

On Butterfly Feelers: Some Examples of Surfing on Wittgenstein's *Tractatus*

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Denk nicht, sondern schau!

Numbers

In this paper I present a hypertext version of Wittgenstein's *Tractatus* which I have developed since 2004 (see <http://www.bazzocchi.com/wittgenstein/default.asp>). The hypertext shows Wittgenstein's *Tractatus* according to its logical architecture and enables the reader to follow its structural nexuses rather than the flat sequence of the printed pages. In my hypertext oriented interpretation of the *Tractatus*, the fundamental key is the numbers of the remarks. I believe that they are to be taken very seriously, as are Wittgenstein's words when he writes to von Ficker: «The decimal numbers of my remarks must absolutely be printed alongside them, because they alone give to the book perspicuity [*Übersichtlichkeit*] and clarity: without the numbering it would be an incomprehensible jumble»¹.

From my perspective, the best way of making us see the *Tractatus* in its proper shape, is to interpret the decimals as technical specifications in order to generate a hypertext (decimals are able to exactly define the organization of the pages, and the connections and the positions of all the remarks). Investigating the hypertext generated from the decimal numbers of the propositions seems in fact to correspond to the proposal contained in the *Tractatus*' explicative note, if we interpret it not as a justification for an unusual numeration, but as a reference to the deep structure of the book, and also as a reading prescription. «Therefore propositions 1, 2, 3, 4, 5, 6, 7» – Wittgenstein specified in the original version of the note – «are the cardinal propositions, propositions n.1, n.2, n.3, etc. are comments to the proposition N° n; propositions n.m1, n.m2, etc. comments to the proposition

N° n.m; and so on».² That is, we must be in a position to pick up at first sight the whole design of the work, in order then to be able to investigate every proposition, thereafter the comments to every investigation, and the comments to the comments, in cascade («and so on») throughout the innumerable paths that the recursive structure permits.³

The main page of the hypertext is therefore the synthetic view with the seven cardinal propositions. It is the starting point for an initial idea of the work, its extreme synthesis – and also, each time, the conclusive page, the point of departure from the system. By clicking on a proposition, a detailed window opens: the proposition itself is on the top, followed by the comments of the immediate successive level. The approach to the text proceeds in an analogous way for every page: after one general look, we can decide to return to the origin page (eventually in order to choose a different path), or to continue towards a further level of comment; and so on recursively. The effect is to reconstruct the conceptual map thanks to logical relations, translated in spatial relations by the hypertext. Here really the logical space and the topological space concur to only one formal representation; aesthetic form and logical form are intuited along the same process of progressive exploration. The sharpening of the formal intuition can lead not only to a different understanding of the remarks, but also to a better sensibility regarding the architecture as a whole.

Tractatus Logico-Philosophicus

Home Italian German English Chinese Map

Introduzione

Prefazione

Tractatus

Nota

1. The world is everything that is the case. *
2. What is the case, the fact, is the existence of atomic facts.
3. The logical picture of the facts is the thought.
4. The thought is the significant proposition.
5. Propositions are truth-functions of elementary propositions.
(An elementary proposition is a truth-function of itself.)
6. The general form of truth-function is: $[p, \bar{p}, N(\bar{p})]$.
This is the general form of proposition.
7. Whereof one cannot speak, thereof one must be silent.

Figure 1: Hypertext homepage.

On the home page, the structural asymmetry emerges at once between the first six propositions (on which we can click in order to open the windows of the analytical fractal) and proposition seven, a pure one-dimensional limit. If we observe that from the point of view of the anticipation supplied by the author in the Preface («The whole meaning of the book could be summed up somewhat as follows: What can be said at all can be said clearly; and whereof one cannot speak thereof one must be silent»), we see that, by zooming in it, «what can be said clearly» progressively expands (propositions 1-6, etc.), while the second part always remains the same (proposition 7: «Whereof one cannot speak, thereof one must be silent»).

The same paradox returns in the letter to von Ficker: «My work consists of two parts: the one presented here plus all that I have not written. [...] Where many others today are just gassing, I have managed in my book to put everything firmly into place by being silent about it». Proposition 7 is no further analyzable because it's a pure limit, it's the envelope that delimits the world of the sayable within which we remain necessarily confined. In the key of Aristotelian ontology, it could be suggested that sections 1-6 constitute the matter of the work, while proposition 7 represents its form, i.e. its more inner character. In the hypertextual approach, all this returns at each immersion in the *Tractatus*, thanks to the architectonic asymmetry of proposition 7 that, starting from the home page, is reflected all through the travel.⁴

By the way, note how much the home page of the hypertext is similar to the first page of the original drawing up of the *Tractatus*, at the beginning of the so-called “Prototractatus” notebook. *Prototractatus*' first page starts from the cardinal propositions and already contains 6 out of 7 of them, arranged together with some first level comments. In reality, it's probable that proposition 6 was added to the page only later on, when the drawing up process was much more ahead: but Wittgenstein seems to want to maintain precisely such a general and unitary outline.⁵

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1 Die Welt ist alles was der Fall ist.

1.1 Die Welt ist die Gesamtheit der Tatsachen, nicht der Dinge

2 Was der Fall ist, die Tatsache, ist das Bestehen von Sachverhalten

2.1 Die Tatsachen begreifen wir in Bildern

2.2 Das Bild hat mit dem Abgebildeten, die logische Form der Abbildung gemein.

3 Das logische Bild der Tatsachen ist der ~~die~~ Gedanke

3.1 Der sinnliche Ausdruck des Gedankens ist das Satzzeichen

3.2 Das Satzzeichen mit der Art und Weise seiner Abbildung ist der Satz

4 Der Gedanke ist der sinnvolle Satz

4.1 Der Satz stellt das Bestehen und nicht Bestehen der Sachverhalte dar

4.2 Der Sinn des Satzes ist seine Übereinstimmung, und nicht Übereinstimmung mit den Möglichkeiten, des Bestehens und nicht Bestehens der Sachverhalte

4.3 Die Wahrheitsmöglichkeiten der Elementarsätze bedeuten die Möglichkeiten des Bestehens und nicht Bestehens der Sachverhalte

4.4 Der Satz ist der Ausdruck der Übereinstimmung und nicht Übereinstimmung mit den Wahrheitsmöglichkeiten der Elementarsätze

5 Der Satz ist eine Wahrheitfunktion der Elementarsätze

6 Die allgemeine Form der Wahrheitfunktion ist:

$$|N(p_0), \bar{\alpha}, N\bar{\alpha}|$$

3

Figure 2: Facsimile of the first text page of the Prototractatus notebook (The Bodleian Library, University of Oxford, MS. Germ. d. 7, p. 3)

Linguistic games

Let us therefore begin travel in the hypertext – which here can only be shortly exemplified – along one of the more evident paths, through the synthetic page dedicated to the picture theory:

2.1 We make to ourselves pictures of facts.

2.2 The picture has the logical form of representation in common with what it pictures.

Clicking on 2.1, we arrive at a more articulated panel (the only one in the *Tractatus* to contain nine propositions, the maximum number given by the decimal system of structuring), that marks an exhaustive and in itself completed progression. Dedicated to the remark «We make to ourselves pictures of facts», the screen embraces a rapid sequence, in which two distinguished formal ganglia ask for our attention. The more obvious, of acoustic rather than of grammatical nature, rises from the unusual assonance between propositions 2.17 and 2.18. Why therefore are they so similar, these two phrases that deal with similitude? What do they have in common between them, in the meanwhile explaining what picture and reality have in common?

Let's try and find an answer by means of pure formal tools, that is by mechanically copying *all the propositional signs that are common* to the two propositions. Therefore:

What picture must have in common with reality in order to be able to represent it – rightly or falsely – is form .

As one can see, all that the two propositions (which illustrate what two similar objects have in common) have in their turn in common, forms an intelligible proposition that says that the two subjects of a pictorial relation (image and reality, proposition and reality, proposition and proposition) have form in common.

2.1

Italian German English Map

We make to ourselves pictures of facts.

2.11 The picture presents the facts in logical space, the existence and non-existence of atomic facts.

2.12 The picture is a model of reality.

2.13⁽¹⁾ To the objects correspond in the picture the elements of the picture.

2.14⁽¹⁾ The picture consists in the fact that its elements are combined with one another in a definite way.

2.15⁽¹⁾ That the elements of the picture are combined with one another in a definite way, represents that the things are so combined with one another. This connexion of the elements of the picture is called its structure, and the possibility of this structure is called the form of representation of the picture.

2.16⁽¹⁾ In order to be a picture a fact must have something in common with what it pictures.

2.17⁽⁴⁾ What the picture must have in common with reality in order to be able to represent it after its manner - rightly or falsely - is its form of representation.

2.18⁽²⁾ What every picture, of whatever form, must have in common with reality in order to be able to represent it at all - rightly or falsely - is the logical form, that is, the form of reality.

2.19 The logical picture can depict the world.

Figure 3: Virtual panel 2.1.

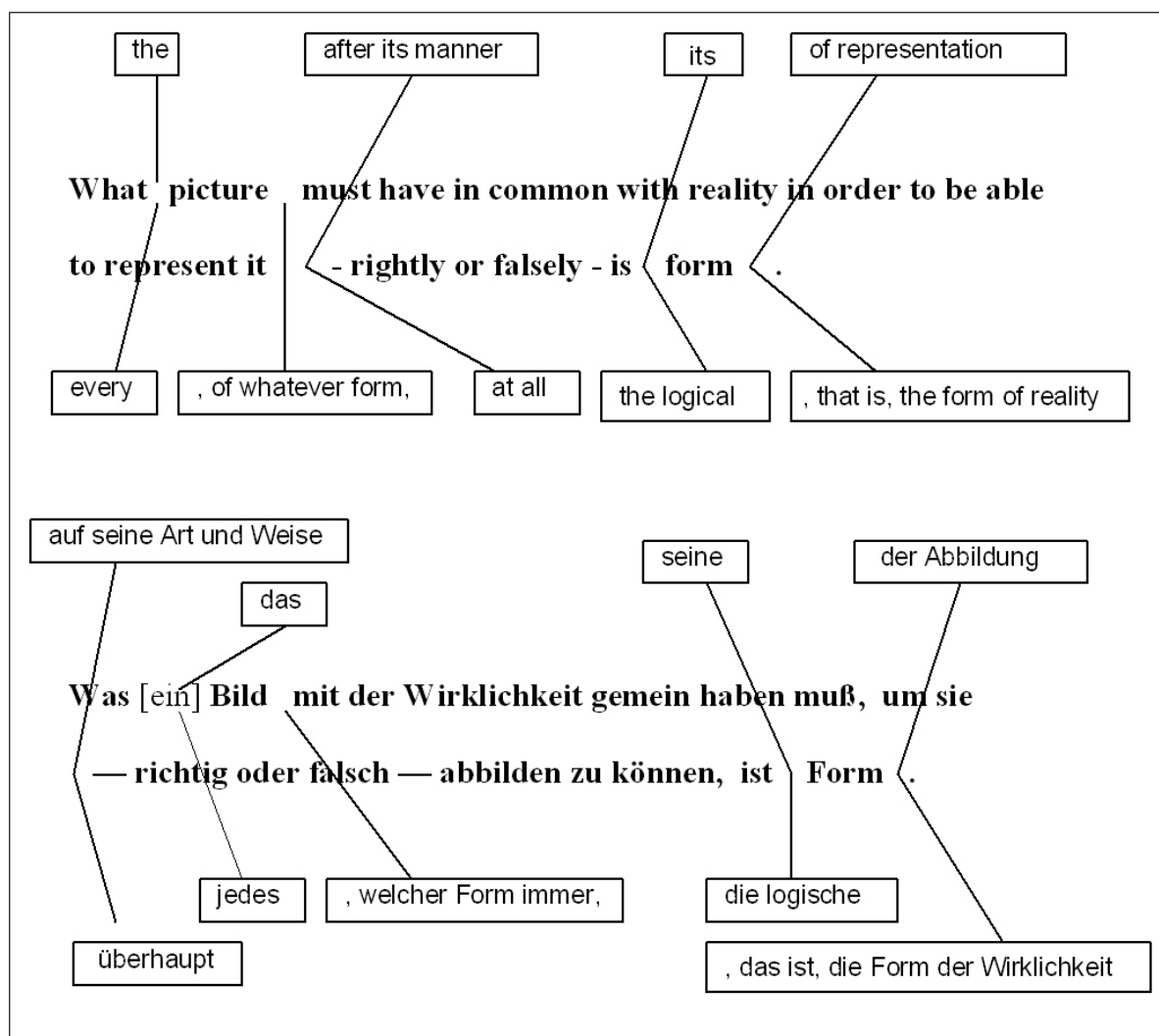


Figure 4: The hidden remark and the game: spot the differences. The English version here adopted is the Odgen-Ramsey translation, revised by Wittgenstein himself.

We can continue with the syntactical manipulation, now playing the “spot the difference” game (between two pictures, or two propositions – it makes no difference, if propositions are like pictures). If we then align on the one hand the specific differences of 2.17, and on the other the specific differences of 2.18, we notice that they closely correspond. 2.17 represents the side of singularity: *the* single picture has in common with reality, in order to represent it *after its manner*, *its* form of representation. 2.18 picks up the aspect of the generalization: *every* picture, *of whatever form*, has in common with reality, in order to represent it *at all*, the *logical* form, *that is the form of reality*. With the charade, Wittgenstein emphasizes the jump to generalization, one that comprehends what all the possible images of a specific reality have in common, i.e. the logical structure of reality itself. The formal

game between propositions 2.17 and 2.18, translated in similar icons, shines on the page and invites us to follow the reflections thus mirrored.

If someone has any doubt that the charade can only be a fortuitous event, he can examine how, on page 6 of the *Prototractatus* manuscript, Wittgenstein has repeatedly corrected the two propositions, with cuts and inserts, until balancing exactly, on the hidden phrase, the specific contribution of each of them (fig. 5). It's a reasonable assumption that this "hidden phrase" had even been, from the chronological point of view, the original nucleus on which basis the 2.17 and 2.18 statements were defined. In fact, it appears already in the 1914 diary as: «The form of a picture can be said that in which the picture *must* concord with reality (in order to be able to represent it)»⁶.

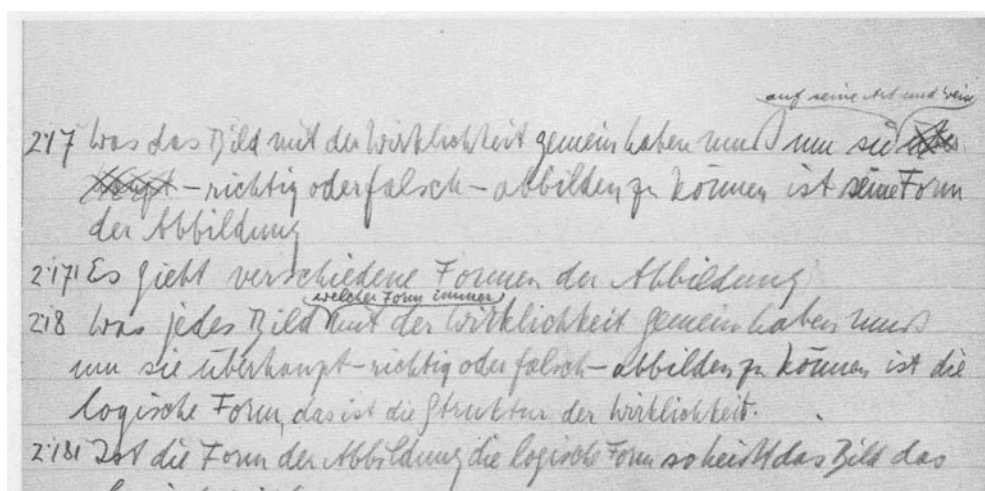


Figure 5: The elaboration of propositions 2.17 and 2.18 on p. 6 of the manuscript (The Bodleian Library, University of Oxford, MS. Germ. d. 7, p. 6).

It's not surprising that the critical literature has never noticed the charade, even if this step has been greatly studied. In the traditional sequential way of reading the book, the point is not so evident, because our attention is totally engaged in managing formal and semantic relations between the various assertions. Moreover, in a sequential reading it is usual to assume a conceptual development from page to page, instead of a topological picture of conceptual relations. On the hypertext page, on the contrary, the logical form of the work is the backbone of the reading process itself, and our formal sensibility is enhanced at its upper level. It's impossible not to notice the particular relation between the two propositions. The difficulty of focusing the point in the traditional approach is evident even in the best analysis

of this step, David Pears' article [Pears 1977]. We can find the main lines of Wittgenstein's picture theory, Pears writes, «in the second part of the second of the seven sections of the *Tractatus*» [p. 191]. More specifically, «the introduction of the images in *Tractatus* 2.1-2.225 can be divided into two sections. The first, which runs down to 2.174, [... and] the second section, which starts at 2.18» [p. 192]. Pears drafts the «gradualism» [p. 195] between these two propositions, in which the generalization would happen, but attributes the hard work of his discovery to the hiding operated by Wittgenstein, in virtue of which «the concept of a picture is generalized by stealth» [p. 195]. Pears cites 2.174 as the immediate previous step before 2.18, and in which «the concept of a picture has not yet been explicitly generalized» [p.193]. Generalization that Wittgenstein would then introduce unexpectedly with what Pears reads as the *following* proposition, 2.18. «The result is that we are led to generalize the concept of a picture by stealth, without quite knowing at what point we took the decisive step» [p. 193]. Of course the decisive step – the decisive juxtaposition – is between the remark 2.17 *and its immediate neighbour* (on the virtual page) 2.18: despite any interleaved comments. (I call “virtual” the hypertext pages because they depend only upon numerical relations and they don't correspond to any edited page. In effect, they are much more real than the paper pages stochastically separated by the printing process).

Indeed, because of the way in which it shines in the hypertext stated by the decimal numeration, the formal game organized by Wittgenstein could be defined as anything but a furtive action.

Feelers

Let us again observe the shape of virtual page 2.1. A second obvious formal particularity can be noticed: there is one proposition formally different from the others. It is the 2.15 remark: the only one on the page which is composed, in effect, by two distinguished periods. To a great extent, the virtual page 2.1 had already been developed in 1915 in pages 4-6 of the *Prototractatus*, but at the time all propositions were rigorously composed by only one period.⁷ The structure was supervised during the “*Korrektur*” in the summer of 1918; the two paragraphs of proposition 2.15, before untied, were reunited in the middle of the page, to illustrate how the possibility of the representation – indeed, of every possible structure – needs *complexity*.

A mouse that wishes to negotiate such a structure will suddenly find itself in a narrow passage, formed by only one tortuous concept: «The form of representation is the possibility that the things are combined with one another as are the elements of the picture» (2.151). It leads to a pentad of further comments; it is on the tip of these sensitive fingers that «the picture is linked with reality; it reaches up to it» (2.1511). Thanks to «the co-ordinations of the elements of the picture and the things» (2.1514), reality perhaps can even be touched: «These co-ordinations are as it were the feelers of its elements with which the picture touches reality» (2.1515)⁸.

It's difficult to return the clear impression that in this moment the hypertextual navigation gives, the impression i.e. of finding ourselves exactly on the thin veins of the feeler that is the 2.1 branch reaching towards the real world. «With “Fühler”» – specifies Wittgenstein to the editor Odgen – «I mean those things that butterflies have» [Wittgenstein 1973, p. 31]. The delicate extremity of the feeler still has a last extroversion: if the image wishes to become a meter and intends to measure scientifically⁹, in order *to touch* it must go further still: «Only the outermost points of the dividing lines *touch* [*berühren*] the object to be measured» (2.15121).

The metaphor of the antennae already occurs in a curious reference of 15 October 1914, which points to a step outside the diaries; the reference would seem a punctual comment to these first pages of the *Prototractatus* (or, possibly, of some its predecessor; note that «here» the matter is not the picture, but «the proposition»): «Here I have considered the relations between the elements of the proposition and their meanings almost like feelers, by means of which the proposition is in contact with the external world; and generalizing a proposition then is like withdrawing the antennas. [...] But is this image right? (Do I truly withdraw an antenna when, instead of $\varphi(a)$, I say $(\exists x). \varphi(x)$?)»¹⁰

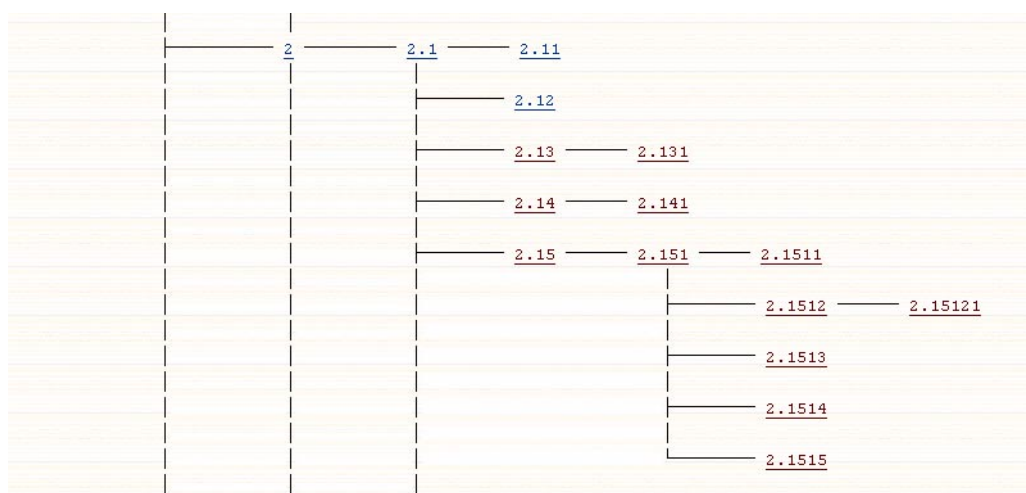


Figure 6: Hypertext map (particular of the branch 2.1).

If, as McGuinness assumes, «the status of his own propositions is always in his mind» [McGuinness 1988, p. 302], we can here assume the metaphor of the antenna, therefore well nested in the architecture of the *Tractatus*, as implicitly referred by Wittgenstein to the structure itself of his work. The progressive refining of the decimal cascade runs from the general level of the cardinal propositions to the particular details of the more extreme branches, like feelers stretched towards the truth: in order then to repeat its travel backwards again and «to withdraw the antennas». The thin filigree of the hypertext becomes almost a sensitive perceptive apparatus with which we explore the world (as a metaphoric example, see fig. 6).

Symphonies and gramophones

The exploration of the hypertext, like a visit to a city¹¹, has neither a proper point of departure, nor a definitive conclusion, but it's always in equilibrium between the formal net arranged by the author (that defines all exploration possibilities, i.e. the transcendental form of every possible travel) and the point of view, the idiosyncrasies and the choices of each reader. Rather, faced with the balanced dance of *Tractatus* articulations, we are tempted to try its *barycentre*. It is natural to test the fourth of the seven branches («The thought is the significant proposition»), which depicts the passage between the world of the facts and the world of the signs. On the rest, as McGuinness observes, «it is possible to defend the view that the work is a kind of systole and diastole around proposition 4, where the most basic propositions of its argument are to be found».¹² This central branch includes three

sections. The first, with triple decimal, states that the specific argument is language, with its difficulties and consequent philosophical drifts. The last, with simple decimal, discusses form and content of a propositional sign. The middle section (with double decimal) aims to picture the pictorial ability of the language itself: we are at the centre of the issue of how the sign can stay in the place of something else. As McGuinness writes, «we are here at the heart of the *Tractatus*. The essence of its account of propositions is contained in the propositions number 4.01-4.0641». ¹³

The focus is directly in evidence: «The proposition is a picture of reality. The proposition is a model of the reality as we think it is» (4.01). The analogy with the picture is explored in every possible suggestion: «A proposition states something only in so far as it is a picture» (4.03); «Propositions can be true or false only by being pictures of the reality» (4.06). The most tangible modelling is at the bottom of the tentacles spread towards reality: «And so the whole, like a living picture, presents the atomic fact» (4.0311). But just in the investigation of 4.01 the analogy, the similitude, shows itself to be the essence of the linguistic act. The *Tractatus* barycentre is hypertext page 4.01. ¹⁴

4.01

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**The proposition is a picture of reality.
The proposition is a model of the reality as we think it is.**

1. [Su](#)

2. [1.](#)

3. [2.](#)

4. [3.](#)

5. [4.](#)

6. [5.](#)

4.011 At the first glance the proposition - say as it stands printed on paper - does not seem to be a picture of the reality of which it treats. But nor does the musical score appear at first sight to be a picture of a musical piece; nor does our phonetic spelling (letters) seem to be a picture of our spoken language.
And yet these symbolisms prove to be pictures - even in the ordinary sense of the word - of what they represent.

4.012 It is obvious that we perceive a proposition of the form "aRb" as a picture. Here the sign is obviously a likeness of the signified.

4.013 And if we penetrate to the essence of this pictorial nature we see that this is not disturbed by apparent irregularities (like the use of # and › in the score).
For these irregularities also picture what they are to express; only in another way.

4.014 ^(?) The gramophone record, the musical thought, the score, the waves of sound, all stand to one another in that pictorial internal relation, which holds between language and the world. To all of them the logical structure is common.
(Like the two youths, their two horses and their lilies in the story. They are all in a certain sense one.)

4.015 The possibility of all similes, of all the images of our language, rests on the logic of representation.

4.016 In order to understand the essence of the proposition, consider hieroglyphic writing, which pictures the facts it describes.
And from it came the alphabet without the essence of the representation being lost.

Figure 7: The genuine barycentre of *Tractatus* hypertext.

This page is all a similitude, because the action itself of showing cannot be properly described, cannot further “be said”. Proposition 4.015 points to the «possibility of all similes» and is placed between the metaphor of the music (to say nothing, between parenthesis, of the symbolism of the tales) and the similitude of hieroglyphic writing. «And if we penetrate to the essence of this pictorial nature», we discover that «that inner pictorial relation which holds between language and world» is the same one that puts in relation «the gramophone record, the musical thought, the score, the waves of sound» (4.014).

Such phantasmagoria of metaphors encloses a last, further elucidation. It is not perhaps a fortuitous case that just on this page, from its more meaningful and evocative proposition (that joins the topic of the logical structure of the similitude to the symbolism of the tale), one can reach the last modification brought to the body of the *Tractatus*: the «addition 72» stuck in extremis to the typescript and lost on the troubled way to the German editor. The comment on which Wittgenstein has hesitated until the end, and that in the edition of the *Annalen der Naturphilosophie* leaves only one sibylline auto referential trace, specifies the logical statute of the «rule of translation».¹⁵

The problem is whether the translation from one symbolism to an other is or is not governed by rules, if it’s a solvable issue on the plan of the «logical structure» (that is, as it would be said in artificial intelligence, on the plan of the “manipulation of symbols”); this is naturally a crucial issue, on which successive Wittgensteinian reflection will become much more critical. By placing the *Tractatus* in equilibrium on the fulcrum of comment 4.0141, Wittgenstein resolves here to support the constituent nature of the rule: the inner likeness between conformations «which at first sight seem to be entirely different» would stand in the fact «that there is a rule by which one could reconstruct the symphony from the line on a gramophone record and from this again – by means of the first rule – construct the score». The ability to interpret the language is similar to the ability of the phonograph to reproduce the melody, for it brings this «law of projection» wired in its own structure. The metaphor of the gramophone, physical instantiation of «the rule of translation», almost seems to suggest the idea of artificial systems, based on formal rules, able to interpret «the logic of representation».

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Notes

1. [Wittgenstein 1969, p. 39]. This is one of the two points in which Wittgenstein writes about the *Tractatus* numeration. In the other, the note to *Tractatus*' first proposition, he claims that the decimal figures indicate the emphasis laid upon respective propositions "in my representation [*in meiner Darstellung*]". So, we can infer that "the decimal numbers alone can transform the incomprehensible jumble of the book into a perspicuous representation". "A perspicuous representation [*übersichtliche Darstellung*] – Wittgenstein will specify in the *Philosophical Investigations* (§122) – makes understanding possible, which just consists in the fact that we "see connections"" (§122).
2. Added by hand on TS 204 ("Gmunden Typescript"), and then corrected by eliminating the reference to the "Kardinalsätze".
3. The top-down strategy is also the way adopted by Wittgenstein in composing the *Tractatus*, if we remain at the content and the numeration of the *Prototractatus* working notebook. Five of the seven cardinal propositions were composed at once on the first page. Of the comments to them, 13 out of 15 (87%) with a single decimal are contained in the first eight pages of the manuscript; 68 out of 81 (84%) with two decimals are in the first fifteen pages, 135 out of 170 (79%) with three decimals appear within the first half of the note-book.
4. A more careful analysis of the hypertext approach to proposition seven can be found in [Bazzocchi 2007(1)].
5. For an outlook on the *Prototractatus* process of composition, see [Bazzocchi 2007(2)].
6. "Die Form eines Bildes könnte man dasjenige nennen worin das Bild mit der Wirklichkeit stimmen muß (um sie überhaupt abbilden zu können)" (20 October 1914).
7. The whole first layer of the notebook, until the caesura at page 28, was composed of single and original propositions (not drafts from previous diaries). Beginning from page 28, the composition technique changes completely, with systematic resumptions of entire steps from the previous notebooks. This "methodological turn" starts in October 1915 and is prefigured in the warning in the notebook head-page; see [Bazzocchi 2005 and 2006(1)]. The 283 propositions of this first layer comprised the skeleton of the entire work (with exclusion of branch 6), in one already complete exposure of all main levels.
8. "Diese Zuordnungen sind gleichsam die Fühler der Bildelemente, mit denen das Bild die Wirklichkeit berührt".
9. "Es ist wie ein Maßstab an die Wirklichkeit angelegt" (2.1512).
10. "Ich habe hier die Beziehungen der Satz-Elemente zu ihren Bedeutungen gleichsam als Fühler betrachtet durch welche der Satz mit der Außenwelt in Berührung steht; und das Verallgemeinern eines Satzes gleicht dann dem Einziehen der Fühler; bis endlich der ganz allgemeine Satz ganz isoliert ist. Aber stimmt dieses Bild? (Ziehe ich wirklich einen Fühler ein wenn ich statt $\varphi(a)$, $(\exists x). \varphi(x)$ sage?)".
11. Surfing on the hypertext seems to be isomorphic to Wittgenstein's method in his lessons: "In teaching you philosophy I'm like a guide showing you how to find your way round London. I have to take you through the city from north to south, from east to west, from Euston to the embankment and from Piccadilly to the Marble Arch. After I have taken you

many journeys through the city, in all sorts of directions, we shall have passed through any given street a number of times – each time traversing the street as part of different journey. At end of this you will know London; you will be able to find your way about like a born Londoner. Of course, a good guide will take you through the more important streets more often than he takes you down side streets; a bad guide will do the opposite” [Gasking-Jackson, 1967, p. 51].

12. [McGuinness 1988, p. 304] This way of expressing oneself, for which in some way fundamental propositions would be found “in” proposition 4, applies very well to the virtual reality of the hypertext, that develops itself by “opening” each remark with the mouse. The vital pulsation, the diastole and the systole, correspond to the feeling of entering and exiting from a level of detail, of opening and closing any further windows.
13. [McGuinness 1988, p. 306]. The analysis of McGuinness often works by nested levels, even if the sequential reading obliges him to extract the virtual pages only mentally, and to cite by heterogeneous blocks: here, the indication “4.01-4.0641” obviously means reference to propositions 4.01-4.06 and, consequently, to their respective comments.
14. If we continued instead by central paths, perhaps we would be forced to choose the third of the six doors, and then the first of the two successive ones, and then the second one of the final couple, until reaching the inner nucleus: “My fundamental thought is that the “logical constants” do not represent; that the logic of the facts cannot be represented” (4.0312).
15. 4.0141: “In the fact that there is a general rule by which the musician is able to read the symphony out of the score, and that there is a rule by which one could reconstruct the symphony from the line on a gramophone record and from this again – by means of the first rule – construct the score, herein lies the internal similarity between these things which at first sight seem to be entirely different. And the rule is the law of projection which projects the symphony into the language of the musical score. It is the rule of translation of this language into the language of the gramophone record”. Ostwald's German edition has only: “4.0141 (Siehe Ergänzung Nr. 72)”.