

# Kripke's *Naming and Necessity*

## Lecture Seven

### Natural Kinds

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# Natural Kinds

Introduction

Natural Kinds

Against Descriptivism for Natural Kind Terms

Natural Kind Terms as Rigid Designators

Theoretical Identifications

Summary

## Re-Cap: The Rejection of Descriptivism

- Descriptivism makes two claims:
  - (i) Every proper name is synonymous with some definite description
  - (ii) Anyone who understands a proper name knows the definite description it is synonymous with
- Kripke rejected descriptivism after presenting a number of objections to it
- Kripke thinks that in general, names are not synonymous with descriptions; names do **not** describe the things they refer to
- Instead, names are **rigid designators**, referring to the very same object in every world

## Re-Cap: Necessity and A Priority

- Kripke uses this new view of names to argue that there are some necessary truths which can only be known a posteriori, and some contingent truths which can be known a priori
- **Necessary A Posteriori**
  - Hesperus is Phosphorus
- **Contingent A Priori**
  - *S* is one metre long

## Re-Cap: Essential Properties

- Kripke went further, and argued that people and objects have a number of **essential properties**
  - To say that  $F$  is an **essential** property of  $x$  is to say that  $x$  could not exist without being  $F$ : there is no possible world in which  $x$  exists but is not  $F$
- If Trump is essentially human, then it is **metaphysically impossible** for him to exist and yet fail to be human, although it may be **epistemically possible**
  - It may well be compatible with all of our current evidence that Trump is really a lizard in disguise
- In general, we cannot figure out the essential properties of things **a priori**; it takes **a posteriori** investigation

## This Lecture: Natural Kinds

- Kripke (*N&N*: 116–34) then went *even further* by extending his ideas about names to cover **natural kind terms**
  - **Natural kind terms** are the terms we use to refer to natural kinds of thing, like 'water', 'gold' and 'tiger'
- Natural kinds are different from ordinary proper names:
  - Proper names refer to people and things, whereas natural kind terms refer to *kinds of thing*
- But nonetheless, Kripke thinks that they are also very similar:
  - Just as proper names are non-descriptive rigid designators of things, natural kind terms are non-descriptive rigid designators of kinds of thing
- If Kripke is right about this, then lots of his metaphysical conclusions about things apply to natural kinds too

## This Lecture: Natural Kinds

Here are the aims of this lecture:

- (1) To get clearer on what philosophers mean when they talk about 'natural kinds'
- (2) To look at Kripke's arguments for thinking that, like proper names, natural kind terms are non-descriptive rigid designators
- (3) To draw out some metaphysical conclusions from Kripke's view of natural kind terms

# Natural Kinds

Introduction

Natural Kinds

Against Descriptivism for Natural Kind Terms

Natural Kind Terms as Rigid Designators

Theoretical Identifications

Summary

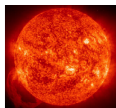


## Some Things Naturally Go Together

- Consider two groups of things



Group A



Group B

- Most of us would agree that the things in Group A all naturally go together: they're all tigers!
- Group B, on the other hand, is not a natural grouping of things at all

## Introducing Natural Kinds

- The reason that all of the things in Group A go together is because tigers are a **natural kind** of thing
- Roughly, to say that a kind of thing is a **natural kind** is to say that it reflects the structure of the natural world
- So when we group tigers together, we are grouping things in a natural way, in a way which reflects the structure of the world
- By contrast, when we group together a fork, a leaf and the Sun, we are not grouping things in a way which reflects the structure of the world
- There is no natural kind of thing which includes a fork, a leaf and the Sun

## Some More Examples

- Here are some more (plausible) examples of natural kinds:
  - Lions, humans, dogs, elephants, dolphins...
  - Gold, lead, hydrogen, helium, lithium...
  - Water, salt, hydrochloric acid...
- All of these seem to be kinds that we find in nature
- When we group things into these various kinds, we seem to be grouping them in a way which reflects the structure of nature

## The Importance of Natural Kinds

- Over the last few decades, the concept of *natural kinds* has taken on a **huge** role in philosophy
- Lots of philosophers think that one of the main jobs of science is to uncover the natural kinds, and figure out the relations that they bear to each other
- If these philosophers are right, then it is very important that we develop a good understanding of the metaphysics of natural kinds

# Natural Kinds

Introduction

Natural Kinds

Against Descriptivism for Natural Kind Terms

Natural Kind Terms as Rigid Designators

Theoretical Identifications

Summary

## Descriptivism about Natural Kind Terms

- What kind of meaning do natural kind terms have? In particular, what does 'gold' mean?
- One natural thought would be that 'gold' is an abbreviation for a long description of the properties we use to identify gold
  - 'Gold' is synonymous with 'a precious yellow metal, which is comparatively abundant in North America, and which...'
- This is very similar to descriptivism, but applied to natural kind terms instead of proper names
  - (i) Every natural kind term is synonymous with some description
  - (ii) Anyone who understands a natural kind term knows the description it is synonymous with

## Rejecting Descriptivism for Natural Kind Terms

- As you all know, Kripke rejected descriptivism for proper names, and he also rejected it for natural kind terms
- The arguments that Kripke uses against descriptivism about natural kind terms are pretty much exactly the same as the arguments he used against descriptivism about proper names
  - The Modal Argument
  - The Semantic Argument
  - The Epistemic Argument

## The Modal Argument

- The Modal Argument (*N&N*: 124–5) tries to show that descriptivism about natural kind terms ends up misdescribing other possible worlds
- Let's say that according to descriptivism, 'gold' is synonymous with 'precious yellow metal'
- But consider these two sentences:
  - (1) If  $x$  is a precious yellow metal, then  $x$  is a precious yellow metal
  - (2) If  $x$  is a precious yellow metal, then  $x$  is gold
- If descriptivism is true, then these two sentences should be synonymous, but they aren't
  - (1) is necessarily true, whereas (2) is (at best) only contingently true



## Super Fool's Gold

- Fool's Gold looks very similar to gold, but it has a completely different chemical structure
- Gold is an element (atomic number 79), whereas fool's gold is an iron sulfide
- Now, fool's gold isn't really all that similar to gold, but now imagine a super fool's gold, which is superficially indistinguishable from gold, but still has a different chemical structure from gold
- There is no such thing as this super fool's gold, but it is surely a *possible* substance



## Super Fool's Gold Still Wouldn't Be Gold

- Importantly, I think most of us would agree that if this super fool's gold did exist, it wouldn't be gold
  - Yes, this super fool's gold is a precious yellow metal, superficially indistinguishable from gold, but it still isn't gold
  - Gold has a particular chemical structure, and I said that fool's gold had a different structure
- But in that case, we can see that these sentences have different modal profiles:
  - (1) If  $x$  is a precious yellow metal, then  $x$  is a precious yellow metal
  - (2) If  $x$  is a precious yellow metal, then  $x$  is gold
- (1) is necessarily true, and (2) isn't:
  - In a world containing super fool's gold, samples of super fool's gold are precious yellow metals, but they aren't samples of gold

## The Semantic Argument

- The Semantic Argument tries to show that descriptivism makes inaccurate predictions about how we would use natural kind terms in various circumstances
- Let's suppose again that according to descriptivism, 'gold' is synonymous with 'a precious yellow metal'
- But now imagine we discovered tomorrow that gold isn't really yellow: a bizarre optical illusion has made it look yellow until now, but really it's blue
- If descriptivism is right, we would all react to this news by saying: Oh, so this stuff isn't really gold!
- But that doesn't seem how we would react. We would say: Oh, so gold isn't really yellow!

## The Semantic Argument in Kripke's Words

*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. Maybe a demon even corrupted the vision of all those entering the gold mines (obviously their souls were already corrupt), and thus made them believe that this substance was yellow, this it is not.*

## The Semantic Argument in Kripke's Words

*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.*

## The Semantic Argument in Kripke's Words

*It seems to me that there would be no such announcement. On the contrary, what would be announced would be that though it appeared that gold was yellow, in fact, gold has turned out not to be yellow, but blue.*

*(N&N: 118)*

## The Epistemic Argument

- The Epistemic Argument tries to show that descriptivism wrongly describes certain a posteriori truths as a priori truths
- Remember that descriptivism about natural kind terms makes two claims:
  - (i) Every natural kind term is synonymous with some description
  - (ii) Anyone who understands a natural kind term knows the description it is synonymous with
- So if 'gold' is synonymous with 'a precious yellow metal', then everyone who understands 'gold' knows it

## The Epistemic Argument

- But now consider these two sentences:
  - (1) If  $x$  is a precious yellow metal, then  $x$  is a precious yellow metal
  - (2) If  $x$  is gold, then  $x$  is a precious yellow metal
- If everyone who understands 'gold' knows that it is synonymous with 'a precious yellow metal', then everyone who understands 'gold' knows that (2) is synonymous with (1)
- But if that were the case, then that would make (2) **a priori**:
  - (1) is straightforwardly a priori
  - But if we knew that (2) was synonymous with (1), then we could convert our a priori knowledge of (1) into a priori knowledge of (2)



## The Epistemic Argument

- We all know that gold is a precious yellow metal, but that is a posteriori knowledge
- We can use Kripke's earlier story of an optical illusion to illustrate that
  - Kripke's story was obviously ridiculous: it would be absurd to believe that gold was really blue, but an optical illusion made it look yellow
  - But still, we do not know that Kripke's story is false **a priori**
  - It takes a posteriori knowledge of the world to know that gold is a precious yellow metal

## Descriptivism Refuted?

- Do these arguments really refute descriptivism about natural kind terms?
- Not straightforwardly: all they **really** show is that 'gold' is not synonymous with 'a precious yellow metal', but it still might be synonymous with another description!
- However, these arguments certainly tell against the view: it is hard to think of any description which could dodge *all* of the objections
- For example, we might be able to get around the Modal Argument by suggesting that 'gold' is synonymous with 'an atom with atomic number 79', but that will make the epistemic argument even worse:
  - It definitely isn't **a priori** that gold has atomic number 79

# Natural Kinds

Introduction

Natural Kinds

Against Descriptivism for Natural Kind Terms

Natural Kind Terms as Rigid Designators

Theoretical Identifications

Summary

## If Not Descriptivism, Then What?

- Kripke rejected descriptivism about natural kind terms for essentially the same reasons that he rejected descriptivism about proper names
  - The Modal Argument
  - The Semantic Argument
  - The Epistemic Argument
- But if descriptivism is the wrong theory about how natural kind terms work, then what is the right theory?
- Kripke's positive picture of natural kind terms is also very similar to his positive picture of proper names

## Natural Kind Terms as Rigid Designators

- According to Kripke (*N&N*: 127–8), natural kind terms are **rigid designators**, picking out a certain kind of thing
  - ‘Gold’ is a rigid designator, referring to a particular kind of physical substance; in particular, it refers to the kind of things which are made up from atoms with atomic number 79
  - ‘Gold’ is **rigid** because it refers to this kind of substance in every possible world
  - Other natural kind terms, like ‘water’, ‘salt’, ‘tiger’... are all rigid designators, rigidly referring to the same kind of thing in every world

## Natural Kind Terms and Ostensive Baptism

- For Kripke, natural kind terms are similar to proper names, in the sense that they are both rigid designators
- That is not all they have in common: Kripke thinks that natural kind terms are introduced via baptisms in a way very similar to the baptisms which introduce proper names
- According to Kripke, the standard way that we introduce a natural kind term, 'K', is by ostending some samples of a substance and stipulating that 'K' is to refer to the kind which all of these samples fall under
  - When we introduced 'gold', we pointed at a range of samples of gold, and stipulated: 'gold' is to refer to the kind which all of these samples have in common

## Natural Kind Terms and Descriptive Baptism

- As well as these ostensive baptisms, Kripke (*N&N*: 130) also allows that we sometimes fix the reference of a natural kind term by description
- I might say: 'Water' is to refer to the natural kind that the majority of the liquid in the oceans falls under
- But crucially, just as with proper names, this would not make 'water' **synonymous** with 'the natural kind that the majority of the liquid in the oceans falls under'
- We use the description to fix the natural kind that a term refers to, but then throw the description away, and use the term as a non-descriptive, rigid designator for that natural kind

## Spreading a Natural Kind Term Around

- Kripke has so far claimed that there are two similarities between proper names and natural kind terms:
  - (i) Proper names and natural kind terms are both rigid designators
  - (ii) Proper names and natural kind terms are both introduced via baptisms
- Kripke adds one more similarity:
  - (iii) Proper names and natural kind terms are both spread around via causal chains of communication



## Spreading a Natural Kind Term Around

- For example, the reason that you use the word 'gold' to refer to a particular natural kind is because there is a chain of communication, starting with the baptism of a certain kind as 'gold', and ending with your acquiring the use of 'gold'
- This story requires the same complications having to do with intentions as the story about proper names
- To pick up on a natural kind term, it isn't enough just to hear someone using it; you have to form the intention to use the term to refer to the same kind as the person you heard it from

# Natural Kinds

Introduction

Natural Kinds

Against Descriptivism for Natural Kind Terms

Natural Kind Terms as Rigid Designators

Theoretical Identifications

Summary

## Necessary Identities

- Kripke's picture of how natural kind terms work is very similar to his picture of how proper names work
- As we saw in the last couple of lectures, Kripke's picture of proper names led to some interesting metaphysical conclusions
- Most importantly, it led to the conclusion that when '*a*' and '*b*' are rigid proper names, ' $a = b$ ' is necessarily true if it is true at all
  - Hesperus is Phosphorus
- Kripke is led to exactly the same conclusion about identities between natural kinds

## Necessary Theoretical Identifications

- Science is full of what philosophers call **theoretical identifications**:
  - (i) Water is  $H_2O$
  - (ii) Gold is the element with atomic number 79
  - (iii) Heat is mean kinetic energy
- Kripke sees all of these identifications as genuine identities: they tell us that one natural kind is identical to another natural kind
- What is more, since natural kind terms are rigid designators, these identifications are not just true, they are necessarily true:
  - 'Water' and ' $H_2O$ ' rigidly refer to the same kind in every world, and so (i) is true in every world

## Natural Kinds and Essential Properties

- From these necessary identifications, we can extract some interesting **essential properties** of natural kinds
- Take this identification, for example:
  - (ii) Gold is the element with atomic number 79
- Since (ii) is necessarily true, we can infer that *having atomic number 79* is an essential property of gold
  - There is no possible world in which gold exists, but doesn't have atomic number 79

## Metaphysical versus Epistemic Possibility

- Of course, it is absolutely crucial to stress that all of these necessary identifications and essential properties are a **posteriori**
- Kripke (*N&N*: 124–5 & 131–4) is happy to accept that it is **epistemically possible** that gold might not have atomic number 79
  - It is compatible with all of our evidence that gold does not have atomic number 79
- But Kripke's point is that, given that gold actually does have atomic number 79, it is **metaphysically impossible** for gold to exist without having atomic number 79
  - There is no alternative world in which gold exists, but has atomic number 80

# Natural Kinds

Introduction

Natural Kinds

Against Descriptivism for Natural Kind Terms

Natural Kind Terms as Rigid Designators

Theoretical Identifications

**Summary**

## The Key Ideas: Natural Kinds

- The first **KEY IDEA** from this lecture is the very idea of a **natural kind**
- When we group things into natural kinds, we have grouped them in a way which reflects the structure of nature itself
- Examples include:
  - Lions, humans, dogs, elephants, dolphins...
  - Gold, lead, hydrogen, helium, lithium...
  - Water, salt, hydrochloric acid...
- **Natural kind terms** are then the terms that we use to refer to natural kinds, like 'lion', 'gold' and 'water'



## The Key Ideas: Against Descriptivism

- Kripke's next **KEY IDEA** is that the way natural kind terms work is very similar to the way that proper names work
- We can show that descriptivism about natural kind terms is false with exactly the same arguments that we used to show that descriptivism about proper names was false
  - (i) The Modal Argument
  - (ii) The Semantic Argument
  - (iii) The Epistemic Argument
- Like proper names, natural kind terms are non-descriptive, rigid designators
- They are introduced via baptisms, and are then spread around through causal chains of communication

## The Key Ideas: Metaphysical Consequences

- The last **KEY IDEA** is that this picture of how natural kind terms work has very similar metaphysical consequences as Kripke's picture of how proper names work
- If '*j*' and '*k*' are natural kind terms, then '*j* = *k*' is **necessarily** true, if it is true at all
  - (i) Water is H<sub>2</sub>O
  - (ii) Gold is the element with atomic number 79
  - (iii) Heat is mean kinetic energy
- However, (i)–(iii) are still **a posteriori**