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GROUNDING LOGIC: A REPLY TO SHENEFELT AND WHITE

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In 'What on Earth is Logic?', Michael Shenefelt and Heidi White offer this observation about the nature of logic: 'If one tries to justify logic logically, one ends up arguing in a circle'. From this, they conclude that 'logic is a horizon beyond which none of our earnest self-reflecting arguments can help us see'. While there is much to appreciate in how they developed this idea, there are several worrying points that could still be raised against their view. In this article, we outline such problems.

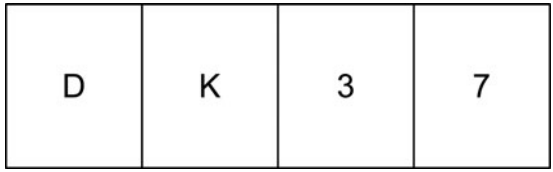
In 'What on Earth is Logic?' (*THINK* 45), Michael Shenefelt and Heidi White have argued for a kind of primitivist (or even mysterian) outlook of the nature of logic. They observe that '[i]f one tries to justify logic logically, one ends up arguing in a circle'. From this, they conclude that 'logic is a horizon beyond which none of our earnest self-reflecting arguments can help us see' (p. 31). Furthermore, they claim that 'the underlying nature of logic is deeply mysterious' (p. 27). While there is much to appreciate in how they developed this idea, there are several worrying points that could still be raised against their view.

First, Shenefelt and White seem to take it as a basic fact that ordinary human beings have the capacity to distinguish the logical from the illogical. For them, we seem to have an implicit knowledge of whether or not a conclusion logically follows from a given set of premises. But if we were to take their observation as a description of the state of our *actual* logical capacities, we would surely see that this is simply not the case.

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The psychology of reasoning literature has provided a number of cases where ordinary human beings fail to be logical. Perhaps, one famous case is the Wason card-selection task.[1] The set-up of the experiment is as follows. Test subjects are presented with four cards of which one side has a letter and a number on the flipside. The following four cards shown are:



The subjects are then asked which two cards should be turned over in order to determine whether the following conditional is true: *If there is a D on one side, then there is a 3 on the other side*.

Anyone familiar with the rules of the material conditional, the logical rules governing if–then statements, would know that the logically correct answer is to turnover the D and 7 cards since these two cards are the only ones that could falsify the claim of the conditional. Oddly enough, less than 10 per cent of Wason's original test subjects were able to identify the logical answer. Thus, contra Shenefelt and White, it would seem that many of us cannot really distinguish the logical from the illogical.

Second, Shenefelt and White argue that since logical consequence cannot be grounded on the workings of the human brain (p. 28), or on linguistic and cultural structures (pp. 28–9), or on a supernatural basis (pp. 29–30), it follows that 'logic's ultimate nature still has a certain inexplicability about it' (p. 30). As a consequence, 'Logic as a science can't follow from any other discipline – disciplines such as neurology, linguistics, anthropology, sociology, or theology – because logic defines what it means to "follow" in the first place' (p. 31). But this indictment seems to rest on certain ambiguities.

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On the one hand, it is true that *logic* defines what it means to 'follow'. But it is also true that there are many logics. As such, there are many definitions of what it means for a conclusion to be a logical consequence of a premise. For example, classical logic defines logical consequence such that any conclusion follows from contradictory premises. Thus, from the premise that dogs are and are not animals, it classically follows that I am the King of Manila. But in a paraconsistent logic, such a conclusion doesn't necessarily follow. For this kind of logic, it's not always the case that a conclusion follows from contradictory premises. Other paraconsistent logics make a stronger claim that a conclusion follows from a premise only if the premise is relevant to the conclusion. Thus, since the premise that dogs are and are not animals is not relevant to the conclusion that I am the King of Manila, it follows that this conclusion does not follow from the premise.

But even if we grant that there's only one sense of what it means to follow, it does not mean that logic can't be *grounded*. For one, logic can be grounded on itself.

Logicians have already done this grounding work in terms of soundness and completeness proofs. A soundness proof shows that if some conclusion provably follows from a premise, then it's impossible for that conclusion to be false while the premise is true, i.e. truth is preserved from premise to conclusion. On the other hand, a completeness proof does the converse. If truth is preserved from premise to conclusion, then we could show that the conclusion provably follows from that premise. This tells us that what it means for a conclusion to follow from a premise rests on two other logical notions: the notion of provability and the notion of truth-preservation.

Shenefelt and White might object that grounding logic in terms of soundness and completeness proofs begs the question since what's doing the grounding is some logical notion. This can't be a proper grounding since the very thing that you're grounding is the same thing which is doing the grounding.

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In response, we might say that grounding logic in terms of the logical notions of provability and truth-preservation might be circular, but it need not be vicious. Following the philosopher Michael Dummett we take it that the main problem of grounding logic does not involve persuasion; rather, it is finding a sufficient explanation of how logical consequence works.

In his 'The Justification of Deduction', Dummett distinguishes two kinds of arguments that are used for proving a conclusion: a suasive argument and an explanatory argument. A suasive argument is used to persuade someone of the truth of a conclusion. On the other hand, in an explanatory argument, the conclusion is already accepted as true; the only thing missing is a sufficient enough explanation for it.

In grounding logic in terms of provability and truth-preservation, we are explaining what it means for a conclusion to follow from a premise. This explanation does not involve a vicious circle since the conclusion that we want to draw – that some conclusion follows from a premise – is already given. We are just giving an explanation of how this is so. As Dummett puts it: 'a philosopher who asks for a justification of the process of deductive reasoning is not seeking to be persuaded of its justifiability, but to be given an explanation for it'.

Where then does this all leave us in terms of grounding logic? Well, it seems to pull us away from Shenefelt and White's primitivist outlook.

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Note

[1] An online version of the test is available here: <http://www.philosophyexperiments.com/wason/Default.aspx>.

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