

are distributed in proportion to the empirical successes of the theories under debate and the non-empirical decision vectors are equally distributed across the theories. The special case of consensus is normatively acceptable only when one theory comes to have all the empirical success available in the domain of inquiry and all the empirical decision vectors are leading scientists toward consensus on the one theory. Finally, dissolution of consensus is warranted when a new theory has empirical success that is not produced by the consensus theory and both the empirical and the non-empirical decision vectors become equally distributed between the new and old theories.

Here are some of her examples. From 1958 to 1970, the geological community moved from a protracted pattern of mostly normatively acceptable dissent, with equal distribution of both types of decision vectors, to normatively acceptable consensus on plate tectonics, where the empirical decision vectors eventually converged. The "central dogma" of molecular genetics that emerged in the 1950s, i.e., that DNA controls cellular processes through messenger RNA and protein synthesis is, on the other hand, a case of normatively unacceptable consensus. Here a number of important empirical successes did not fit the dogma, involving work by Sonneborn and Sager on cytoplasmic inheritance and by McClintock on genetic interactions. Still, given an imbalance of non-empirical decision vectors (involving reductionist metaphysics, the physical science training of new geneticists, as well as sexism and anti-Semitism directed against those working outside the dogma), consensus on the central dogma or virtual consensus formed anyway. A third example is the 1989 dissolution of the consensus that cold fusion is not a viable energy source. In this case, Solomon argues that the emergence of dissent was normatively inappropriate since there was in reality no experimental success on the side of cold fusion. Dissent was created nevertheless because of a balance of opposing non-empirical decision vectors.

These and many other examples that Solomon develops in impressive detail bring home the stunning originality and power of her social empiricism. Nevertheless, there are puzzles. Solomon insists on categorizing certain types of decision vectors as empirical and others as non-empirical independently of their effects in a given case (pp. 57-58) and then uses this scheme to label vectors in her examples. Does this approach even make sense given her general statement of the distinction? Solomon states: "*Empirical decision vectors are causes of preferences for theories with empirical success. . . . Non-empirical decision vectors are other reasons or causes for choice*" (p. 56; her italics). But the above examples and many others demonstrate that decision vectors that she categorizes as *non-empirical*, such as peer pressure or ideology, are often among the causes that explain why some scientists prefer a particular theory that has *empirical* success. Hence, the same vectors labelled as non-empirical can be empirical according to her statement of the distinction and her own examples. The opposite can also be true. The preference for theories that predict the available data, which she categorizes as an empirical decision vector, can, in the context of other vectors involving sexist preferences and beliefs, result in a preference for a theory with no empirical success. In both instances the distinction itself, when coupled with examples, is inconsistent with her classification of the specific types of decision vectors.

Consideration of Solomon's views on empirical success only exacerbates the problem. The kind of empirical success that matters according to her is success

that is "robust" and "significant." In fact, in stating her epistemology she notes that this is the kind of empirical success that she is concerned about throughout (p. 118). "Significant" empirical success is, among other things, the successful *novel* prediction of phenomena. Note, however, that successful prediction of phenomena will not count as novel if another theory that is otherwise at least equally credible predicts the same phenomena (pp. 29-31). Unfortunately, decision vectors, such as a preference for scope or for simplicity, that Solomon classifies as non-empirical, are critical for determining whether another theory is *otherwise* at least equally credible. Thus, whether a theory has empirical success can depend on non-empirical decision vectors, contrary to her own understanding of the distinction between empirical and non-empirical decision vectors.

Can the originality and normative power of the theory be preserved without these inconsistencies? I think so. The core of her epistemology is that the acceptability of dissent and consensus depends on the distribution of decision vectors with respect to empirical success. This insight is solidly within the new framework and does not depend on some types of decision vectors "always" being tied to some empirical success and others "never" being so as required by her classification scheme (p. 63). A significant bonus is that feminist decision vectors, which Solomon sees as non-empirical (see her last chapter), can and often do have *empirical* significance. It also means that the feminist empiricism exemplified in the work of Lynn Hankinson Nelson and Helen Longino (and my own) can be understood as giving an empirical basis to feminist-motivated science without supposing that feminist empiricism must be tied to the old framework Solomon rightly rejects.

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Terms and Truth: Reference Direct and Anaphoric

ALAN BERGER

Cambridge, MA: MIT Press, 2002, xvii + 234 pp.

Alan Berger's *Terms and Truth* covers various expressions—particularly names and anaphoric pronouns, but also demonstratives and general terms—as they occur in various linguistic contexts, including identity sentences, belief ascriptions, and negative existentials. A central thesis of Berger's book is that all of these expressions are rigid designators. (So I assume that Berger would say, contrary to what the subtitle might suggest, that anaphoric reference *is* direct reference.)

The book has three parts. In the first two, Berger distinguishes two kinds of rigid designators (chap. 1) and uses this distinction to address several philosophical problems: namely, reference transmission and change (chap. 2), identity sentences (chap. 3), belief ascriptions that contain empty names (chap. 5), intentional identity (chap. 6), and negative existentials (also chap. 6). In Part 3, he criticizes several accounts of anaphoric pronouns (chap. 7) and develops his own formal semantics (chap. 8).

I am sympathetic to the claim that names are rigid designators, but I have reservations about Berger's views about belief ascriptions that contain empty names and about negative existentials. The rest of this review is devoted to those views.

In the nineteenth century, astronomers thought that there was a planet between Mercury and the Sun, and they introduced "Vulcan" as a name for such a planet. But there was, and is, no such planet, so "Vulcan" is an *empty* name: it does not refer to anything.

(1) Leverrier believes that Vulcan is a planet

seems true. But, since there is no object for "Vulcan" to refer to, it seems that there is no proposition for "that Vulcan is a planet" to refer to and, hence, for (1) to say that Leverrier believes. So it seems that (1) cannot be true. Berger agrees that (1) cannot be true (p. 112), since he agrees that there is no proposition for "that Vulcan is a planet" to refer to (p. 106). But he argues that, although (1) is not *true*, it is nonetheless *assertable*. The assertability of (1) is to be explained by the truth of the following instance of the *Belief Commitment Schema* (pp. 108-109):

(2) $\exists f_{A-B} \exists c_i \exists C_{Vulcan \text{ is a planet}} \exists c_u [Leverrier \text{ is committed to the claim that } \exists o (f_{A-B}(c_i)=o) \ \& \ C_{Vulcan \text{ is a planet}}(c_u) = \text{that Vulcan is a planet} \ \& \ \text{Vulcan is a planet}]$.

(2) is rather technical, quantifying as it does over anaphoric background functions f_{A-B} , contexts of introduction c_i , characters $C_{Vulcan \text{ is a planet}}$, and contexts of use c_u . But the technical details do not matter here. (2) implies

(3) Leverrier is committed to the claim that Vulcan is a planet.

But, if (1) cannot be true, because there is no proposition for "that Vulcan is a planet" to refer to and hence for (1) to say that Leverrier believes, then it is hard to see how (3) could be true, for if there is no proposition for "that Vulcan is a planet" to refer to, then there is no proposition for (3) to say that Leverrier is committed to. It seems that the truth of (3) is precisely what Berger thinks he needs to explain the assertability of (1) (see p. 104). But, as they say, what you cannot believe you cannot believe, and you cannot be committed to it either. (The same goes for Berger's claim in Chapter 6 that, although you cannot *refer to* an object that does not exist, you can *mention* it.) And, without (3), Berger does not have an account of the assertability of (1).

Negative existentials are also notoriously difficult.

(4) Vulcan does not exist.

seems true. But, if there is no object for "Vulcan" to refer to, then it seems that there is no proposition for (4) to express. And, hence, it is hard to see how (4) could be true. Berger agrees that (4) is not true (p. 153). (Thus, the titles of Chapter 6—"Intentional Identity and True Negative Existential Statements"—and of §6.6—"True Negative Existential Statements"—are misleading.) But he argues that, although (4) is not true, it is nonetheless assertable. The assertability of (4) is to be explained by the truth of

(5) $\neg \exists x [x = f_{A-B}(c_i) \ \& \ x \text{ is in } w]$

where f_{A-B} is the anaphoric background function for "Vulcan," c_i is the context of introduction, and w is a world (p. 156). Again, it is somewhat technical, but I take it that (5) is roughly equivalent to something like

(6) It is not the case that anything satisfies the anaphoric background condition for "Vulcan"

where something satisfies the anaphoric background condition for "Vulcan" in the actual world only if it is a planet between Mercury and the Sun.

On Berger's view, (4) is not true. But (4) seems true. If Berger is to appeal to something like (6) to explain why (4) seems true, then he will have to say that our intuitions about the truth-value of (4) are sensitive, in one way or another, to the truth-value of (6). If he is to have a uniform account, then he will also have to say that our intuitions about the truth-value of

(7) Venus exists

are sensitive, in one way or another, to the truth-value of

(8) Something satisfies the anaphoric background condition for "Venus."

But Berger admits that, although sentences like (7) and (8) agree in truth-value, they do not agree in modal profile: (7) is true in a world in which there is no human language, whereas (8) is not (p. 156). And we do not have the intuition that the existence of Venus depends on the existence of human language. So Berger has to deny that our intuitions about the modal profile of (7) are sensitive to the modal profile of (8). But it is implausible that our intuitions about the truth-value of (7) should be divorced from our intuitions about its modal profile. Since our intuitions about the modal profile of (7) are not sensitive to the modal profile of (8), our intuitions about the truth-value of (7) should not be sensitive to the truth-value of (8) either; and hence our intuitions about the truth-value of (4) should not be sensitive to the truth-value of (6). But, in that case, Berger is left without an account of why (4) seems true.

Such shortcomings aside, this book is a fine contribution to post-Kripkean philosophy of language.

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Self-Trust and Reproductive Autonomy

CAROLYN MCLEOD

Basic Bioethics

Cambridge, MA: MIT Press, 2002, xii + 199 pp., \$29.95

Carolyn McLeod's *Self-Trust and Reproductive Autonomy* is an insightful and readable contribution, not only to the reproductive ethics literature, but to moral psychology and to the literature on autonomy. McLeod moves easily between the theoretical and the practical—she draws heavily upon moral psychology, feminist