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Names and Natural Kind Terms

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Names and natural kind terms have long been a major focus of debates about meaning and reference. This article discusses some of the theories and arguments that have appeared in those debates.

It is remarkably difficult to say what *names* are (more exactly, *proper names*) without making controversial theoretical assumptions. I shall not attempt to do so here. I shall instead rely on paradigm examples that nearly all theorists would agree are proper names, for instance, ‘Aristotle’, ‘Mark Twain’, ‘London’, ‘Venus’, and ‘Pegasus’. All of the proper names that I shall discuss are singular nouns that have no syntactic structure. Most of them refer to objects (for instance, people, cities, and planets), but some, such as ‘Pegasus’, apparently do not.¹

¹ One might initially think that an expression is a proper name iff it is a singular noun that lacks syntactic structure. But this proposal has at least three problems. First, it incorrectly entails that certain simple indexicals, such as ‘I’ and ‘you’, are proper names. (See the entry on INDEXICALS.) We could try to correct this by requiring that names not be indexicals, but the resulting characterization would be controversial, for some theorists hold that names themselves are indexicals. (These theorists say that ‘John’ is an expression that refers to different people in different contexts; its referent in any context is constrained to be some individual that bears the name ‘John’. Other theorists think that proper names like ‘John’ are ambiguous in some way similar to ‘bank’. This is the view that is adopted in the text, partly for convenience.) Second, some proper names, such as ‘the Nile’, may have genuine syntactic structure: notice that modifiers can be inserted between ‘the’ and ‘Nile’, as in ‘the beautiful blue Nile’. Also, the singular nouns ‘Mount Everest’, ‘10 January 2001’, ‘Queen Elizabeth II’, and ‘Professor Michael Dummett’ should perhaps be counted as proper names, but they may have semantically

Natural kind terms are expressions that refer to, or are in some way semantically associated with, *natural kinds*, such as biological taxa, natural substances, and natural phenomena. Saul Kripke's (1980) examples of natural kind terms include 'water', 'gold', 'cat', 'tiger', 'whale', 'heat', 'hot', 'loud', 'red', and 'pain'. By '*non-natural kind terms*' most philosophers mean terms that are semantically associated either with *artifactual kinds* (such as 'gin', 'pencil', 'sonata', 'financial', and 'sale') or with *metaphysically heterogeneous kinds* (such as 'grue' and 'nonhuman').

I begin below with proper names and the question 'What is the meaning of a proper name?' I turn to natural kind terms later.

1. The Millian Theory of Proper Names

One particularly simple theory of meaning for proper names says that *the meaning of a proper name is the object to which it refers*.² This theory is now strongly associated with John Stuart Mill (1843), and is often called the *Millian Theory* of proper names or *Millianism*.³ Many modern philosophical discussions of proper names have been concerned either with criticizing

significant syntactic structures. Third, some apparent proper names are not syntactically singular. For instance, 'the Pittsburgh Pirates' is a proper name for a baseball team, but it is not syntactically singular, for the sentence 'The Pittsburgh Pirates *is* winning the game' is ungrammatical.

² More accurately: the meaning of a proper name, *if any*, is the object to which it refers, *if any*. Contemporary philosophers of language distinguish between many different sorts of meaning, including linguistic meaning, character, propositional content, intension, and extension, to name a few. (See the entries on FORMAL SEMANTICS/MODEL THEORETIC SEMANTICS and INDEXICALS.) Millianism is a theory about the propositional contents of names. I ignore all other sorts of meaning from here on. I also ignore tense and context-sensitivity.

³ This theory is almost certainly ancient in origin. It is sometimes called 'the theory of direct reference', following Kaplan (1989).

the Millian Theory and finding a replacement for it, or with defending the Millian Theory from objections.

Millianism is often combined with a certain traditional theory about the meanings of sentences. According to this theory, declarative sentences *express propositions*, and the meaning of a declarative sentence is the proposition it expresses. Distinct sentences can express the same proposition: for example, ‘Cologne is pretty’ and ‘Köln ist schön’ (in German) both express the proposition that Cologne is pretty. When a person assertively utters a sentence, she asserts the proposition that the sentence expresses. People also bear various attitudes towards propositions, such as belief, disbelief, and doubt. Propositions have truth values; the truth value of a sentence is that of the proposition it expresses. Some versions of this view say that propositions have constituent structures that resemble the constituent structures of sentences. On such views, if sentence S expresses proposition P, then the ultimate constituents of P are the meanings of the words that appear in S. For example, ‘Venus shines’ expresses a proposition whose constituents are the meanings of ‘Venus’ and ‘shines’. The combination of this traditional theory with Millianism entails that ‘Venus shines’ expresses a proposition that has the planet Venus itself as a constituent. This is a *singular* proposition, that is, a proposition that has an individual as a constituent. It can be represented with the ordered pair <Venus, shining>. I shall use ‘Millianism’ to refer to this combined theory in most of what follows.

2. Objections to the Millian Theory

There are four objections to Millianism that have often motivated philosophers to reject it. These objections appear in the work of Gottlob Frege (1893/1952) and are sometimes known

as *Frege's Puzzles* (see the entry on FREGE AND SEMANTICS).

The first is the *Objection from Cognitive Significance*. The names 'Mark Twain' and 'Samuel Clemens' refer to the same person. Therefore, if Millianism is correct, they have the same meaning. Sentences (1) and (2) differ only in that (2) contains the name 'Samuel Clemens' in a position where (1) contains 'Mark Twain'.

1. Mark Twain is Mark Twain.
2. Mark Twain is Samuel Clemens.

Therefore, if Millianism is true, sentences (1) and (2) mean the same thing, and express the same proposition. However, (2) is informative whereas (1) is not: as Frege put it, (2) can contain a valuable extension of our knowledge, but (1) cannot. Furthermore, a rational, competent speaker could understand both and yet think that (1) is true and (2) is false. Finally, (1) is analytic and *a priori*, whereas (2) is synthetic and *a posteriori*. (More accurately, the propositions that sentences (1) and (2) express are *a priori* and *a posteriori*, respectively.) In short, these sentences differ in *cognitive significance*. But if they expressed the same proposition, they would not differ in cognitive significance. Therefore, Millianism is incorrect.

Frege used identity sentences to state his objection, but a parallel objection can be formulated without them (Salmon 1986). For instance, Millianism entails that (3) and (4) express the same proposition.

3. If Mark Twain is an author, then Mark Twain is an author.
4. If Mark Twain is an author, then Samuel Clemens is an author.

Yet (3) is uninformative, *a priori*, and analytic, whereas (4) is informative, *a posteriori*, and synthetic. A closely related objection concerning cognitive significance can be stated using (5)

and (6).

5. Mark Twain wrote *Huckleberry Finn*.

6. Samuel Clemens wrote *Huckleberry Finn*.

(5) and (6) are both synthetic, *a posteriori*, and informative, yet they still differ in cognitive significance, in the following sense: a competent, rational speaker who understands both could think that (5) is true and (6) is false.

The second major argument against Millianism is the *Objection from Belief Ascriptions*. Consider belief ascriptions (7) and (8).

7. Mary believes that Mark Twain is Mark Twain.

8. Mary believes that Mark Twain is Samuel Clemens.

These belief ascriptions are exactly alike, except that (8) contains the name 'Samuel Clemens' in a position where (7) contains 'Mark Twain'. Therefore, if Millianism is correct, then (7) and (8) express the same proposition and cannot differ in truth value. But (7) could be true while (8) is false. Therefore, the Millian Theory is incorrect. Notice that this objection relies on the claim that (7) and (8) can differ in *truth value*, whereas the previous objection relied on the claim that (1) and (2) differ in *cognitive significance*.

The third major argument is the *Objection from Meaningful Sentences Containing Non-Referring Names*. The name 'Pegasus' does not refer. Therefore, Millianism entails that it is meaningless. Thus, if Millianism is correct, then sentence (9) contains a meaningless word.

9. Pegasus flies.

But if (9) contains a meaningless word, then (9) as a whole is meaningless. Therefore, if Millianism is correct, then sentence (9) is meaningless. But (9) is clearly meaningful.

The final argument, the *Objection from Negative Existentials*, is closely related to the previous argument. Consider (10).

10. Pegasus does not exist.

If the Millian Theory is correct, then ‘Pegasus’ and sentence (10) are meaningless. If (10) is meaningless, then it is not true. But (10) is true. Therefore, the Millian Theory is incorrect.

Notice that the preceding objection relies on the claim that (9) is *meaningful*, whereas this objection relies on the claim that (10) is *true*.

3. Description Theories of Proper Names

The problems with Millianism have motivated many philosophers to accept *Description Theories of Proper Names* (also known as *Descriptivist Theories*). These philosophers include Frege (1893/1952), Bertrand Russell (1911), Ludwig Wittgenstein (1953), John Searle (1958), and Peter Strawson (1959).⁴ The basic idea of these theories is that the meanings of proper names are the same as those of certain definite descriptions. One particularly simple Description Theory says that a speaker associates a definite description with each name that she uses. The speaker will provide the description she associates with name N if she is asked “Who, or what, is N?” or “Who do you mean by ‘N’?”.⁵ The description “defines” the name and determines its reference, in her idiolect. For example, when some people are asked ‘Who is Aristotle?’ they consistently answer ‘The ancient philosopher who wrote the *Nicomachean Ethics*’. The sentence

⁴ It is controversial whether Frege accepted a Description Theory; see the entry on FREGE AND SEMANTICS. Nevertheless, in what follows I shall assume that the Fregean *sense* of a proper name is, or determines, a descriptive meaning of a sort like that described below.

⁵ I use double quotes in place of corner quotes throughout this article.

‘Aristotle was smart’ expresses, in such a speaker’s idiolect, the proposition that the ancient philosopher who wrote the *Nicomachean Ethics* was smart. The referent of her utterances of ‘Aristotle’ is the referent of the definite description.

Other Description Theories differ from this simple one in important respects, but many satisfy the following theory *schema*.

A Schema for Description Theories of Meaning for Proper Names

If S is a speaker, and N is a proper name in S’s language L, then there is exactly one property P such that:

1. P satisfies condition C.
2. S authoritatively associates P with N.
3. N refers in L to object O iff O is the one and only thing that is P.
4. If F is a predicate that expresses property P in English (or in some language L’ that is an extension of English), then N in L is synonymous with the definite description “the F” in English (or L’).

Clause (1) allows Description Theorists to place substantive conditions, or constraints, on property P. Some sort of constraint is necessary to assure that description theories avoid the objections that plague Millianism. Suppose, for instance, that a Description Theory said that the property associated with ‘Twain’ in every English speaker’s language is *being identical with Twain* and that the property associated with ‘Clemens’ is *being identical with Clemens*. These properties are the same, and so this theory would entail that the names ‘Twain’ and ‘Clemens’ have the same meaning in every English speaker’s language. Certain other *relational properties* (properties whose instantiation consists in standing in relations to other individuals) must also be

ruled out. For instance, similar problems would arise if ‘Twain’ were associated with *being the author most admired by George Orwell* and ‘Clemens’ with *being the author most admired by Eric Blair*, for Orwell is identical with Blair, and so these are the same property. Clause (1) is schematic because Description Theorists differ about the constraints that they wish to place on property P. Theorists with strong Fregean leanings might hope to avoid the above problems by insisting that property P be a purely general, non-relational property. Russell (1911) would allow P to be a relational property, but would hope to avoid problems with cognitive significance by requiring that the relata be objects with which speaker S is *directly acquainted*, for instance, S herself and her current experiences, and the properties and relations exemplified by her current experiences.

Clause (2) uses the notion of *authoritative association*. A typical user of the name ‘Twain’ believes that Twain (and the referent of ‘Twain’) is human, is an American, is a writer, and so on. In that loose sense, typical users of ‘Twain’ *associate* many properties with it. But Description Theorists hold that for every speaker and name there is a single associated property that has a certain *authority* for the speaker. This is the property that determines the reference and meaning of the name for the speaker. Suppose, for instance, that S consciously introduces the name N into her language by saying or thinking “I shall use ‘N’ as an abbreviation for ‘the P’”, and suppose her subsequent uses of N are guided by this stipulation.⁶ Then Description Theorists would say that S authoritatively associates P with N. But most Description Theorists think that such a ceremony is not necessary for authoritative association. Many hold that one or

⁶ For the sake of simplicity, I often assume in this paragraph (and the remainder of this section) that the relevant speaker’s public language is English. I also freely abuse the distinction between use and mention.

more of the following are at least strong indicators that S authoritatively associates P with N.

(a) Whenever S utters “N is Q”, S entertains and intends to communicate the proposition that the P is Q. (b) Whenever S is asked “Who is N?”, S answers “N is the P” (or “N, if he exists, is the P”).⁷ (c) S takes the question “Does N exist?” to be settled once S knows whether there is a unique thing that has P.

Most Description Theorists think that different people who speak the same public language (e.g., English) authoritatively associate different properties with the same proper name. Therefore, most Description Theorists think of language L as the speaker’s *idiolect*.⁸

Clause (3) specifies how the *referent* of the name in S’s idiolect is *determined* (or *fixed*, as Kripke 1980 puts it): it is the object that uniquely satisfies the authoritatively associated property. Clause (4) adds something further: it specifies the *meaning* of the name in S’s idiolect, by requiring that N be *synonymous* with a definite description. It mentions extensions of English, and cross-linguistic synonymy, because many Description Theorists hold that property P may be inexpressible in both ordinary English and the speaker’s language L (except by using the name N).

⁷ A speaker might introduce N as an abbreviation for “the P”, even if she thinks that there is nothing that is uniquely P and so thinks that “the P” is non-referring. (Thanks to Leslianne LaVallee for this point.) Kripke (1980) overlooks or ignores this possibility in his critique of Description Theories.

⁸ See the entry on LANGUAGES AND IDIOLECTS. Some description theorists seem to allow L to be a public language (e.g., English), apparently because they think that every proper name has a single descriptive meaning in a given public language. These theorists seem to hold that the descriptive meaning of a name in a public language is determined by the beliefs of all the speakers of that language who use the name. Such theorists conceive of the authoritative association relation differently from other description theorists. See Searle (1958), Strawson (1959), and, for discussion, Evans (1973). See also notes 12 and 13.

Early advocates of Description Theories (such as Frege and Russell) seemed to assume that the property that a speaker authoritatively associates with a name is rather simple, for instance, a property that specifies a famous deed of the name's referent, or a property that specifies the appearance of the referent to the speaker. Subsequent Description Theorists (such as Wittgenstein, Strawson, and Searle) have doubted this. These theorists point out that speakers usually do not introduce names into their languages in formal ceremonies using simple definite descriptions. Speakers also tend to answer the question "Who is N?" differently on different occasions. Moreover, speakers tend *not* to think that questions of the form "Does N exist?" are conclusively settled once it is determined whether there is an object that uniquely has one of these simple properties. These considerations lead some Description Theorists to hold what are sometimes called *Cluster Description Theories*. According to these theories, the property that a speaker authoritatively associates with a name is (typically) a property of the form *being a thing that satisfies a majority of the properties $P_1, P_2, P_3, \dots, P_n$ when these properties are weighted in way W* . Call this a *cluster property* and a description that expresses it a *cluster description*. Cluster Description Theorists do not think that speakers consciously use cluster descriptions to introduce names into their languages or that they will produce one when asked "Who is N?". Rather, they think that the cluster property that S authoritatively associates with N is determined by more complex relations among S, N, and P_1 - P_n , for instance, S's disposition to think that the sentence "N exists" is true in various scenarios in which there is an object that has P_1 and P_2 , but not P_3 , or has P_2 and P_3 , but not P_1 , and so on.⁹

⁹ The Cluster Description Theories described above entail that the referent of N has a certain disjunctive property, *being a thing that is Q_1 or Q_2 or \dots or Q_n* , where each Q_i is a conjunction of properties in P_1 - P_n such that having Q_i is sufficient for having a majority of P_1 - P_n .

Description Theories seem to deal well with Frege's objections to Millianism. Suppose typical speakers authoritatively associate different properties with the names 'Mark Twain' and 'Samuel Clemens'. Suppose, for example, that a given speaker authoritatively associates the property of being an author of *Huckleberry Finn* with 'Mark Twain', and authoritatively associates the property of being a person who published U.S. Grant's autobiography with 'Samuel Clemens'. Then sentences (1) and (2) express the same propositions as (1D) and (2D) in that speaker's language.¹⁰

1. Mark Twain is Mark Twain.
2. Mark Twain is Samuel Clemens.
- 1D. The author of *Huckleberry Finn* is the author of *Huckleberry Finn*.
- 2D. The author of *Huckleberry Finn* is the person who published U.S. Grant's autobiography.

Thus, (1) and (2) express different propositions in the speaker's language, and so the sentences can differ in informativeness, *a priori*, and analyticity, in her language, and the speaker could rationally think that they differ in truth value. Moreover, the 'that'-clauses of (7) and (8), in her language, refer to different propositions.

when these are weighted in way W. (For instance, the referent of N has the property of being either (P₁ and P₂) or (P₂ and P₃ and P₄) or) Therefore, some Description Theories hold that the meaning of a proper name N is a complex disjunctive property of the above sort. The main advantage of this alternative is that it does not entail that the meaning of a proper name partly concerns an arcane weighting of properties. I shall count these as Cluster Description Theories.

¹⁰ (1D) and (2D) contain the proper names 'U.S. Grant' and '*Huckleberry Finn*'. On most Description Theories, these names have descriptive meanings in nearly all idiolects. I ignore this in what follows (similarly for all other proper names that appear in definite descriptions).

7. Mary believes that Mark Twain is Mark Twain.
8. Mary believes that Mark Twain is Samuel Clemens.

Therefore, (7) and (8) attribute belief in different propositions to Mary, and so can differ in truth value. Suppose this same speaker authoritatively associates the property of being a winged horse with the name 'Pegasus'. Then sentences (9) and (10) are synonymous with (9D) and (10D) in her language.

9. Pegasus flies.
10. Pegasus does not exist.
- 9D. The winged horse flies.
- 10D. The winged horse does not exist.

Thus sentences (9) and (10) are both meaningful in the speaker's language, and sentence (10) is true.¹¹

Some Description Theorists deny that proper names are *synonymous* with definite descriptions, but hold that proper names have their *references fixed* by description. They accept a theory that satisfies clauses (1)-(3), but not clause (4). Let us call the schema obtained by deleting clause (4) *A Schema for Description Theories of Reference-Fixing for Proper Names*.¹²

¹¹ Sentences containing non-referring definite descriptions raise complications for many semantic theories. Russell, for instance, would hold that (10D) is ambiguous, and is true on one disambiguation and false on another. Frege might say that in (10D) 'the winged horse' refers to its customary sense (descriptive meaning). See Salmon (1989, 1998) for discussion.

¹² Mere reference-fixing theorists differ from full-blown meaning theorists about the nature of the authoritative association relation. Suppose predicate F expresses property P for two speakers. Suppose one of them stipulates that N will be an abbreviation for "the F" in her language, while the other uses "the F" to fix the reference, but not the meaning, of N in his language. Then both speakers will, in some sense, authoritatively associate P with N, but the nature of the association will be different in the two cases.

A theory of this latter sort does *not* attempt to describe the *meanings* of proper names. In fact, a Millian can accept a Description Theory of reference-fixing for proper names: such a Millian would hold that the *meaning* of a proper name is simply its referent, but would hold that the reference of the name is fixed by some description. Theorists who accept a Description Theory of Reference-Fixing, but who reject Description Theories of Meaning, cannot respond to Frege's Puzzles in the ways described above. They need alternative responses.¹³

4. Objections to Description Theories

Keith Donnellan (1972), Saul Kripke (1977, 1980) and David Kaplan (1973, 1989) have presented three influential types of objection to Description Theories of meaning and reference-fixing: modal, epistemic, and semantic.¹⁴

4.1. Modal Objections

The modal objections are mainly due to Kripke. Let Sue be an English speaker whose language includes the name 'Mark Twain'. Description Theories entail that there is some

¹³ It is unclear whether some Cluster Description Theorists are mere reference-fixers or full-blown meaning theorists. See Strawson (1959), Searle (1958, 1983), and Jackson (1998b), and, for discussion, Kripke (1980) and Evans (1973). Some of these theorists seemingly hold that the relevant reference-fixing property does *not* vary from speaker to speaker within a single linguistic community. Rather, there is a single reference-fixing property that is determined by the beliefs of the community's members. See also note 8.

¹⁴ There is another important objection to Description Theories of Meaning that I do not have space to describe in detail here. It claims that if Description Theories were correct, then most belief ascriptions would be false, roughly because different people authoritatively associate different properties with the same proper name. See Kripke 1979, section I, and Richard 1990, chapter 2.

property that she authoritatively associates with the name. Suppose that when she is asked ‘Who is Mark Twain?’ she consistently answers ‘Mark Twain is the author of *Huckleberry Finn*.’

Then simple Description Theories say that she authoritatively associates the property of being an author of *Huckleberry Finn* with the name. So these theories entail that the name is synonymous in Sue’s idiolect with the description ‘the author of *Huckleberry Finn*’ and that sentences (11) and (12) are synonymous in her idiolect.

11. If Mark Twain exists, then Mark Twain is an author *Huckleberry Finn*.

12. If the author of *Huckleberry Finn* exists, then the author of *Huckleberry Finn* is an author of *Huckleberry Finn*.

(12) expresses a necessary truth, in Sue’s idiolect. So, if (11) is synonymous with (12), in her idiolect, then (11) also expresses a necessary truth, in her idiolect. But (11) does not express a necessary truth in Sue’s idiolect, if she is a typical speaker. For Sue (if she is typical) will concede that Mark Twain could have been dropped on his head as an infant, and consequently suffered brain damage, and never have written anything. She will (if she is typical) persist in this judgment after long reflection, and so will judge that (11) is not a necessary truth. Thus (11) is not a necessary truth in her idiolect, and simple Description Theories of the above sort are false.

A similar objection can be stated using sentences that contain modal phrases. Make the same assumptions about Sue as above, and consider sentences (11N) and (12N).

11N. Necessarily: if Mark Twain exists, then Mark Twain is an author *Huckleberry Finn*.

12N. Necessarily: if the author of *Huckleberry Finn* exists, then the author of

Huckleberry Finn is an author of *Huckleberry Finn*.

(The colons indicate that ‘necessarily’ takes *wide scope* over the definite descriptions in the sentences: see the entry on RIGIDITY). It seems that, on simple Description Theories, (11N) and (12N) should be synonymous in Sue’s idiolect. (12N) is clearly true in Sue’s idiolect, but the above considerations seem to show that (11N) is false in her idiolect.

A similar objection can be posed for Cluster Description Theories. Let us suppose that Sue sincerely says ‘Twain was human, was American, was an author of *Huckleberry Finn*, . . .’, where the ellipsis is filled in with various other predicates. Suppose that, by close questioning, we discover that she thinks that certain of the properties expressed by the predicates are “more important” to Twain than others. Then a Cluster Description Theorist might hold that the property that she authoritatively associates with ‘Twain’ is the property of being a thing that has a majority of the properties being-human, being-American, being-an-author-of-*Huckleberry Finn*, . . . when these are weighted in way W. If so, then a Cluster Description Theory would entail that (13) and (14) are synonymous in Sue’s idiolect.

13. If Mark Twain exists, then Mark Twain is a thing that has a majority of the properties being-human, being-American, being-an-author-of-*Huckleberry Finn*, . . . when these are weighted in way W.
14. If the thing that has a majority of the properties being-human, being-American, being-an-author-of-*Huckleberry Finn*, . . . when these are weighted in way W exists, then the thing that has a majority of the properties being-human, being-American, being-an-author-of-*Huckleberry Finn*, . . . when these are weighted in way W is a thing that has a majority of the properties being-human, being-

American, being-an-author-of-*Huckleberry Finn*, . . . when these are weighted in way W.

(14) expresses a necessary truth, in Sue's idiolect. The above Cluster Description Theory thus entails that (13) also expresses a necessary truth in her idiolect. But, if Sue is typical, there will be plenty of evidence against this claim. Sue, if she is typical, would concede that Twain could have failed to be American (his mother could have moved to Canada just before he was born), could have been dropped on his head while an infant and not written anything, and so on. Thus she is likely to concede that he could have failed to have a majority of the properties that she attributes to Twain. Therefore, (13) does not express a necessary truth in her idiolect, and so the above Cluster Description Theory is false.¹⁵

Considerations like those above led Kripke (1980) to claim that ordinary proper names are *rigid designators*. A singular term T (for instance, a proper name or definite description) *refers to object O at possible world W* iff O is the object that is (semantically) relevant for determining the truth value at W of sentences containing T. A singular term T is a *rigid designator* iff T refers to the same object with respect to all possible worlds.¹⁶ For instance, 'The Stagirite teacher of Alexander is a philosopher' is true at a given world W iff the thing in W (whatever it may be) that is both Stagirite and a teacher of Alexander in W is also a philosopher in W. The relevant person is Aristotle in some worlds, but someone else in others. Thus, 'the

¹⁵ The objection can be easily modified to target Cluster Description Theories that use complex disjunctive properties instead of weightings. See note 9.

¹⁶ Kripke (1977, 1980) gives various definitions of 'rigid designator'. The one in the text is the simplest. See Salmon (1981) for a taxonomy of types of rigid designator. See also Kaplan (1989) and Stanley (1997). For more on the use of possible worlds in semantics, see the entry on FORMAL SEMANTICS/MODEL THEORETIC SEMANTICS

Stagirite teacher of Alexander' does not refer to the same object with respect to all worlds, and so is not a rigid designator. By contrast, 'Aristotle is a philosopher' is true at a world W iff Aristotle (*our* Aristotle, so to speak) is a philosopher at W. Thus, Aristotle is the referent of 'Aristotle' at all possible worlds, and so 'Aristotle' is a rigid designator. Kripke claimed that, in general, the definite descriptions that ordinary speakers associate with proper names are not rigid designators, and so cannot be synonymous with those names. (For more details, see Salmon 1981, Stanley 1997, and the entry on RIGIDITY.)

The modal objections target Description Theories of *meaning* that claim that proper names are *synonymous* with definite descriptions. They are ineffective against Description Theories of *Reference-Fixing* that deny synonymy, for these theories do not imply that (11) is necessary if (12) is, or that (13) is necessary if (14) is.

4.2. Epistemic Objections

The epistemic objections are due to Kripke. Return to Sue and the earlier simple Description Theory. According to this simple Description Theory, (11) and (12) are synonymous in Sue's idiolect. Therefore, they express the same proposition. (12) expresses a logical truth, in Sue's idiolect. That proposition is knowable *a priori*, without any appeal to empirical evidence. Moreover, it can *easily* be known to be true by reflection. Thus, if (11) expressed the same proposition as (12) in Sue's idiolect, then it would be an *a priori* knowable logical truth that could easily be known to be true simply by reflection. But Sue cannot know the proposition expressed by (11) in her idiolect by reflection alone, without any appeal to empirical evidence. Moreover, Sue, if she is typical, would not claim that (11) is logically true,

or “true by definition”. She would surely think that she needs empirical evidence to bolster her claim to know that (11) is true. Thus, the simple Description Theory is incorrect. A similar argument, with appropriate changes, can be mounted against the earlier Cluster Description Theory: (14) expresses a proposition, in Sue’s idiolect, that can be known *a priori*, whereas (13) does not.

The objection is directed at theories that claim that proper names are *synonymous* with definite descriptions. Kripke says that a similar argument is effective against Description Theories of Reference-Fixing that deny synonymy. Suppose that Ellen deliberately fixes the reference of ‘Twain’ using the description ‘the author of *Huckleberry Finn*’, but does not take the name to be synonymous with the description. Kripke claims that any speaker who fixes the reference of ‘Twain’ in this way can easily know *a priori* the proposition expressed by (11) in her idiolect. Call this ‘Kripke’s *a priori* claim’. If Kripke’s *a priori* claim is correct, then on Description Theories of Reference-Fixing, Ellen could easily come to know the proposition expressed by (11) in her idiolect by reflection alone. But she could not. In fact, if she is typical, she would think that she needs empirical evidence to know that (11) is true. Thus, Kripke concludes, Description Theories of Reference-Fixing are incorrect. It is controversial whether epistemic arguments of this sort are sound, for many philosophers disagree with Kripke’s *a priori* claim (see, for instance, Donnellan 1979 and Salmon 1986).

4.3. *Semantic Objections*

The final type of objection is semantic, and is due to Donnellan and Kripke. (Devitt and Sterelny (1999) call these ‘arguments from ignorance and error’.) Suppose that Bobby learns the

name 'Christopher Columbus' in grade school in a normal way. When asked 'Who is Christopher Columbus?' he consistently answers 'The first European to land in America.' So suppose that he authoritatively associates the property of being the first European to land in America with the name 'Christopher Columbus'. Then, according to simple Description Theories, the name in his language refers to the first European to land in America. But this person (if there is one) is probably a Norse sailor. Clearly the name 'Christopher Columbus' does not refer, in Bobby's language, to any such Norse sailor. Thus simple Description Theories are false. Cluster Description Theories seem to fare just as badly with examples like this one, for the other properties that Bobby associates with the name may also be ones that Columbus fails to have. For instance, Bobby may say 'Columbus was Spanish, and sailed the ocean blue in 1392, . . .'. In short, a speaker may have a name N in his language that refers to object O, though the beliefs that he would express by uttering sentences containing N are seriously erroneous. Description Theories of Meaning and Reference-Fixing incorrectly entail, in such cases, that N fails to refer or that N refers to an object that is not the real referent of the name. This objection casts serious doubt on clause (3) of the Description Theory Schema.

A related semantic objection casts doubt on both clause (2) and clause (3). Suppose that Paul acquires the name 'Richard Feynman' by overhearing someone say 'Richard Feynman is a physicist'. When asked 'Who is Richard Feynman?', he answers 'A physicist.' At first glance, it seems that the only property that Paul could authoritatively associate with the name 'Richard Feynman' is the property of being a physicist. But Paul, like most normal people, does not believe that there is one and only one physicist. This raises a problem for clause (2), for it is doubtful that he *authoritatively* associates any property with the name. Furthermore, contrary to

clause (3), the name ‘Richard Feynman’ in his idiolect refers to Feynman, even though he does not associate a property with the name that uniquely picks out Feynman.

The semantic objections work equally well against both Description Theories of Meaning and Description Theories of Reference-Fixing, for the problematic consequences follow merely from their common claim about reference-fixing.

4.4. Responses

Defenders of Description Theories have vigorously responded to the above objections. In response to the modal objections, some defenders have claimed that proper names take *wide scope* with respect to modal operators, such as ‘necessarily’ (Dummett 1981, Sosa 2001). On this view, (11N) is synonymous not with (12N), but with (12N*).

12N*. The author of *Huckleberry Finn*_i is such that: necessarily, if he_i exists, then he_i is an author of *Huckleberry Finn*.

But (12N*) is false, just like (11N). However, this view does not provide an immediate response to the modal objection that relied on the *non*-modal sentences (11) and (12). For further discussion, see Stanley (1997), Sosa (2001), Soames (2002), and the entry on RIGIDITY. Other defenders of Description Theories have claimed that proper names are synonymous with *rigid* descriptions, such as ‘the thing that *actually* authored *Huckleberry Finn*’. For discussion, see Salmon (1981), Soames (2002) and the entry on RIGIDITY.

Description Theorists’ replies to the epistemic objections are often closely connected with their replies to the semantic objections (see below). Some claim that when the *correct* description is used, the resulting sentence expresses, in the speaker’s language, an *a priori*

knowable proposition. A Description Theorist of *Reference-Fixing* who denies synonymy could claim that his view does not imply that the speaker can know *a priori* the proposition expressed by the sentence in her idiolect.

Defenders of Description Theories have argued that the semantic objections incorrectly specify the relevant reference-fixing property. For instance, Description Theorists might claim that Bobby's reference-fixing property for 'Christopher Columbus' is not the property of being the first European to land in America. Rather, it is the property of being a thing that the person from whom Bobby got the name referred to with the name 'Columbus'. Or, even more likely, it is some cluster property that involves the preceding property and many others. These defenders say, in effect, that the semantic objections rely on faulty assumptions about the authoritative association relation: the reference-fixing property that a speaker authoritatively associates with a name cannot be discovered simply by asking the speaker "Who is N?". For further discussion, see Searle (1983), Lewis (1984), Kroon (1987), Jackson (1998b), and Soames (2002).

5. The Causal Theory of Reference

In addition to arguing *against* Description Theories of Meaning and Reference, Kripke, Donnellan, Kaplan, Devitt (1981) and others argued *in favor* of an alternative theory of reference that is often called the *Causal Theory of Reference* (or 'the Historical Explanation Theory' or 'the Causal-Historical Theory'). On this theory, an utterance of a name refers to an object in virtue of standing in a certain causal relation to the object: for example, our present utterances of 'Aristotle' refer to Aristotle because our utterances are causally connected to Aristotle in the right way. According to typical versions of this theory, there is a causal chain that begins with

Aristotle's parents' dubbing him with the ancient Greek equivalent of 'Aristotle'. The chain continues with various other people acquiring the name, mostly by hearing others use the name and intending to use the name in the same way. As long as the receiving speakers intend to use the name in the same way as those that preceded them, the right sort of causal relation is maintained, and their utterances of the name refer to Aristotle. Thus, utterances of 'Aristotle' by people in the chain refer to Aristotle even if those people know very little about the referent, or have seriously erroneous beliefs about the referent.

Although the Causal Theory paints a picture of reference-fixing that many philosophers find attractive, some cases present apparent problems for it. There seem to be cases in which a name is passed along a causal chain in the way prescribed by the Causal Theory, but in which the name shifts its reference from one object to another. For instance, Evans (1973) claims that the name 'Madagascar' shifted in reference from a region of mainland Africa to an island near Africa's coast, though every speaker in the chain intended to use the name in the same way as his predecessors. There may also be a causal chain of the above sort connecting our utterances of 'Santa Claus' to a historical saint, even though our utterances do not refer to that saint (Kripke 1980). These cases show, at the very least, that the causal relation that allegedly fixes reference is quite complex.

The problems with the Causal Theory have little evidential bearing on Millianism, for the theories are concerned with two different questions. One question is 'What is the meaning of a proper name?' Another question is 'What makes it the case that a given proper name has whatever meaning it has, or refers to whatever object it refers to?' Millianism is an answer to the first question. It does not try to describe how reference occurs; it simply takes for granted

that proper names refer. Consequently, Millianism is consistent with a very wide range of theories of reference-fixing, including, for instance, Description Theories of Reference-Fixing, the Causal Theory, the Divine Command Theory of Reference (the view that reference is an irreducible relation that holds between a name and an object because God commands it), and the Supervenience Theory (the view that facts about reference supervene on the physical facts, but perhaps in a way that cannot be finitely described). The Causal Theory, on the other hand, is concerned with the second question. It attempts to describe how the reference of a proper name is determined by other facts. It does not try to specify the meaning of a proper name. In fact, the Causal Theory is consistent with non-Millian theories of meaning, for instance, the theory that the meaning of a proper name consists of the referent together with the name itself. Description Theories of Meaning are unusual, in that they not only specify the meaning of a proper name (roughly, a property), but also describe what makes it the case that a proper name refers to an object (the object satisfies the property) and what makes it the case that a name means what it does (authoritative association). This may explain why some critics of Description Theories of Meaning have felt obligated to give an alternative theory of reference-fixing for proper names. For further discussion, see Kaplan (1989) and Stalnaker (1997).

6. Two Special Description Theories and Some Non-Millian, Non-Descriptive Alternatives

There are two special Description Theories that are worth mentioning separately. The first is the *Metalinguistic Theory* (Bach 1981, Katz 1994). According to one version of this theory, a proper name N is synonymous with a definite description of the form “the bearer of ‘N’”. This theory takes the bearing relation for granted (just as Millianism takes the referring

relation for granted). The second special Description Theory is the *Causal-Description Theory* (Lewis 1984, Kroon 1987, Jackson 1998b). According to one theory of this type, an utterance U of proper name N is synonymous with a description of the form “the thing to which U bears relation R”, where R is the causal relation that fixes the reference of utterances of N.

Some philosophers have argued for theories that are neither Millian nor descriptive. For instance, Devitt (1996) has proposed that the meaning of a proper name N that refers to O is the property of referring to O via C, where C is a causal chain involving tokens of N. On this view, ‘Twain’ and ‘Clemens’ have different meanings because they refer in virtue of different causal chains, one involving tokens of ‘Twain’, the other involving tokens of ‘Clemens’. Devitt furthermore holds that speakers need not have even tacit beliefs about these causal chains. In that sense, speakers need not know the meanings of the names they understand.

There are various theories that hold that the meaning of a proper name either is, or can be represented by, an ordered pair consisting of the referent and something else that figures importantly in how the speaker thinks of the referent. For instance, one such theory says that the meaning of ‘Twain’ consists of Twain himself and some property that the speaker ascribes to the referent, such as the property of being human (Geach 1962). Other such theories hold that the meaning of ‘Twain’ for a speaker consists of (or can be represented by) the ordered pair of Twain and either (i) the name ‘Twain’, or (ii) the speaker’s *mental* name for Twain, or (iii) the speaker’s *mental file* on Twain, or (iv) the conceptual, inferential, or causal role of the name in the speaker’s thought processes. (See Field 1977, Evans 1982, Forbes 1990, and the entry on CONCEPTUAL ROLE SEMANTICS.)

The above theories may be vulnerable to modal and epistemic objections, depending on

details. More importantly, many of these theories entail that distinct names rarely or never have the same meaning. (Some entail that distinct *utterances* of a single name cannot have the same meaning.) This consequence suggests that many seemingly true assertion ascriptions are false. Consider, for instance, the Metalinguistic Theory. Suppose that the monolingual German speaker Karl utters ‘Köln ist schön’. Then an English speaker can truly say ‘Karl said that Cologne is pretty’. But according to the Metalinguistic Theory, the English ascription says that Karl said that the bearer of ‘Cologne’ is pretty. Yet Karl said no such thing. Analogous criticisms can be made of the other theories.¹⁷ For discussion, see Salmon (1986), Richard (1990), and Soames (2002).

According to some versions of *Two-Dimensional Semantics*, every proper name has *two* meanings, one of which is (roughly) a uniquely identifying property and the other of which is the individual that satisfies the property.¹⁸ These theories may be vulnerable to versions of the preceding objections to Description Theories. For discussion and criticisms, see Jackson (1998a), Stalnaker (2001), Chalmers (2002), Byrne and Pryor (2004), Soames (2004, 2005), and the entry on TWO-DIMENSIONAL SEMANTICS.

7. The Millian Theory Reconsidered

The apparent problems with non-Millian theories (particularly with Description Theories)

¹⁷ Mere reference-fixing versions of these theories may not be vulnerable to this criticism, but they also do not provide immediate solutions to Frege’s Puzzles.

¹⁸ More accurately, the advocates of these theories say that every proper name has two *propositional contents*, each of which is an *intension*. See note 2 and the entry on TWO-DIMENSIONAL SEMANTICS.

have led some philosophers to reconsider the objections to Millianism. Many modern Millian replies to the objections rely on two ideas: the theory of *mediated belief*, and the distinction between *semantics and pragmatics* (Salmon 1986, Soames 2002, and Braun 1998).

According to many defenders of Millianism, the binary belief relation is mediated by a third type of entity, for instance, a sentence, a mental state, or a mental representation. One believes a proposition by accepting a sentence, or being in a mental state, or having a mental representation function in one's mind in the right way. These mediating entities are *ways of taking propositions* or *propositional guises*. An agent can believe a single proposition in two distinct ways, or under two distinct guises. For instance, a person who thinks that (1) and (2) are both true believes the proposition that Twain/Clemens is Twain/Clemens in two distinct ways.

1. Mark Twain is Mark Twain.
2. Mark Twain is Samuel Clemens.

But a rational agent can believe the identity proposition in one way without believing it in another way. Such an agent might think that (1) is true but be unsure about (2). A rational agent can even believe the identity proposition in one way, and also believe the *negation* of that proposition in a suitably different way. Such a rational agent could think that (1) is true and (2) is false. Furthermore, some Millians hold that the proposition expressed by (2) is *a priori* and uninformative, but that this proposition may appear to lack those properties when it is entertained in a way that corresponds to sentence (2). This is one Millian response to the Objection from Cognitive Significance.

Many Millians also emphasize the distinction between (i) the proposition that a sentence expresses as a matter of *semantics*, or meaning, and (ii) the propositions that utterances of the

sentence “suggest”, or conversationally implicate, or *pragmatically convey* in some way. (See the entry on THE SEMANTICS/PRAGMATICS DISTINCTION.) An alternative Millian response to the Objection from Cognitive Significance says that utterances of (1) and (2) pragmatically convey different propositions, even though they semantically express the same proposition. For instance, an utterance of (2) might pragmatically convey the proposition that the author of *Huckleberry Finn* is the publisher of U.S. Grant’s autobiography. A rational speaker could disbelieve this pragmatically conveyed proposition, and so mistakenly think that (2) itself is false.

The Objection from Belief Ascriptions is the subject of a large literature (see OPACITY). Some Millian responses to it use the same ideas as the preceding responses. Some Millians (Salmon 1986, Braun 1998) hold that (7) and (8) semantically express the same proposition, but a rational agent can believe this proposition in one way (a way corresponding to (7)), while believing the negation of this proposition in another way (a way corresponding to (8)).

7. Mary believes that Mark Twain is Mark Twain.

8. Mary believes that Mark Twain is Samuel Clemens.

Some Millians also (or instead) think that utterances of these sentences typically differ in the propositions they pragmatically convey (Salmon 1986, Soames 2002). For instance, an utterance of (7) conveys the true proposition that Mary would assent to sentence (1), whereas (8) conveys the false proposition that Mary would assent to sentence (2). This might lead a speaker to think that (8) can differ in truth value from (7). Other Millians (who might be more accurately called “quasi-Millians”) think that, although (1) and (2) semantically express the same proposition, (7) and (8) semantically express distinct propositions that can differ in truth value. This occurs

because the ‘that’-clauses of (7) and (8) refer to amalgams of (i) the proposition expressed by (1) and (2) and (ii) certain representations, for instance, the words in the ‘that’-clauses, or Mary’s mental representations. See Richard (1990) for a representative theory of this sort.

In response to the Objection from Meaningful Sentences Containing Non-referring Names, some Millians, such as Salmon (1998), argue that the name ‘Pegasus’ refers to a mythical object. Thus on this view, ‘Pegasus’ is meaningful and so is sentence (9).

9. Pegasus flies.

Others Millians (Braun 2005) maintain that ‘Pegasus’ fails to refer, but that sentence (9) nevertheless expresses a *gappy* proposition, a proposition that has an unfilled position where an individual referent would normally appear. The mythical-object response entails that Pegasus exists and that (10) is false.

10. Pegasus does not exist.

On the gappy proposition response, (10) expresses a gappy proposition that is either true or truth-value-less.

The Millian responses to Frege’s Puzzles are far from universally accepted. The theories of meaning and reference-fixing for proper names continue to be topics of intense investigation and debate.

8. Natural Kind Terms

As I pointed out earlier, Kripke says that all of the following expressions are natural kind terms: ‘water’, ‘gold’, ‘cat’, ‘tiger’, ‘whale’, ‘heat’, ‘hot’, ‘loud’, ‘red’, and ‘pain’. I noted that the distinction between natural and non-natural kind *terms* relies on a distinction between natural

and non-natural *kinds*. Thus, the distinction between natural and non-natural kind terms is more metaphysical than linguistic. Viewed linguistically, Kripke's natural kinds terms are quite diverse. Some are nouns, whereas others are adjectives. Some can be used as a singular term (for instance, 'red' in 'Red is a color') whereas others cannot ('cat'). Of the nouns, some are count nouns ('tiger'), while others are mass nouns ('water'). But nearly all of them are *general terms* (or 'general names', as Mill called them): they can be correctly applied to more than one object, when they are used *predicatively*. (Predicative uses often involve the copula and/or the determiner 'a', as in 'is hot' and 'is a tiger'.) I begin below with the semantics of kind terms in general. I consider later whether the semantics of natural kind terms is in any interesting way distinct from that of non-natural kind terms.

Millianism says that the meaning of a proper name is its referent. An obvious analogous view for kind terms is the view that the meaning of a kind term is its *extension*, where the *extension* of a kind term is the set of objects to which it correctly applies, in predicative uses. Call this view *Extensionalism*. Extensionalism faces serious difficulties with pairs of kind terms that have the same extension and yet differ in meaning. For instance, it is often said that the common nouns 'renate' (animal having a kidney) and 'cordate' (animal having a heart) are co-extensive. Whether or not this is so, the terms clearly differ in meaning. One indication of this is that the sentence 'Necessarily, all renates are renates' is true, whereas the sentence 'Necessarily, all renates are cordates' is false. *Complex* kind terms provide further counterexamples to Extensionalism. For instance, the common noun phrases 'person who was President of the USA in March 2002' and 'person who was governor of Texas in 1998' have the same extension (the set whose sole member is George W. Bush), but differ in meaning.

An obvious alternative to Extensionalism is the view that the meaning of a simple kind term is a *property*. Thus the meaning of ‘round’ is the property of being round, the meaning of ‘renate’ is the property of being a reneate, the meaning of ‘cordate’ is the property of being a cordate, and so on. Such a theory can be extended to complex kind terms in several ways (Salmon 1981, 1986; Soames 2002). This theory escapes the above problems with Extensionalism, for the preceding kind terms express distinct properties.

According to traditional *Description Theories of Meaning for Kind Terms*, many syntactically simple kind terms are synonymous with complex descriptive phrases (Mill 1843). These theories are in many ways similar to Description Theories of proper names. On a simple theory of this type, speakers associate complex descriptive phrases with many simple adjectives and common nouns. A speaker will provide the descriptive phrase that she associates with a simple kind term K if she is asked “What is a K?” or “What do you mean by ‘K’?”. The speaker takes this descriptive phrase to “define” the kind term, and to determine which objects fall under it, and to determine whether “There are K’s” is true. In that sense, she authoritatively associates the property expressed by the complex descriptive phrase with the simple kind term. For example, a speaker who is asked ‘What is a tiger?’ might answer ‘a carnivorous cat-like animal with a tawny coat and transverse black stripes’. The sentence ‘All tigers live in Asia’ expresses, in such a speaker’s idiolect, the proposition that all carnivorous cat-like animals with tawny coats and transverse black stripes live in Asia. The extension of ‘tiger’ in her idiolect is the set of objects that are carnivorous cat-like animals with tawny coats and transverse black stripes. The sentence ‘There are tigers’ is true iff this set has members.

Like Description Theories of proper names, Description Theories of kind terms come in

many versions. Yet many satisfy the following theory schema.

A Schema for Description Theories of Meaning for Kind Terms

If S is a speaker, and K is a simple kind term of type T in S's language L, then there is exactly one property P such that:

1. P satisfies condition C.
2. S authoritatively associates P with K.
3. O is a member of the extension of K in L iff O has property P.
4. If D is a complex descriptive phrase that expresses P in English (or in some extension of English L'), then K in L is synonymous with D in English (or L').

Description Theorists claim that many simple kind terms are synonymous with complex descriptive phrases that provide substantive *analyses* of those terms. But Description Theorists admit that this is not the case for all simple kind terms—some express simple properties and are unanalyzable. For instance, some theorists might say that 'red', 'round', and other observational terms are not analyzable; other theorists would say the same about some other class of simple kind terms. Thus, the above Schema is restricted in its application to simple kind terms of type T, where T is a schematic constraint on kind terms about which description theorists may disagree. Clause (1) is also schematic and allows different theorists to place different constraints on property P. Theorists with Russellian leanings might allow P to be a relational property that involves individuals with whom the speaker is directly acquainted. Theorists with Fregean leanings might insist that P be purely general.

Clauses (1)-(3) provide a theory of how the extension of a kind term is fixed. Clause (4) specifies the meaning of such a kind term. Let us say that the schema that includes (1)-(3), but

excludes clause (4), is *A Schema for Description Theories of Extension-Fixing for Kind Terms*. There are *cluster* versions of Description Theories of Meaning and Extension-Fixing for Kind Terms, just as there are for proper names. On such a view, a simple kind term's extension is fixed, and perhaps its meaning is expressed, by a complex phrase of the form *has a majority of properties $P_1, P_2, P_3, \dots, P_n$ when these properties are weighted in way W* .

Description Theories are initially attractive for several reasons. As mentioned before, when speakers are asked "What do you mean by 'K'?", they usually provide complex descriptions. Moreover, it may initially seem that a speaker does not understand a term, or is not competent with it, unless she can provide such a description. Finally, it might initially seem that sentences such as 'Tigers are large, cat-like animals with orange and black stripes' express necessary, *a priori*, and analytic truths, or at least come close to doing so. Description Theories of Kind Terms easily explain these judgments.

9. Objections to Description Theories of Kind Terms

The objections to Description Theories of Kind Terms are similar to the preceding objections to Description Theories of Proper Names. They are due primarily to Kripke (1980) and Putnam (1975). I concentrate below on simple Description Theories concerning simple kind terms, and assume that it is obvious how to modify them so as to target cluster theories.

Suppose that 'tiger' is a kind term in Sue's language. The Description Theory says that she authoritatively associates some (complex) property with it. Assume that when Sue is asked 'What is a tiger?' she answers 'A tiger is a carnivorous cat-like animal with a tawny coat and transverse black stripes.' So, on simple Description Theories, she authoritatively associates the

property expressed by the complex descriptive phrase with the term ‘tiger’. Thus, (15) and (16) are synonymous in her language.

15. A thing is a tiger if and only if it is a carnivorous cat-like animal with a tawny coat and transverse black stripes.

16. A thing is a carnivorous cat-like animal with a tawny coat and transverse black stripes if and only if it is a carnivorous cat-like animal with a tawny coat and transverse black stripes.

This theory is vulnerable to a modal objection. Sentence (16) obviously expresses a necessary truth in Sue’s language. But (15) does not: it is (metaphysically) possible for there to be some species of animal whose members look like tigers but whose members differ radically in important internal respects from tigers. Members of this species may be incapable of interbreeding with tigers; they may even be reptilian. They are not tigers. Sue would surely concede all of this, if she is a typical speaker. Thus, (15) does not express a necessary truth in her language, contrary to the Description Theory.

The theory is also vulnerable to epistemic objections. Sentence (16) expresses a proposition that can be known *a priori*. Thus, the Description Theory entails that sentence (15) does also. But the proposition expressed by (15) in Sue’s language is not knowable *a priori*. Empirical evidence is needed in order to be justified in believing that every animal that has a “tigerish” appearance is a genuine tiger (and Sue would concede this, if she is typical).

The preceding objections make use of Description Theories’ claim that the kind term ‘tiger’ is *synonymous* with the complex descriptive phrase. Description Theories of *Extension-Fixing* are not vulnerable to the modal objection. It is controversial whether such theories are

vulnerable to the epistemic objection. (The controversies are similar to those surrounding Description Theories of proper names.) But the following semantic objections are intended to show that even Description Theories of Extension-Fixing for kind terms are incorrect.

Consider Sue again, and assume that she acquired the term ‘tiger’ in a normal way, and that (as before) she associates the above complex descriptive phrase with ‘tiger’. Suppose that, deep in the jungles of some unexplored region of Earth, there is a species of animal whose members look like tigers, but whose members cannot interbreed with tigers, and differ radically in important internal respects from tigers. Suppose, for instance, that they are reptilian rather than mammalian. Such animals would not fall in the extension of ‘tiger’ in Sue’s language, contrary to Description Theories of Extension-Fixing.

Other arguments from ignorance and error also seem to be effective against extension-fixing theories. Suppose that Bobby acquires the term ‘dinosaur’ by seeing pictures of them and hearing that they lived millions of years ago. If asked ‘What is a dinosaur?’ he might say, ‘A dinosaur is a large lizard that lived millions of years ago’. Dinosaurs, however, are not lizards. Thus, according to Description Theories, the extension of ‘dinosaur’ in Bobby’s language does not include any dinosaurs. But surely it does. Suppose that Doug is a desert-dweller who has never seen an elm or a beech, but hears some visitors discussing them. He associates the same description with each term, ‘a large tree’. Nevertheless, if he utters ‘No elm is a beech’, he expresses a truth. Thus, it seems that the two expressions have different extensions in his language, contrary to Description Theories (Putnam 1975).

The *Twin Earth Objection* is another semantic objection due to Putnam (1975). Suppose that there is a distant planet that is a duplicate of Earth in many respects, except that the clear,

drinkable liquid that falls from the sky and fills the lakes and streams on Twin Earth is not H₂O, but another compound, XYZ. Suppose that Oscar on Earth and Twin Oscar on Twin Earth are molecule-for-molecule duplicates of each other. Then, it seems, Oscar and Twin Oscar associate the same descriptions and properties with the word ‘water’. Yet the extension of ‘water’ for Oscar is the set of all portions of water (i.e., H₂O), whereas the extension of ‘water’ for Twin Oscar is the set of all portions of XYZ.

Defenders of Description Theories of Kind Terms have given replies to the above objections that are similar to the previous replies to objections to Description Theories of Proper Names. To defend Description Theories from modal objections, some add rigidifying devices to complex descriptive phrases, for instance, ‘member of the species whose *actual* members are carnivorous cat-like animals with tawny coats and transverse black stripes’. Some claim that the sentences containing the correct extension-fixing descriptions do express *a priori* knowable propositions. Most importantly, many defenders claim that the alleged counterexamples do not give the correct extension-fixing description for a given kind term and speaker. In Sue’s case, the correct extension-fixing description may include reference to herself, as in ‘the type of animal I saw at the zoo yesterday’, or may include reference to experts’ judgments, as in ‘animals called ‘tigers’ by biologists’. Probably, the correct description is a complicated cluster description that includes these descriptions and more. In any case, the correct extension-fixing description cannot be elicited from a speaker simply by asking her ‘What is a tiger?’. For discussion, see Searle (1983), Lewis (1984), Jackson (1998b), and Soames (2005).

10. Natural Kind Terms, Non-Natural Kind Terms, Rigid Designation, and the Causal

Theory of Reference

Most of Kripke's and Putnam's objections focus on Description Theories of *natural* kind terms, but many of them work equally well against Description Theories of *non-natural* kind terms. Suppose, for instance, that Sue uses the term 'pencil' and associates with it the property of being a cylindrical writing instrument with a metallic lead core. On Description Theories, ordinary pencils, which have non-metallic graphite cores, do not fall in the extension of her utterances of 'pencil'. Yet it seems that Sue utters a truth when she grasps an ordinary pencil and says 'This is a pencil'. Thus, Description Theories of non-natural kind terms are as implausible as Description Theories of natural kind terms. For further discussion, see Putnam (1975), Burge (1979), Donnellan (1983), and Devitt and Sterelny (1999).

In light of the arguments against Extensionalism and Description Theories, one might reasonably conclude that the meaning of *any* simple kind term, whether natural or non-natural, is a simple non-descriptive property. The meaning of 'tiger' is the property of being a tiger, and the extension of the term is the set of things that have that property. Similarly, the meaning of 'pencil' is the property of being a pencil, and its extension is the set of pencils.¹⁹ Call this the *Property Theory* of kind terms. On this view, the semantics of simple *non-natural* kind terms is just like that of simple natural kind terms.

Kripke (1980) and Putnam (1975) claim that natural kind terms are rigid designators. This claim conflicts with the Property Theory, given three assumptions: (i) a kind term is a rigid designator iff it has the same reference with respect to all possible worlds, (ii) the reference of a

¹⁹ An advocate of the Property Theory could allow that the extension of a kind term is a *property* when it is used as a singular term, as is 'red' in 'Red is a color'. See Soames (2002).

kind term at a possible world is its extension at that world, (iii) the extensions of most natural kind terms vary from possible world to possible world. Kripke and Putnam apparently reject (ii): they hold that natural kind terms refer, not to their extensions, but to natural kinds. For instance, ‘tiger’ refers to the species *Felis Tigris*, ‘water’ to the substance *Water*, and so on. Each simple natural kind term refers to the same natural kind with respect to all possible worlds, and so is a rigid designator, even if the extension of the term varies from world to world. (See the entry on RIGIDITY.) Suppose, in addition, that the *meanings* of these simple natural kind terms are just the kinds to which they refer.²⁰ Then predicative uses of kind terms can be analyzed in terms of kind membership: ‘All tigers are animals’ is (roughly) synonymous with ‘All members of *Felis Tigris* are members of *Animalia*’. Call this the *Kind Designation* theory. There are two main differences between it and the Property Theory. First, the Kind Designation Theory says that simple kind terms rigidly refer to kinds, whereas the Property Theory says that kind terms non-rigidly refer to extensions (sets). Second, the Kind Designation Theory says that the *meaning* of a simple kind term is the kind to which it refers, whereas the Property Theory says that the meaning is a property.²¹

²⁰ This claim conflicts with Putnam’s (1975) theory of meaning (see Salmon 1981). Kripke (1980) does not present a theory of *meaning* for natural kind terms.

²¹ Kinds and properties appear, at first glance, to be distinct types of entity, for objects *have* (or exemplify) properties, but are *members* of kinds. (This apparent difference may be misleading, but I cannot address this metaphysical issue here.) Advocates of the Kind Designation Theory can allow that some *complex* kind terms are *non-rigid* designators: for instance, ‘the species that Sue esteems above all others’ may refer to *Felis Tigris* in one world and to *Cynomys Ludovicianus* (the prairie dog) in another. Other complex kind terms rigidly refer, for instance, ‘the species that *actually* Sue esteems above all others’. For discussion, see Salmon 1981, Soames 2002, and Salmon 2003. Some advocates of the Kind Designation Theory might also wish to distinguish between *reference* and *designation*: they may claim that simple kind terms rigidly *designate* kinds (just as proper names rigidly designate objects), but non-

The Kind Designation theory can easily be extended to non-natural kind terms (Salmon 1981, 2003; Soames 2002). The expression ‘pencil’ refers to the kind *Pencil*, with respect to all possible worlds. Thus, ‘pencil’ is a rigid designator. If the *meaning* of ‘pencil’ is the kind to which it refers, then predicative uses can be analyzed in terms of membership: ‘All pencils are yellow’ is (roughly) synonymous with ‘All members of *Pencil* are members of *Yellow*’. Thus, there is nothing distinctive about the semantics of natural kind terms on either the Property Theory or the Kind Designation Theory.

The Property Theory and the Kind Designation Theory are consistent with many different theories concerning the *fixation* or *determination* of meaning, reference, and extension for kind terms (just as Millianism is consistent with many different theories of reference-fixing for proper names). Kripke (1980) and Putnam (1975) argue for a Causal Theory of Reference for *natural* kind terms. (See also Salmon 1981 and Soames 2002.) On this theory, a person who introduces a natural kind term typically does so by observing a sample of the kind, and fixing the reference of the term with a description like “the TK of which *this* sample is a member”, where TK is a term for a Type of Kind, for instance, ‘species’ or ‘chemical substance’. If a subsequent speaker hears the introduced kind term, then he can use it to refer to the same kind, as long as he intends to use the term in the same way as his predecessors, even if he is quite mistaken about the kind’s properties. Ordinary users defer to expert users when deciding whether an item falls in a term’s extension (this is part of what Putnam calls ‘the division of linguistic labor’), but even experts can make mistakes. If the meaning of a simple natural kind term is just the kind to which it refers, then the reference-fixing process also fixes the meaning.

rigidly *refer* to extensions.

The Causal Theory of Reference for natural kind terms may be even more problematic than the Causal Theory of Reference for proper names (see Devitt 1981, Wilson 1982, Devitt and Sterelney 1999, Soames 2002). But if it is correct, then much of it could be extended to *non-natural* kind terms. (For discussion, see Lewis 1984, Devitt and Sterelny 1999, and Soames 2002.) It remains controversial whether natural and non-natural kind terms differ in how their meanings, references, and extensions are determined.²²

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