

REVIEWS

The Association for Symbolic Logic publishes analytical reviews of selected books and articles in the field of symbolic logic. The reviews were published in *The Journal of Symbolic Logic* from the founding of the JOURNAL in 1936 until the end of 1999. The Association moved the reviews to this BULLETIN, beginning in 2000.

The Reviews Section is edited by Steve Awodey (Managing Editor), John Baldwin, John Burgess, Mark Colyvan, Anuj Dawar, Marcelo Fiore, Noam Greenberg, Hannes Leitgeb, Ernest Schimmerling, Carsten Schürmann, Kai Wehmeier, and Matthias Wille. Authors and publishers are requested to send, for review, copies of books to *ASL, Box 742, Vassar College, 124 Raymond Avenue, Poughkeepsie, NY 12604, USA*.

In a review, a reference “JSL XLIII 148,” for example, refers either to the publication reviewed on page 148 of volume 43 of the JOURNAL, or to the review itself (which contains full bibliographical information for the reviewed publication). Analogously, a reference “BSL VII 376” refers to the review beginning on page 376 in volume 7 of this BULLETIN, or to the publication there reviewed. “JSL LV 347” refers to one of the reviews or one of the publications reviewed or listed on page 347 of volume 55 of the JOURNAL, with reliance on the context to show which one is meant. The reference “JSL LIII 318(3)” is to the third item on page 318 of volume 53 of the JOURNAL, that is, to van Heijenoort’s *Frege and vagueness*, and “JSL LX 684(8)” refers to the eighth item on page 684 of volume 60 of the JOURNAL, that is, to Tarski’s *Truth and proof*.

References such as 495 or 280I are to entries so numbered in *A bibliography of symbolic logic* (the JOURNAL, vol. 1, pp. 121–218).

DOMINIC HYDE. *Vagueness, logic and ontology*. Ashgate, Aldershot, 2008, xii + 226 pp.

Vagueness, logic and ontology is an important addition to the vagueness literature. Anyone working in the area needs to read it and will learn much from doing so. One of the most interesting aspects of the book is the way it combines discussions of two topics that have generally been treated more or less separately in the literature—vagueness (comprising issues to do with the proper treatment of vague language and the resolution of the sorites paradox) and ontological vagueness (comprising issues to do with vague objects: vagueness of composition, existence, identity and so on)—into a unified argument.

Chapter 1 introduces the notion of vagueness. Chapter 2 discusses Russell’s theory, on which vagueness is a purely representational phenomenon, not associated with any underlying ontological indeterminacy. Furthermore, vagueness is seen as a feature of natural language, not of ‘Ideal Language’ (p. 35), which—like the world—is precise. Hence classical logic can be retained, provided we restrict logic to ideal language.

Subsequent chapters seek a view which allows logic to be applied to natural language. Chapter 13 discusses approaches according to which classical logic may be retained by regimenting natural language into a precise language, without (serious) loss of expressive power. Hyde rejects three strategies for reaching such a language, concluding that we have no good reason to think that the world can be completely described in language free of vagueness.

Given that we are stuck with the vagueness of natural language but wish to apply logic to it, two options are open: adopt a non-classical logic, or argue that classical logic is compatible with vagueness. Unfortunately, Hyde does not fully explore the latter route: epistemicism is not discussed, on the grounds that the text is already too long (p. 3); pragmatism is similarly set aside; and contextualism is not mentioned at all. (Those interested in paraconsistent approaches to vagueness—who will be familiar with Hyde’s important earlier work in this area—will also be disappointed: a full discussion of such views is “left for another day” (p. 104).)

Turning to non-classical approaches, Chapter 4 discusses supervaluationism and subvaluationism. Hyde identifies two ways of defending supervaluationism against standard objections: the first appeals to the claim that there is no vagueness in the world in order to argue that the phenomena in question are desirable features of supervaluationism; the second admits them as costs but defends supervaluationism via cost/benefit analysis. In this chapter Hyde argues forcefully against the second kind of defence, and argues that subvaluationism is neither worse nor better off than supervaluationism when it comes to its own, dual problems.

The next two chapters turn to the claim—underlying the first sort of supervaluationism—that there is no vagueness in the world. A significant part of Chapter 5 is devoted to a rebuttal of Evans’s argument against ontological vagueness. Hyde sees Evans as arguing first that where there is ontological vagueness there is vague identity and second that there can be no vague identity. Hyde defends a qualified version of the first step but rejects the second step outright, claiming—following Keefe—that the flaw in Evans’s reductio of vague identity is this: the result $(\lambda x[\nabla a = x]b)$ of applying lambda-abstraction to a sentence $(\nabla a = b)$ containing the indeterminacy operator (∇) does not attribute a *property* (i.e., $\lambda x[\nabla a = x]$) to b in the sense of ‘property’ that features in Leibniz’s Law. Hyde never explains what he means by saying that an abstract “does not denote a property” (p. 126). Various possible interpretations come to mind, but I suspect (for reasons given in my *Why sense cannot be made of vague identity*, *Noûs*, vol. 42 (2008), pp. 1–16) that any attempt to make the idea precise will lead to the realisation that whenever $\nabla a = b$ holds but $\nabla a = a$ does not, a and b do differ in a way in which a proper formulation of Leibniz’s Law says that a and b do not differ when $a = b$. Of course the issue cannot be judged effectively in the absence of a precise elaboration of Hyde’s position; it is a pity that he does not provide one. Chapter 6 counters another class of arguments against ontological vagueness: arguments which centre on problems of individuating, designating and counting vague objects.

In light of the rejection of supervaluationism and the setting-aside of paraconsistent views, Chapter 7 turns to Hyde’s favoured logic of vagueness: a truth-functional system involving two truth values but three possible truth statuses (being true, being false, taking neither value), modelled by the three-valued Łukasiewicz logic. A number of well-known objections are considered, the most powerful being the objection from higher-order vagueness. If the lack of a sharp boundary between the tall and the non-tall requires positing a third truth status ($\frac{1}{2}$) between true (1) and false (0), it seems that the apparent lack of a sharp boundary between the clearly tall and the borderline tall should require positing an additional value between $\frac{1}{2}$ and 1; extending this line of reasoning pushes us to an infinite-valued logic. Hyde rejects this move, arguing that higher-order vagueness can be accommodated by positing metalinguistic vagueness, which can itself be accommodated using only the original three truth statuses. Nevertheless, he holds that the resulting complexity of assignments of truth statuses to sentences describing assignments of truth statuses (and so on) can be *modelled* usefully by the infinite-valued Łukasiewicz logic whose values are the rational numbers between 0 and 1 inclusive. (He does not discuss standard reasons for favouring a complete lattice of values and hence moving to the *real* interval $[0, 1]$: fuzzy logics are not considered.) The move to an infinite-valued logic raises the familiar objection that such views involve excessive precision. Hyde’s response is that only the *ordering* of the values matters: “The

choice of a specific value from among the infinitely many possible ... is arbitrary except in so far as it preserves ordering requirements imposed by the structure of higher-order vagueness" (p. 207). It seems that this response will not work, however: as Keefe notes (*Vagueness by numbers*, *Mind*, vol. 107 (1998), pp. 565–579), the definitions of Łukasiewicz negation and conditional presuppose that the set of truth values has more structure than simply an ordering. Hyde could avoid this problem by moving from Łukasiewicz to Gödel logic, where the negation and conditional are defined thus:

$$x \rightarrow y = \begin{cases} 1 & \text{if } x \leq y, \\ y & \text{if } x > y, \end{cases} \quad \neg x = \begin{cases} 1 & \text{if } x = 0, \\ 0 & \text{otherwise.} \end{cases}$$

This, however, would undercut his response to the sorites paradox: "The paradox is more and more compelling as the difference between adjacent items in the series with respect to *F* becomes less and less ... because the relevant conditionals more and more closely approximate true conditionals" (p. 209).

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NICHOLAS J. J. SMITH. *Vagueness and degrees of truth*. Oxford University Press, Oxford, 2008, viii + 341 pp.

A number of book length treatments of natural language vagueness and the associated puzzle of the sorites paradox have been published in the last 15 years, but Smith's is unique in its defence of a particular fuzzy logic approach. Clear, closely argued and technically adept, the book defends what Smith calls a "fuzzy plurivaluationist" account of vagueness—one that proposes degrees of truth to model the gradual transitions from truth to falsity said to be characteristic of the nature of vagueness, and which also identifies the distinct phenomenon of semantic indeterminacy more typically confused for so-called "higher-order vagueness" which requires what Smith calls "plurivaluationism".

Smith's book is divided into three parts. Part I (chapter one and two) gives an overview of the range of possible theories of vagueness—epistemicism, many-valued and truth-value gap accounts, supervaluationism, "plurivaluationism", contextualism, intuitionism—and an analysis that seeks to understand their differences "at a more fundamental and illuminating level".

Part II (chapter three and four) seeks to give a definition of vagueness against which the various competing theories are assessed. Smith describes and defends a definition in terms of what he calls "closeness", a weakened form of tolerance. The claim is that a vague predicate is such that if *a* and *b* are very similar in respect of *F* then *Fa* and *Fb* are *very similar* in respect of truth (as opposed to *identical* as tolerance demands). (Some subsequent modifications are offered to deal with special cases.) This definition is offered to unify the disparate phenomena that vague predicates are taken to exhibit: borderlines cases; blurred boundaries; and Sorites-susceptibility. It is admittedly not a "theory neutral" definition and is, in fact, used to rule out certain candidate theories and rule in a degree of truth account but Smith defends his seemingly question-begging methodology here. He is seeking to give a "fundamental definition" that correctly describes the essential features of vagueness and such a definition cannot be theory-neutral. With a definition in place (chapter three), theories can be assessed as regards their compatibility with the definition and the general form of the correct theory of vagueness can be shown to be one invoking degrees of truth (chapter four).

Part III (chapter five and six) describes and defends the specific theory proposed by Smith. A fuzzy logic is described that is claimed to involve no violation of classical logic—though classical semantics is abandoned, classical consequence is nonetheless regained through a novel definition of logical consequence. Arguments for the retention of classical consequence