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Review

Reviewed Work(s): Naming, Necessity, and Natural Kinds by Stephen P. Schwartz
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of C. I. Lewis's arguments that seem to show that a contradiction entails everything and a necessary truth is entailed by everything. Lewy examines with great care the attempts by von Wright (XXXV 461(7)), Geach (XXV 334(4)), Smiley (XXX 240), and others to avoid this conclusion. The discussion of the work of Anderson and Belnap is not proportional to its importance and technical depth, but the author explains in the preface that he has not had the time to keep pace with all the developments here. Nevertheless, it seems to the reviewer that Lewy's criticism of these attempts is fairly compelling. His verdict is that we cannot avoid Lewis's conclusions and at the same time maintain that entailment is transitive without running afoul of other intuitions, e.g. that the disjunctive syllogism is valid. Lewy concludes that our intuitions about entailment are inconsistent and that strict implication is the best rational reconstruction. It is very difficult to resist the idea, noted above, that there is a more intimate relation of entailment. The only remaining possibility is to accept that explicit contradictions do entail anything and that some necessary truths are entailed by everything and to resist the generalization to all cases. This is evidently very difficult to do.

In later chapters there are a number of suggestions about various implication relations. The most interesting of these is "P analytically entails Q," explained as: P strictly implies Q and Q contains no concepts that P does not contain. This requires a more precise account of concept containment, which is not supplied. For a formalized language, an analysis is perhaps possible by using equivalence classes as concepts, as outlined above. Lewy supposes that analytic entailment is connected with a concept of *analytic necessity* in such a way that P analytically entails Q if and only if it is analytically necessary that $P \supset Q$. The reviewer cannot make out what the concept of analytic necessity as applied to arbitrary propositions (not necessarily conditionals) is supposed to be. This point is not explained.

Another relation, proposed as a possible improvement on strict implication in the direction of entailment, is "P strictly entails Q," defined as follows: $P \supset Q$ is a substitution instance of $P' \supset Q'$ such that (1) $P' \supset Q'$ is a tautology, (2) Q' is purely contingent, and (3) $\sim P'$ is purely contingent. And S is *purely contingent* if and only if (1) S is contingent, and (2) there is no R such that (a) R contains a tautologous conjunct, and (b) R is truth-functionally equivalent to S. Finally, Lewy defines "P is *truth-functionally equivalent* to Q" as: $P \equiv Q$ is a substitution instance of a tautology $P' \equiv Q'$ such that no well-formed proper part of $P' \equiv Q'$ is a tautology. When this is unraveled, one finds that the relation is vacuous because no well-formed formula is purely contingent. This is because the formula $V \equiv (V \lor \sim U) \& V$ is a tautology with no tautology as a part, and $S \equiv (S \lor \sim S) \& S$ is a substitution instance. Then the right hand side is the undesired R.

Although the emphasis in this review has been on apparent errors or defects, the reviewer wishes to stress that this is in many ways a very excellent book.   C. ANTHONY ANDERSON

STEPHEN P. SCHWARTZ. *Preface.* **Naming, necessity, and natural kinds,** edited by Stephen P. Schwartz, Cornell University Press, Ithaca and London 1977, pp. 9–10.

STEPHEN P. SCHWARTZ. *Introduction.* Ibid., pp. 13–41.

KEITH S. DONNELLAN. *Reference and definite descriptions.* A reprint of XL 276 (12). Ibid., pp. 42–65.

SAUL KRIPKE. *Identity and necessity.* Ibid., pp. 66–101. (Reprinted from *Identity and individuation,* edited by Milton K. Munitz, New York University Press, New York 1971, pp. 135–164.)

HILARY PUTNAM. *Is semantics possible?* Ibid., pp. 102–118. (Reprinted from *Language, belief, and metaphysics,* edited by Howard E. Kiefer and Milton K. Munitz, Contemporary philosophic thought, vol. 11, State University of New York Press, Albany 1970, pp. 50–63.)

HILARY PUTNAM. *Meaning and reference.* Ibid., pp. 119–132. (Reprinted from *The journal of philosophy,* vol. 70 (1973), pp. 699–711.)

WILLIAM K. GOOSENS. *Underlying trait terms.* Ibid., pp. 133–154.

W. V. QUINE. *Natural kinds.* Ibid., pp. 155–175. (Reprinted from *Essays in honor of Carl D. Hempel, A tribute on the occasion of his sixty-fifth birthday,* edited by Nicholas Rescher et al., D. Reidel Publishing Company, Dordrecht 1969, pp. 5–23.)

IRVING M. COPI. *Essence and accident*. Ibid., pp. 176–191. (Reprinted from *The journal of philosophy*, vol. 51 (1954), pp. 706–719.)

GARETH EVANS. *The causal theory of names*. Ibid., pp. 192–215. (Reprinted from *Aristotelian Society supplementary volume XLVII*, London 1973, pp. 187–208.)

KEITH S. DONNELLAN. *Speaking of nothing*. Ibid., pp. 216–244. (Reprinted from *The philosophical review*, vol. 83 (1974), pp. 3–31.)

ALVIN PLANTINGA. *Transworld identity or worldbound individuals?* Ibid., pp. 245–266. (Reprinted from *Logic and ontology*, edited by Milton K. Munitz, New York University Press, New York 1973, pp. 193–212.)

STEPHEN P. SCHWARTZ. *Bibliography*. Ibid., pp. 267–272.

This collection brings together a number of important but loosely related essays on the topics mentioned in the volume's title. The topics received unified treatment in Saul Kripke's *Naming and necessity* (*Semantics of natural language*, D. Reidel, 1972, pp. 253–355 and pp. 763–769), but the principle governing selection for the present volume is hard to discern. The volume is advertised, and introduced by the editor, as centering on "the new theory of reference." But the essays by Copi and Quine on natural kinds, and by Plantinga on trans-world identity, are only distantly related to reference (and to one another). The essay by Kripke is more concerned with necessity than with reference. And the volume includes neither Keith Donnellan's *Proper names and identifying descriptions* (*Synthese*, vol. 21 (1970), pp. 333–358) nor anything from Kripke's *Naming and necessity*, the key pieces that most directly attack traditional views of how names refer.

This review will concentrate, however, on the approach to reference reflected in essays in the volume. The prime interest to logicians of this approach is that it challenges traditional thinking in logic about the basic functions of concepts or non-syncategorematic terms.

It is, of course, impossible accurately to summarize "traditional thinking" on such a topic. But a terminology and a few rough precepts can be cited. Traditionally, concepts (or words) are said to have two sorts of semantic aspects (or meaning)—an "extension" and an "intension." This terminology traces back at least to Boethius and seems to have its roots in Aristotle. The tradition runs through Cajetan, the *Port Royal logic*, Leibniz, Hamilton, Boole, Mill, Keynes, Carnap, and a host of others. Significant transformations of the tradition occur in Locke and Frege. We shall return to Frege. The extension of a concept or word was said to be all of the objects, taken together, to which the concept or word applies. In the case of a singular term or proper name, the extension could be counted the referent. The intension was more variously characterized. Commonly, it was said to be those properties that must be possessed in order for the term or concept to be applicable, or in order for the members of the extension to "belong together."

Two precepts have frequently been associated with this terminology. One is that the intension is accessible to the mind and provides means by which members of the extension are picked out or thought about by ordinary users of the term. The other is that the intension uniquely determines the extension.

An important outgrowth of this scheme occurs in the work of Frege. He distinguished *Bedeutung* and sense. The *Bedeutung* of a singular expression is the object, if any, that is its referent. The *Bedeutung* of any other expression is a function. Extensions in the traditional sense dropped out of the theory. Frege applied the terminology of extension in an original and ultimately unsatisfactory way to the *Bedeutung* of certain singular terms, but he never applied it to the *Bedeutung* of general terms. The sense of an expression is its cognitive value, or the mode by which the *Bedeutung* is presented to the judging mind. Thus Frege omitted the notion of property from his account of sense and showed little interest in essence or necessity. He promoted the first precept governing intensions to the status of the distinguishing feature of sense. Sense was identified with mode of presentation to a thinker, and was utilized to account for the cognitive value of judgments. Frege retained an analogue of the second precept governing intension in his account of sense: sense uniquely determines *Bedeutung*.

The critical reaction reflected by the present collection has its roots, I think, in the work of Quine and Wittgenstein, each of whom, from different perspectives, questioned the propriety of thinking of intension, sense, or meaning as something that discretely attaches to terms and that is present to the mind. Wittgenstein, particularly, emphasized that what fixes the extension

of a term might be a set of descriptions not in the repertoire of any one person but distributed among members of a community who use the term.

The approach to reference reflected in this collection takes this emphasis yet further. It holds that, at least in some cases, the reference, extension, or *Bedeutung* of a term is not fully determined by descriptions, properties, or senses available to the users of a term—even all users in a community. In effect it questions the conjunction of the two primary precepts governing extension and intension.

The paper that first signalled the approach was Donnellan's *Reference and definite descriptions* (1966). This paper distinguishes "referential" from "attributive" uses of definite descriptions. A person who uses a definite description attributively states something about whatever is the so-and-so, that is, whatever fits the description. A person who uses such a term referentially states something about an entity that he picks out by using the description, but which may or may not fit the description. For example, the description in 'The man in a green suit drinking the martini is a spy' might be used in either way. It would likely be used attributively if the speaker had just been informed that to find the spy in the room, he should seek the unique man wearing a green suit and drinking a martini. It would probably be used referentially if the speaker were looking at a particular man whom he intended to pick out as a spy: whether the glass contains liquor or water might be irrelevant to whether he succeeds in picking out the man.

Donnellan elaborates the distinction in various ingenious ways and uses it in an attack on Russell's theory of descriptions. Basically, he holds that that theory fails to account for referential use. The argument against Russell is successful insofar as it shows that Russell did not account plausibly for occurrences of indexicals, which may not be backed by a uniquely identifying description. The same point holds for incomplete definite descriptions ('the green table') that depend on context for a referent. But Donnellan further claims that, contrary to Russell's theory, the description ϕ in a referential use of $\ulcorner$The ϕ is $\psi\urcorner$ may be *irrelevant* to "what is stated": what counts is whether what is picked out referentially is ψ. This further claim seems less decisive against a Russellian view supplemented with an account of such indexicals as the occurrence of 'The' in a referential use of $\ulcorner$The $\phi\urcorner$. Russell's theory can be defended by distinguishing what the speaker refers to from what the (indexically governed) definite description denotes (in the context), and by claiming that Donnellan's judgments about referential uses affect the former, whereas Russell's theory is about the latter. Thus $\ulcorner$The ϕ is $\psi\urcorner$ would be true if and only if one and only one ϕ is picked out in the context, and it is ψ. The speaker might succeed in picking out with $\ulcorner$The $\phi\urcorner$ something that is not ϕ. But such speaker reference is compatable with the claim that $\ulcorner$The $\phi\urcorner$ failed to denote. In any case, the paper serves to highlight the fact that reference, at least speaker reference, or indexical reference, can occur even though it is not evidently determined by the descriptions, properties, or the like, of which the speaker makes use.

This point is greatly enlarged and given substantial philosophical context in the papers by Donnellan and Kripke mentioned earlier and not included in this volume. Both of these papers provide examples in which proper names appear to succeed in referring even though no descriptions available to the user(s) of the name uniquely determine the referent. Donnellan's also produces cases in which the associated description gives the *wrong* referent. In my judgment, the examples make their point. It applies to the traditional theory and, in a somewhat more complicated way, to Frege's.

Both papers also suggest that reference is fixed by causal or historical relations between current uses of a name and earlier applications of the name to its bearer. Such relations are sustained by passage of the name from speaker to speaker. They may survive distortion or loss of information which might have been used to fix the name's bearer—and even distortion of the name. Detailed characterization of these relations is labyrinthine, as Donnellan and Kripke suggest. Beyond a certain point such characterization is probably not philosophically rewarding. The matter is discussed further in the sensitive and probing paper by Gareth Evans, *The causal theory of names*. What is important, however, is the development of a picture according to which reference depends at least partly on the etiology of use.

Kripke's paper *Identity and necessity* (1971) defends the view that true identity statements involving proper names on both sides of the identity sign are necessarily true, even when *a posteriori*. The defense rests on the claim that proper names designate the same object in all possible

worlds. This claim is plausible for most uses of proper names, granted the notion of possible world. Indeed, the fundamental intuitions Kripke calls upon are, I think, independent of the theoretical structure he uses. The claim that names are rigid designators is also used by Kripke in *Naming and necessity* to bolster his attack on the theory that a name somehow expresses what definite descriptions express. The argument is simply that since definite descriptions are non-rigid, they do not properly determine the referents of proper names in modal contexts. The argument (in contrast to others Kripke gives) is not very compelling since the description theorist can outfit the relevant descriptions with a rigidifying device (easily explained). Kripke's paper elaborates a number of other views, familiar from *Naming and necessity*, in an attractively informal style.

Proper names and other context-dependent indexical expressions might be seen by traditional theorists as special cases, although the neglect of indexicals, which pervade language, is a serious weakness in traditional theory. Common nouns lie nearer to the heart of the traditional viewpoint. Hilary Putnam's *Is semantics possible?* (1970) concentrates on them. This paper received less attention at its original publication than it deserved. In retrospect it can be seen to be a seminal, important contribution. Putnam argues that the properties by means of which we normally recognize natural kinds are not analytically associated with the natural kind term and are not necessarily associated with the natural kind. Normal lemons might have turned out to be, or might come to be, non-yellow, or differently sized or shaped, or to have a different taste than common examples of lemons. Moreover, distinct natural kinds might have the same superficial characteristics. Putnam's theme is that the identifying features of a kind word, its "intension," may not fix its extension. (Again, the conjunction of the two traditional precepts governing intension and extension is questioned.) Putnam suggests that the extension is fixed partly by tests used by scientific experts, not necessarily by ordinary users of the term. Related points were independently made by Kripke in *Naming and necessity*.

These points are utilized by Putnam to construct a representation of the "meaning" of natural kind words. I think that presenting his views as an account of "meaning" is probably unfortunate expositional strategy. The account has the doubtful consequences that it is part of the meaning of natural kind words that they apply to natural kinds, and that a change in the superficial characteristics commonly associated with the kind suffices to change the meaning of the relevant word. (This latter criticism is made in William Goosen's *Underlying trait terms*.) On the other hand, Putnam provides insight into our ability to convey in a few short remarks "what a word means" or "what an *X* is."

Putnam's *Meaning and reference* (1973) deepens the basic points of *Is semantics possible?* and gives them firmer foundation. It proposes a celebrated "Twin-Earth" thought experiment. Imagine a fraternal twin of Earth with a functional *Doppelgänger* for a given user of the sign 'water.' Twin Earth has no water, but includes a liquid, with entirely different chemistry, that plays some of the same roles in the lives of the Twin Earthians that water plays among Earthians. The *Doppelgänger* engages in the same behavior as his Earthian counterpart and associates the same superficial characteristics with the liquid he calls 'water.' Putnam points out that on Twin Earth, the sign 'water' does not mean *water*. More to the present point, the properties in terms of which the extension of the sign 'water' is identified by a given user of the sign, including quite competent users, do not fix the extension of the sign. The extension of 'water' differs in the two situations, though the superficial characteristics remain the same.

The issues surrounding the thought experiment are convoluted. Numerous variants can be constructed to broaden its import and to show that common objections do not strike at the heart of Putnam's position. There are also a few points on which Putnam's interpretations of the thought experiment seem to me vulnerable. I will mention one. Putnam errs, I think, in holding that the sign 'water' is shown by the thought experiment to be indexical. It is not the case that the extension of the term in a single language may shift while its conventional meaning remains constant. The English word 'water' would still refer to water ("our water") even if we were to use it on Twin Earth. Of course, if we used it there long enough it might change its reference; but this change would involve a change of meaning, not a mere indexical shift of reference with context. The fact that words like 'water' are not indexical suggests that Putnam's cases cannot be assimilated in any simple way to the cases of demonstratives and proper names. In my view,

this point deepens rather than lessens their interest. The main thrust of the thought experiment against the traditional account of intension and extension is, I think, very powerful and central.

The effect on Frege's account is less clearcut. As I noted, Frege did not identify the mode of presentation or sense of an expression with the superficial properties used to identify the expression's extension. He would have regarded 'water is that which has properties $P_1 \ldots P_n$' as expressing something potentially different in cognitive value from what 'water is water' expresses. 'Water' on Earth and Twin Earth differs not only in meaning but in its role in expressing potential knowledge. So it is natural for Frege to say that the sign differs in sense in the two cases. Unlike the traditional notion of intension, Frege's notion of sense was not meant to be a notion that is pretheoretically explicable—say, in terms of the phenomenal properties of a thing. Sense was first and foremost whatever accounted for sameness and difference of cognitive value, as illustrated by such tests as the "paradox of identity"—an instance of which I used four sentences back. Putnam assumes that the beliefs of the *Doppelgänger* and his counterpart are the same since the associated properties are the same. I believe that this view cannot be sustained, at least in versions of the thought experiment in which 'water' does not mean *water* on Twin Earth. In any case, the relevance of the thought experiment to our understanding of mentalistic notions and to Frege's theory is a complicated matter that needs (and has begun to receive) special attention.

The point about Frege has a more general application. The critics of the tradition have tended not to address in depth the problems of cognitive value that exercised Frege and Russell—the paradox of identity, the problem of substitutivity in propositional-attitude contexts, the problem of negative existentials, the problem of specifying the "sense" of non-denoting names or common nouns. No very plausible account of these problems has issued from the attacks on the traditional theory of intension and extension. Donnellan's *Speaking of nothing* (1974) discusses the problem of negative existentials involving proper names. He elaborates on the fact that a non-denoting name in a negative existential statement will have an etiology that traces to a "historical block," not a referent. This point is surely relevant to the "truth conditions" of negative existentials. But it does not provide a representation of a person's information when he knows what is expressed by them. Different users of names (sometimes users of different names in different languages) are said to believe or know the same thing. It is not plausible that what they know, or the information they have, is captured by an account of whatever sense in which these names have a common history. Donnellan does not claim the contrary, as far as I can tell. But he does not provide a clear alternative to Fregean or Russellian representations of the cognitive value of non-denoting names in negative existentials.

Despite differences in motivation, emphasis, doctrine, and scope, the papers by Donnellan, Kripke, and Putnam have a generically similar direction. They have led to a radical rethinking of oversimple versions of the traditional doctrine of intension and extension. They have opened inquiry into the logic of sentences containing names and indexicals (not to mention Kripke's vitalization of modal logic). They have deepened and sharpened Wittgenstein's emphasis on social and historical aspects of meaning and reference determination, and have provided a picture of reference that constitutes a striking alternative to the traditional one. They have not successfully dealt with the problems about knowledge and belief that motivated the systems of Frege and Russell. But no doubt insights they have obtained can be brought to bear on these problems. The present collection, though not ideally representative, gives some sense of the background for these important developments in logic and philosophy.   TYLER BURGE

MERRIE BERGMANN, JAMES MOOR, and JACK NELSON. *The logic book.* Random House, New York 1980, ix + 459 pp.

MERRIE BERGMANN, JAMES MOOR, and JACK NELSON. *Solutions to selected exercises in The logic book.* Random House, New York 1980, 252 pp.

The logic book is an engaging, lucid, and comprehensive introduction to classical sentential logic and quantification theory. Unlike most texts, it can be used with success in a variety of courses, including accelerated courses for students with mathematical maturity, and also slow-moving courses for students who have had little previous exposure to abstract reasoning. The book has several questionable features and contains one or two outright errors, but on the whole it is a splendid piece of work.