Abstracts

Juliet Floyd (Boston University)

"Surveyability" in Hilbert, Turing and Wittgenstein

Recent debates about the philosophical status of formalization and mechanization of proof may be illuminated by considering the mutual impact Wittgenstein and Turing had on one another around issues concerning the evolution of notations in symbolic logic. When Wittgenstein remarked in 1937 that 'a proof must be surveyable' he was reworking ideas of Frege, Hilbert and Turing. "Surveyability" for Wittgenstein was neither a verificationist requirement nor a refutation of the claim that all proofs must have corresponding formal proofs, much less a refutation of logicism. Instead, it placed front and center what mathematicians do, i.e., it explores what logicism comes to in an everyday sense. The idea -- consonant with certain trends in so-called "philosophy of mathematical practice", including recent work by Kennedy on "formalism freeness" and by Floyd on Turing's conception of "everyday phraseology" -- is not to provide or ask for a "foundation" for mathematics in any ordinary sense, but rather to take a pragmatic and mathematically flexible approach to the very idea of "foundations".

In 1939 Wittgenstein and Turing discussed these ideas in Wittgenstein's Cambridge lectures on the foundations of mathematics, sparking some of Turing's subsequent work on types. The relevant ideas here draw out new ways of looking at Turing's 1936 paper, as well as his more speculative writings in the late 1940s about "intelligent machinery" and his 1950 "Turing Test"

James Shaw (Pittsburgh)

Some Remarks on Agreement in Wittgenstein: Relativism and Independence

Wittgenstein seems to suggest at certain points that persistent, concurring agreement on basic calculations helps to settle which practice the calculations are a part of. I briefly develop my understanding of these points as generating a relatively benign linguistic relativism for calculating talk. I then note that this relativism, perhaps surprisingly, tends to propagate into a local linguistic relativism of semantic (or 'semantic-like') concepts via reflections on cognitive finitude reminiscent of Kripke (1982). I distinguish the relativism of interest to me from any form discerned by Kripke's Wittgenstein. I also note that this semantic relativism-though again technically benign-can apply pressure to some ways of construing mathematical reality as independent from our access to it.

José Zalabardo (UCL)

A Pragmatist Approach to Arithmetical Discourse

I sketch an application to arithmetical language of the pragmatist approach that I develop for other discourses in my Pragmatist Semantics (OUP 2023). On a pragmatist construal, what makes a sentence have the meaning it has is the procedure that regulates its acceptance. I propose that what makes sentences of the form "there are n Fs" (cardinality statements) have the meaning they have is the fact that their acceptance is regulated by counting-by the

existence of a bijection between the Fs and the numerals up to "n". This approach is compatible with the idea that cardinality statements successfully discharge the function of representing the world. I outline an account of the states of affairs that cardinality statements would represent, on the pragmatist approach.

Simon Friederich (Groningen)

Wittgenstein and the alignment problem for autonomous AI

Artificial intelligence systems are developed that rival or surpass humans in more and more aspects of analytic reasoning. Some experts fear that such systems might at some point take over control from humans, ushering in a state of permanent dystopia or even causing human extinction. The best response, according to many of these experts, including AI pioneer Stuart Russell, is to solve the problem of advanced AI "alignment." By definition, an AI system is "aligned" if it acts as intended by its operator.

Here I argue that we should not hope to solve the alignment problem for autonomous artificial agents. The reason has to do with Wittgenstein's considerations that cast into doubt the idea of facts about meanings and intentions. Accordance of an action with some agent's intentions can be judged only in conditions where there are established practices against which such judgments are made. As I argue, such conditions are unlikely to hold in conditions where autonomously acting artificial agents are deployed "in the wild". Additionally, one can expect the operator's intentions to be unstable both under manipulation by the AI system and under rational reflection instigated by the AI system, with no difference between the two that can be operationalized.

I conclude that the alignment problem for autonomous artificial agents is an insufficiently clear target for pinning our hopes on it. Continuing to develop increasingly advanced AI systems while hoping to "solve alignment" on the fly seems to be an irresponsible strategy.

Crispin Wright (Stirling/NYU)

Reflections on RFM I, §156

In part I of the Remarks on the Foundations of Mathematics, Wittgenstein writes that ". . .the reason why [the steps in a logical inference] are not brought into question is not that they 'certainly correspond to the truth' -- or something of the sort, -- no, it is just this that is called 'thinking', 'speaking', 'inferring', 'arguing'. There is not any question at all here of some correspondence between what is said and reality; rather is logic antecedent to any such correspondence; in the same sense, that is, as that in which the establishment of a method of measurement is antecedent to the correctness or incorrectness of a statement of length." (RFM I, §156)

This remark jars with the natural thought that a competent reflective inferrer does indeed know that the transitions in logically valid inferences 'certainly correspond to the truth'- that that is exactly what we recognise in recognising that a step is valid.
Wittgenstein's talk of logic as "antecedent" to correspondence to truth seems to involve espousing a kind of logical non-cognitivism. I'll argue that such a view is powerfully supportable, and is something we can live with.

Jasmin Traechtler (Dortmund)

Mathematics as Crown Witness for Certainty

In his last writings, Wittgenstein deals with different kinds of certainty, such as the certainty of particular basic empirical statements, the certainty of other minds and the certainty of logical and mathematical statements. The latter often serve him as an object of comparison or rather: as prime example of certainty as an irrefutable indubitability, especially in contrast to the imponderables of other minds. For "[t]here can't be a long dispute in a court of law about whether a calculation has this or that result; but there certainly can be about whether someone was irritated or not" (LWPP II, 85). On the other hand, there are situations in which I do not need "to be less certain that someone is in pain than that $12 \times 12 = 144$ (LWPP II, 92). So, what characterizes mathematical certainty?

In this talk, I would like to approach the answer to this question by taking a detour via Wittgenstein's methodology: For it is striking that Wittgenstein's grammatical investigations into various kinds of certainty do not take place "at home", so to speak, but often in the courtroom. In the following, I will therefore first discuss some of Wittgenstein's courtroom scenarios on mathematical certainty in contrast to the imponderables of other minds in his last writings. Subsequently, I will point out that these primarily take on the methodological role of a touchstone of certain philosophical modes of expression and thus help to overlook the actual use of language. I will conclude by showing to what extent mathematics acts as a 'crown witness' for certainty in Wittgenstein's courtroom scenarios and what consequences this has for other "kinds of certainty".

Sorin Bangu (Bergen)

Proofs and Concepts

In his Remarks on the Foundations of Mathematics, Wittgenstein claims, puzzlingly, that "the proof creates a new concept" (RFM III-41). This paper aims to contribute to clarifying this idea, and to show how it marks a major break with the traditional conception of proof. However, the most natural way to understand his claim is open to criticism, and a secondary goal of the talk is to offer an interpretation of it that neutralizes the objection. The discussion proceeds by analyzing a well-known geometrical proof.

Matteo Plebani (Turin)

Wittgenstein on mathematical generality

In this paper, I will try to make sense of a tantalizing remark that we find in the Tractatus: "the generality required in mathematics is not an accidental generality" [T 6.031] A notion recently introduced by Øystein Linnebo (2022), the notion of instance-based generalization, can help us here: Wittgenstein can be interpreted as expressing the view that mathematical generalizations, unlike many empirical generalizations, are not instance-based in the sense of Linnebo: we should not conceive them as being true in virtue of their instances being true. In this paper, I will use Linnebo's distinction between instance-based and generic explanations of the truth of a generalization to interpret Wittgenstein's notion of non-accidental generality. I

will argue that clarifying this notion can deepen our understanding of several aspects of Wittgenstein's philosophy of mathematics.

Karim Zahidi (Antwerp)

Wittgenstein in Cantor's paradise

Throughout Wittgenstein's later writings on mathematics there is a consistent negative appraisal of Cantorian set theory. In this talk I want to explore what Wittgenstein's critique amounts to. I will focus on his critique of Cantor's diagonal proof of the uncountability of the real numbers and will explore whether this critique is also applicable to Cantor's first proof of uncountability of the reals. This case study will then be used to explore Wittgenstein's view on the role of mathematical proof in concept formation.