

The Bezboruah-Shepherdson Incompleteness Theorem

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In 1976, Amala Bezboruah and John Shepherdson published an Incompleteness Theorem that was advertised as a Second Incompleteness Theorem for Q. Georg Kreisel objected that such a result was meaningless since Q could not verify basic properties of a provability predicate.

In my talk, I will discuss why the usual formulation of the result is defective. The proper statement tells us that the theory PA^- does not prove the consistency of a very weak theory BeSh. I will (try to) undermine Kreisel's objection, as a supposedly philosophical insight, by arguing that there is no reason that a theory should prove meaning postulates for a provability predicate in order to talk about it.

I will discuss a new proof of the Bezboruah-Shepherdson Theorem for a different sequence coding based on ideas of Nielsen and Markov. The new proof works for PA^- plus all true universal sentences.

Finally, I will indicate how, even if PA^- does not prove the Löb Conditions, it still has an interesting provability logic. For example, in this logic, we still have uniqueness of modalised fixed points.