

The proposition as a cross-section in the stream of experiences

ABSTRACT

The aim of this article is to explore, in a temporal perspective, Wittgenstein's concept of proposition, developed at the end of 1929 and beginning of 1930. To comprehend this concept it is crucial to understand the way he articulates *hypotheses* and *genuine propositions*. Through this distinction Wittgenstein seeks to safeguard, in that period, the pictorial concept of proposition and, more importantly, the complete determination of sense. The way Wittgenstein articulates hypothesis and genuine proposition has some important temporal aspects. The temporal perspective will be central for the understanding of the requirement of the instantaneity of verification and to how Wittgenstein will regard the transtemporality of sense. The final part of this paper will be dedicated to some ideas present in section 102 of the BT (MS 111), where Wittgenstein locates a false analogy that, according to the temporal interpretation here proposed, would lead to the abandonment of the idea of genuine propositions.

Keywords: numbers; verification; physical time; phenomenological time; false analogy.

RESUMO

O objetivo deste artigo é explorar, em uma perspectiva temporal, o conceito de proposição, desenvolvido por Wittgenstein, no final de 1929 e começo de 1930. É crucial à compreensão desse conceito a distinção entre hipótese e proposição genuína. Através dessa distinção, Wittgenstein ainda salvaguarda, neste período, a concepção pictórica de proposição e a ideia de uma plena determinação do sentido. O modo como ele articula hipótese e proposição genuína tem alguns importantes aspectos temporais. A perspectiva temporal será central ao entendimento do caráter instantâneo da verificação e como Wittgenstein concebe a transtemporalidade do sentido. A parte final deste artigo será dedicada à seção 102 do BT (MS 111), na qual Wittgenstein localiza uma falsa analogia, que, de acordo com a perspectiva temporal aqui explorada, levaria ao abandono da ideia de proposição genuína.

Palavras-chave: números; verificação; tempo físico; tempo fenomenológico; falsa analogia.

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1 Introduction

This article will explore Wittgenstein's concept of proposition, at the end of 1929 and beginning of 1930 (in the middle period, but after the demise of phenomenological language). To comprehend this concept it is crucial to understand the way the author articulates *hypotheses* and *genuine propositions*. Genuine propositions are the ones definitively verifiable by immediate experience. And he articulates this concept with his notion of hypothesis through the idea that a genuine proposition is, so to speak, "(...) a particular cross-section of an hypothesis" (MS 107, p. 283 / PB, §228). The study of this relation seems to me important for more than a couple of reasons.

Through the distinction between *hypotheses* and *genuine propositions* Wittgenstein aims still to safeguard (in 1929-30) a pictorial concept of proposition and, more importantly, the complete determination of sense. This clearly sets some crucial ideas of his middle period in the tractarian horizon. Thus, to understand how Wittgenstein departures from this concept around 1931, can give us an interesting perspective to comprehend the development of his philosophy (and the final downfall of the tractarian pictorial notion of proposition).

Another reason for this study is that Wittgenstein's concept of hypothesis would be by itself worthy of a closer investigation. This concept was the core of Wittgenstein's altercation with Carnap, in 1931 (present in the famous letter to Schlick, about the apple tree). The meaning attributed by Wittgenstein to the concept of hypothesis would be, according to him, so unique, that he was sure that Carnap had stolen it from him, since Carnap could not have taken it from Poincaré or Reichenbach (Cf. Stern, 2009). I do not intend to investigate here the altercation between Wittgenstein and Carnap (or the contrast with Poincaré's or Reichenbach's concept). I just aim to explore in details some aspects of the meaning attributed by Wittgenstein to it.

A final reason for the study of this topic is that the way Wittgenstein articulates hypothesis and genuine proposition has some important temporal aspects, very little explored by the secondary literature on the middle Wittgenstein (with the exception of Hintikka (1996), Denis Perrin (2007) and Ferraz Neto (2003), very little attention has been paid to the temporal aspect of Wittgenstein's philosophy). The temporal perspective seems to me crucial for the understanding of the requirement of the instantaneity of verification and to how Wittgenstein will regard, at this period, the transtemporality of sense. To achieve a temporal understanding of those ideas will also allow us to comprehend the depth of a very important false analogy located by Wittgenstein in section 102 of BT/ MS 111 (which would lead, from a temporal perspective, to the abandonment of the idea of genuine proposition).

First, in the paper, I will briefly explore the intrusion of numbers, in 1929, in the atomic propositions, as a way of understanding Wittgenstein's reason

for adopting verificationism. Afterwards, I will explore two central problems that his new concept of proposition aims to solve (that will have profound temporal implications).

The central part of this paper will be dedicated to the relation between propositions and hypotheses. My aim is to investigate the temporal role played by hypotheses, which allows Wittgenstein to treat propositions as temporal cross-sections of hypotheses, which can be instantaneously and definitively verified by immediate experience.

The final part of this paper will be dedicated to some ideas present in section 102 of the BT (from MS 111). In this section, Wittgenstein will locate a false analogy that, according to the temporal interpretation here proposed, would lead to the abandonment of the idea of genuine propositions.

2 Sense and verification (a temporal problem)

In the TLP, "[t]o understand a proposition means to know what is the case if it is true" (TLP, 4.024). Even though in the *Tractatus* the sense of a proposition is directly linked to the state of affair that verifies it, there is no explicit reference to verification or to the idea of a *method of verification* (which will be central to his philosophy in 1929). There is only the connection between sense and truth-conditions.

We can conceive Wittgenstein's embrace of verificationism, in the middle period, as motivated by some important changes in his philosophy, resulting from the idea, present in the SRLF, that "[...] numbers (rational and irrational) must enter into the structure of the atomic propositions themselves" (SRLF, p. 165). The presence of numbers in the structure of the atomic propositions would make the sense of the proposition inseparable from the system of coordinates and the length unities (that are part of the methods of measurement, through which the projection between reality and language occurs). Without the system of co-ordinates and the unities chosen, the numbers (necessary to the atomic propositions) would have no meaning at all. As expressed by Gallerani Cuter:

"None of these numbers would mean anything by themselves. They could only perform their functions if they were associated in advance to certain systems of measurement" (GALLERANI, 2012).

This intrusion of numbers would bring to the foreground the importance of the methods of measurements, since it will be through the length unity of the method that the system of co-ordinates will touch reality. In this way, the unities and the standards become an important element in the harmony between language and reality. This importance can be retraced to the double citizenship of those elements: they are part of reality that belongs to language.

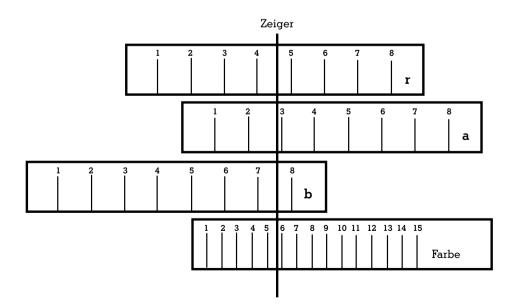
In the construction of a method of measurement, an object will be chosen arbitrarily as a unity or as a standard. In this way, the objet becomes part of the symbolism, but at the same time, this object will be in the same space of possibility as what is to be measured. As expressed by Wittgenstein:

"The unit length is part of the symbolism. It belongs to the method of projection. Its length is arbitrary, but it is what contains the specifically spatial element" (MS 106, p. 45 / PB, §45).

The relation between numbers and length unities is that, according to Wittgenstein, "(...) if I call a length '3', the 3 signifies via the unit length presupposed in the symbolism" (MS 106, p. 45/PB, §45).

This can show us, to a certain extent, why Wittgenstein gave central importance, in 1929, to the idea that the sense of a proposition is the way it is verified (Cf. PR, §227). It is not enough to have a length unity or a standard, for the projection between reality and language. It is necessary a method (a series of procedures), through which the symbolism used to write the proposition (using numbers) can be compared to reality - making it possible to determine its truth-value. Thus, we can regard the presence of numbers in the atomic propositions as one important reason for the idea that "[t]he verification is not one token of the truth, it is the sense of the proposition" (MS 107, p. 143 / PB, §166), since (as expressed in WWK) "[i]n order to get an idea of the sense of a proposition, it is necessary to become clear about the procedure leading to the determination of its truth" (WVC, p. 244).

It is in this perspective that propositions will be regarded as the determination of values in superposed scales (represented in the famous image of §84, in PR):



This would be the proposition "that a coloured circle, of colour... and radius... was located at....".

3 The transtemporality of sense

This concept of proposition (that we will explore lengthier latter on) allows Wittgenstein to solve two problems (that will have deep temporal implications).

The first one comes from the recognition of the logical dependence of atomic propositions. Due to the recognition that atomic propositions can be logically dependent (as in the paradigmatic case of colors) names could no longer be treated as sheer substitutes of their meanings (as in the TLP). There must be a logical relation between names, which leads to the exclusion of its incompatible attributes. The solution offered by Wittgenstein, in 1929-30, was to regard the proposition as a member of a system of propositions (PR, §§15 and 82). Through this concept, Wittgenstein will treat the *name* as a *value* in the system (determined using a scale or yardstick) and the proposition as the specification of the value (conjoined with other determinations in other scales, which would make possible, for example, to specify a place and a time, in which those values should be found in immediate experience). Therefore, the logical exclusion of incompatible attributes would be expressed through the impossibility of setting one scale simultaneously at two graduation marks (Cf. MS, 108, p. 53 / PR, §84). According To Wittgenstein:

"In that case every assertion would consist, as it were, in setting a number of scales (yardsticks) and it's *impossible* to set one scale simultaneously at two graduation marks" (MS, 108, p. 53 / PB, §84).

Thus, in this new concept of proposition, Wittgenstein concludes: "[w] hat we have recognized is simply that we are dealing with yardsticks, and not in some fashion with isolated graduation marks." (MS, 108, p. 54 / PB, §84). This brings a temporal dimension to language, since "[...] the use of a word isn't over in an instant, any more than that of a lever" (MS 107, p. 234 / PB, §15). The determination of the value in the scale (for the construction of the proposition) would take place in time, similarly to the determination of the position of a lever.

Another problem that this new concept of proposition aims to solve is the problem of the endurance of sense throughout time (that we could entitle here as the problem of the "transtemporality of sense"). To understand this, it is necessary to notice first an important difficulty posed by time to intentionality.

In MS 107, Wittgenstein writes that "[i]f you exclude the element of intention from language, its whole function then collapses" (MS 107, p. 289 / PB, \$20). But intention cannot determine, once and for all, the sense of a proposition, since it disappears in the flux of experience. For example, if we have (presently) the expectation that something will happen, in the future (when the intentional act of expecting is in the past), we could not, as Wittgenstein says,

"[...] confront the previous expectation with what happens" (Cf. MS 107, p. 257 / PB§28). In the future, we cannot access the past intentional act, to know if what presently happens is what we have expected in the past.

Wittgenstein's way out of this problem (at the end of 1929 and beginning of 1930) is still through the tractarian notion of a picture (*Bild*): "[w]hat is essential to intention is the picture: the picture of what is intended" (MS 107, p. 289 / PB, §21). The picture will be the expression of the expectation and the only source of knowledge for the comparison in the future with the occurrence that could fulfill or not the expectation. However (and this is the main problem), the disappearance of the intention in the temporal flux resets the problem, but now at another level: "[t]he intention never resides in the picture itself, since, no matter how the picture is formed, it can always be meant in different ways" (MS 107, p. 292 / PB, §24).

The solution to this other problem clearly also sets Wittgenstein's middle philosophy in the tractarian horizon, in view of the fact that it uses as central the idea of an a priori (atemporal) structure, that fixes the logical multiplicity of the space of possibilities (fulfilling the function played by the logical space in the TLP). The sense of the proposition (of the picture), that is the expression of the expectation, could endure through time, since it will have an internal (necessary) relation with the proposition that describes the future event that fulfill the expectation. Both determine the same place in the space of possibilities. A doubt regarding the relation between the expectation and its fulfillment would be equivalent, for example, to the question if the word "red" (that determines one place in the space of colors) has the same meaning in the propositions "I expect to see a red patch" and "I see now a red patch".

In this way Wittgenstein can regard the relation between expectation and its fulfillment as an internal relation (in which "[t]he event that replaces the expectation, is a reply to it" - (MS, 107, p. 257 / PB, §28); without the need of a third element (as in the causal theories of sense of Russell and Ogden & Richards - (Cf. PR, cap. III). The internal character of the relation would be metaphysically guaranteed by the logical multiplicity of the space of possibility.

But the question that becomes central is: how thus the proposition (that is the expression of expectation) can be in the same space of possibility as the expected phenomenon, in such a way that the values determined by the picture could be fulfilled or not by the future occurrence, in that space of possibility? As expressed by Wittgenstein: "[...] the expectation must be in the same space as what is expected" (MS 107, p. 258 / PB, §28). The answer can be found in the already mentioned double citizenship of the unities and standards of the methods of measurements. The proposition will be constructed by means of the length unities through which numbers acquire its meanings. The length unities are part of language that are in the same space as what is to be ex-

pected (Cf. MS, 107, p. 281 / PB, §38). Thus, the proposition can be fulfilled or not directly by experience, without the need of a third element.

From a temporal perspective, the specification of a unity is the arbitrary election of an object, whose endurance through time will not be put to question. This specification is the acceptance of an element of reality as invariable. For this reason, the question regarding if the values determined in the proposition are the same or not in the future would have no sense. The construction of a length unity is the determination of a thing (in the space of possibility of the phenomena to be measured) that we will accept as the same throughout time.

4 The distinction between hypothesis and genuine propositions

But there is a deep fracture that runs through Wittgenstein's middle philosophy, at the end of 1929 and beginning of 1930. And it will be necessary to accommodate this concept of proposition as a *picture* (constructed by "setting a number of scales") with this fracture.

At this period, Wittgenstein's philosophy has still a hierarchical structure, divided between a primary/phenomenological system and a secondary/physicalist. The problem of the relation between those two systems becomes more pressing at the second part of 1929. After reaching the impossibility of the phenomenological language (in middle 1929 - Cf. MS 105, p. 114 / PB, §69d), Wittgenstein comes to accept that language is necessarily hypothetical. The problem is that he still regards phenomena as the only truth-makers of our propositions. The resulting tension can be summarized (in a semantical vein) by the famous quote: "[t]he world we live in is the world of sense-data; but the world we talk about is a world of physical objects" (WLC 30-32, p. 82).

The concept of genuine proposition, from the end of 1929 and beginning of 1930, was designed by Wittgenstein to bridge this gap between the physicalist world of our hypothetical language and the phenomenological reality that verifies it.

A key to understand this concept of proposition can be found in the way Wittgenstein conceives the relation between *hypothesis* and *expectations* (future phenomena that we expect to find in immediate experience). The phenomenological *expectations*, obtained through the use of hypotheses, will be what Wittgenstein regards as the paradigmatic case for the understanding of *genuine propositions* (to be constructed by means of numbers and the articulation of different methods of measurement).

All these ideas can be retraced to a very simple one that, according to Wittgenstein, comes straight from reality (Cf. PR, §225). We never see a ball lying on a table. We only see one side of it. In phenomenological terms, what we have in our visual field is the occurrence, for example, of a circle in a square. Over time the dimensions of the circle and of the square may vary a lot (as well

as its colors). What is hypothetical is the way we connect all these changing phenomenological aspects (given in different successive times) into two enduring forms that we call "ball" and "table". Those two objects will be the hypothetical logical structures that we use to bring the multiplicity of phenomenological experiences into unities, which are called "physical objects". And it is the way we can signify "by one word" the multiplicity of phenomena, through the use of hypotheses (calling it "ball" and "table"), that makes hypothetical languages a more practical mode of presentation, than the phenomenological description of experience (Cf. MS 105, p. 108).

It is crucial to notice the temporal backdrop of those ideas, since they articulate two different temporalities. Phenomena are given to us in the present flux of "phenomenological time" (whose structure is the order of our memories - Cf. MS 112, p. 131r/TS 211, p. 535/TS 212, p. 1362/BT, §105, p. 364.). But if we apply a hypothesis to a certain series of phenomena (given at different times), we subsume the changing and unstable multiplicity of experience into transtemporal forms (that we call "physical objects") (Cf. WVC, p. 257). In other words: physical objects will be necessarily transtemporal, because they are the resulting form of connecting phenomena given at different times through a hypothesis. Thus, physical objects necessarily will stretch beyond the present of experience, since they are the forms that we regard the same, throughout time.

From this temporal difference between phenomena and physical objects, we can establish that the tension behind the idea, that the world we live in is the world of sense-data and the world we talk about is a world of physical objects, will have a temporal counterpart. Although we live in the present flux of phenomenological time, we talk about transtemporal entities.

A crucial point, for the understanding of Wittgenstein's philosophy in 1929, is that, in order to be able to talk about transtemporal entities, we need a time whose structure stretches beyond the present flux of experience. Thus, we will need to construct a secondary topologically linear time, where we can locate temporally the physical objects. This secondary time is a necessary hypothetical construction of our language, in which, according to the author, we "translate the temporal relationships [of experience] into spatial ones" (BT, §102, p. 353). And it is the necessity of this secondary time that led Wittgenstein to conclude, in the beginning of 1929, that "[w]hat we understand by the word 'language' unwinds in physical homogeneous time" (MS 105, p. 114 / PB, §69d).

But to bring the multiplicity of phenomena into transtemporal unities is not the only role played by hypotheses. When we apply a hypothesis to a series of phenomena we regard the resulting form as being governed by certain laws (Cf. WVC, p. 256). Those laws that govern the hypothetical connection are the same laws that can be expressed in mathematical form, in what we call the "laws of physics" (Cf. WWK, p. 255). That is why Russell (supporting a con-

structivist concept, similar to middle Wittgenstein's ideas) regards a physical object as "[...] a series of aspects whose matter obeys the laws of physics" (RSDP, p. 164. ("The Relation of Sense-data to Physics" (1914)). In other words: when we apply to experience a hypothesis, we connect the phenomena in such a way that we grant to the resulting form "causal powers" (Cf. CAMPBELL, 1995, Chapter 2.4, An Explicit Physics).

It is the way hypotheses connect the phenomena in a *law-governed* manner that allows us to generate from it *expectations* of future phenomena. For example, from the hypothetical sentence "the ball is on the table" we can expect (from the use of the hypotheses of "ball" and "table") to find in our visual field a circle (located in a certain place, with a certain radius and a certain color) and a square (located in a certain place, with a certain dimension and a certain color). And since hypotheses connect experiences from different logical forms, through its use we can also generate expectations about the tactile space, auditory space etc.

This shows us that, if we restrict ourselves to phenomena immediately given, we cannot form *expectations* (in this sense), because there are no causal relations between phenomena (there is no law governing the relations of phenomena). From a given phenomenon (or a series of phenomena), any phenomenon can follow. If I expect a certain phenomenon to occur in the future, it will be due to the *laws* (built from past regularities), that govern the form, that we apply to phenomena. Therefore, it is the use of hypotheses that makes (future) expectations possible.

The importance of this concept for Wittgenstein's middle philosophy is that expectations will be what he regards as the paradigmatic case for understanding genuine propositions. According to him: "An hypothesis is a law for forming propositions. You could also say: An hypothesis is a law for forming expectations" (MS 107, p. 283 / PR, §228).

A proposition will be a picture of a phenomenon that we expect to find in immediate experience. It is this picture that bridges the gap between the physicalist world of our hypothetical language (in physical time) and the phenomenological reality (in phenomenological time) that verifies it. And this proposition will be verifiable because it will be constructed by means of numbers, whose meanings are determined by the unities of methods, present in the same space of possibilities as the phenomena to be measured.

On the other hand a hypothetical sentence would not be for Wittgenstein a proposition at all, since it cannot be verified. The verification of a hypothesis would never be complete. We could always generate new expectations from the hypotheses, in such a way that its verification will always remain open to the future. And no matter how many genuine propositions, generated by the use of the hypothesis, have already been verified, we will never approach a point from which we can jump from the truth of the propositions to the truth of

the hypothesis. According to Wittgenstein: "[a]n hypothesis simply has a different formal relation to reality from that of verification" (PR, § 228).

The temporal aspect of the relations between hypotheses and genuine propositions will be crucial for the understanding of the requirement of the *instantaneity* of verification. According to Wittgenstein:

The stream of life, or the stream of the world, flows [everything flows] on and our propositions are so to speak verified only at instants (*nur in flashes / in Augenblicken* [in the blink of an eye] *verifiziert*). (MS 107, p. 222 / PB, §48).

This idea that propositions are verified only at *instants* (in a blink of an eye) is the direct consequence of the temporal status of what genuine proposition pictures. Although physical objects are transtemporal forms, the phenomenon depicted by the proposition is always changing and unstable (given to us in the present flux of phenomenological time). Thus, for a proposition to have a completely determined sense, in such a way that it could be definitely verifiable by immediate experience, it has to picture an *instant* of the flux - given *in a blink of an eye*.

Wittgenstein achieves this instantaneity treating the genuine proposition as a temporal "[...] cross-section of an hypothesis" (MS 107, p. 283 / PB, §228) - in the same way as the phenomenological aspect (given in experience) is treated as a temporal cross-section of the physical object. Wittgenstein summarizes this idea through an important spatial analogy: "An object is similar to a body in space - the particular [phenomenological] aspects are the cross-sections made when we cut through it". (WVC, p. 256).

In a temporal perspective, we could say that an object is a transtemporal form (that stretches itself along the line of the physical homogeneous time - beyond the present experience). The particular phenomenological aspects are instantaneous temporal cross-sections of the object. In the same way, the genuine proposition will be regarded as a *picture* of the temporal instantaneous cross-section of the object, in such a way that our proposition could be verified, so to speak, in a *blink* of an eye.

5 The demise of genuine propositions

But why does Wittgenstein abandon this concept latter on?

Around middle 1931 (in MS 111 - present in section 102 of BT), Wittgenstein locates a confusion between the temporal grammar of immediate experience and physical objects at the base of the idea that we could pinpoint an *instant* of immediate experience. The problem is that when we think of the possibility of cutting experience across (determining a precise instant in the flux of experience), according to Wittgenstein, we would no longer be in the phenomeno-

logical time, but in physical time (whose linear topology is similar to a film). As expressed by the author:

We imagine that experience is like a film strip, and that we can say: This picture and no other is in front of the lens at this moment.

But only in a film can one talk about a picture that is present at this moment; not when one moves from physical space and its time to visual space and its time (MS 111, p. 8 / BT, §102, p. 351).

According to this passage, only in physical time we can talk about what is precisely at *this* moment. When we think that this is also possible in phenomenological time, we are just mistaking the temporal grammar of the immediate experience and physical objects. We treat experience as having a linear topology (in the same way as the physical time - or a film strip). And this supposed linearity of experience would lead us to regard the relation between the present moment of experience and time as the same as a point to a line. So we end up thinking that we can cut experience across at precisely *that* point. But all this is nothing but an illusion that results from the confusion between the statuses of physical objects in physical time and experience in phenomenological time.

Nevertheless, to think that, if experience where given in physical time, we could determine precisely what was immediately given at an instant, will also be regarded by Wittgenstein as a fiction. According to him:

That moment in time – of which I say that it is the present, and which contains everything that has been given to me – itself belongs to physical time.

For how is such a moment determined? By the stroke of a clock, perhaps? And can I really describe the entire experience that is simultaneous with this stroke? If you think about trying it you'll notice immediately that what we're talking about is fiction (MS 111, p. 8 / BT, §102, p. 351).

The crucial point to be noticed is that if the idea that we could describe what is given in a precise instant of immediate experience is nothing but a fiction, the idea of genuine propositions (that would picture this instant) should also be one. Wittgenstein's solution is that:

We have to give up the view that in order to speak about the immediate, we must speak about a state at a moment in time. [...] This idea is already based on a physical image, that of the stream of experiences that I'm now cutting across at a point [in einem Punkt quer durchschneide]. (MS 111, p. 5 / BT, §102, p. 352 (de 7 de julho de 1931).

In this passage the idea that we could speak about the immediate at a moment in time is treated as just an illusion caused by the false analogy with physical time (leading to the supposition that we could cut the stream of experiences across at a certain point). However (and this is the importance of this false analogy), this idea (that Wittgenstein urges us in BT to give up) is precisely the core of his philosophy from 1929-30:

The stream of life, or the stream of the world, flows [everything flows] on and our propositions are so to speak verified only at instants (MS 107, p. 222 / PB, §48).

Thus, from a temporal perspective, we can conclude, that, according to BT 102 / MS 111, his concept of verification from 1929-30 was based on the false analogy that we could bisect the stream of experiences, in the same fashion that we can cut the topologically linear time of physics at a point. This false analogy expressed itself in two different levels, in 1929-30. First, in the idea (according to him, taken straight from reality) that phenomenological aspects, given in experience, could be regarded as temporal cross-sections of transtemporal objects. And second (and more importantly), the false analogy would be present in the idea that genuine propositions are those capable of depicting these temporal cross-sections of the transtemporal objects. Those ideas are just two sides of the same coin - the temporal illusion of the possibility of cutting the stream of experiences across at a point.

Abbreviations

| MS | Manuscripts from Nachlass |
|-----------|---|
| PR | Philosophische Bemerkungen |
| SRLF | Some Remarks on Logical Form |
| TLP | Tractatus logico-philosophicus |
| TS | Typoscripts from Nachlass |
| WLC 30-32 | Wittgenstein's Lectures, Cambridge 1930-1932 |
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| RSDP | B. Russell, The Relation of Sense-data to Physics |

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