

A HERTZIAN INTERPRETATION OF WITTGENSTEIN'S *TRACTATUS*

Sara Bizarro

RESUMEN

En este artículo se compara a Hertz y a Wittgenstein para proponer una nueva interpretación del *Tractatus*. Revisaré las ideas de Wittgenstein sobre los objetos simples y las compararé con las partículas materiales de Hertz. Luego afirmaré que si uno entiende las partículas materiales de Hertz como entidades lógicas que parecen más coordinadas que físicas, se puede lograr una interpretación del *Tractatus* que calla deliberadamente acerca de la naturaleza de la realidad y que por tanto escapa a las interpretaciones objetivista y subjetivista del libro. Pienso que este es solamente uno de los grandes resultados de repensar las ideas de Wittgenstein a través de las de Hertz.

PALABRAS CLAVE

Wittgenstein, Hertz, física, filosofía de la ciencia, historia de la filosofía.

ABSTRACT

In this paper I will compare Hertz and Wittgenstein in order to bring forth a new interpretation of the *Tractatus*. I shall look at Wittgenstein's ideas about simple objects and compare them with Hertz's material particles. I shall then claim that if one understands Hertz's material particles as logical entities that are more co-ordinate like than physical, one can reach an interpretation of the *Tractatus* that is deliberately silent about the nature of reality, therefore escaping both objectivist and subjectivist interpretations of the book. This, I think, is just one of the great results of re-thinking Wittgenstein's ideas through Hertz's.

KEYWORDS

Wittgenstein, Hertz, physics, philosophy of science, history of philosophy

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«As a matter of fact, we do not know, nor have we any means of knowing, whether our conceptions of things are in conformity with them in any other than this one fundamental respect». Heinrich Hertz, *The principles of mechanics* (2007, p. 2)

WITTGENSTEIN'S *TRACTATUS* AND THE VIENNA CIRCLE

Traditionally, references to the Vienna Circle and to Wittgenstein's *Tractatus* have appeared hand in hand. Wittgenstein's impact in the Vienna Circle was unquestionably overwhelming. The *Tractatus* was extensively discussed by the members of the Circle and some of its ideas were seminal for the development of the Circle's philosophy. For instance, Carnap, in his notes about the *Tractatus*, said that it was «carefully read in the circle and everything talked through»¹ and listed as positive influences the importance of language analysis for philosophy and the idea that the origin of philosophical pseudo questions was in the misuse of language.

However, the pairing up of Wittgenstein and the Vienna Circle often lead to serious misinterpretations of the *Tractatus*. One example is the interpretation of Wittgenstein's ideas about simple objects. In the *Encyclopedia of Philosophy*, edited by Paul Edwards (which by the way I think is still one of the best philosophy encyclopedias around) Nicola Abbagnano writes:

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¹Carnap's paper at the Archives for Scientific Philosophy.

The sense-impressions spoken of by Pearson and the sensations spoken of by Mach, Avenarius, and Petzoldt as neutral elements that constitute all the facts of the world, both physical and psychological, correspond exactly to the objects (*Gegenstände*) spoken of by Ludwig Wittgenstein in his *Tractatus Logico-Philosophicus* as the constituents of atomic facts and to the elementary experiences (*Elementarerlebnisse*) spoken of by Rudolf Carnap in *Der logische Aufbau der Welt* (Abbagnano, 1967, p. 223).

This interpretation of simple objects as sense impressions might have been suggested by Wittgenstein's own allusion to color examples when referring to simple objects. For example, in 2.0131, while talking about objects, Wittgenstein says «A speck in the visual field, though it need not be red, must have some color» and in 2.0251 he writes «Space, time, and color (being colored) are forms of objects». Although the meaning of these color examples might be vague, they seem to indicate that objects might have something to do with sense impressions if a speck in the visual field can be brought up in the context of discussing objects. However in 2.0232 Wittgenstein says «In a manner of speaking, objects are colorless». Therefore one must conclude that the use of color while speaking about objects should not lead one to sense impression interpretation of Wittgenstein's simple objects. In fact, if one reads 2.0131 and 2.0251 carefully one sees that Wittgenstein underlines he is not claiming that objects are patches of color, but that objects are the form that permits having *some color* or being *colored*. We shall return to this in the end of the paper. A Hertzian interpretation of objects will allow us to make perfect sense of these passages. Now I just want to underline that even if it might have been possible to interpret objects as sense impressions, it is not clear whether such interpretation holds at all.

The question about how objects are to be interpreted is relevant when analyzing how the *Tractatus* relates to the philosophy of the Vienna Circle. One of the main ideas propagated by the Circle is the Verifiability Principle. This principle claims that a sentence

has meaning only if it is in principle verifiable. This principle is usually claimed to have been inspired in Wittgenstein's ideas since Wittgenstein defended that a proposition could be decomposed into elementary propositions whose names stand for objects. In this vein a proposition is true if it corresponds to the fact which it depicts. The Verifiability Principle is said to have been originated in these ideas. But, in order to know how to verify the meaning of a sentence, it seems that in the end, one must know which are the simple objects that correspond to the simple names. The idea that sense-impressions are such objects is an empiricist way of looking at them, but it is quite doubtful that this is what Wittgenstein had in mind when he talked of simple objects.

TWO TRADITIONAL WAYS OF UNDERSTANDING WITTGENSTEIN'S OBJECTS

In 1964 James Griffin's "Wittgenstein's Logical Atomism" and George Pitcher's "The Philosophy of Wittgenstein", presented what was then called a *new interpretation of the Tractatus* (Keyt, 1965). These books offered arguments against understanding objects as sense-impressions or sense-data and for understanding them as something like Hertz's material particles. I shall present their arguments in this section but before that, I want to make clear what is at stake when one is trying to interpret what is meant by simple objects in the *Tractatus*.

There are two different traditional ways of interpreting the *Tractatus*. These two interpretations were probably debated in the Vienna Circle and appear in Rose Rand's² notes, she writes:

Logical Form and Form of Reality is considered by Wittgenstein to be Identical. How should this be understood?

One cannot say that language and reality are similar. But should the described content have similarity with reality, so that the form

²Rose Rand was a member of the Vienna Circle and later she was one of Wittgenstein's students in Cambridge.

of the content and the form of reality are the same? But even if that what is perceived and that what is thought are by comparison similar, can one equate reality with that what has been perceived? There are two possible interpretations: A. The content of my sentence is similar to Objective reality. B. The content of my sentence is similar to perceived reality and the rules which rein the contents of my sentence are superimposed to reality.

The *Tractatus* does not have on it an explicit viewpoint. Neither is assumed that the real has a structure on its own and it is identical with the content of the sentences, nor that its structure is superimposed by language. Only the general statement that logical form is the form of reality is said in the *Tractatus* (Rand, series 5, box 9, folder 11-18).

So it seems to be a fundamental vagueness in the *Tractatus* as to the nature of reality and therefore also as to the nature of objects. However, commentators have tried to read the *Tractatus* in one way *or* the other. Interpretation A brings forth an objective reading of the *Tractatus* that makes the propositions of science propositions about Objective reality. Interpretation B creates a reading in which the world is *constructed* by language leading to a subjective view that can go as far as claiming that Wittgenstein is a solipsist. Each of these interpretations will also yield a specific view of what Wittgenstein's simple objects are. In interpretation A objects can, for instance, be something like the particles postulated in physical theories, while in interpretation B objects could be subjective language laden with sense-data.

It is interesting to note also that it is the positivistic reading of objects as sense data that can lead to a more subjectivist interpretation of the *Tractatus*. This is probably why the Vienna Circle members felt that it was necessary to go further than Wittgenstein had gone in creating explicit conditions for a criterion of meaning, creating such tools as the Verifiability Principle. Puzzling remarks like 5.61 or 5.62 where Wittgenstein claims that the limits of my language mean the limits of *my* world, or 6.431 where he says that

at death the world does not alter, but comes to an end, must have left the members of the circle horrified, like Carnap who wrote he disagreed with all the mystical stuff at the end. However, this too will fit the Hertzian interpretation in the end. But before getting to that, let's look at some of the arguments relating the nature of objects put forward by Griffin and Pitcher.

Griffin and Pitcher are trying to counter the interpretation of Wittgenstein's simple objects as sense impressions or sense data. For this purpose they point out certain characteristics assigned to objects by Wittgenstein that do not fit the sense impression reading. I will just bring up three of their examples: 1. objects are simple (2.02) – sense data are not simple, a speck in the visual field has both shape and color and therefore it is not simple and is not a good candidate for an object; 2. objects are unalterable and subsistent (2.027) – sense data are not unalterable and subsistent, since they are momentary sense impressions; 3. elementary propositions are independent (4.211, 5.134) – that means that the proposition *this is red* is not an elementary proposition, because it cannot occur at the same time as *this is green* when referring to the same speck, and since elementary propositions are constituted by simple names that refer to simple objects one can see that *red* is not the name of an object (Griffin, 1964). This is also brought up by Wittgenstein in 6.3751.

These three arguments alone seem, at first sight, to be decisive against the interpretation of simple objects as sense data or sense impressions. As an alternative, Griffin proposed the idea that simple objects should be interpreted as something like Hertz's material points. In this interpretation, simple objects could be something like particles in physics. This would lead to a more objectivist reading of the *Tractatus*, where propositions about objective reality are possible and science will create such propositions. But David Keyt, in his "A New Interpretation of the *Tractatus* examined" (1965), showed that the arguments put forward against the sense-data interpretation can also be directed against the physical particles interpretation. Here is how Keyt points the three arguments against the physical particle interpretation: 1. objects are simple

– particles have mass, and therefore they are not simple; 2. objects are unalterable and subsistent – if one interprets subsistent not as eternal but as a-temporal, then objects must be something like simple qualities, like universals, and not physical particles that subsist in time (Keyt, 1965, pp. 235-237); 3. the independence of elementary propositions argument can also be construed against physical particles since a particle *cannot be in two places at the same time* as Wittgenstein notes in 6.3751. Therefore, Keyt says *this here then* is the contrary of *this there then* where *this* as used in the two propositions refers to the same material point (Keyt, 1965, p. 234), and since one of the requirements for the independence of elementary propositions is that «it is a sign of a proposition's being elementary that there can be no elementary propositions contradicting it» (4.211), then *this* as used in the propositions is not a name and a material point is not an object.

So it seems that neither interpreting objects as sense data, nor interpreting them as physical particles, creates a coherent interpretation of the *Tractatus* propositions about objects. What I shall try to show in the next section of this paper is that, if we have a *proper* view of what Hertz's objects are, we can have a *third* interpretation that is compatible with the comments made about objects *and* that shows also that the *Tractatus* is not in need neither of a subjective nor an objective interpretation – in fact, to go beyond that is one of the main tasks of the book.

HERTZ'S MATERIAL PARTICLES AND MATERIAL POINTS

There is a way of understanding Hertz's simple objects that will not equate them with something like physical particles. In the literature there is some confusion about what Hertz's simple objects are. Griffin compared Wittgenstein's objects to Hertz's material points and more recently so did Grasshoff (1997, pp. 87-120). However, if one looks at the *Principles of Mechanics*, one can see that material points are not the simple objects postulated; the simple objects in Hertz are called *material particles*. By calling his simple objects

material particles, Hertz might have misled his reader to thinking that these objects have to be interpreted as physical entities. But there are several reasons why this needs not be so.

The *Principles of Mechanics* is divided in two books, and the first book is said by Hertz to be completely independent of experience. In a Prefatory note Hertz says: «The subject-matter of the first book is completely independent of experience. All the assertions made are *a priori* judgments in Kant's sense» (Hertz, 2007, p. 45). Therefore one can conclude that Book one is more of a logical nature than of an empirical one. This is one reason. But an even stronger reason I think can be found in the definition of material particle itself. Here is how Hertz defines a material particle:

Definition 1. A material particle is a characteristic by which we associate without ambiguity a given point in space at a given time with a given point in space at any other time.

Every material particle is invariable and indestructible. (Hertz, 2007, p. 45).

Now I think that one way of understanding this definition is to equate the so called *material particle* with a sort of space-time point as defined by a space-time set of coordinates. Plus these *material particles* are said to be invariable and indestructible, adding on to the idea that these are not physical simple objects, but logical simple objects. It is interesting to add that what Hertz is trying to do with this and the following definitions in the book, is to define mass using only the Kantian forms of space and time. In this way, mass will be a concept defined *a priori*, independent from experience, so it seems to me that Hertz is not making statements about physical simple objects, but about logical simple objects.

The next definition in the book introduces mass as follows:

Definition 2. The number of material particles in any space, compared with the number of material particles in some chosen space at a fixed time, is called the mass contained in the first space. (Hertz, 2007, p. 46).

This definition I think can be interpreted as defining mass *a priori* by stating that one can pick a certain area of space-time points as defined by a set of coordinates and use it as a measuring unit in order to define the mass of some other set of space-time points. And this is how the concept *mass* is introduced. After mass, Hertz finally introduces the material point, using the concept of mass.

Definition 3. A finite or infinitely small mass, conceived as being contained in an infinitely small space, is called a material point. A material point therefore consists of any number of material particles connected with each other. (Hertz, 2007, p. 46).

A material point is then a certain *arrangement* of material particles. At this point I think the similarities with the notion of objects in the *Tractatus* become evident. But before comparing Hertz and Wittgenstein I just want to introduce Hertz's 4th definition, the definition of a system of material points. This definition, I think, will elucidate what Hertz is trying to achieve by building his system in this way. Here's the last definition:

Definition 4. A number of material points considered simultaneously is called a system of material points, or briefly a system.

Then Hertz adds that *only* these so called *systems* can be the proper objects of physical theories. It is quite important to understand why Hertz is putting forward all these *a priori* definitions to arrive at the notion of a *system*. The key to understanding this will be the key to understanding objects in the *Tractatus* and its stance on reality. In order to understand what Hertz is aiming at, we have to go back to the Introduction. In the first paragraph of the Introduction to the *Principles of Mechanics*, Hertz presents his ideas about pictures, which are also similar to Wittgenstein's ideas about pictures in the *Tractatus*. Hertz says that we form to ourselves images of external objects so that «the necessary consequents of the images in thought are always the images of the necessary consequents in nature of the things pictured» (Hertz, 2007, p. 1). In this way we

are able to *predict* future events and check for the validity of our pictures. These images don't picture *things* in themselves; they picture certain *structures* of things, of *arrangement* of things. This is all we can know of reality.

With this in mind one can understand Hertz's definitions above. Hertz is making an enormous effort to create a foundation for the science of mechanics that does *not* postulate *anything* about things in themselves. The only appropriate objects of physics are the *systems* of material points. We can postulate a certain behavior, or certain laws to a certain system and then check if they occur in nature. But things, the simple objects in nature, we can only define logically. The point is that, even though we cannot know *reality*, we can still reach out to it by founding our science on what we *can know*, the structure. And that is all we need for physics.

A HERTZIAN INTERPRETATION OF THE *TRACTATUS*

Hertz's ideas, I shall claim, are perfectly mirrored in the *Tractatus*. The idea that the images, or pictures of reality, represent only its *structure* can be found clearly in Hertz's introduction to the *Principles of Mechanics*, and that is also one of Wittgenstein's fundamental ideas of the *Tractatus*. The way a picture represents, in Wittgenstein's words, is that when the elements of a picture are related to one another in a determinate way, things should be related to one another in the same way (2.15), and Wittgenstein underlines «That is how a picture is attached to reality» (2.1511), it is «laid against reality like a measure» (2.1512). This idea is *exactly* what Hertz suggested – the images we make of things are images of the *structure* of things and science deals with these *structures*, with these *configurations* with these *systems*. That is why science cannot deal with material particles or material points, but rather with *systems* of material points.

Now, just as Hertz's system was built in such a way that impossible assumptions about the nature of reality should not be necessary, so did Wittgenstein built his ideas in the *Tractatus* in the

same way. If one understands Wittgenstein's in the light of Hertz's ideas, one can understand all the comments about the world and about objects that appear in the *Tractatus*. For instance, the very first sentences of the book, «the world is all that is the case»:

1. And «the world is the totality of facts, not of things» (1.1), become clear. What is being said is again that the reality we can talk about or have been the object of science, therefore what we call the *world*, is only the *configuration* of things, not things in themselves. This configuration of things is called by Wittgenstein a *state of affairs*

2. And these *states of affairs* are said to be a combination of *objects* or things (2.01). So the next question should be, in light of what we have learned from Hertz, how should we interpret Wittgenstein's simple objects?

As we had seen before, both, interpreting objects as sense-data and interpreting them as physical particles, were not consistent with some of the characteristics that are attributed to objects in the *Tractatus*. Now I shall claim that interpreting objects as Hertzian simple objects is compatible with the *Tractatus* characterization of objects. Hertzian simple objects, I have claimed, can be understood as a sort of space-time point as defined by a space-time set of coordinates, and so they are not physical entities, but logical entities.

Lets then go through the three requirements that were not fulfilled by sense impressions and physical particles:

1. Objects are simple – hertzian objects as I understand them are not physical so they don't have neither mass, nor shape, nor color, they are true simple objects.

2. Objects are unalterable and subsistent – Hertz's material particles are invariable and indestructible, because Hertz was not referring to physical particles but to spacio-temporal points as defined by their co-ordinates.

3. Independence of elementary propositions – it is not possible to construct an argument against simple logical objects similar to the one constructed against colors or physical particles because *this* can never refer to a true simple object, *this* is not a name that stands for a simple object.

So, Wittgenstein's simple objects when understood as Hertz's simple objects, are not, and could never be physical particles. To avoid saying anything about reality itself was Hertz's point when he constructed his system as a logical *a priori* system. And Wittgenstein is trying to do the same thing. That Wittgenstein's objects are not *material* can also be clearly seen in propositions 2.021 and 2.0231, where Wittgenstein says that «objects make up the substance of the world», but that «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 configuration of objects that they are produced». The so-called material, or what can be the object of science, is only a certain *configuration* or *system*, just like Hertz had suggested.

We can now go back to Rose Rand's two ways of interpreting the *Tractatus*. Interpretation A was an objectivist reading of the *Tractatus* in which the propositions of science were propositions about Objective reality. Interpretation B was a subjectivist reading of the book; where reality was nothing more than our perception of it and therefore it was possible to create an understanding of the book in which language *constructs* the world. Interpretation A was related to the idea that simple objects are physical particles, and interpretation B with the idea that objects are sense-data. As I noticed, one could have objects as sense data, and still defend an empirical-scientific view of the world in which some objectivity prevails, that is what the Vienna Circle tried to do. However, as I said, some propositions of the *Tractatus*, like 5.61 or 5.62 where Wittgenstein claims that the limits of my language mean the limits of my world, would lead one to go with interpretation B.

Before looking at these interpretation with Hertzian eyes I just want to quote another of Rose Rand's notes that I think also already holds the key for understanding the *Tractatus* and it's notion of reality. Here is what she wrote:

According to the *Tractatus* a picture is a correspondence of form and structure between the description and the described. This con-

cept does not necessarily demand that there should be an objective reality, independent from the observer, since nothing is said about such reality. The only presupposition is that what is given to us is to be grasped in some rules because some of its features are appearing in a regular way, so that relations between the observed objects can be described (Rand, series 5, box 9, folder 14-15).

Again, the idea is that we don't have to say *anything* about the nature of reality and we still can describe its workings pretty well. This seems to me to lead to the conclusion that neither interpretation A, nor interpretation B can be put forward as adequate interpretations of the *Tractatus*. The whole point underlying the idea that what we know is the *structure* is, as Hertz clearly pointed out, that we don't *have* to make any claims whatsoever about the nature of reality. This idea, I claim, Wittgenstein picked up from Hertz, and therefore the *Tractatus* should have neither an objectivist nor a subjectivist reading.

The philosophical consequences of taking this Hertzian stance might explain the puzzling remarks in 5.61 and 5.62, about the limits of my language being the limits of my world or the even bolder remark in 6.431 when Wittgenstein says that at death the world does not alter, but comes to an end. According to Hertz we do not know and have no possible way of knowing the so-called reality in any other respect than in its *structure*, because by building similar structured images we can predict the future. According to Wittgenstein a picture is just such a structured image. Now the question can be asked, how do we distinguish a picture from that which is pictured? We cannot. It depends on what is used as a picture. This example will also help us to understand the philosophical consequences of the Hertzian stance.

The Hertzian stance, I claim, rejects both subjectivist and objectivist interpretations of the *Tractatus*. These interpretations are obviously based on the traditional philosophical distinction between subject and object. In interpretation A the subject has an objective knowledge of the object, and in interpretation B the

subject constructs the object, building a subjective knowledge. But if none of these interpretations is correct, one can ask, what is the role of the *subject* and the *object* in the *Tractatus*? My claim is that, in a Hertzian interpretation, there is no role anymore for a *subject* and an *object*. Both subject and object are part of the same natural environment in which certain combination of objects, with their determinate *structures*, can be used as pictures of other combinations of objects. The distinction between subject and object is therefore unnecessary and artificial. This, I think, is why Wittgenstein claims there is much truth in solipsism (5.62), and why he can equate the limits of language, of logic and of the world (5.61), for the possibilities of *configuration* of objects are the same everywhere, and whether one configuration is used as a picture of another is secondary.

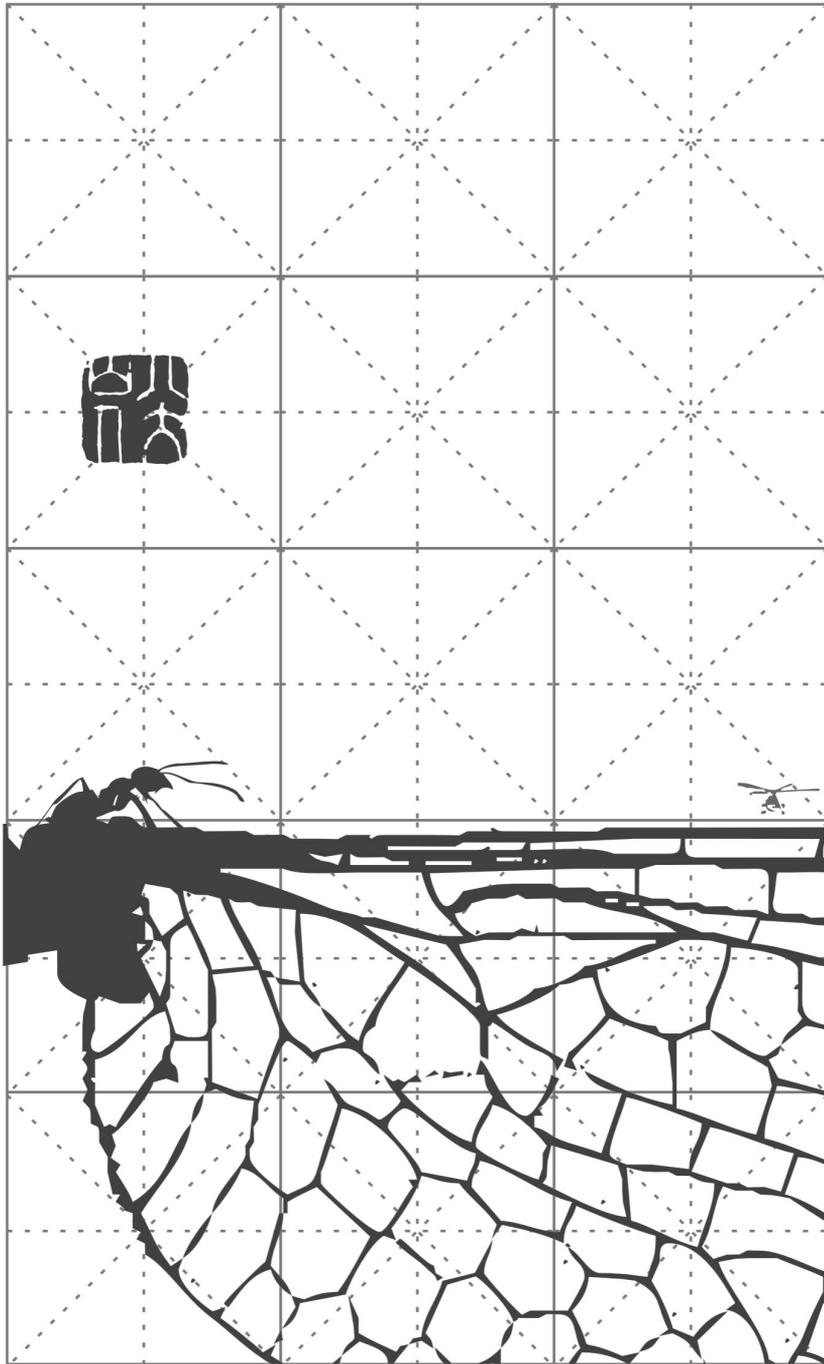
This might be a difficult view to grasp, and this is where the so-called mystical section of the *Tractatus* appears out of non-mystical considerations. The best way I can put this into words is by saying that in Wittgenstein's conception of the world everything is at, so to speak, the same *level*. If there is no clear distinction between *subject* and *object*, then, like Wittgenstein says in 6.4311 «Our life has no end in just the way as our visual field has no limits» and if there was such a thing as death, it could not be an *event in life*, but only the world itself coming to an end (6.431). Now, I do not think these radical conclusions were intended by Hertz, but I do think that the Hertzian stance about how we only know the *structure* of events leads to abandoning the necessity of the concept of objective reality and that with this concept abandoned, the ideas of subject and object were seen by Wittgenstein also as just some more misleading philosophical ideas that prevent us from seeing the world aright (6.54).

To sum up this paper, what I claim is that a Hertzian view of the *Tractatus* allows us to reject both an objectivist and a subjectivist interpretation of the book and to understand why the *Tractatus* does not take neither one nor the other. Also, looking at Hertz's simples allows us a coherent understanding of Wittgenstein's

simple objects. Furthermore, the Hertzian stance can also be the link between Wittgenstein's ideas about objects, the world, pictures and the mystical. For all these reasons, I think it is quite interesting and helpful to try to understand the *Tractatus* in a Hertzian way, and that's what I have tried to do in this paper. The connection between Hertz and Wittgenstein has been suggested in the literature here and there, but I think and hope my paper indicates how much ground there is still to be covered.

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