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Names and Natural Kind Terms

1. **Natural Kind Terms**:
   Words for kinds of things, including:

   (a) **Species**: *e.g.* 'tiger', 'penguin'

   (b) **Substances**: *e.g.* 'gold', 'beer'

   (c) **Phenomena**: *e.g.* 'heat', 'static electricity'

   They are the words which we use to helpfully answer such questions as:

   (1) What kinds of fruits are grown in the San Joaquin Valley?

   (2) What kind of stuff is that?

2. **Natural kind terms are used (and sometimes introduced) in scientific theorizing**. There is a question of the semantic bond for such terms as well. Indeed, this question has occupied philosophers of science: in virtue of what, say, does out use of 'heat' refer to a certain phenomenon in our environment (rather than, say, the psychological effects of that phenomenon on us)?
   [**BLACKBOARD**]: draw the heat cartoon.

3. **Natural kind terms are almost exactly like proper names**:

   > [M]y argument implicitly concludes that certain general terms, those for natural kinds, have a greater kinship with proper names than is generally realized. This conclusion holds for certain for various species names, whether they are count nouns, such as 'cat', 'tiger', 'chunk of gold' [!], or mass terms such as 'gold', 'water', 'iron pyrites'. It also applies to certain terms for natural phenomena, such as 'heat', 'light', 'sound', 'lightning', and, presumably elaborated [!], to corresponding adjectives – 'hot', 'loud', 'red'. (p. 134)

   The Points of Similarity:

   (a) Natural kind terms are "rigid designators". (This is not emphasized by Kripke very much, but see pp. 139, 140.) This may be motivated by the "intuitive test" for rigid designation:

(3) Something other than electricity might have been electricity

is intuitively false. (Try it for other examples of natural kind terms!)

(b) The conditions we associate with natural kind terms do not (typically) hold necessarily of the kinds to which they refer. (This is also not much emphasized by Kripke.) For example, most of us associate the property *having monetary value* with gold. But of course

(4) Gold has significant monetary value.

might have been false, and *is* false in some possible world.

(c) The conditions we associate with natural kind terms are not (typically) known *a priori* to hold of the kinds to which those terms refer. Consider

(5) Gold is a yellow metal.

> Could we discover that gold was not in fact yellow? Suppose an optical illusion were prevalent, due to peculiar properties of the atmosphere in South Africa and Russia and certain other areas where gold mines are common. Suppose there were an optical illusion which made the substance appear to be yellow; but, in fact, once the peculiar properties of the atmosphere were removed, we would see that it is actually blue. [...] Would there on this basis be an announcement in the newspapers: 'It has turned out that there is no gold. Gold does not exist. What we took to be gold is not in fact gold'? Just imagine the world financial crisis under these conditions! Here we have an undreamt of source of shakiness in the monetary system. (p. 118)

(d) Ordinary speakers can be (and sometimes are) massively misinformed about the kinds to which they refer. What are the properties ordinary speakers associate with 'gold'?

(6) Gold is the substance that's shiny, yellow, heavy, ...

> [W]e use 'gold' as a term for a certain *kind* of thing. Others have discovered this kind of thing and we have heard of it. We thus as part of a community of speakers have a certain connection between ourselves and a certain kind of thing. The kind of thing is *thought* to have certain identifying marks. Some of these marks may not really be true of gold. We might discover that we are wrong about them. Further, there might be a substance which has all the identifying marks we commonly attributed to gold and used to identify it in the first place, but which is not the same kind of thing, which is not the same substance. We could say of such a thing that though it has all the appearances we initially used to identify gold, it is not gold. Such a thing is, for example, as we well know, iron pyrites or fool's gold. (pp. 118-9)

> Just as something may have all the properties by which we originally identified tigers and yet not be a tiger [they're fool's tigers!], so we might also find out tigers had *none* of the properties by which we originally identified them. Perhaps *none* are quadrupedal, none tawny yellow, none carnivorous, and so on; all these properties turn out to be based on optical illusions or other errors, as in the case of gold. (p. 121)

(Aristotle, for instance, thought that water was an element.)

The granite controversy.

(e) Ordinary speakers can be (and very often are) underinformed about the kinds to which they refer. (This is not a point I find in Kripke; it was made forcefully by Putnam.) For example, the only information I might associate with 'elm' is that it is a kind of tree. (Similarly for molybdenum, californium, einsteinium, etc.)

(f) The causal-historical theory of reference applies:

> For species, as for proper names, the way the reference of a term is fixed should not be regarded as a synonym for the term. In the case of proper names, the reference can be fixed in various ways. In an initial baptism it is typically fixed by an ostension or a description. Otherwise, the reference is usually determined by a chain, passing the name from link to link. The same observations hold for such a general terms as 'gold'. (p. 135)

Some Points of Difference:

(a) **Scientific Essentialism**: Natural kind terms are apt for use in scientific theorizing.

> In general, science attempts, by investigating basic structural traits, to find the nature, and thus the essence (in the philosophical sense) of the kind. (p. 138)

A ***scientific essentialist*** believes that science reveals the natures of things. For instance, scientists have discovered the following truths:

(7) Heat is the motion of molecules.
(8) Whales are mammals.
(9) Gold is a metal

Kripke says: these claims are not just true, but **necessarily true**.

These claims are, obviously, ***a posteriori***, discovered by the methods of natural science.

The result is: science lays bare, not just how things happen to be, but how they ***had to be***.

(b) ***Defending Scientific Essentialism***

i. ***The Old Aristotelian View***: Traditionally, Aristotelians held that two kinds of scientific claim were necessarily true:

- **Sortal Claims**: claims about what sort a given individual belonged to:
  (10) Obama is human (if he exists).
  (11) Obama is a rational animal (if he exists).

- **Species subsumption**: claims about higher-order categorizations:

(12) Cats are animals
(13) Whales are mammals.

Other cases could be explained as logical consequences of these central cases, *e.g.*

(14) Obama is rational.

ii. ***The Lockean Backlash***: These claims all seem to involve *a posteriori* necessities. There were several grounds for suspicion of them, some of which we've already encountered:

- **NAP correspondence**
- **The Epistemological Mystery of Necessity**
- **The Metaphysical Mystery of Necessity**

Lockeans suggested, then, that all of these cases could be accommodated if we accepted that both proper names and natural kind terms were disguised definite descriptions. For instance, if 'Obama' disguised 'the human being who is now President of the USA', then the necessity of (10) is easily explicable as the necessity of a logical truth:

(15) the human being who is now President of the USA is human (if he exists).

Likewise, if "whale" abbreviates "the largest marine mammals", then (13) is a disguise for:

(16) The largest marine mammals are mammals.

These claims are *a priori* and necessary. Their necessity is no more mysterious than that of any other logical truth.

Obviously, we have already seen how Kripke criticized the Descriptivism that underlies this Lockean response. Kripke's scientific essentialism is *neo-Aristotelian*.

iii. ***Scientific Identification***: Science investigates the natures of things in part by discovering interesting identifications:

(17) Water is H_2O
(18) Heat is the motion of molecules.

These identifications link a natural kind term to a specification of *underlying structure*. Kripke has provided materials for an argument that these identifications are

necessary.

iv. ***The argument from Rigid Designation***: Consider (17). Kripke has argued that 'water' is a rigid designator; it is plausible to think that 'H_2O' is, too. (By the intuitive test.) Since both are rigid designators, both designate the same kind in every possible world in which they designate anything at all. Scientific progress has revealed that they designate the same kind in the actual world. So they must designate the same kind in every possible world. But then the identity claim (17) is true in every possible world.

v. ***The argument from Rigid Designation is bad***: This argument fails, since rigid designation allows failure of designation in worlds where the kind does not exist. Consider (18), in a possible world w in which there are no molecules: matter isn't lumpy – it's continuous gunk all the way down. It's reasonable to think that there is no such thing as the motion of molecules in w, but there is heat in w. (At least, the argument from rigid designation does not show that this is impossible). If there is such a w, then (18) is false in w, and so not necessarily true.

vi. **Recalcitrant cases**: Most of the scientific claims Kripke thinks are necessary can be treated as cases of identity. Some can't. For instance:

(19) This table is made of molecules (if it exists).

vii. **Conclusion**: Kripke never gives an argument *for* scientific essentialism. He only gives defensive arguments:

- against **Lockean accommodation**; and
- against **denial** of the necessity of the claims in question.

(c) **The specific form of reference-fixing**:

> If we imagine a hypothetical (admittedly somewhat artificial) baptism of the substance, we must imagine it picked out as by some such 'definition' as, 'Gold is the substance instantiated by the items over there, or, at any rate, by almost all of them.' (p. 135)

REMARKS:

i. **Reference fixed by ostension of paradigm cases**

ii. **Reference-fixing can go wrong** if the items are very heterogeneous.

iii. **An initial set of superficial characteristics** is generalized *a posteriori* from the paradigm cases.

iv. **Scientific progress** is made by replacing this list of superficial characteristics with deep "structural traits."

> [S]cientific investigation generally discovers characteriztics of gold which are far better than the original set. For example, it turns out that a material object is (pure) gold if and only if the only element contained therein is that with atomic number 79. (p. 138)

(d) **The centrality of reference-fixing**

> Usually, wen a proper name is passed from link to link, the way the reference of the name is fixed is of little importance to us. It matters not at all that different speakers may fix the reference of the name in different ways, provided that they give it the same referent. The situation is probably not very different for species names [....] The interesting fact is that the way the reference is fixed seems overwhelmingly important to us in the case of sensed phenomena: a blind man who uses the term 'light', even though he uses it as a rigid designator for the very same phenomenon as we, seems to us to have lost a great deal, perhaps enough for us to declare that he has a different concept. [....] The fact that we identify light in a certain way seems to us to be *crucial*, even though it is not necessary; the intimate connection may create an *illusion* of necessity. (p. 139)