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FIL217 / FIL317- *Wittgenstein
studies*

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From the Tractatus to the
Philosophical Investigations



A fact about ordinary language

The meaning of expressions and phrases of everyday language is vague, ambiguous and context dependent.

Science

«But science
("Wissenschaft") needs
exactness!»

Vagueness, ambiguity, context dependency

- Vagueness
 - "There are **about** thirty people in this room",
"He is a **good** student"
- Ambiguity
 - The word "is", "Die **Bank** ist teuer" ...
- Context dependency
 - Deictic expressions, : «this», «here», «now»,
«I», «tomorrow» ...

Proper names and definite descriptions

«Thank God: Ordinary language also includes some proper names and definite descriptions!»

– «Kevin Cahill», «Bergen», «The 11th president of Italy» ...

Exact language: A possible way out?

- «We need exact language; let's create it.»
- Or (Frege!): «Let's make the exactness, that actually already is *inherent* in our existing language (in our **thought**), explicit in a *Begriffsschrift*.»
- «In such an exact *Begriffsschrift*, we must be maximally *formal* and should not at all have to stress with messy contents.»
 - An artificial and formal language, a **logical syntax**.
Syntax rather than semantics!

«We need an exact language that ...»

- is context independent
- permits exact operations on the basis of logical syntax alone
- can in principle be processed by machines!
 - An artificial language («Artificial intelligence»!)
- is a *calculus*: a formal system with exact rules for how to process signs
- establishes the truth of complex propositions on the basis of their *logical form alone*
 - The *Tractatus*' truth tables calculus!

Promotion of logical syntax is *one* tendency in the *Tractatus*

TLP #3.317

... Die Festsetzung wird also nur von Symbolen, nicht von deren Bedeutung handeln.

Und *nur* dies ist der Festsetzung wesentlich, *daß sie nur eine Beschreibung von Symbolen ist und nichts über das Bezeichnete aussagt.*

... The stipulation will therefore be concerned only with symbols, not with their meaning.

And the *only* thing essential to the stipulation is *that it is merely a description of symbols and states nothing about what is signified.*

TLP #3.33

In der logischen Syntax darf nie die Bedeutung eines Zeichens eine Rolle spielen; sie muß sich aufstellen lassen, ohne daß dabei von der *Bedeutung* eines Zeichens die Rede wäre, sie darf *nur* die Beschreibung der Ausdrücke voraussetzen.

In logical syntax the meaning of a sign should never play a rôle. It must be possible to establish logical syntax without mentioning the *meaning* of a sign: *only* the description of expressions may be presupposed.

So, how does it work?

- Create a calculus for identifying the truth value of a complex sentence purely on the basis of running the distribution of truth values for the simple sentences it is composed of.
 - If it shall be possible to distribute the truth values of the simple sentences arbitrarily – then the simple sentences (elementary propositions) must be logically independent from each other!
- By running a complex sentence (e.g. "p & q") through the truth table calculus we *show* how its truth value series results from the truth values of the simple sentences it is composed of (e.g. "p", "q").

– "&" is *shown* by the T, F, F, F truth value series; "~" through the F, T truth value series, etc.:

p	&	q
T	T	T
T	F	F
F	F	T
F	F	F

~	p
F	T
T	F

- TLP #4.31: The truth-possibilities can be presented by schemata of the following kind ("T" means "true", "F" "false". The rows of T's and F's under the row of the elementary propositions mean their truth-possibilities in an easily intelligible symbolism).

Problems?

- Well, no problem – as long as the concept of elementary proposition is presupposed and does its work as it is introduced in the *Tractatus*: e.g.: the elementary propositions do in no way exclude or include each other.
- But what happens if they do? I.e. if p and q actually exclude each other on the basis of their meaning, like for example colour statements can exclude each other?
- Substitute "p" with «This is red», and q with «This is green»:

$$\frac{p}{T} \quad \frac{\&}{T?} \quad \frac{q}{T}$$

- «a is red» *could* be thought of as a candidate for elementary proposition. But, according to the *Tractatus*, it cannot be an elementary proposition precisely because of the exclusion problem.

The colour exclusion problem

TLP 6.3751

- Daß z.B. zwei Farben zugleich an einem Ort des Gesichtsfeldes sind, ist unmöglich, und zwar logisch unmöglich, denn es ist durch die logische Struktur der Farbe ausgeschlossen.
- Denken wir daran, wie sich dieser Widerspruch in der Physik darstellt: Ungefähr so, daß ein Teilchen nicht zu gleicher Zeit zwei Geschwindigkeiten haben kann; das heißt, daß es nicht zu gleicher Zeit an zwei Orten sein kann; das heißt, daß Teilchen an verschiedenen Orten zu Einer Zeit nicht identisch sein können.
- (Es ist klar, daß das logische Produkt zweier Elementarsätze weder eine Tautologie noch eine Kontradiktion sein kann. **Die Aussage, daß ein Punkt des Gesichtsfeldes zu gleicher Zeit zwei verschiedene Farben hat, ist eine Kontradiktion.**)

The colour exclusion problem (premiss 1)

- Elementary propositions are logically independent of each other; they cannot exclude each other.
- Therefore mutually exclusive color statements cannot be elementary propositions.
- If they cannot be elementary propositions, they must be further analyzable (TLP #4.211, #6.3751).
- **(1) In the end, the analysis of “*a is red*” must yield elementary propositions.**

The colour exclusion problem in the Tractatus (premiss 2)

- Some color statements are mutually exclusive: “a is red” excludes “a is green”.
- There is only *logical* necessity / impossibility; therefore the analysis must show that the mutual exclusion of “a is red” and “a is green” is of a logical kind.
- The logical product of color statements such as “a is red” and “a is green” must amount to a *logical contradiction*.
 - “a is red & a is green” must be a logical contradiction.
- **(2) Logical analysis must show that the logical product of “a is red” and “a is green” – none of the two being an elementary proposition - is something like “a is red and a is not red” – thus a logical contradiction.**

Some Remarks on Logical Form on the colour exclusion problem

- That (1) “*a* is red” can be analyzed into an elementary proposition and that (2) “*a* is red & *a* is green” is a logical contradiction, is to be shown through logical analysis.
- *Some Remarks on Logical Form* (SRLF, 1929) undertakes the logical analysis of color statements.
- But SRLF does not succeed
 - in showing that “*a* is red” and “*a* is green” are mutually exclusive on the basis of logical syntax alone, and thus, in showing that their logical product amounts to a logical contradiction.
 - in showing that color statements are composed of simpler statements that lead to elementary propositions.

Some Remarks on Logical Form on the colour exclusion problem

- If color statements cannot be analyzed into *simpler* statements that lead to elementary propositions, are they themselves elementary propositions? We may try to answer Yes. But ...
- ... If color statements are elementary propositions, what about the *independency* view of elementary propositions?
 - Then at least some elementary propositions are mutually exclusive and not independent of each other!
- Three Tractatus views are at stake:
 - The *independency* view of elementary propositions
 - The view that elementary propositions are *simple*
 - The view that logic “must take care of itself” (TLP #5.473)
 - We seem to need more than logical necessity / possibility only! On the basis of logical syntax / logical analysis alone we cannot show how color statements can exclude each other!

Conclusions from the colour exclusion problem

- SRLF concludes that color statements such as “*a is red*” and “*a is green*” must be regarded themselves elementary propositions, but then
 - elementary propositions can be mutually exclusive (“*a is red*” and “*a is green*” exclude each other for “phenomen(ologic)al” impossibility)
 - there is no longer only logical impossibility
 - elementary propositions, states of affairs and facts are no longer independent of each other
- **The *Tractatus* conception of elementary propositions can just as well be given up!?**

My whole task consists in explaining the nature of the proposition. (NB p. 39, 22.1.1915)

Language (Sprache)	World (Welt)
complex proposition (zusammengesetzter Satz)	a group of states of affairs (Sachlage?)
elementary proposition (Elementarsatz) [sense]	state of affairs (Sachverhalt)
true elementary proposition (wahrer Elementarsatz) [truth]	fact (Tatsache)
name (einfaches Zeichen, Name) [have reference only in the context of an elementary proposition]	simple object (einfacher Gegenstand)

Want more problems?

Some questions to the Tractatus

- Was nun Ihre eigene Schrift anbetrifft, so nehme ich gleich an dem ersten Satze Anstoss. Nicht, dass ich ihn für falsch hielte, sondern weil mir der Sinn unklar ist. "Die Welt **ist** alles, was der Fall ist". Das "ist" wird entweder als blosser Copula gebraucht, oder wie das Gleichheitszeichen in dem volleren Sinne von "ist dasselbe wie". Während das "ist" des Nebensatzes offenbar blosser Copula ist, kann ich das "ist" des Hauptsatzes nur in dem Sinne eines Gleichheitszeichens verstehen. Bis hier ist, glaube ich, kein Zweifel möglich. Aber ist die Gleichung als Definition zu verstehen? Das ist nicht so deutlich. Wollen sie sagen: "Ich will unter 'Welt' verstehen alles, was der Fall ist? Dann ist "die Welt" der erklärte Ausdruck, "alles was der Fall ist" der erklärende. In diesem Falle wird nichts damit behauptet von der Welt oder von dem, was der Fall ist, sondern, wenn etwas behauptet werden soll, so ist es etwas über den Sprachgebrauch des Schriftstellers. Ob und wieweit dieser etwa mit dem Sprachgebrauch des Lebens übereinstimme, ist eine Sache für sich, auf die aber für den Philosophen wenig ankommt, nachdem er seinen Sprachgebrauch einmal festgestellt hat. ... (Frege in a letter to Wittgenstein. In: Ludwig Wittgenstein: Gesamtbriefwechsel/ Complete Correspondence. Electronic Edition, 3.4.1920, IntelLex <http://pm.nlx.com>)

World vs. Reality

- TLP #2.04: The totality of existent atomic facts is the world.
- TLP #2.06: The existence and non-existence of atomic facts is the reality.
- TLP #2.063: The total reality is the world.
- From #2.04 and #2.06 one is tempted to conclude that "world" denotes a subset of "reality" – but this seems contradicted by #2.063.

”Can you give me an example ...?”

- The Tractatus doesn't give a single example of an elementary proposition.
- The Tractatus doesn't give a single example of a simple object.

N. Malcolm, *Ludwig Wittgenstein* *A Memoir*, p.70

- "I asked Wittgenstein whether, when he wrote the *Tractatus*, he had ever decided upon anything as an *example* of a 'simple object'. His reply was that at that time his thought had been that he was a *logician*; and that it was not his business, as a logician, to try to decide whether this thing or that was a simple thing or a complex thing, that being a purely *empirical* matter! It was clear that he regarded his former opinion as absurd."

"Nonsense" I

- TLP #4.124, #5.5351, #6.54: Attempts at describing the logic of our language – though important they may be – are condemned to fail to make sense since they attempt at *saying* what only can be shown: what *can* be shown of the "Gerüst der Welt" is shown by every use of language.
 - The sentences of logic, mathematics, the foundations of the natural sciences, ethics and philosophy are all "pseudo-propositions" (either senseless or nonsensical).
- Tautologies (and contradictions) are senseless ("sinnlos").
- Sentences which contain formal concepts are nonsensical ("unsinnig").
 - Examples for formal concepts include "object", "complex", "number" (TLP #4.126ff)
 - TLP #4.1272: *So one cannot say, e.g. "There are objects ..."*
- Sentences which contain value concepts are nonsensical ("unsinnig").
- A proposition is nonsensical if it contains a sign without meaning. (TLP #5.4733)

”Nonsense” II

- Russell, in his preface to TLP: “... Mr Wittgenstein manages to say a good deal about what cannot be said ...”
- Is the context-principle part of the ladder to be thrown away? (TLP 3.3 a.o.)
- Is the sign-symbol distinction part of the ladder to be thrown away? (TLP 3.32 a.o.)
- ...



The PI's description /
diagnosis of the
Tractatus' reasoning
behind "simple names- /
simple objects-
philosophy"

PI §39

- 39. ... if "**Excalibur**" is the name of an object, this object no longer exists when Excalibur is broken in pieces; and as no object would then correspond to the name it would have no meaning. But then the sentence "Excalibur has a sharp blade" would contain a word that had no meaning, and hence the sentence would be nonsense. **But it does make sense**; so there must always be something corresponding to the words of which it consists. **So the word "Excalibur" must disappear** when the sense is analysed and its place be taken by words which name simples. It will be reasonable to call these words the real names.

The reasoning behind

- A sentence built with "Excalibur" has sense even if the object to which "Excalibur" refers no longer exists.
- For a sentence to make sense it is a precondition that it contains elements which refer to objects.
- Therefore, the object of reference cannot be Excalibur, and the expressions which refer to objects cannot be words like "Excalibur".
- Therefore, there must be simple names which refer ("bedeuten"), and simple objects as their objects of reference («Bedeutungen»):
 - So the word "Excalibur" must disappear when the sense is analysed and its place be taken by words which name simples. (PI §39)

PI §59

- 59. "A *name* signifies only what is an *element* of reality. What cannot be destroyed; what remains the same in all changes." ...We see *component parts* of something composite (of a chair, for instance). We say that the back is part of the chair, but is in turn itself composed of several bits of wood; while a leg is a simple component part. We also see a whole which changes (is destroyed) while its component parts remain unchanged. These are the materials from which we construct that picture of reality.

PI §60

- 60. When I say: "My broom is in the corner",—is this really a statement about the broomstick and the brush? Well, it could at any rate be replaced by a statement giving the position of the stick and the position of the brush. And this statement is surely a further analysed form of the first one.—But why do I call it "further analysed"?—Well, if the broom is there, that surely means that the stick and brush must be there, and in a particular relation to one another; and this was as it were hidden in the sense of the first sentence, and is *expressed* in the analysed sentence. ...

From the Tractatus to the later philosophy: "meaning" re-visited

From reference to rules

- Tractatus: Sense comes from elementary propositions composed of names which refer to simple objects in the world.
- If there are no elementary propositions – how are sense and meaning accounted for?
- "Middle period": Meaning is established through language-internal **rules** rather than language-external **reference**.
- The meaning of a sentence does not come from reference to objects, but from a system of linguistic rules.

The chess analogy

- The meaning of a chess figure does not come from a relation of representation (picture theory!), but from a chess-internal system of rules.
 - What would a chess figure represent?
- The rules of chess are purely conventional and not bound by reference to ontological entities.
- Not even ostensive definition ("This is ...") is bound by a language-external world.
 - Ostensive acts take place within a system which is - if not directly a part of language – at least intimately interwoven with language and its rules.
- Language is in a certain sense autonomous and independent of the world.

From rules to practice

One way of introducing the «Primacy of practice»-view

- The "Meaning is rules"-view can be challenged on the basis of the "Rules regress" and the "Authority regress" problems.
- Wittgenstein's response to this challenge leads to his "Primacy of practice"- and "Meaning is use"-views (see Newen & von Savigny, *Analytische Philosophie: Eine Einführung*, 1996; p. 92f).

Rules and authority regress

- Rules regress: If not through reference to the language-external world – where do the words and sentences get their meaning from? From rules. But what rules the rules? Rules? And what rules the rules which rule the rules? Rules. ...?
- Authority regress: Who decides *which* rules? Rules can be agreed upon and changed (they are conventional) – but on the basis of what authority? And if one is supposed to follow rules – on what basis? Where does the authority come from? ?

Where does authority come from?

- What comes first - *rules* or *practice*?
 - Primacy of rules view (regulism): "It is clear what the rules are – let's see whether practice confirms to them".
 - Problem: What gives the rules their authority?
 - Primacy of practice view: "Let's look at our practices and behaviour, and derive the rules from there".

The Tractatus' «meaning»
revisited: Practice and use
rather than reference!

TLP used the word "meaning" wrongly: PI §40

- 40. Let us first discuss *this* point of the argument: that a word has no meaning if nothing corresponds to it.—It is important to **note that the word "meaning" ["Bedeutung"] is being used illicitly** if it is used to signify the thing that 'corresponds' to the word. That is to confound the meaning of a name with the *bearer* of the name. When Mr. N. N. dies **one says** that the bearer of the name dies, not that the meaning dies. And it would be nonsensical to say that, for if the name ceased to have meaning it would make no sense to say "Mr. N. N. is dead." [cf. Frege's use of the word "Bedeutung"]

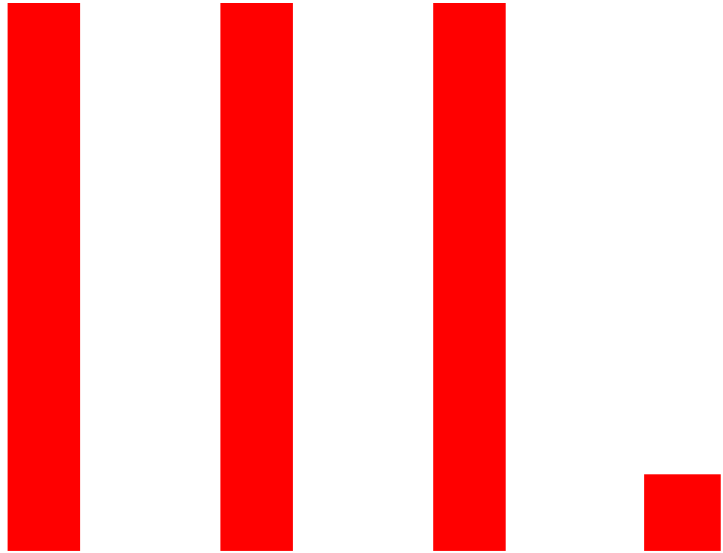
TLP used the word «simple» wrongly: PI §47

We use the word "composite" (and therefore the word "simple") in an enormous number of different and differently related ways. (Is the colour of a square on a chessboard simple, or does it consist of pure white and pure yellow? And is white simple, or does it consist of the colours of the rainbow?—Is this length of 2 cm. simple, or does it consist of two parts, each 1 cm. long? But why not of one bit 3 cm. long, and one bit 1 cm. long measured in the opposite direction?)

"Meaning is use": PI §43

43. For a *large* class of cases—though not for all—in which we employ the word "meaning" it can be defined thus: the meaning of a word is its use in the language.

And the *meaning* of a name is sometimes explained by pointing to its *bearer*.



PI preface

Four years ago I had occasion to re-read my first book (the *Tractatus Logico-Philosophicus*) and to explain its ideas to someone. It suddenly seemed to me that I should publish those old thoughts and the new ones together: that the latter could be seen in the right light only by contrast with and against the background of my old way of thinking.

... against the background of my old way of thinking

TLP	PI
?	Persons, humans (PI §1)
?	Body language (PI §1)
?	Behaviour, but also acting (PI §1)
?	Examples (PI §1)
?	Real, everyday language and life (PI §§1, 108, 156, 241)
?	Criss-cross (PI preface, §68)
?	1-word sentences (PI §19)
?	Many kinds of sentences (PI §23)
?	Life, biology (PI §§19, 23, 142, 441, 472; PI II xii / §365f)
?	Development, change, variation (synchrone and diachrone) (PI §§ 11, 12, 14, 18, 23)
?	Many problems (PI §133)
?	Many methods (PI §133)
?	Use (PI §§ 1, 43, 432)
?	Vagueness and open-endedness (PI §§ 18, 66f, 71, 133)

Exactness still an issue?

Understanding, as it is usually conceived, is a vague process – we are only interested in what is exact. But not because we are only interested in the “ideal” of a language which reality only approximates, but because we only in this way can capture what is expressed in every language.

But what am I saying when I say “that only what is exact interests me”? What is the inexact? What is the vague that I exclude? Isn't it that I have to exclude what I don't know in precise enough terms? I.e. don't I want to say that — — —.

Why do I say: feelings, moods etc. that accompany, follow, or precede a sentence don't interest me! Because it is only the symbolic structure that interests me.

Doesn't the vague consist in the fact that it does not belong to the symbol, that it can be one way or the other, even when the symbol remains the same?

No, there is still something else: that, in a sense, it is my only task to say something clearly and not to allude to anything.

It is almost as though I wanted to say I'm weaving a tapestry & therefore I cannot have any unclear colour transitions. But in reality this is not a good simile.

Shall I say that exactness consists in the fact that what is dubious does not concern us?

What does our exactness consist in?

Frege about psychological logic. His comments are all concerned with the inexactness of a psychological study in contrast to a logical one.

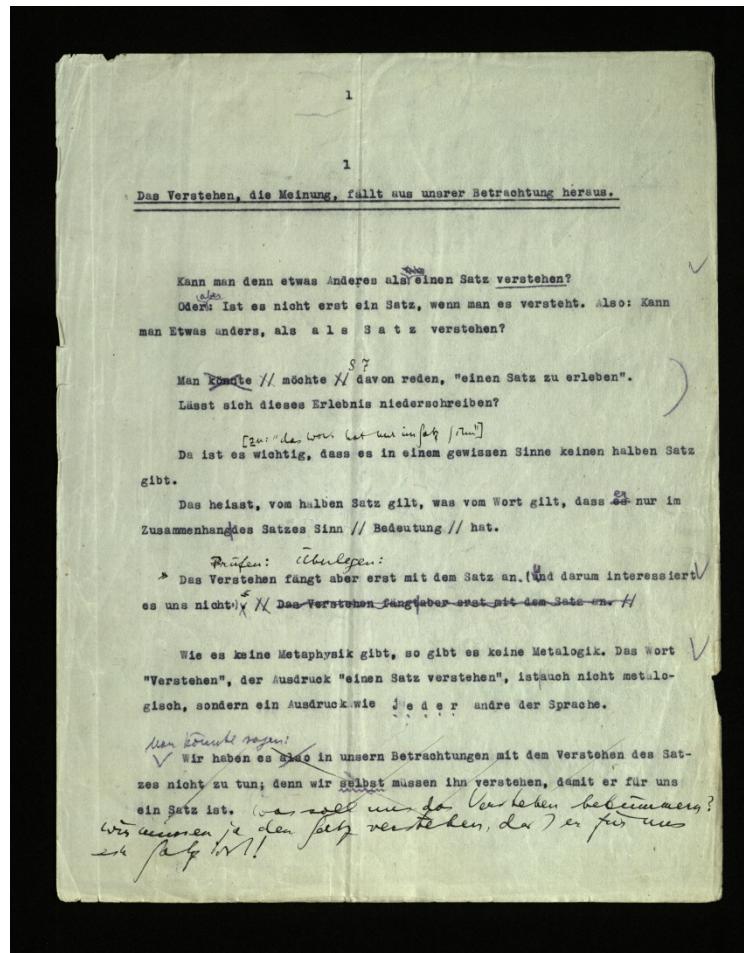
Can I say that I am only interested in the *content* of the sentence? And the content of the sentence lies in it.

The sentence has its content as a component of the calculus.

Is thus, “understanding a sentence” of the same kind as “mastering a calculus”? Thus, as knowing how to multiply? I think so.

http://www.wittgensteinsource.org/BFE/Ms-153a,102r_f ff. (1931)

The issue of understanding: Calculus or human practice driven?



Ts-213,1r[1]

Can one understand something else than a sentence?

Or, rather: **Does it only become a sentence if one understands it?** Thus: Can one understand something in other ways than *as a sentence*?

- Further on understanding: see PI §§ 527, 531, 610.

PI §81

(...) All this, however, can only appear in the right light when one has attained greater clarity about the concepts of understanding, meaning, and thinking. For it will then also become clear what can lead us (and did lead me) to think that if anyone utters a sentence and *means* or *understands* it he is operating a calculus according to definite rules.

No human agents needed?

PI§1: “(...) the individual words in language name objects—sentences are combinations of such names. (...) Every word has a meaning. This meaning is correlated with the word. It is the object for which the word stands.”

PI: Practice comes first

- Meaning and authority are established by our **practices** (linguistic and other)
 - Focus on practice
 - Focus on the *use* of words
- Language is
 - an activity
 - a social activity
 - an activity which is embedded in forms of life
- "Forms of life" (PI §19): 19. It is easy to imagine a language consisting only of orders and reports in battle.—Or a language consisting only of questions and expressions for answering yes and no. And innumerable others.—And to imagine a language means to imagine a form of life.
- «Language games»: Exemplifications of linguistic practices as embedded in forms of life.

"Meaning is use"

- If meaning is tied to use, then one method for dealing with philosophical problems arising from questions of meaning is to pay attention to actual linguistic usage.
- Studies of how words actually are used become key to the method of philosophy!
 - A range of relevant contexts: linguistic, extra-linguistic, social, cultural, historical ... **ordinary language**
 - Frege's context principle!
 - Variety and multiplicity: Not *one* "general form of proposition"; not *one* meaning of "simple" ...
 - "Family resemblance"
- Focus on examples of use.
- Focus on examples as constitutive parts of learning language and communication - see PI §208.

N.

Frontmatter

- Title
 - „Philosophische Untersuchungen“
- Motto
 - "Überhaupt hat der Fortschritt das an sich, dass er viel größer aussieht als er wirklich ist." (Nestroy)
- **Preface**

PI preface, 1945

The thoughts which I publish in what follows are the precipitate of philosophical investigations which have occupied me for **the last sixteen years**. They concern many subjects: the concepts of meaning, of understanding, of a proposition, of logic, **the foundations of mathematics**, states of consciousness, and other things. I have written down all these thoughts as *remarks*, short paragraphs, of which there is sometimes a fairly long chain about the same subject, while I sometimes make a sudden change, jumping from one topic to another.—**bring all this together in a book** whose form I pictured differently at different times. But the essential thing was that **the thoughts should proceed from one subject to another in a natural order and without breaks**.

After several unsuccessful attempts to weld my results together into such a whole, I realized that I should never succeed. The best that I could write would never be more than philosophical remarks; my thoughts were soon crippled if I tried to force them on in any single direction against their natural inclination.—**And this was, of course, connected with the very nature of the investigation. For this compels us to travel over a wide field of thought criss-cross in every direction.**—The philosophical remarks in this book are, as it were, a number of sketches of landscapes which were made in the course of these long and involved journeyings.

The same or almost the same points were always being approached afresh from different directions, and new sketches made. ...

Four years ago I had occasion to re-read my first book (the *Tractatus Logico-Philosophicus*) and to explain its ideas to someone. It suddenly seemed to me that I should publish those old thoughts and the new ones together: **that the latter could be seen in the right light only by contrast with and against the background of my old way of thinking.**

For since beginning to occupy myself with philosophy again, sixteen years ago, I have been forced to recognize **grave mistakes in what I wrote in that first book.** I was helped to realize these mistakes—to a degree which I myself am hardly able to estimate—by the criticism which my ideas encountered from Frank **Ramsey**, with whom I discussed them in innumerable conversations during the last two years of his life. Even more than to this—always certain and forcible—criticism I am indebted to that which a teacher of this university, Mr. P. **Sraffa**, for many years unceasingly practised on my thoughts. I am indebted to *this* stimulus for the most consequential ideas of this book.

Earlier draft to a preface, 1930

(Published in CV 1998, p.9e ff / Preface to *Philosophical Remarks*)

... Our civilization is characterized by the word **progress**. Progress is its form, it is not one of its properties that it makes progress. Typically it constructs. Its activity is to construct a more and more complicated structure. And even **clarity** is only a means to this end & not an end in itself.

For me on the contrary clarity, transparency, is an end in itself

I am not interested in erecting a **building** but in having the foundations of possible buildings transparently before me.

So I am aiming at something different than are the scientists & my thoughts move differently than do theirs.

Each sentence that I write is trying to say the whole thing, that is, **the same thing over and over again & it is as though they were views of one object seen from different angles.**

I might say: if the place I want to reach could only be climbed up to by a **ladder**, I would give up trying to get there. For the place to which I really have to go is one that I must actually be at already.

Anything that can be reached with a ladder does not interest me.

One movement orders one thought to the others in a series, the other keeps aiming at the same place.

One movement constructs & takes (in hand) one stone after another, the other keeps reaching for the same one.

Earlier draft to a preface, 1930 (cont.)

- Cf. R. Carnap's (preface to) *Der logische Aufbau der Welt* (1928; transl. 1961): "Consequently they have taken the strict and responsible orientation of the scientific investigator as their guideline for philosophical work, while the attitude of the traditional philosopher is more like that of a poet. ... This requirement for justification and conclusive foundation of each thesis will eliminate all speculative and poetic work from philosophy. ... in slow careful construction insight after insight will be won. ... Thus stone will be carefully added to stone and a safe building will be erected at which each following generation can continue to work."