Carrie S. Jenkins, *Grounding Concepts, An Empirical Basis for Arithmetical Knowledge,* (Oxford: Oxford University Press), 2008. Pp. 304 £35.00 HB

By Philip Ebert

This is an extremely interesting book that discusses a very broad range of challenging topics, covering core issues in the philosophy of mathematics, epistemology, philosophy of language and metaphysics, with the aim of offering an "empirical basis for arithmetical knowledge". Jenkins accomplishes a daring feat: Jenkins not only paves the ground for a new and interesting empiricist approach to the a priori, but she does so in an incredibly lucid and accessible fashion and on a consistently high-argumentative level. In doing so, Jenkins overcomes various stumbling blocks in founding an empiricist approach to substantive a priori knowledge and her most powerful tool is the idea of grounding concept which, in combination with suitable definitions and carefully argued for theses makes room for a class of arithmetical propositions that are empirically grounded yet known a priori.

The book is divided into three parts. It begins by outlining the three guiding intuitions that are to be respected in this empiricist approach. These are (a) that arithmetic is an a priori discipline; (b) that arithmetical realism is correct, i.e. that arithmetical claims are true independent of us; (c) that empiricism is correct, i.e. that all knowledge of the independent world is obtained through the senses.

The first part discusses these intuitions and provides the necessary stage setting for the account. Chapter one contains a very interesting discussion of the relevant notion of independence assumed in the second intuition. The second chapter starts with a brief discussion of internalism and externalism and offers some reasons to adopt a broadly externalist outlook. This is followed by a close critical study of various other views on the market for the a priori (Boghossian, Peacocke, Bealer and Field). Despite the complexities of these alternative approaches, Jenkins treatment is very lucid and the discussion of Boghossian's views is especially recommended.

Preparing for the main part of the book is another chapter entitled "A theory of knowledge" in which Jenkins offers her favourite supposedly Gettier-proof account of knowledge. Roughly, it is an explanationist account where a true belief p counts as knowledge, iff the subject's belief *p* can be well explained to someone not acquainted with the details of the subject's situation (i.e. an outsider) just by citing *p*. This chapter is concise and maybe even a bit compressed but although this conception of knowledge does play a role in the notion of grounding concept, any number of externalist accounts of knowledge are compatible with the core idea of the book, as Jenkins herself acknowledges.

The following three chapters, making up part II of the book, outline, develop and clarify the core idea of grounding concepts. The basic idea is this: Concepts are regarded as mental representation, in particular, referring concepts are treated as mental representations of some real feature in the world. In turn, a relevantly accurate concepts is a concept that is fitting, i.e it refers and it does not misrepresent its referent in any respect relevant to our purported way of knowing that *p*. A concept is considered as grounded if it is relevantly accurate and there is nothing lucky or accidental about it being so (compare pp.127ff). The idea of grounding concept is in some sense analogous to acquiring knowledge of your surroundings by examining a map:

"In short, grounding for concepts is an aid to knowledge because it transforms one's conceptual scheme from a work of art into a trustworthy map. Grounding ensures a non-accidental relationship between our concepts (or their ultimate constituents) and the world, which is what enables us to acquire knowledgeable beliefs about the world by examining those concepts. In just the same way, the fact that there is a non-accidental correlation between the dots on the map of Scotland and the Scottish cities enables one to acquire knowledgeable beliefs about Scotland by examining that map." (p.135)

The empiricist component comes into play through the assumption that only data obtained through the senses can be relevant to concept grounding and in section 4.5 Jenkins suggest two “purely hypothetical” models how such data, which, to be sure, need not be available or consciously entertained by the subject might help with this. What is important here is that Jenkins suggests that concepts themselves and not merely whole propositions may, individually, be grounded by sensory data.

The account so far is heavily externalist and one might worry that all that has been shown is how it is possible to have grounded concept. Yet, what reasons are accessible to a theorist to regard the concepts in use as actually grounded? It is here that Jenkins appeals to the idea of indispensability. By making the substantial assumption that ”when and only when our sensory data make it respectable to rely on C will C be indispensably useful to us in dealing with that sensory data” (p.146) there will be accessible reasons to think that that certain concepts are grounded, namely indispensable ones.

So, how is this model to be applied to the truths of arithmetic? Consider this three step model;

1. A correctly conducted investigation of our concepts of 7, +, 5, =, 12 leads us to believe that 7 + 5 =12
2. Our concepts of 7, + 5, =, 12 are empirically grounded.
3. So, 7 + 5 =12 is empirically known.

Yet this way of knowing is, according to Jenkins also a priori since there is no dependence on empirical evidence. That is, step (2) does not play an evidential role. Despite this lack of evidential role our knowledge is still empirical since Jenkins defines empirical knowledge as knowledge secured in a way which involves some epistemic use of the senses. Hence, our knowledge is a priori and empirical. Further- more, since arithmetical concepts are considered indispensable to our best scientific theories we have reason to believe that our arithmetical concepts are justified and so we can claim arithmetical knowledge.

The following two chapters discuss and defend this idea in more detail. Here many other highly relevant issues, such as the issue about unconceptualized sensory input that is being assumed, the problem of ungrounded and inaccurate concepts, and how this view is partly informed by but in many respects different from the other recent proposals (such as Neo-Fregeanism, simple conventionalism, success semantic, Bostock, Maddy and others) are very clearly discussed, although, in places, acquaintance with the relevant literature is assumed.

The last part – again containing three chapters – is entitled "objections" and analyses what Jenkins regards as the core mistake of other philosophers who came in some ways close to the idea of grounding concepts.

Let me now raise some general concerns. The idea of grounding concepts seems intuitive for statements such as all vixens are female, where it seems reasonable to assume some kind of empirical basis for the concepts involved. It is harder to accept this for abstract terms such as arithmetical concepts, concepts of stronger mathematical theories or even logical concepts. The simple variant of this concern, rejected by Jenkins, would be to assume that instances of a concept need to be experienced in order for a concept to be grounded and so it would seem impossible to ground such concepts purporting to refer to abstract entities (abstract concepts, for short). So what else could ground arithmetical concepts?

In response, the proposal is made that concepts of abstract objects may be grounded directly, by earning their keep in being indispensable in our scientific theories. However, this does not yet explain in virtue of what type of sensory data (without requiring an actual instance of course) they are empirically grounded (i.e non-accidentally fitting a referent). The role of indispensability seems to have shifted here from initially providing accessible reasons to a thinker that the employed concepts are grounded to somehow "directly" grounding concepts. How this is supposed to work in detail is unclear to me and further explanation might be required here.

An alternative response to the problem of grounding abstract concepts is to appeal to the relevant subject matter. On the account on offer here, little is said about the relevant subject matter of mathematics. However, this is hardly an oversight of the author, rather it seems that Jenkins aims to remain open about this subject matter and so makes her proposal compatible with different conceptions. Of course, it is difficult to remain open-minded about the subject matter if one wants to appeal to it to ground the relevant concepts. Jenkins toys with a broadly structuralist stance (p.158-62) but if this route is taken, it raises the question of how exactly these structures have to be constituted to ground the relevant concept and how we can know them as such. The latter question, it seems, requires an appeal to an epistemic source that is independent of grounded concepts. Alternatively, grounding of arithmetical concepts might involve both the subject matter and the idea of indispensability. In that case a more detailed explanation of how these two ideas work in tandem would be required.

A further interesting feature of Jenkins' account is a separation of the form of theoretical structure of arithmetic, i.e. its axiomatic structure, from its epistemic structure. That is, the approach Jenkins takes is not to first explain how, for example, we know by appeal to concept grounding the Peano axioms of arithmetics and then, by means of proof, we can extend our knowledge to such statements as "7 + 5 = 12 ". Instead, the main example to explain our arithmetical knowledge is the statement "7 + 5 = 12 ". This raises the important questions of which arithmetical statements can be known in the above way and can we know the basic axioms of arithmetic in this way?

Nevertheless I think this is an excellent book and considering that its aim is to "locate, as an attractive option in philosophical space, a new kind of arithmetical epistemology" (p.1) then this aim has clearly been achieved – hands down.

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