Levels of intension and theories of reference

INGVAR JOHANSSON

THERE is today in Anglo-American philosophy a division of theories of reference into two major classes: traditional ones and causal ones. According to the traditional theories, a general term or name refers to whatever fits the characteristics the term or name means. Such theories rely on an intension/extension distinction, and maintain that intension determines extension. Saul Kripke, Hilary Putnam and others have challenged this idea, and argued that names and nouns designating natural kinds have no intension and consequently must have their referring function explained in some other way. Reference, they say, is established by a causal chain rather than by associated descriptions. These new causal theories of reference are, to quote S. P. Schwartz's meritorious introduction to them: "the most serious challenge ever to traditional theories of meaning and has important implications for other areas of philosophy." ([6], p. 13)

In this paper I shall argue (1) that both the traditional theories and the new causal theories of reference has a false assumption in common, (2) that there is a third and unexplored kind of theory, and (3) that this third alternative is more reasonable, especially since it is consistent with the *prima facie* plausibility of the view that intension determines extension. If the causal theories of reference have important implications for other areas of philosophy, this, in my opinion, is even more true of the third kind of theory that I am going to put forward. However, with one exception, I shall not pursue these implications here. The exception concerns Thomas Kuhn's so-called incommensurability thesis.

Both the traditional and the causal theories referred to, take it for granted that *unambigous* terms have, if they have an intension at all, exactly *one* intension. It must be noted that this *one* intension can contain parts. A conjuction of unambigous terms is a new unambigous term with *one* intension; the term 'being blue and round' has like the terms 'being blue' and 'being round' one intension. Another way of phrasing this point is to say that the aforementioned theories presuppose that there is only *one level* of meaning. Schwartz summarizes what I have in mind in the following way:

"The central feature, then, of what is here meant by a traditional theory of meaning are the following: (1) Each meaningful term has some meaning, concept, intension, or cluster of features associated with it. It is this meaning that is known or present to the mind when the term is understood." ([6], p. 15)

It may look like a tautology to say that unambigous terms have exactly one intension. But it is not a tautology. One way to get rid of the appearance of obviousness is to notice that terms can have presuppositions .

When, in a natural language, we use a definite description like 'The King of France', we do *not say* but we *presuppose* that there is a king of France. In this sense I regard the usual Strawsonian analysis as correct. But there is another presupposition as well. We presuppose but do not say that the king of France is a person. And like the ordinary intension this other presupposition exists in our language. The same remark also applies to general terms. To take the most obvious example: The term 'yellow' means a disjunction of yellow colour hues, i.e. "yellow", but the term also indicates or *presupposes* the concepts of "colour" and "property". In the same way the term 'table' means "table" and presupposes "usable thing" and "material thing"; the term 'gold' means "gold" and presupposes "material thing" and "element"; and so on.

The distinction now being made is obviously a distinction between two kinds of intension. I shall label them 'explicit intension' and 'implicit intension', respectively. But the distinction is also a distinction between *levels of intension* , since the explicit and implicit intensions can not be regarded as glued together by conjunction or disjunction into one single intension. According to this analysis, an unambigous general term has *at least two levels of intension*; or, for short, two intensions. Not *one* as has hitherto been falsely assumed by many philosophers. Later on I shall argue that there can be more than two intensions, but to begin with I shall discuss examples where only two are involved. In these cases one intension is explicit and the other implicit.

What I am saying is in harmony with the Whorf-Sapir hypothesis, i.e. the view that different natural languages can contain different abstract categories and different metaphysical systems. This notion of containment can, I think, be analyzed with the help of the notion of 'implicit intension'.

Having two intensions instead of one might seem to make no difference with regard to the view that intension determines extension. In one sense this is true, and indeed I shall argue that both the explicit and the implicit intensions determine their own respective extensions. In another sense, however it does make a difference. Having two levels of intension makes it possible to solve what might be called the 'Putnam Problem' and the 'Kripke Problem'. I am not going to discuss in any detail Putnam's and Kripke's analyses, but instead try to show that my 'double' or 'multiple' intension-determines-extension thesis enables me to handle the kind of situations which Putnam and Kripke think implies a rejection of the view that intension determines extension.

The Problem of Scientific Realism

Putnam has written much about the meaning of 'meaning' but his real concern, I think, was that of defending scientific realism. He has taken seriously the fact that there are not only epistemological arguments in favour of relativism, but a lot of semantical arguments as well. It is the latter ones he is - or, at least: was - combatting. He wanted to show that it is possible to talk about truth and progress. In particular he wanted to defend as literally true the way of speaking in which we say that science has discovered that water consists of hydrogen and oxygen. The alternative way of speaking is to say that once upon a time we had a term 'water' with an intension which was such that the extension of the term was determined by means of visible and tangible properties, but, that, later on, we found it convenient to replace this term with another term having an intension which delimits water by means of molecular properties. According to this latter view scientists do not make discoveries, they merely change general terms. The reasons

they have for changing terms have to do with fashion, the *Zeitgeist*, or are of a pragmatic nature. If intensions determine their extensions, the relativist and pragmatic way of speaking might seem to be the true one. In both cases a kind of linguistic idealism replaces scientific realism. Scientific discoveries are reduced to changes of language.

The first thing to remember is that the intension-determines-extension thesis has abstracted epistemology away. The thesis says that a term which is *correctly* applied yields the extension of the term. If, for instance, I take a thing which is in fact green to be blue, this in no way affects the thesis that the intension of 'blue' determines its extension. I just made a mistake when applying the term, and my slip is disregarded in the context at hand.

Now, let us take a look at some examples. I shall start by commenting upon the *discoveries* that whales are not fish and that phlogiston does not exist. Then, after making some remarks with regard to Kripke's rigid designators, I shall discuss Putnam's wellknown water example.

If, looking at the whales-fish example, we take into account both an explicit and an implicit intension, the two concepts of fish should be analyzed in something like the following way:

'fish $_1$':
       explicit intension: "living wholly in water, moving only by swimming"

       implicit intension: "natural kind *fish*"

'fish $_2$':
       explicit intension: "cold-blooded, living wholly in water, moving only by swimming, do not feed their young with milk from the breast"
       implicit intension: "natural kind *fish*"

If we consider *only* the explicit intensions, it then appears quite tree to say that we first had a term which *correctly* applies to whales, and that this term was exchanged for a term which *correctly* does not apply to whales. With regard to the implicit intensions, however, things are a bit different. The implicit intension of 'fish $_1$' is exactly the same implicit intension as that of 'fish $_2$', and this intension can *never* have been *correctly* applied to whales. Intension determines extension, and whales do not belong to the extension. If we consider concrete uses of language then we must say that as far as explicit intensions were concerned, no one failed to refer. But with respect to the implicit intension, failure of reference was normal for a long time. And, as this implicit intension is an intension of both the term 'fish $_1$' and the term 'fish $_2$' it is true to say without reservations that whales are not fish. It doesn't matter whether we use 'fish $_1$' or 'fish $_2$' or just 'fish'. Whales are not fish, and we have discovered that in about the same way in which we can discover that something which we thought was blue actually is green.

The structure of this analysis can be transferred to many similar cases, but I shall merely sketch the case of phlogiston. When historians of science say, today, that it was discoverd at the end of the 18th century that phlogiston does not exist, we may well wonder how those scientists who believed in phlogiston managed both to perform and to communicate the results of experiments with this non-existing stuff. The outline of my answer is simple. The term 'phlogiston' had an explicit, although very vague, intension which made it possible to describe really occurring processes as processes involving phlogiston. A historian of chemistry might be able to grasp this

intension. On the other hand 'phlogiston' had an implicit intension: "element", or perhaps "substantial form" in the Aristotelian sense. The explicit intension was probably correctly applied most of the times, whereas the implicit intension never was correctly applied. Thus, it is correct to say that science has discovered that phlogiston does not exist.

The case of phlogiston might be hard to understand because the explicit intension has left our language. There are, however, similar examples where this has not yet happened. Think of the old Hippocratic theory of the four humours, implying that there are four fundamental psychological characters: melancholics, cholerics, phlegmatics and sanguines. We do not today believe, that there are such characters in the full Hippocratic sense. Psychology has *discovered* that. In spite of this, however, we can and sometimes actually do use the terms in question. I would say that we now use the terms with *only* explicit intensions.

The Kripke Problem

Kripke's problem in contrast to that of Putnam is primarily a problem of language analysis, not the problem of scientific realism. His intuition is that proper names are able to refer independently of identifying descriptions, but this intuition clashes with the common theories of reference which make names dependent on such descriptions. Now, if his intuition is correct, it should be possible to maintain that a name can name a specific individual in all possible worlds. The name becomes a rigid designator.[1]

My position differs both from that of Kripke and from the positions he is criticizing. In my view, names can be proper names without having identifying descriptions in the sense of an *explicit* intension. They can not, however, be names without having an *implicit* intension.[2] If we let an arrow represent pure reference, i.e. reference without intension, my analysis looks as follows:

'Jack':
        explicit intension: "$\rightarrow$"

        limplicit intension: "male human being"

A male human being can in principle have an infinite number of different properties, states and dispositions. Consequently, it may look as if a name like 'Jack' contained no identifying descriptions at all. In the strict sense, however, there is an identifying description even if it is a very abstract one, i.e. "male human being." I do not think that a name can function as a name unless it is related to at least some such abstract category. Even the terms 'this' and 'that' have to be connected with some category if they are going to pick out something in the world. Otherwise, they just say that *something* exists, and that is not enough for referring to anything specific, neither a particular nor a universal.

On the other hand, the kind of pure reference or 'zero' explicit intension which I have symbolized with "$\rightarrow$", is always necessary when one talks about a particular in contradistinction to a universal. In the section on 'The Problem of Scientific Realism' above, such arrows were not needed because the discussion was not concerned with particulars. These arrows contain what I regard as the grain of truth in Kripke's analysis of names. They symbolize that names can not be

reduced to intensions. What is wrong in Kripke's analysis is that he believes that "→" can function without any intension at all connected to it.[3]

In one sense Kripke comes very close to my distinction between ('zero') explicit intension and implicit intension. He makes a distinction between a 'name' and a 'description used to fix its reference' ([6], p. 93). In order to baptise someone as 'Jack' it might be necessary to add 'this male human being'. Otherwise the audience perhaps picks out an individual which is not intended; let's say his twin sister. We can sketch Kripke's view in the following way:

names: "→"

'Jack':

description used to fix the reference: "male human being"

According to Kripke, the description which fixes the reference is merely contingently attached to the name. This, he argues, is shown by facts such as the following (this specific example is mine). Assume a pair of twins are to be baptised, one is a boy and one is a girl. The priest is told that the male child should be called 'Jack', but when the ceremony is over one discovers a fatal mistake. It is the girl who has been baptised 'Jack'. When the mistake is discovered, it is linguistically correct to exclaim: 'Oh, look, Jack is the girl!' In spite of the fact that the reference is fixed by the intension "male human being", this intension is overruled by the referent.

So far I am in agreement, but such examples merely show that no specific identifying description or implicit intension may be necessary for the name's functioning as a name. It does not prove that all intensions are collectively superfluous. The situation described should be analysed as follows. First of all, it should be noted that there is more than one implicit intension at work. I think the minimum schema needed is the following:

('zero') explicit intension: "→"

'Jack':   implicit intension $_1$: "male human being"
implicit intension $_2$: "one spatio-temporally localizable object which can preserve its identity through time"

The second implicit intension is no more able in itself to pick out an object at a particular place at a particular time than is the first. Baptizing is a procedure which requires some kind of space time-coordinates, and so the kind of reference the arrow symbolizes is needed. But there is also a dependence going in the other direction. The arrow needs not any specific intension but *some* intension in order to work. It is the implicit intension$_2$ which makes it possible to override the implicit intension$_1$ of 'Jack'. If one did not presuppose that by 'Jack' one has baptized something which preserves its identity through time, one could not possibly say that one had discovered that Jack is a female. The conclusion to be drawn is that each intension (or identifying description) can in principle be suspended by 'the arrow' and *another*, more fundamental intension of the name, but not that all intensions can be so suspended. The fundamental intension even has the predominant role in determining the extension of the name, and so it is very misleading to take the irreducibility of "→" as something which contradicts the intension-determines-extension thesis.

Having recourse to the implicit intension$_2$ also makes it possible to do away with the causal theories of reference. It is this kind of very abstract intension which accounts for the possibility of the reapplication of a name after the baptising event. In this simple way I think it is possible to believe in something like rigid designators without believing in Kripke's theory of reference. Kripke, like Putnam, is at bottom deceived by the false assumption that unambigous general terms have one intension and proper names none ([6], pp. 72f).

The Putnam Problem

We are now in a position where we can handle Putnam's own example of a natural kind term, 'water'. This example differs from both the whales-fish example and the phlogiston example. In the former case it was discovered that a supposed instance of one species is in fact an instance of a different species, and in the latter case it was discovered that a pretended natural kind does not exist at all. In the water example neither of this happens. Putnam sketches a situation where it is discovered that water can not be identified as a colourless and tasteless liquid which comes as rain and exists in rivers, lakes and oceans. It must be identified as the molecular structure H_2O. An 'underlying trait' is discovered.

In order to bring out what happens in such a situation, Putnam asks us to imagine a Twin Earth which is exactly like our Earth in all conceivable respects; even the same language are spoken ([6], pp. 120f). With one exception: water on Twin Earth does not have the molecular structure H_2O but the structure XYZ. Suppose that the molecular structure of water is discovered at the same time on both planets. Before this moment the term 'water' obviously has the same intension on both planets, but after the discovery the intensions must differ. 'Water' on Earth then means "H_2O" and 'water' on Twin Earth means "XYZ". This story, Putnam maintains, can not be accounted for if intension determines extension. To some extent I agree. The changes of intension seem to have something to do with what the term 'water' has been applied to. The two different extensions of the term 'water' seem in some way or other to determine the new intensions, "H_2O" and "XYZ", respectively. The question is whether the new intensions are determined in a way which is in conflict with the intension-determines-extension thesis.

If the kind of analysis of the 'Putnam Problem' which I offered earlier would be sufficient, then the schemas below should give the clue to the solution. 'Water' is the term used before the discoveries of the molecular properties, respectively. 'Water$_E$' is the term used afterwords on Earth, and 'water$_{TE}$' the term used afterwords on Twin Earth.

'water':
       explicit intension: "being a colourless tasteless liquid, comes as rain, exists in rivers, lakes and oceans"
       implicit intension: "natural kind *water*"

'water$_E$':
       explicit intension: "H_2O"
       implicit intension: "natural kind *water*"

explicit intension: "XYZ"
'water_{TE}':
                    limplicit intension: "natural kind *water*"

Since, as postulated, neither of the intensions above are misapplied, the schemas can not explain why the implicit intensions of 'water_E' and 'water_{TE}' must have different extensions. Even if Twin Earth was wholly left out of account, a problem would remain, namely the problem of how to explain the shift of explicit intension between 'water' and 'water_E'. Let us now look at Putnam's proposal for a solution. He says that natural kind terms function as proper names; they do not however name ordinary individuals but natural kinds. Using my schemas, Putnam's view should be symbolized by merely using the arrow for pure spatio-temporal reference, i.e.:

'water_E':   ('zero') explicit intension: "$\rightarrow$"
'water_{TE}':   ('zero') explicit intension: "$\rightarrow$"

The arrows point, right from the start to different objects, and so, according to Putnam, there is no problem in explaining why in the one case water becomes H_2O and in the other XYZ. Different properties are discovered in different objects, and the terms on Earth and Twin Earth do refer to different objects. Now, the problem here is the same as that pointed out with regard to Kripke's discussion of proper names. It is impossible to pick out something in the world if the term used has no intension at all. Merely to point, i.e. "$\rightarrow$", is not to refer. There must at least be *one* additional intension at work if a term is to refer. But in order to analyse the situation Putnam wants us to consider, *two* more intensions are needed. The following schemas give us what we need:

                    ('zero') explicit intension: "$\rightarrow$"
                    explicit intension: "being a colourless liquid, comes as rain, exists in rivers, lakes
'water':   and oceans" "natural kind *water*"
                    implicit intension: "natural kind *water*"

                    ('zero') explicit intension: "$\rightarrow$"
'water_E':   explicit intension: "H_2O"
                    implicit intension: "natural kind *water*"

                    ('zero') explicit intension: "$\rightarrow$"
'water_{TE}':   explicit intension: "XYZ"
                    implicit intension: "natural kind *water*"

Putnam says that 'water' is a name which names a natural kind, but in my view the latter fact is not a contingent fact. If 'water' is to name a natural kind this fact must in some sense be part of the name, namely as an implicit intension. The most important point to notice with regard to the schemas above, however, is that natural kinds are not ordinary properties like colour and shape. The latter *are* properties, but natural kinds *have* properties. In this respect natural kinds are more like objects than ordinary properties. And it is this similarity which in turn explains the similarity between Kripke's analysis of proper names (i.e. reference to objects) and Putnam's analysis of natural kind terms.

It is because natural kinds can *have* properties that one can make mistakes with regard to properties when using a natural kind term. It is also because of this that the explicit intension "being a colourless and tasteless liquid, comes as rain, exists in rivers, lakes and oceans" can so to say be squeezed out by the ('zero') explicit intension "→" and the implicit intension "natural kind water". The parallel to my remarks about Kripke is as obvious as it can be. It is because objects which preserve identity through time can *have* properties that one can make mistakes with regard to properties when referring to such objects. And it is also because of this that the implicit intension$_1$, "male human being", could in the 'Jack' example be overruled by the ('zero') explicit intension and the implicit intension$_2$, "one spatio-temporally localizable object which can preserve its identity through time."

Kripke and Putnam should in my opinion be given credit for highlighting the fact that there is more to terms than ordinary intension and extension (i.e. the arrow "→"), but this fact is not in conflict with the view that intension determines extension. The fact mentioned is of course in conflict with the opinion that intension *alone* can determine the extension, but I am defending the different thesis that intension always is an important and integral part of the determination. *Kripke's and Putnam's real mistake, is that they do not keep these two theses strictly apart.* And it is hard to do so if one does not accept the concept of 'implicit intensions', because then the partiality of the pure naming easily becomes regarded as completed by something which is externally and contingently attached to the name, something like Kripke's 'descriptions used to fix the reference'. Putnam brings in here a notion of 'crossworld relation', a notion which makes his whole analysis depend on a theory of possible worlds ([6], p. 129).[4]

The Kuhn Problem

In spite of much that has been written since the appearance of Kuhn's *The Structure of Scientific Revolutions*, both by Kuhn himself and by his defenders and critics, I think it is obvious that the intent behind the original incommensurability thesis is that incommensurability does not imply total *incomparability*. Richard J. Bernstein has given good arguments in favour of the truth of this intent ([1], pp. 79-93). He, however, consciously avoids problems connected with theories of meaning and reference. In my opinion, the simplest solution to the 'Kuhn Problem', i.e. the problem how to reconcile incommensurability with comparability, is to be found in a theory of meaning and reference which takes account of the distinction between explicit and implicit intension.

One of Kuhn's examples of incommensurable theories are the geocentric and the heliocentric world views. That the theories are incommensurable means, among other things, that there are real communication problems across the theory border. Kuhn writes:

"Communication across the revolutionary divide is inevitably partial. Consider, for another example, the men who called Copernicus mad because he proclaimed that the earth moved. They were not either just wrong or quite wrong. Part of what they meant by 'earth' was fixed position. Their earth, at least, could not be moved. Correspondingly, Copernicus' innovation was not simply to move the earth. Rather it was a whole new way of regarding the problems of physics

and astronomy, one that necessarily changed the meaning of both 'earth' and 'motion'." ([5], pp. 149-50).

A similar point can be made with tegard to the concept of planet. When the geocentric world view reigned supreme, 'planet' meant something like "a star that wanders". Today, it means something like "a large body moving around a star". The problem is to explain how the concepts can clash. They just seem to be different. The outline of my solution, of course, is to say that the meanings referred to are the explicit intensions in question, and that the clash is to be found at the level of implicit intension. I think an implicit intension of both concepts of planet are something like "material heavenly body" and "natural kind *planet*". We get the following schema:

'planet ₁':

      explicit intension: "a star that wanders"

      implicit intension: "material heavenly body", "natural kind *planet*"

'planet ₂':

      explicit intension: "a large body moving around a star"

      implicit intension: "material heavenly body", "natural kind *planet*"

The structure of the schema above is exactly the same as in the whales-fish example discussed when introducing the Putnam Problem. This is no accident. At bottom, the Putnam Problem and the Kuhn Probtem are one and the same. Here therefore I can afford to be rather brief. The geocentric and the heliocentric world view are *incommensurable* at the level of explicit intensions but *comparable* at the level of implicit intensions. Another way of phrasing this is to say, that at the level of explicit intensions there is meaning variance and no referential identity, but at the level of implicit intensions there is no meaning variance and referential identity (Cf. [4], pp. 127-29). Because of this it is at least possible to maintain, i.e. to *say*, that science has *discovered* that neither the moon nor the sun is a planet, even though to the modern mind it sounds like a tautology and to the medieval mind a contradiction to say that the moon and the sun are not planets. Language analysis does not imply epistemological relativism.

Concluding Comment

In the way now described, I think the distinction between explicit and implicit intension and the in troduction of levels of intension make it possible for us to be consistent and at the same time subscribe to both scientific realism, rigid designators, incommensurability and the intension-determines-extension thesis. The argument is, I think, neat and simple. In order to avoid misunderstandings, however, I want to stress that I do not believe that a term has to have just one or two implicit intensions. There may be many, and they can probably be hierarchically ordered. The kind of implicit intension I have been talking about is always abstract in relation to the term's explicit intension. But abstraction admits in most cases of degrees. Consequently, there ought to be many levels of implicit intensions. However, as I said at the beginning of this paper: I am putting forward an unexplored alternative, and not all its implications can be pursued at once.

References

[1] BERNSTEIN, R. J. *Beyond Objectivism and Relativism*. Oxford: Basic Blackwell, 1983.
[2] GALLOIS, A. "Rigid Designation and the Contingency of Identity". *Mind*, Vol. 95 (1986), pp. 57
[3] HUSSERL, E. *Logical Investigations* vol. 11. London: Routledge & Kegan Paul, 1970.
[4] JOHANSSON, I. *A Critique of Karl Popper's Methodology*. Gothenburg: Scandinavian University Books, 1975.
[5] KUHN, T. S. *The Structure of Scientific Revolutions*. Chicago and London: The University of Chicago Press, 1970.
[6] SCHWARTZ, S. P. (ed.) *Naming, Necessity, and Natural Kinds*. Ithaca and London: Cornell University Press, 1977. This anthology contains a bibliography to the whole discussion of traditional versus causal theories of reference.
[7] SMITH, A. D. "Rigidity and Scope". *Mind*, Vol. 93 (1984), pp. 177-93.
[8] STEINMAN, R. "Kripke Rigidity versus Kaplan Rigidity". *Mind*, Vol. 94 (1985), pp. 431-42.

Notes

1. The point I am going to make is intended to apply to all different kinds of rigid designators proposed, even the most rigid ones. That is the reason why I do not discuss the definitions of strong vs weak rigidity, de jure vs de facto rigidity, Kaplan vs Kripke rigidity, and unrestricted vs restricted rigidity. See e.g. the articles [7], [8], and [2]

2. A similar idea is put forward by E. Husserl, in his *Logical Investigations* ([3], pp. 495-98).

3. The arrow represents pure reference. The notion of 'pure referentiality' is also used by A.D. Smith [7]. Smith claims among other things that Kripke has failed to prove that names are (strongly) rigid designators and pure referrers. My claim is that such a proof is impossible since pure referrers are impossible.

4. I shall not try to discuss theories of possible worlds, but I would like to point out a difficulty which is peculiar to Putnam. Possible worlds seem to make up a natural kind. Natural kinds have to be named, but only what is actual can be named. Therefore: Possible worlds have to be named but cannot be named.