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WHAT DO WE TALK ABOUT?*

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1. Introduction. By observing a black swan, one ascertains an interesting zoological fact. The fact involves two items, a specific object and the property of being a black swan, and consists in the former instantiating the latter. The object is in itself of little interest. Our environment abounds in objects, and knowledge is hardly enhanced by one of them being merely picked out for consideration. The same goes for the property. Properties are at least as plentiful as objects and one does not get to know anything by merely focussing attention upon one of them. What is of interest is the combination of the two items, i.e. the circumstance that the object instantiates the property. And this is what the said fact consists in.

The above triviality would be hardly worth stating if it were not for a considerable number of philosophers anxious to deny it. These philosophers are adamant that there are no such items as properties. They have to deny, therefore, that a fact can consist in a particular instantiating such an item. It is not my intention to quarrel with this extremist view. Rather, I am addressing myself to those who concede that besides concrete particulars like persons, birds, chairs, and ink marks, there are things which may or may not be *true of* such particulars, and that these latter things are not concrete particulars in turn (especially not ink marks or sequences of such) but abstract *conditions* or *attributes*: colors, temperatures, chemical constitutions, party affiliations and the like. In what follows I shall assume that over and above *extensional* entities—truth-values, individuals, numbers, classes of individuals, classes of ordered n-tuples of individuals, and the like—the reader countenances also corresponding *intensional* entities, that is, propositions, individuals-in-intension, magnitudes, properties, relations, and so on.

Recent developments in logical theory forestall many objections which used to be raised against intensions. In particular, they forestall the objection that intensions are difficult to individuate. For it turns out that intensions are best explicated as a special brand of functions and we know perfectly well how to individuate functions. The functions in question are defined on the family of possible worlds (or on parts thereof) and range over extensions of appropriate types. Thus, propositions take possible worlds to truth values, individuals-in-intension take possible worlds to individuals, magnitudes take them to numbers, properties to classes, and n-ary relations to classes of ordered n-tuples. The value of an intension at a particular world is spoken of as its *extension in* that world.

The point I want to raise with those who do not balk at intensions and their explication in terms of possible worlds is one about reference. It seems to me that

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despite the recent resurgence of the intensional point of view, it has not been sufficiently appreciated yet that intensions figure prominently among the entities we commonly talk *about*. There seems to be a strong tendency to regard an intension as something that normally serves as a mere *vehicle* of reference, the real target of reference being an extension.

This tendency is stronger in regard to some types of intension and somewhat weaker in regard to others. There is, for instance, an almost universal consensus that the phrase 'the morning star' in

(1) The morning star is a planet

refers to Venus, the celestial body. It will be admitted that the phrase is somehow connected with an individual-in-intension, i.e. with a function which takes each possible world to the individual which appears as the brightest object in that world's morning sky. But this function is seen as representing a peculiar *way* in which the phrase refers to Venus—the value taken by the function at the actual world. It will be denied that the function itself receives reference in (1).

Likewise, the phrase 'the number of Earth's natural satellites' in

(2) The number of Earth's natural satellites is less than 3

is usually construed to refer to the number 1. It will be admitted that the phrase is somehow associated with a magnitude, i.e. with a function which takes each possible world to whatever number of satellites Earth has in that world. But this function, it is held, only needs to be invoked to explain the peculiar *way* in which (2) refers to 1, i.e. to account for the fact that 1 is referred to *qua* the number of Earth's natural satellites. It will be denied that the magnitude itself receives reference in (2).

There is also a tendency to construe the sentence

(3) Venus is a planet

as treating of the class consisting of Mercury, Venus, Earth, . . . , and Pluto. Again, it will be admitted that the term 'planet' has something to do with the property of being a planet, i.e. with the function which takes each possible world to the class of individuals which are the planets of that world. But it will be denied that this function receives reference in (3). The sentence, it will be said, is about the class of actual planets and says that Venus is a member of that class.

The aim of the present article is to show that the above construals of sentences like (1), (2), and (3) are not only incompatible with the intensional point of view, but also conducive to semantic theories which are demonstrably inadequate from whatever philosophical point of view one may take.

2. Classes and properties. To say of an individual that it is a member of a class makes a trivial statement. For as is well known classes are *individuated* by their memberships. Where X is a member of class C, it is *inconceivable* for C to lack X, since no class lacking X can be the same class as C; classes are not shrinkable: by subtracting X from C one obtains a class which is numerically distinct from C;

thus to say that X is a member of C is saying something that could not possibly have been otherwise. By the same token, if X is a nonmember of C, it is inconceivable for X to belong to C; classes are not inflatable: by adding X to C one obtains a different class; thus to say that X is a member of C is saying something which could not possibly have been the case. Sentence (3), however, is neither trivially true nor trivially false. It says something which, though true, might have been false. Consequently, the statement expressed by (3) cannot be to the effect that Venus is a member of a class.

On the other hand, to say of an individual that it instantiates a *property* need not be trivial. A property may be instantiated by one class of objects in one world and by another class in another. Thus even if such a property P actually is instantiated by an individual X, it may still be possible for the very same P not to be instantiated by X. To say that X instantiates P is then saying something which, though true, might have been false. But in such a case what is being spoken of is an individual and a property: nothing is being said of any class.

Let us write V, P, and C respectively for Venus, the property of being a planet and the class {Mercury, Venus, Earth, ..., Pluto}. P is thus a function from possible worlds to classes of individuals and takes C as its value at the actual world. Consider the proposition that V is a member of C. This proposition is true in a world W just in case V is in C. Thus the value of the proposition at W is CV and the proposition itself is constructible as

(*) $\lambda w . CV$

where w ranges over possible worlds. Now consider the proposition that Venus is a planet. This proposition is true in a world W just in case Venus is a member of the extension PW of P in W. The value of the proposition at W is thus $[PW]V$ and the proposition itself is constructible as

(3a) $\lambda w . [Pw]V$.

I submit that the logical structure of the attributive statement (3) is correctly described by the formula at (3a). It differs essentially from (*), a formula which depicts the logical structure of a membership statement. Whereas (*) contains a class term C, (3a) contains no such term: the only self-contained components of (3a) are a property, P, and an individual, V. Whereas in (*) the abstraction operator λw is applied to a closed formula and generates therefore a constant (i.e. trivial) function, in (3a) the operator binds an essential occurrence of w in its scope and generates a function which takes one truth value in some worlds and the other truth value in others.

It is hardly surprising that the presence of the possible-world variable w is not visibly manifested in the surface structure of the ordinary-language sentence (3). It is a familiar fact that in ordinary language, bound variables are seldom visibly evinced and have to be unearthed by logical analysis. What is disturbing, however, is the fact that the presence of the variable w in the logical structure of (3) is systematically obliterated by the manner in which the sentence is symbolized in modern logical literature. It is an almost universal practice to symbolize (3) in the manner 'PV' or '$P(V)$'. This mode of notation creates an illusion that the term 'P' applies directly to V and that the whole sentence expresses a membership statement—a statement which declares Venus to be a member of a class. And once the sentence is misparsed in this way, there seems little doubt which particular class the sentence speaks of: it seems obvious that it speaks of C—the class of individuals which enjoy the property of planethood in the actual world.

It is easy to show, however, that this analysis is wrong. The point is that (3) can be false *despite* Venus's being a member of C. For consider a possible world in which Venus fails to be a planet. In such a world (as in any world) it is true that Venus is a member of C (i.e. of the class consisting of Mercury, Venus, . . ., and Pluto), yet (3) is false. Now surely a sentence cannot be false in a state of affairs where what it says is the case. Consequently, what (3) says cannot be to the effect that Venus is a member of C (or any other class).

3. Putnam on 'about'. The thesis that predicates like 'planet', 'crow', or 'black' denote properties rather than classes is implicit in several recent semantic theories. But the authors of these theories often unnecessarily obscure the matter by saying 'class' where what they actually mean is a property. H. Putnam's attempt in [1] to explicate the subject matter of categorical statements (like 'All crows are black', 'No crow is black', etc.) is a typical case in point.

Putnam considers a first order language having a finite number of primitive monadic predicates $P_1, \ldots, P_m$ and a fixed finite domain of individuals which are named in a one-to-one fashion by constants $a_1, \ldots, a_n$. Any $m\,.\,n$-way conjunction which for any $1 \leq i \leq n$ and $1 \leq j \leq m$ contains either $P_j(a_i)$ or $\bar{P}_j(a_i)$ but not both is said to be a *state description*. E.g. if $m = 2$ and $n = 3$

$$(\mathrm{S}_0) \qquad P_1(a_1)\bar{P}_1(a_2)P_1(a_3)P_2(a_1)P_2(a_2)\bar{P}_2(a_3)$$

is a state description. Each state description represents in an obvious manner one of the 2^{mn} possible worlds allowed for by the language.

Here is Putnam's crucial proposal.

(D1) *What a state description S says about a class C* is defined as follows: a state description S may imply that the individuals designated by certain a_i are *not* in C, in each case count $\bar{C}(a_i)$ as "information about C"; it may imply that the individuals designated by certain a_i *are* in C, in each such case count $C(a_i)$ as "information about C"; and, in addition, every atomic or negated atomic constituent of S containing an a_i designating a member of C is to be counted as "information about C." Moreover, the sentence

$$(4) \qquad C(a_{i_1})C(a_{i_2})\ldots C(a_{i_k})\bar{C}(a_{j_1})\ldots\bar{C}(a_{j_p}) \\ P_{11}(a_{i_1})\ldots P_{1m}(a_{i_1})\ldots P_{k1}(a_{i_k})\ldots P_{km}(a_{i_k})$$

(where $a_{i_1}, \ldots, a_{i_k}$ are all the individuals a_i such that $C(a_i)$ follows from the state description S, $a_{j_1}, \ldots, a_{j_p}$ are all the individuals a_j such that $\bar{C}(a_j)$ follows from S, and P_{l_j} is the j^{th} atomic predicate or negated atomic predicate which is such that $P_{i_j}(a_{i_1})$ follows from S) is said to *express what S says about C.*[1]

On the face of it, Putnam seems to take it for granted that sentences of the language under consideration speak of classes: definition (D1), taken literally, is of what S says about a class. But closer examination of the definition makes one wonder.

The logical purist will be quick to point out that Putnam's definition sins against the use/mention distinction. In the definiendum, the symbol 'C' is clearly used to denote an unspecified *class*. In (4) and the legend attached to it, on the other hand, the symbol is mentioned: for here what are spoken of are formulas having that symbol as a component part.

But sloppiness of this sort is often quite innocuous and easy to remove. To lay the use/mention purist's qualms at rest let us understand Putnam's definition as saying, strictly speaking, this: In order to obtain a formula expressing what S says about a given class, one picks an arbitrary (atomic or compound) predicate C which has the class as its extension; (4) then expresses what S says about that class.

But there is a snag in this. Considering that a predicate may take different extensions in different worlds it does not quite make sense to require that the given class be the extension of C, period. The requirement must be, rather, that the given class be the extension of *C in a specific world.* The question arises which particular world should this be in our case?

One answer that might suggest itself is this: the world in question is the actual one. In other words, it might be thought that (D1) is to be understood thus: to obtain a formula which expresses what S says about the given class, one takes a predicate C whose *actual* extension is that class and constructs (4).

Construed in this way, however, (D1) is simply incorrect, since what it defines S to say about a given class depends on the choice of the predicate C. To see this, suppose the given class has a_1 as its only member and the actual world is the one represented by the state description

$$P_1(a_1)\bar{P}_1(a_2)\bar{P}_1(a_3)P_2(a_1)P_2(a_2)P_2(a_3).$$

Now let us try to determine what S_0 says about that class. Since clearly both P_1 and P_1P_2 (i.e. the conjunction of P_1 and P_2) have $\{a_1\}$ as their actual extension, either can be plugged in as C in the schema (4). According as we choose P_1 or P_1P_2, we obtain either

$$P_1(a_1)P_1(a_3)\bar{P}_1(a_2)P_1(a_1)P_2(a_1)P_1(a_3)\bar{P}_2(a_3)$$

or

$$P_1P_2(a_1)\overline{P_1P_2}(a_2)\overline{P_1P_2}(a_3)P_1(a_1)P_2(a_1).$$

These two formulas are far from equivalent. Hence, if the above construal of (D1) was the intended one, Putnam's proposal would be logically unsound.

[1] (D1) is not a word by word quotation but a very close paraphrase of Putnam's definition as it appears on pp. 126–127 of [3]. The latter contains a number of minor misprints and notational inconsistencies which are corrected in (D1).

But surely Putnam can be trusted to know a logically defective definition when he sees one. Putnam is hardly guilty of a primitive error of this sort and consequently the way we have tentatively construed his definition above can hardly be faithful to his intentions. Let us then try again.

There is a very simple way of making everything fall into place: by understanding Putnam to be defining what a state description says, not about a class (i.e. a collection of individuals) but about a *property* (i.e. a function taking possible worlds to classes). If in (D1) we take the term 'class' to mean property, the use/mention purist's objection is easily disposed of. For the definition is then naturally understood as saying this: in order to obtain a formula expressing what S says about a given property, one picks an arbitrary (atomic or compound) predicate C which has the same extension as that property in every possible world, and constructs (4). Admittedly, there may still be more than one predicate satisfying this requirement. But any two such predicates will be logically equivalent and so will be the formulas obtained by plugging the predicates in the schema (4). The choice between the two predicates is thus completely immaterial, and the definition is logically impeccable.

In some places Putnam unmistakably uses the term 'class' to speak about a property. For instance, he states that "a class may have different *size* in different 'possible worlds'" ([3], p. 126). This statement would be patently wrong if Putnam adhered to the standard practice of using the term 'class' to mean simply a collection of objects. For any collection has clearly a unique size (cardinality) and is numerically distinct from any collection of a different size. So Putnam must be referring not to a collection but to a function taking possible worlds to collections. His statement is clearly to be understood as saying that such a function may take different possible worlds to collections of different sizes.

If so, then—using the standard terminology—Putnam's underlying assumption seems to be that categorical statements speak about properties, not classes. And this, of course, is a perfectly natural assumption to make. It is indeed in full accordance with our intuition to say that the sentence 'All crows are black' treats of two properties, that of being a crow and that of being black. For what the sentence says is that nothing has the former property without also having the latter. Nothing is being said of any *class*.

It thus appears as if the whole confusion over (D1) was due simply to the fact that Putnam deviates from established usage by saying 'class' where what he means is a property. Yet a closer examination of Putnam's theory reveals that what is involved is far from a mere terminological idiosyncracy.

Let us look at (D1) again. Granted that the definiendum is what a state description S says about a *property*, the definition, though logically correct, seems distinctly counterintuitive. One would expect that what S_0 says about the property P_1 is no more and no less than that a_1 and a_3 have the property and that a_2 lacks it. That a_1 has P_2, on the other hand, is naturally classified as information about P_2, not about P_1. Yet Putnam earmarks this information as information about P_1.

This counterintuitiveness of Putnam's basic concept reappears and is amplified in some of his further concepts, especially in that of the amount of information an arbitrary sentence gives about a property. The definition is as follows.

(D2) Let S be any sentence. Then *the corresponding sentence* T_C is obtained by (1) finding a disjunction of state descriptions which is equivalent to S; and (2) replacing each state description in the disjunction by a sentence which expresses what that state description says about C [see (D1)].

We now state:

Let S and T_C be related as just described. Then, the amount of information S gives about $C =_{\mathrm{df}}$ the amount of information of T_C

(where the amount of information of a sentence is understood to be $\log_2$ of the total number of states of affairs minus $\log_2$ of the number of states of affairs in which the sentence comes out true).

To see how counterintuitive this definition is, let us consider the following example. It is natural to expect the amount of information sentence $P_1(a_1)$ gives about the property P_1 to be the same as the amount of information sentence $P_1(a_1)P_2(a_2)$ gives about P_1. For suppose that P_1 and P_2 are the respective properties of being a swan and of being black. Imagine that the only piece of information I possess is that a_1 is a swan, i.e. $P_1(a_1)$. Imagine furthermore that subsequently I acquire an additional piece of information to the effect that some other individual, a_2, is black, i.e. $P_2(a_2)$. It would be absurd to maintain that this additional piece of information will enhance my knowledge regarding swanhood. Yet this is exactly what happens according to (D2). A simple calculation reveals that on (D2), the amount of information $P_1(a_1)P_2(a_2)$ gives about P_1 (namely, 3-$\log_2 3$) strictly exceeds the amount of information $P_1(a_1)$ gives about P_1 (namely, 1).

For a yet more striking example, consider $P_1(a_1)$ and $P_2(a_1)P_2(a_2)P_3(a_1)P_3(a_2)$. On (D2), the amounts of information the two sentences give about P_1 are, respectively, 1 and 3-$\log_2 3$. Thus, taking P_1 again to be swanhood, we obtain the perplexing result that a sentence, which says of a definite object that it is a swan, gives strictly *less* information about swanhood than does a sentence where the property is not even mentioned!

It is not difficult to see that the fault lies with Putnam's basic definition (D1). As pointed out above, it is a mistake to hold that what a state description says about a property goes beyond the information it gives on the distribution of that property through the universe of discourse. There is, for instance, no reason to think that $P_2(a_1)$ is part of what S_0 says about P_1.

I can think of only one way to explain Putnam's error: by assuming that his irregular use of the term 'class' is not a gratuitous terminological eccentricity, but a symptom of the fact that the author does indeed think of sentences like S_0 as statements about collections. For only if one thinks of S_0 as speaking (*inter alia*) of the class $\{a_1,a_3\}$, may one be tempted to maintain that what S_0 says about P_1 is not just $P_1(a_1)P_1(a_3)\bar{P}_1(a_2)$, but also whatever else S_0 says about the two members of the class, a_1 and a_3.

The meaning of Putnam's term 'class' thus seems to vacillate between 'collection' and 'property' and the author does not seem to realize that his definitions only make sense if the term is understood in the latter sense. A neglect of the distinction between classes and properties has led to a theory which is not only philosophically objectionable, but also materially inadequate.

4. Individuals and individuals-in-intension. The reason why sentence (1) cannot be about the planet Venus is parallel to the reason why (3) cannot be about the class {Mercury, Venus, . . ., Pluto}. Those who hold that (1) does treat of Venus, the celestial body, will probably agree with one another that what (1) *says* about the celestial body is (may be *inter alia*) that it is a planet. It is easily seen, however, that (1) might be true *without* that body's being a planet. For consider a world in which Mars instead of Venus is the brightest celestial body one can see in the morning sky and in which Venus fails to be a planet. Clearly there are possible worlds of this sort. But in any such world, (1) comes out true. Surely a sentence cannot come out true in a state of affairs where what it says is not the case. Hence what (1) says cannot be to the effect that Venus is a planet.

As above, let P be the property of being a planet and M the individual-in-intension associated with the term 'the morning star'. M is thus a function which takes each possible world to the individual (if any) which is the morning star in that world. (1) is clearly true in a world W just in case the morning star of that world, i.e. MW, is in the extension of P in W, i.e. in PW. Thus the truth value of (1) in W is $[PW][MW]$, and the proposition denoted by (1) can be constructed as

(1a) $\lambda w \,.\, [Pw][Mw]$,

where w ranges over possible worlds.

I submit that (1a) is the logical structure of (1). It differs substantially from the logical structure of (3), which, as we have seen, takes the form (3a). Whereas (3a) contains an individual term, V, (1a) contains no such term. (3) treats of an individual-in-intension and a property: it treats of no individual.

The fact that in (1a) M is applied to a bound variable w is ill-reflected in the syntax of the corresponding ordinary language sentence (1). The surface structures of (1) and (3) obliterate the vast difference between their logical structures (1a) and (3a). And the sloppiness of the ordinary language idiom is codified by the prevalent practice of symbolizing (1) and (3) uniformly as '$P(M)$' and '$P(V)$'. An illusion is thus created that (1), just as (3), attributes P to a specific individual.

This erroneous analysis of (1) will probably be defended in the following way. Planets, it will be said, are individuals, not functions. Hence given that (1) is true, it must attribute planethood to an individual, rather than to a function M, as suggested above.

This, however is like saying that the sentence 'sin 30° is less than 1' cannot be about the sine function because a function is not the sort of entity that may be less than 1. What has been suggested above is not the absurdity that (1) attributes planethood to the function M itself. On our analysis, (1) says this: the actual value of M—whichever individual this may be—is a planet. (1) ascribes planethood to the actual value of M leaving it open which particular individual it is, hence without *mentioning* any particular individual. (1) says that the actual value of M

falls within the class of actual planets. But for this to be the case, no *particular* individual needs to be a planet. For all (1) says, *any* individual may be the actual value of M.

5. Goodman on 'about'. What has been advocated in the foregoing section can be succinctly stated thus: a definitely descriptive term (like 'the morning star' or 'the tallest spy') does not denote the object which happens to answer the description but rather the function associating with each possible world the object which answers the description in that world. A sentence containing the term conveys information about this latter function rather than about the value the function takes in the actual world.

Any definitely descriptive term can be put into the form 'the unique x such that x is a ϕ', which is customarily abbreviated to '$(\iota x)\phi x$'. Hence, part of what has been argued for above can be stated thus: a sentence containing '$(\iota x)\phi x$' is not about the unique object (if there be such) which actually happens to be a ϕ.

The unqualified opposite view, namely the thesis that

(D3) a sentence containing essentially a definite description is about the object which actually happens to answer the description,

is well known to be untenable. For in conjunction with the natural requirement that logically equivalent sentences have the same subject matter, (D3) yields the absurd conclusion that every sentence is about everything. To see this, let us consider an arbitrary sentence S and show that, on (D3), S is about Chicago, the American city. First assume that S is true. S is logically equivalent to

(5) $\text{Chicago} = (\iota x) \,.\, (x = \text{Chicago} \;\&\; S) \vee (x = \text{Dallas} \;\&\; \bar{S}).$

Note that the right-hand side of (5) constitutes an essential occurrence of a definite description fitting Chicago. Now consider the case where S is false. S is logically equivalent to

(6) $\text{Dallas} = (\iota x) \,.\, (x = \text{Dallas} \;\&\; S) \vee (x = \text{Chicago} \;\&\; \bar{S}).$

Note that the right-hand side of (6) constitutes an essential occurrence of a definite description fitting Chicago. Thus in either case, S is logically equivalent to a sentence which, according to (D3), is about Chicago.

There exists, however, a theory of 'about' which preserves the underlying idea of (D3) but precludes the simple counterargument just given. The theory was proposed by N. Goodman:

(D4) Let us say that a statement T follows from S differentially with respect to k if T contains an expression designating k and follows logically from S, while no generalization of T with respect to any part of that expression also follows logically from S. Then ... S is *absolutely about* k if and only if some statement T follows from S differentially with respect to k. ([1], p. 7)

On (D4), sentence (6), for instance, no longer qualifies as evidence that S is about Chicago, despite the fact that it follows logically from S and contains an expression designating Chicago. For the generalization

$$(\forall y) \,.\, y = (\imath x) \,.\, (x = y \;\&\; S) \vee (x = \text{Chicago} \;\&\; S)$$

of (6) with respect to 'Dallas' also follows from S.

Goodman's requirement that T be generalizable with respect to no *part* of the expression designating k seems to me intuitively rather undermotivated. But credit is due to it for ingeniously barring simple counterexamples. The counterexample which follows is, as a result, somewhat involved.

What we are going to show is that on (D4) the sentence 'Chicago is a city' is not only about Chicago, but also about Dallas and any other city on the globe.

To begin with, let us consider the class L of terrestrial coordinates with integral values of degrees and minutes. L is thus a finite class of items like $\langle 30.58 \text{ N } 49.01 \text{ E}\rangle$, $\langle 68.64 \text{ S } 172.12 \text{ W}\rangle$, etc. Each city t is geographically located at a unique element—call it $l(t)$—of L. For instance, $l(\text{Chicago}) = \langle 41.50 \text{ N } 87.45 \text{ W}\rangle$.

Let us fix a linear ordering $<$ of L, say the lexicographical one. Thus for any two members a and b of L, we have $a < b$ or $b < a$. Now we define three binary relations as follows:

$$x <^{*} y \equiv_{\mathrm{df}} C(x) \;\&\; C(y) \;\&\; x \neq y \;\&\; l(x) < l(y) \;\&\; -(\exists z)[C(z) \;\&\; l(x) < l(z) < l(y)]$$

(where C is the predicate 'is a city'),

$$R_{\mathrm{F}}(x,y) \equiv_{\mathrm{df}} x <^{*} y \vee [x = y \;\&\; -(\exists z) x <^{*} z],$$
$$R_{\mathrm{B}}(x,y) \equiv_{\mathrm{df}} y <^{*} x \vee [x = y \;\&\; -(\exists z) x <^{*} z].$$

Now consider an arbitrary city Y other than Chicago. We shall show that according to (D4),

(7) $C(\text{Chicago})$

is about Y.

Case 1: $l(\text{Chicago}) < l(Y)$. It is easy to see that there are cities $x_1, x_2, \ldots, x_n$ such that Y (as a value of y) satisfies

(Φ) $R_{\mathrm{F}}(\text{Chicago}, x_1) \;\&\; R_{\mathrm{F}}(x_1,x_2) \;\&\; \ldots \;\&\; R_{\mathrm{F}}(x_{n-1},x_n) \;\&\; R_{\mathrm{F}}(x_n,y)$.

Moreover, for no city y other than Y it is possible to find $x_1, \ldots, x_n$ satisfying Φ. In consequence, the term

(Φ^*) $(\imath y)(\exists x_1)(\exists x_2) \ldots (\exists x_n)\Phi$

designates Y.

It is not difficult to show that

(8) $(\exists z) R_{\mathrm{F}}(\Phi^*, z)$

follows logically from (7). Moreover, observe that 'R_{F}', 'Chicago', and Φ^* itself are the only components of Φ^* generalizable upon in (8). Writing $\Phi^*(R_F, \text{Chicago})$ for Φ^*, the three generalizations take the respective forms

$$(\forall r)(\exists z)r(\Phi^*(r,\text{Chicago}),z),$$
$$(\forall u)(\exists z)R_F(\Phi^*(R_F,u),z), \text{ and,}$$
$$(\forall f)(\exists z)R_F(f,z).$$

But none of these follows logically from (7). Thus (8) follows from (7) differentially with respect to Y.

Case 2: $l(Y) < l(\text{Chicago})$. We get a parallel result by using R_B in lieu of R_F.

In either case, (7) is absolutely about the arbitrary city Y.

Thus, although it is more tedious to demonstrate it, (D4) fares no better than (D3).

6. Actuality. All the fallacies concerning the referents of descriptive terms like 'planet', 'the number of planets', 'the morning star', etc. spring from a common source: a subtle error concerning the nature of actuality. The error is most conveniently diagnosed in connection with terms like 'planet' and 'red'; but the diagnosis carries easily over to terms of other categories.

It has become a stock item of conventional philosophical wisdom to hold that a collection of objects can be specified in two different ways. One can specify the *elements*, i.e. to stipulate in regard of each individual whether it belongs to the collection or not. Alternatively, it is held, one can specify a *property* and stipulate that the class in question is the one formed by all, and only, the individuals which instantiate that property.

In the English language the term 'red' is obviously associated with a property, namely the property of being red. Now if it were true that this property determines a unique collection, it would be only natural to hold that someone who utters the term 'red' employs the property to refer to the collection specified by the property. It would be natural to hold that 'red' denotes the collection while the property itself has only to do with the peculiar *manner* in which 'red' denotes the collection.

But is it true that by specifying a property one specifies a class? Let us observe that it would be ridiculous to maintain that one can specify a number by specifying a function which takes that number as one of its values. 0.5, for instance, is not specified by saying that it is in the range of the sine function. To specify a number by way of a function one must cite, besides the function itself, a definite argument. Thus 0.5 can be specified as the value of sine *at 30 degrees*. A property, we know, is a function mapping possible worlds into classes. Hence to specify a class by way of a property one must cite, besides the property itself, a definite world. Thus where W is a definite world, a class can be specified as the class of individuals which are red *in the world* W.

Thus far almost everybody will agree. "Yes," it will be said, "in specifying a class through a property one must, strictly speaking, also specify a world. But there is no difficulty here. For it is obviously understood that the requisite world is the *actual* one, the one which actually obtains."

But which particular world *is* the actual one? Do we know? To determine which one of the vast range of conceivable worlds is actualized seems to be the ultimate object of science. Whether this object is attainable or not, we can rest assured that it has not been attained yet. All we have (hopefully) achieved so far is to set some of the worlds aside as definitely nonactual. But of those that remain *any*—for all we know—may be the actual one.

It is easy to see that knowing which possible world is actualized is tantamount to omniscience. For someone who knows the identity of the actual world can readily determine the actual truth value of any given proposition (i.e. a function from possible worlds to truth values) by simply taking the value of the proposition at that world. Now this is certainly not a position we can assume ourselves to be in. But then we must concede that we do not know which world is actual.

It follows that someone who speaks of the extension of redness in the actual world specifies no particular class: he has cited a property, but no particular world. Unless, of course, we allow for the absurdity of someone citing an item without having the faintest idea which item he cites.

This absurdity is commonly condoned. One is committed to it whenever one treats the term 'the actual world' as a name of a world. For if the term denoted the world which happens to be actual, then whoever uttered, say, the sentence

(9) Venus is a planet in the actual world

simply could not know what he was talking about. He would mention a world, being in no position to find out which one. Yet (9) is clearly tantamount to (3), whose subject matter is plagued with no elusive element of this sort.

The truth of the matter is that 'the actual world' is not a name of a particular world any more than 'the morning star' is a name of a planet. Rather than a world, the actual world is something that this, that, or the other world may *be*: it is a *status* which worlds may enjoy. The actual world, in other words, is a world-in-intension, i.e. a function, call it '@', taking possible worlds to possible worlds. The value of @ at a world W is the world which is actual in W. And it is easy enough to see which world is actual in a given world W: W itself. @ is thus seen to be the identity function defined on the family of possible worlds. And this function—something we are perfectly familiar with—is what the term 'the actual world' stands for. Thus it is that when uttering (9) we know perfectly well what we are talking about. And thus it is that (9) is tantamount to (3). For (9) is clearly true in a world W if Venus, V, belongs to the extension of planethood, P, in the world which is actual in W, i.e. in $@W$. This extension is clearly $P[@W]$, so the truth value of (9) in W is $[P[@W]]V$. Thus the proposition denoted by (9) can be constructed as

(9a) $\lambda w \,.\, [P[@w]]V.$

But since @ is an identity function, (9a) is the same proposition as (3a), which we have seen to be the proposition denoted by (3).

Unfortunately, the misconstrual of the term 'the actual world' as a name of a world is fostered by many possible-world semanticists. The most notable example of this attitude is David Lewis's theory of actuality expounded in [2]. Lewis treats the term 'the actual world' as just another indexical term:

> I suggest that "actual" and its cognates should be analyzed as *indexical* terms: terms whose reference varies, depending on the relevant features of the context of utterance. The relevant features of context, for the term "actual," is the world at which a given utterance occurs. According to the indexical analysis I propose, "actual" ... refers at any world w to the world w. ... "Actual" is analogous also to "here," "I," "you," "this," and "aforementioned"—indexical terms depending for their reference respectively on the place, the speaker, the intended audience, the speaker's acts of pointing, and the foregoing discourse. ([2], pp. 184–185)

Yet there seems a world of difference between 'this', 'now', 'here', 'I', 'you' and the like on the one hand, and 'the actual world' on the other. By pointing his index finger at an object and saying 'this', a speaker directly selects a definite item in his environment and makes it perfectly clear to himself and to his audience precisely *which* particular item is being spoken of. The same goes for 'I', 'now' and other indexical terms. By saying 'the actual world', on the other hand, one is not selecting a particular world. What one directly brings up for consideration is a certain idiosyncratic *feature*—actuality. This feature is bound to be had by some world or other but one leaves it, as it were, to the hard facts to decide which particular world it is. In this, 'the actual world' is rather like 'the tallest spy'. By saying 'the tallest spy' one is not selecting a particular person. What one directly brings up for consideration is a certain feature—that of being a spy taller than all other spies. This feature is, in all likelihood, had by a unique person, but one leaves it to the facts to decide which particular person it is. But terms like 'the tallest spy' are invariably classified as nonindexical.[2]

It is also palpably counterintuitive to count the identity of the possible world in which an utterance is made among the contextual features relevant to that utterance. For contextual features are those aspects of the circumstances in which an utterance is made which partly determine the *force* of the utterance, i.e. *what is being said.* Typically, such features are (a) ascertainable by all parties to a successful communication, and (b) determinative only of the *content* of a communication, not of its truth value. The identity of the actual world meets neither of the two conditions. As for (a), we know that, barring omniscience, the actual world is known neither to the speaker nor to his audience. And as for (b), if one knew the identity of the actual world, one would not only know what has been said, one would *ipso facto* know as well whether what has been said (or indeed any other proposition) is true or false.

If the knowledge of the actual world was one of the preconditions of grasping the message carried by an utterance, communication would be pointless. For if

[2] Incidentally, it is difficult to see why terms like 'the tallest spy' do not figure among Lewis's paradigms of indexical terms. It seems that on his view, the term 'the tallest spy' refers to one person or another depending on the world at which it is uttered. And this, according to the above quotation, is enough for a term to be an indexical one.

one did not possess that knowledge, the message would escape him. And if one did possess it, the message could not enlighten him.[3]

[3] The author is indebted to Martin Frické for a number of helpful suggestions.

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