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Wittgenstein Didn't Absolutely Agree with Gödel's Theorems and Russell's Paradox

(and he was right)

In 1956 a few writings of Wittgenstein that he didn't publish in his lifetime were revealed to the public. These writings were gathered in the book *Remarks on the Foundations of Mathematics* (1956). There, we can see that Wittgenstein had some discontentment with the way philosophers, logicians, and mathematicians were thinking about paradoxes, and he even registered a few polemic reasons to not accept Gödel's incompleteness theorems.



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M.A. in Philosophy. Fritz Lang's Metropolis, and a King Kong graphic novel got me into science fiction when I was a kid.

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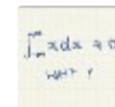
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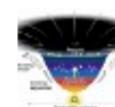
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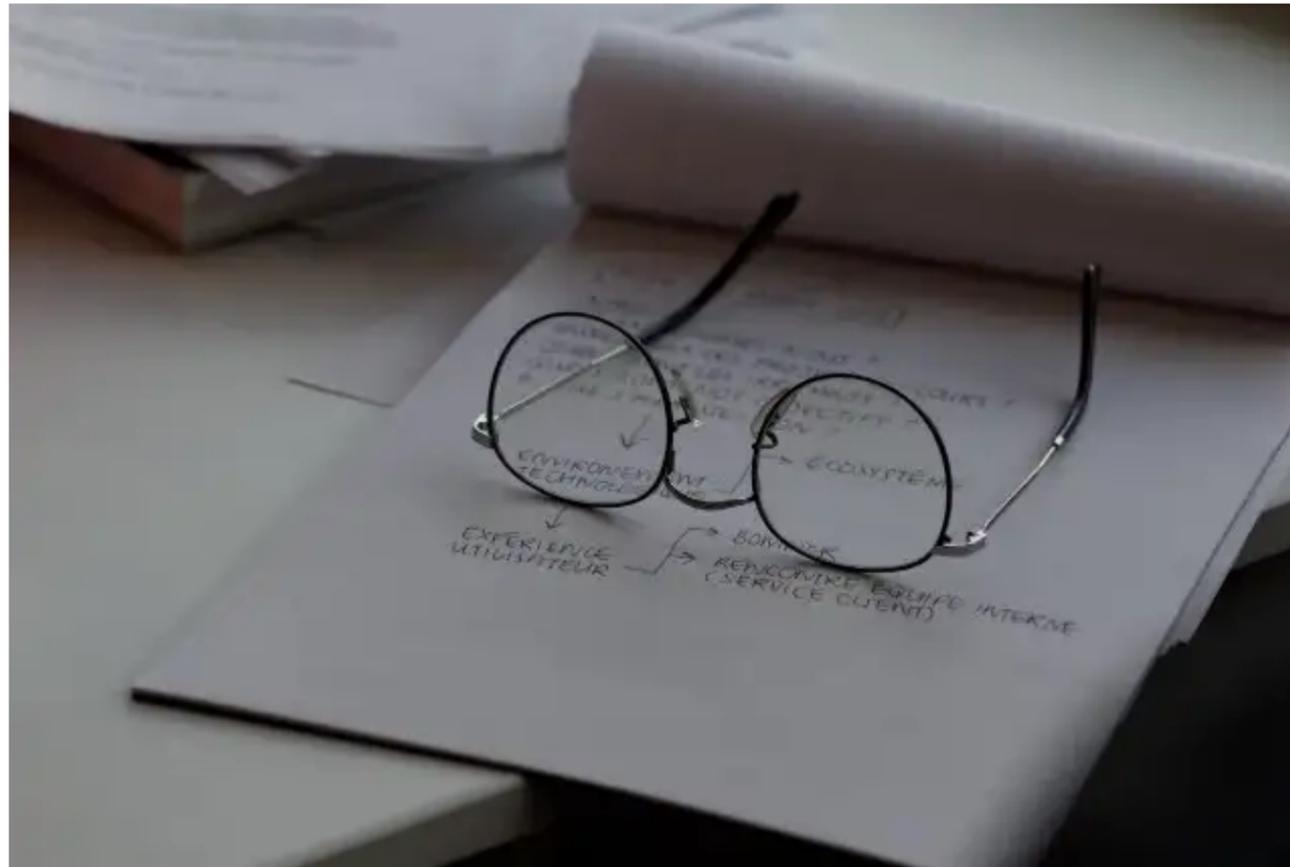
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Wittgenstein vs. Russell

Here is what Wittgenstein thought about inconvenient paradoxes in logic and arithmetic:

If a contradiction were now actually found in arithmetic that would only prove that an arithmetic with such a contradiction in it could render very good service; and it will be better for us to modify our concept of the certainty required, than to say that it would really not yet have been a proper arithmetic. “But surely this isn’t ideal certainty!” — Ideal for what purpose? The rules of logical inference are rules of the language-game (RMF, Wittgenstein).

Now, think with me. If we try to find the square root of 4 we would face two possible answers: 2 and -2. Does this indeterminacy do any harm to arithmetic? Of course not. Both natural numbers and integers are used in the Economy, for example, without trouble.

But in the famous Russell Paradox something similar happens. In this paradox, we can't decide whether the "*set of all sets that are not members of itself*" is or isn't a member of itself. So we find a formal limit in this set, just like when we try to find the square root of 4, which leads us to indeterminacy. Is it unlogical, or impossible to mathematic deal with indeterminacy? No! As Wittgenstein once said in the *Tractatus*:

It is as impossible to represent in language anything that 'contradicts logic' as it is in geometry to represent by its coordinates a figure that contradicts the laws of space, or to give the coordinates of a point that does not exist.
Wittgenstein (*Tractatus* 3.032).

So it seems, in fact, that the indeterminacy of Russell's famous paradoxical set reveals to us a different type of set. A kind of set that can't define its own members (as when we can't decide the square root of 4).

Wittgenstein vs. Gödel

There is an ongoing struggle between adepts of both of them. To be better acquainted with this struggle I recommend the following articles [1], [2], [3], which are indicated at the end of this text.

First of all, we have to admit that Wittgenstein didn't give much attention to Gödel's theorems. That's for sure. It seems that he did all he could to ignore it. But, then, a student once asked him, "may there not be true propositions

which are written in this (Gödelian) symbolism, but are not provable in Russell's system?" And Wittgenstein replied, "why should not propositions — of physics, e.g. — be written in Russell's symbolism?" showing a very limited, and unusual response to Gödel's first incompleteness theorem.

Let's try to understand better what was going on. Before we arrive at the terrifying Gödel's incompleteness conclusion (that any formal system cannot prove that the system itself is consistent and complete) we must first understand how *propositional variables* are used in Gödel's symbolic language rules — which were adapted from Russell and Whitehead's *Principia Mathematica* (1910) and were used to show what would happen in every closed formal system, including the ones we use in physics—.

According to Nagel and Newman, authors of *Gödel's Proof* (1958), in Gödel's first theorem, if the letter '*S*' stands for a formula, its formal negation, namely, *non'S*', is also a formula. Consequently, the following occurs: if "*p* is a nondemonstrable formula" we would also have a propositional variable "*p* is a demonstrable formula". If we operate a system with both formulas we, ultimately, would not know if *p* is a nondemonstrable or demonstrable proposition.

But is that so? Let's take one example here. Let's analyze if there is a liar or an honest person enunciating the following phrase:

Everything I say is a lie.

Before we assume truth or falsity in this sentence, would it not be important to know what the self-proclaimed liar is lying about? What I mean is, there should be some examples of what he/she ever said that we could test (by

looking to reality) for truth, falsity, or indeterminacy. If he/she doesn't say any statement of this kind, then, all we have is indeterminacy.

What I'm trying to say here is that Wittgenstein tried to point out, in response to Gödel's work, that we need propositions that we can test in "reality" to help us determine truth, falsity, or indeterminacy of propositions. And, since *propositional variables* tend to establish without evidence that there can be valid negations of fundamental propositions, we can say that Gödel was taking for granted the condition of undecidability and incompleteness of any formal system already in the formation rules of the language of his theorem. But Gödel wasn't wrong when he did that.

Indeed, Wittgenstein was a very pragmatic thinker, so it was kind of natural for him to question **if Gödel's incompleteness would be applied to physics**. The right answer to this question, however, is both "yes and no" (incompleteness can be, and can't be applied to physics), because the rules of physics may change one day if the rules of the universe also change (so, we can say physics may never be a completed science). But all successful theories in physics that we have today are fact-based. Therefore, these theories will always be the successful ones (they will always be complete in some sense), once they referred accurately to facts (which means, they will always be the ones that reached fact-based truths).

[1] *A Note on Wittgenstein's "Notorious Paragraph" about the Gödel Theorem* (2000). By Juliet Floyd and Hilary Putnam in *The Journal of Philosophy*, Vol. 97, No 11 (2000), pp. 624–632

[2] *Misunderstanding Gödel: New Arguments about Wittgenstein and New Remarks by Wittgenstein* (2003). By Victor Rodych in *Dialectica* Vol. 57, No 3 (2003), pp. 279–313.

[3] *Wittgenstein and Gödel: An Attempt to Make "Wittgenstein's Objection" Reasonable* (2018). By Timm Lampert in *Philosophia Mathematica* Vol. 26, No 3 (2018), pp. 324–345.

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