert (ed.), *Laws of nature. Essays on the Philosophical, Scientific and Historical Dimensions*, Walter de Gruyter, Berlin, New York, 1995, pp. 3-52.

else has happened (TLP 6.37) and as the world is independent of my will (TLP 6.373), then from the fact that I expect the sun to rise, it does not follow that the sun will rise. Therefore, there is no possibility of inductively knowing something like the so-called laws of nature. On the one hand, the so-called regularities, having no connection with the logical order of the world, could express only contingencies, not non-essential aspects of the facts: everything we see could be different; everything we can describe in this world could be different. (TLP 5.634) On the other hand, induction is an illusory epistemic tool, which reflects a psychological need, not a possibility of real knowledge. However, induction is useful in the process of assuming the simplest law of science that can be harmonized with our experience. (TLP 6.363) Therefore, Wittgenstein cannot be called a regularist in the matter of laws. It's no surprise here. If for regularists the natural sciences are an activity in which generalizations based on observation and experiment play a central role, for German physicists in the late nineteenth and early twentieth century (Helmholtz, Hertz, and Boltzmann, those who contributed - through the considerations on the mathematical modelling of natural phenomena - to the genesis of the pictorial theory of the proposition) science was something other than empirical research of regularities.

The structural approach to the laws of nature starts from the premise that "structures, not events, are seen as ontologically primary; structures generate the regular patterns and phenomena which are observable in the world." (Weinert 1995, 49) Even if Wittgenstein denies any form of natural necessity and the structural approach presupposes "a weak sense of natural necessity as an entailment of the observable by underlying structures" (Weinert 1995, 49), we can see the ubiquity of structural thinking in *Tractatus*.[2] Essential propositions from the corpus of *Tractatus* show us a structural way of theorizing about representation, image, sentence, and world:

> "There must be something identical in a picture and what it depicts, to enable the one to be a picture of the other at all." (TLP 2.161)
> "A picture contains the possibility of the situation that it represents." (TLP 2.203)

[2] I think that the demonstration made by Ilie Pîrvu (2001) in this direction is consistent and convincing. (Ilie Pârvu, "'Mein Grundgedanke Ist... ' The Structural Theory of Representation as the Metaphysics of Wittgenstein's *Tractatus Logico-Philosophicus*", *Synthese*, 2001, 129 (2): 259-274.)

> "To give the essence of a proposition means to give the essence of all description, and thus the essence of the world." (TLP 5.4711)
> "The substance of the world *can* only determine a form, and not any material properties. For it is only by means of propositions that material properties are represented—only by the configuration of objects that they are produced." (TLP 2.0231)

Propositions such as "Form is the possibility of structure" (TLP 2.033), "The exploration of logic means the exploration of *everything that is subject to law*" (TLP 6.3), and "The laws of physics, with all their logical apparatus, still speak, however indirectly, about the objects of the world" (TLP 6.3431) would lead us to admit that Wittgenstein is tacitly approaching a structural approach to the laws of nature, even if there is no explicit support from him in this direction. However, I think it is difficult to identify a law of nature with a logical structure of a category of facts because Wittgenstein seems to completely give up this philosophical category, which he links to an uncritical, problematic way of theorizing. I think we need to see the abandonment of the category of the laws of nature as part of the same deflationary effort, the effort to make metaphysics transparent, which led Wittgenstein to give up the metaphysical categories of physical necessity or necessary causality. Instead, I think we can identify in the *Tractatus* a quasi-instrumentalist approach to the laws of science.

The instrumentalist approach focuses mainly on elucidating the status and role of the laws of science seen as tools that allow the description, organization, and domination of experience. Instrumentalism does not acquire its specificity due to its ontological assumptions; this approach does not even consider the laws of nature (onto-metaphysical entities), but, especially, the laws of science (logical-epistemic entities). For example, Ernst Mach had an instrumentalist approach to the issue of laws. Mach thought that "it is the object of science to replace, or save, experiences, by the reproduction and anticipation of facts in thought. Memory is handier than experience, and often answers the same purpose. This economical office of science, which fills its whole life, is apparent at first glance; and with its full recognition all mysticism in science disappears." (Mach 2013, 481) When people learn the most important laws of science in the educational process, they do nothing but save their own experience by learning from others. Thus, the laws of science become ways of transmitting in a condensed form to other people the significant experience of scientists in a certain field, up to a certain point. In essence, Mach believes that "in sciences that are more highly

developed, rules for the reconstruction of great numbers of facts may be embodied in a single expression." (Mach 2013, 485) Even though Wittgenstein has been labeled an instrumentalist, the way he understands the laws of science is different from Mach's way of understanding the laws of science.

4. Laws of science in *Tractatus Logico-Philosophicus*

After eliminating the laws of nature as metaphysical realities, thought of as intangible realities, which generated a type of attitude that ancient thinkers had only before Fate or before God, Wittgenstein articulates a constructivist-instrumental approach to the laws of science. Causality, eliminated as a metaphysical reality, eliminated as a necessary connection between things, is preserved by Wittgenstein as an epistemic tool. The principle of causality can be seen in *Tractatus* as a second-order law of science; the purpose of this principle is to function as a formal indication of the construction of the laws of science, of the laws of the first order. In turn, the first-order laws of science function as indications for the construction of ordinary propositions of science, of propositions that are descriptions of facts.

> "The law of causality is not a law but the form of a law." (TLP 6.32)
> "'Law of causality' – that is a general name. And just as in mechanics, for example, there are 'minimum principles', such as the law of least action, so too in physics there are causal laws, laws of the causal form." (TLP 6.321)

But the "law of causality" is not the only second-order law of science; the principle of sufficient reason, the principle of continuity in nature, and the principle of the minimum action, are all part of the same category, they are all *a priori* intuitions about the possible forms of the propositions of science. (TLP 6.34) The network of laws and propositions about facts of a scientific theory must be constructed by a series of formal constraints, specified by second-order laws; thus, the laws proposed by a certain scientific theory finally have a unitary form.

The relationship between the second-order laws of science and the first-order laws of science can be further clarified if we analyze the metaphor of the network proposed by Wittgenstein in TLP 6.341. The philosopher asks us to imagine a white surface covered with irregular black spots. We can obtain a complete and unitary description of this surface by covering it with a network of sufficiently fine squares to be

able to tell about each square whether it is white or black. The shape of the mesh of the network was chosen arbitrarily, triangles or hexagons could be chosen as well. The different forms of the network mean alternative systems of describing the world. Mechanics is just one of these systems, but if we adopt it, then all the propositions that describe the world should be deduced from the axioms of mechanics. If adopt the system of mechanics, its axioms act as structural constraints: whatever you want to describe, have to do it starting from its axioms. In this sense, any effort to describe the world is a constructive one, but any edifice thus resulting must obey a second-order law that dictates the form of all the propositions of the descriptive system.

Starting from the metaphor proposed by Wittgenstein, we find that a system of describing the world is always superimposed on a pre-existing image of facts or an image of the world, not on the facts themselves. Through this overlay, a new image is built, which, however, offers a unified description, generated by the meshes of the network that have the same shape. From TLP 4.063 we know that saying about every square of the network whether it is black or white is equivalent to saying whether it is true or false. To provide a scientific system of description means to indicate, in the end, which of the elements of that system is true and which is false. However, the shape of the network used does not say anything about the image over which it was superimposed. It is only relevant that the image can be fully described by a network of certain fineness. (TLP 6.342) Similarly, the laws of science of the second-order say something only about how the network used in the description was built, not about what the network describes. (TLP 6.35) Therefore, Newtonian mechanics does not say anything about the world either; but this states something: that the world can be described in that particular way in which it is described. Also, the fact that one system can be described more simply than another says something about the world. Therefore, different networks can be used simultaneously as part of a unified network: we could build the network from meshes of different types: triangles, squares, and hexagons. (TLP 6.342)

For our analysis of the problem of the laws of science in *Tractatus*, it is significant that the image obtained by overlapping the network must be a unified one, generated by the meshes of the network that have the same shape. To construct, within a certain system of scientific description, propositions of the same form, it is necessary to have certain propositions with special status (or “axiom”) that provide instructions for the construction of other propositions. Principles like the

ones mentioned above (the principle of causality, the law of the minimum, etc.) are used precisely to provide constraints for constructing meaningful propositions in a given system, no matter what happens in reality. (Tejedor 2015, 103) A causal law is a set of instructions for using causal terms (for example, "cause") - one that allows us to generate meaningful propositions that have the form stipulated by the causal system in the intended situation. (Sandis & Tejedor 2017, 579) These principles, or, as we have called them above, second-order laws, have two features: they are *a priori* and can generate alternative and optional descriptions of the world. But according to 6.33, these *a priori* intuitions are not just simply *a priori* beliefs, but *a priori* knowledge. It is knowledge not in the sense of true and well-founded opinions, but rather a kind of knowing how. It is tacit knowledge, somewhat similar to that embraced by members of communities of the same paradigm that theorizes, experiments, and tries to solve problems within the same paradigm, within the same logical space of action. The constraints within a paradigm, even if they are not fully aware by all researchers, will structure according to the same logic all the compartments of scientific research.

According to Chon Tejedor, knowledge of structuring principles such as the principle of causality implies, first of all, the ability to use signs in specific ways and purposes. Second, knowledge of structuring principles involves the ability to construct meaningful propositions according to a unified set of instructions, according to a "single plan" (TLP 6.343). But this set of instructions is not something that can be represented by meaningful sentences. These instructions, says Chon Tejedor, become visible through the way we use signs to construct meaningful propositions within that system. Our knowledge of these principles is of the know-how type: we know how to construct meaningful representations (iconic images, propositions, mathematical models) by the instructions regarding a certain system. (Tejedor 2015, 104) Sets of science propositions constructed based on instructional principles are arbitrary in the sense that there is no privileged scientific description of the world. (TLP 6.341) Scientific descriptions are optional because we can choose one of several possibilities. (TLP 6.341) Scientific descriptions are also arbitrary because none of them (and none of the guiding principles that guided the construction of the description) are specifically required by the essence of language or representation. The logic of facts can be articulated in various systems of representation. Therefore, we can imagine the situation in which scientific descriptions can be constructed following other formal principles and constraints. If

many of the laws of science have been constructed following the principle of causality, then it is not obligatory that any law which will function as an instruction for a concrete description of the world be a causal law. After all, what matters in a representation is not the way of representation, but the logic of representation. Under these conditions, descriptions that use different ways of representation may have the same (logical) form of representation. A meaningful proposition constructed according to the principles of a certain system in the natural sciences will take on a certain form of representation, specific to that system; the same logical form, being formulated in another system of the natural sciences, could take on a different way of representation. Causal laws function as criteria that select propositions with a meaning of causal form (which has the form "p causes q") that will belong to a specific scientific description. Thus, they will exclude certain uses of the signs as irrelevant or as pointless in the chosen description system. For example, a system that allows remote action will contain meaningful propositions that involve the notion of an effective causal magnet; on the contrary, a causal system that does not allow remote action will eliminate such propositions as nonsense. According to Wittgenstein, it is the role of the scientist, not the philosopher, to specify what are these laws or principles according to which you build your systems. In essence, the laws of the natural sciences are tools that circumscribe how signs should be used in the construction of descriptions of facts. The way a description is structured betrays which law was at stake. (Sandis & Tehedor 2017, 579)

According to Weinert, Wittgenstein was labelled an instrumentalist in the matter of the laws of science for two reasons: *first*, because he did not regard the law of causation and conservation laws as authentic laws, but only scientific forms of law, and *second*, because, from his point of view, theories of science are but different paths that can be followed to describe the world; hence it was only a step to "the basic instrumentalist idea that scientific theories are more or less efficient ways of making sense of the phenomena, without, however, acquiring truth values." (Weinert 1995, 28)

5. Conclusions

First, in Wittgenstein's view, philosophy can do nothing but clarify the propositions of science; science can do nothing but describe facts; science with philosophical aspirations and philosophy with theoretical-explanatory aspirations are comparable nonsense. *Secondly*, Wittgenstein renounces considering the problem of natural necessity, the

necessary causality, and the laws of nature as first-order philosophical problems, regarding them as philosophical nonsense; we could keep the possibility of interpreting the laws of nature in a structural way, but once the problem is eliminated, I think that the interpretations that could offer us the solution to the problem should also be eliminated. It would be wrong to dispute the philosopher's real interest in the problems of existential metaphysics, just as it would be incorrect to attribute to him the fact that he keeps alive metaphysical problems that he eliminates because they are nonsense, ways of mimicking philosophical depth. *Third*, Wittgenstein retains the principle of causality, but in a metaphysically transparent form; this principle is converted into a second-order law of science which functions as an indication of the construction and criterion for the selection of causal propositions that will belong to a specific scientific description. *Fourth*, the minimalist way of approaching the problem of the laws of nature in *Tractatus* had a modest echo among philosophers[3] who set out to clarify the role and status of the laws of nature in science, the reality of laws of nature, and their essence, and the possibility of capturing real laws in scientific theories. The elimination of potential sources of order from nature – the necessary causality, the physical necessity, or the actual existence of the laws of nature – and the transformation of philosophical discussion of laws into a discussion about the constraints to be observed in formulating scientific descriptions could hardly be satisfactory for philosophers or physicists with strong ontological commitments.

[3] Philosophers who claimed from Wittgenstein's ideas (Ryle, Toulmin) built the so-called inference-licence perspective of laws. Weinert believes that the most important features of this approach are three: first, the laws of science are understood as the essence of the method by which the scientific community comes to provide a representation of natural phenomena; second, laws of science make it possible to infer particular propositions from other particular propositions (for example, statements that describe the exact position of a planet and its speed in orbit at a given time can be deduced by using the laws of planetary motion, statements with regarding its position and speed over a hundred years) and, thirdly, even if they allow us to infer particular propositions from other particular propositions, the laws cannot be considered empirical propositions. Basically, from this perspective, the laws would be just simple rules of inference. This approach is, however, difficult to accept; in the absence of a firm ontological commitment, it is difficult to construct and accept a theory of the laws of science understood only as rules of inference.

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