

Meaning, Reference and Modality B

Reference and Modality

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KRIPKE

Saul Kripke (1940—2022)

◀ Founding father of Kripke models.

- Richard Montague, Stig Kanger, Dana Scott, Jaakko Hintikka, Arthur Prior.

▶ Principal inventor of rigid designation.

- Ruth Barcan Marcus, Keith Donnellan, David Kaplan and Hilary Putnam.

▶ Ultimate fighter of “description theories” of names.

- vs. Gottlob Frege, Bertrand Russell, Peter Strawson, John Searle.

◀ Philosophy of Language.

- Pretense Theory of Fiction.
- A Puzzle about Belief.
- Speaker’s Reference.
- Kripkenstein.
- Presupposition.

Naming and Necessity: transcripts of oral lectures in 1970.

A Prioricity and Necessity

Kripke emphasizes the distinction between the concepts of *a prioricity* and *necessity* (and attributes a lack of attention to this as a source of confusion).

A priori / a posteriori

- Roughly, a true statement is a **priori** iff it can be **known** independent of experience;
- and a **posteriori** iff it is not a priori.

Necessary / contingent

- Roughly, a true statement is (metaphysically) **necessary** iff it **couldn't** (metaphysically speaking) have been otherwise;
- and **contingent** iff it is not necessary.

Question: Which of the following are a priori, a posteriori, necessary, contingent?

- 1 All bachelors are unmarried
- 2 Paul and Søren are teaching MRM
- 3 If Paul and Søren are teaching MRM, then Paul and Søren are teaching MRM
- 4 Biden is the President of the United States

The Epistemological and the Metaphysical (pp. 36–7)

It may appear that a prioricity and necessity are *coextensive*: a statement is a priori iff it is necessary. But ...

[we] are dealing with two different domains

The Epistemological and the Metaphysical

It's certainly a philosophical thesis, and not a matter of obvious definitional equivalence, either that everything A PRIORI is necessary or that everything necessary is A PRIORI.

[E]ven though someone said that it's necessary, if true at all, that every even number is the sum of two primes, it doesn't follow that anyone knows anything A PRIORI about it. It doesn't even seem to me to follow without some further philosophical argument (...) that anyone COULD know anything A PRIORI about it.

- A prioricity and necessity being coextensive is not obvious, but rather *if true*, a substantive fact.

	Nec.	Cont.
A-Pri.	✓	?
A-Post.	?	✓

[✓:= old wisdom]

[?:= not inconceivable]

- And in fact, Kripke argues that they are *not* coextensive: there are **a posteriori necessary** truths, as well as **a priori contingent** truths.
- And what's his argument?¹ Perhaps surprisingly, on Kripke's account, this is one, of several, consequences of his ideas on **naming!**

¹ You might have wondered where our discussion of sense and reference of expressions (including names) fits in. We've talked about the 'necessity' in 'Naming and Necessity', but where does 'naming' fit in?

From Frege to Kripke, in brief

Recall the sentences:

$(h = h)$ Hesperus is Hesperus

$(h = p)$ Hesperus is Phosphorus

While the latter $(h = p)$ is informative, the former $(h = h)$ isn't.

- **Frege** explains this through his **Sinn/Bedeutung** distinction: while Hesperus and Phosphorus share the same Bedeutung, they have different Sinne.
- **Russell** through a **descriptivist** theory of proper names: they are abbreviations for definite descriptions – ‘Hesperus’ for ‘the brightest body in the evening sky’, and ‘Phosphorus’ for ‘the brightest body in the morning sky’.²
- **Searle** through a **cluster** descriptivist theory of names, associating a cluster of descriptions to a proper name, rather than only one. [more on this on Friday/next week :)]

Kripke disagrees with all accounts: names are rigid designators, while (clusters of) definite descriptions need not be

²This also solves the ‘Plato’s beard’ puzzle, cf. Quine; more on this on Friday/next week :)

Rigid Designation

Rigid Designators:

Let's use some terms quasi-technically. Let's call something a RIGID DESIGNATOR if in every possible world it designates the same object (...). (Saul Kripke, 1972, *Naming and Necessity*, p. 48)

Kripke (on Lewis) on Possible Worlds:

Those who have argued that to make sense of the notion of rigid designator, we must antecedently make sense of 'criteria of transworld identity' have precisely reversed the cart and the horse; it is BECAUSE we can refer (rigidly) to [Biden], and stipulate that we are speaking of what might have happened to HIM (under certain circumstances), that 'transworld identifications' are unproblematic in such cases. (p. 49)

'Possible worlds' are STIPULATED, not DISCOVERED by powerful telescopes. (...) Why can't it be part of the DESCRIPTION of a possible world that it contains [Biden] and that in that world [Biden] didn't win the election? (p. 44)

Names are Rigid Designators

There is no reason why we cannot stipulate that, in talking about what would have happened to [Biden] in a certain counterfactual situation, we are talking about what would have happened to HIM. (p. 44)

We can point to the man [Biden], and ask what might have happened to HIM, had events been different. (p. 46)

[F]or although the man [Biden] might not have been the President, it is not the case that he might not have been [Biden] (though he might not have been called '[Biden]'). (p. 49)

Names are rigid designators. (p. 48)

Whence: 'Hesperus is Phosphorus' is a **necessary** truth!
And it is definitely **a posteriori**.³

³Exercise: On a descriptivist account is $h = p$ necessary? A posteriori?

Three Subsequent Revelations

Kripke says he experienced three subsequent revelations.

- (i) The necessary self-identity of objects.
[Is obvious, see below on this slide.]
- (ii) The necessity of identity statements with rigid designators.
[Logically follows, see next slide.]
- (iii) The necessity of identity statements involving names.
[Follows from the rigidity of names.]

The Necessary Self-Identity of Objects

Identity is a relation between objects that holds between an object and itself. [Aristotle, Frege, Wittgenstein, Hintikka, . . .]

Identity is an ‘internal’ relation.

It belongs to being an object. It is essential and necessary.

Necessity of ID statements with Rigid Designators

- | | | | |
|-----|--|---|-------------------------|
| (1) | | $(x = x)$ | (ax.) |
| (2) | $[[x/z]\Box(x = z)] \equiv \Box(x = x)$ | | (N, 1) |
| (3) | | $(x = y)$ | (ass.) |
| (4) | | $[[y/z]\Box(x = z)] \equiv \Box(x = y)$ | (Leibniz 3, 2) |
| (5) | $((x = y) \rightarrow \Box(x = y))$ | | (\rightarrow , 3, 4) |
| (6) | $\forall xy ((x = y) \rightarrow \Box(x = y))$ | | (\forall , 5) |

That Settles It!

[Assumption: Variables refer rigidly.]

After Frege

One Thing Remains to be Explained.

Hesperus is Phosphorus.

- This is informative.
- This is necessary.

» How can it *appear to be contingent*?

Colloquial Mistakes

*Sloppy, colloquial speech, which often confuses use and mention, may, of course, express the fact that someone might have been called, or not have been called, ‘Aristotle’ by saying that he might have been, or not have been, Aristotle. Occasionally, I have heard such loose usages adduced as counterexamples to the applicability of the present theory to ordinary language. Colloquialisms like these seem to me to create as little problem for my theses as the success of the ‘Impossible Missions Force’ creates for **the modal law** that the impossible does not happen. (p. 62, fn. 25)*

[Note, this “modal law”: $(\neg\Diamond p \rightarrow \neg p)$ equals (T): $(p \rightarrow \Diamond p)$]

Wrong Explanations

Why do people, **mistakenly**, say
that Phosphorus might not have been Hesperus?

Supposing that Hesperus is Phosphorus, let's try to describe a possible situation in which it would not have been. Well, it's easy. Someone goes by and he calls two different stars 'Hesperus' and 'Phosphorus'.

*But are those circumstances in which Hesperus is not Phosphorus or would not have been Phosphorus?
It seems to me that they are not. (p. 102)*

Apparent Contingencies

So two things are true: first, that we do not know APRIORI that Hesperus is Phosphorus, and are in no position to find out the answer except empirically.

Second, this is so because we could have evidence qualitatively indistinguishable from the evidence we have and determine the reference of the two names by the positions of two planets in the sky, without the planets being the same. (p. 104)

But are those circumstances in which Hesperus is not Phosphorus or would not have been Phosphorus?

It seems to me that they are not. (p. 102)

Mistaken Necessities

The strategy [used (...) to handle the apparent contingency of the necessary A POSTERIORI] was to argue that although the statement itself is necessary, someone could, QUALITATIVELY speaking, be in the same epistemic situation as the original, and in such a situation a QUALITATIVELY analogous statement could be false. (p. 150)

*But are those circumstances in which Hesperus is not Phosphorus or would not have been Phosphorus?
It seems to me that they are not. (p. 102)*

Four Kinds of Truths

- Necessity and A Prioricity are not Necessarily or A Priorily the same.

	Nec.	Cont.
A-Pri.	✓	?
A-Post.	?	✓

[✓ := old wisdom]
[? := not inconceivable]

- Not just not inconceivable, but actually realized.

	Nec.	Cont.
A-Pri.	$x = x$	$M(\ulcorner x Mx \urcorner)^*$
A-Post.	$h = p$	$M(\ulcorner x Lx \urcorner)$

[* *SNS* (See Next Slide).]

Now That it Comes Up . . .

Wittgenstein says something very puzzling about it [the standard meter in Paris]. He says: 'There is one thing of which one can say neither that it is one meter long nor that it is not one meter long, and that is the standard meter in Paris.' (p. 54)

- Upon reflection, one can say it.

The resulting statement is CONTINGENT and A PRIORI.

- Or, so it is argued.

Summary so far

Main take-aways:

- The coextensiveness of a prioricity and necessity is not an obvious fact. *If true*, it's a substantive link between an **epistemological** and a **metaphysical** concept.
- Not only that, it is false! There are **necessary a posteriori** statements ($h = p$) as well as **contingent a priori** statements ('the standard meter is 1 m long').
- Importantly (and, perhaps, shockingly), this is a consequence of how **names** function!⁴ They are **rigid designators**, unlike (most) definite descriptions.
- This contrasts with descriptivist theories of names (more on this next time! :))

Notable mentions:

- Possible worlds are **stipulated, not discovered**.
- Kripke's arguments rely heavily on **intuition**. Consider: How convincing/credible are intuition-based arguments?
- Kripke (and others) see mathematical truths as quintessential necessary truths—important for understanding, e.g., GAMUT's 'the number of planets' example in explaining *de re* vs. *de dicto* modalities.

For modeling modal predicate logic:

- Constants and variables should be rigid (as per Kripke).
- Definite descriptions, and predicates, shouldn't as their extension can vary from world to world.

⁴Recall (the exercise on) slide 9.

MODAL PREDICATE LOGIC

Modal Predicate Logic Architecture

Syntax EXTEND the language of modal propositional logic with names, predicates, variables, and quantifiers, OR, ALTERNATIVELY, EXTEND the language of predicate logic with modal operators.

Models We HAD FO-models $M = \langle D, I \rangle$ with a valuation $V_{M,g}(\phi)$;
We HAD MPL-models $M = \langle W, R, V \rangle$ with a valuation $V_{M,w}(\phi)$;
We TAKE models $M = \langle W, R, D, I \rangle$ with a valuation $V_{M,w,g}(\phi)$.

Notation $V_{M,w,g}(\phi) = 1$ (GAMUT) iff $M, w, g \models \phi$ (here).

That's Straightforward!

Design Choices (GAMUT, et al.)

- First: D is a **domain function**, assigning each world w its domain of individuals D_w . (Existence is contingent.)
- Second: The interpretation function I interprets individual constants **rigidly**, variables are interpreted **rigidly** as well. (Kripke's idea)
- Third: Valuations are partial (Frege's idea).
(EITHER $M, w, g \models \phi$ OR $M, w, g \models \neg \phi$ OR **NEITHER** of the two.)
- Fourth: The logic is **weak Kleene**: “neither” indicates “uninterpretable” and not “unknown”, as it would in a strong Kleene system.

That's Sophisticated!

Three Valued Logics

- *Weak Kleene Truth Tables (Used Here)*

ϕ	$\neg\phi$	$\phi \wedge \psi$	T F $*$	$\phi \vee \psi$	T F $*$	$\phi \rightarrow \psi$	T F $*$
T	F	T	T F $*$	T	T T $*$	T	T F $*$
F	T	F	F F $*$	F	T F $*$	F	T T $*$
$*$	$*$	$*$	$*$ $*$ $*$	$*$	$*$ $*$ $*$	$*$	$*$ $*$ $*$

- *Strong Kleene Truth Tables (Not Used Here)*

ϕ	$\neg\phi$	$\phi \wedge \psi$	T F $*$	$\phi \vee \psi$	T F $*$	$\phi \rightarrow \psi$	T F $*$
T	F	T	T F $*$	T	T T T	T	T F $*$
F	T	F	F F F	F	T F $*$	F	T T T
$*$	$*$	$*$	$*$ F $*$	$*$	T $*$ $*$	$*$	T $*$ $*$

- *Alternatives are Available (Not Relevant Here)*

Now the Delicate Stuff

- Recall: we have truth (\models) and falsity ($\models\!\!\!\!\neq$), but there can be a “gap”. Untruth need not be falsity, neither need unfalsity be truth.
- First, the atomic cases. (Thanking Frege and Kripke.)

(i) $M, w, g \models Rt_1 \dots t_n$ iff $[t_1]_{M,g} \in D_w, \dots, [t_n]_{M,g} \in D_w$ and
 $\langle [t_1]_{M,g}, \dots, [t_n]_{M,g} \rangle \in I_w(R)$.

$M, w, g \models\!\!\!\!\neq Rt_1 \dots t_n$ iff $[t_1]_{M,g} \in D_w, \dots, [t_n]_{M,g} \in D_w$ and
 $\langle [t_1]_{M,g}, \dots, [t_n]_{M,g} \rangle \notin I_w(R)$.

$M, w, g \models t_i = t_j$ iff $[t_i]_{M,g}, [t_j]_{M,g} \in D_w$ and $[t_i]_{M,g} = [t_j]_{M,g}$.

$M, w, g \models\!\!\!\!\neq t_i = t_j$ iff $[t_i]_{M,g}, [t_j]_{M,g} \in D_w$ and $[t_i]_{M,g} \neq [t_j]_{M,g}$.

[If t is an individual constant then $[t]_{M,g} = I(t)$;

if t is a variable then $[t]_{M,g} = g(t)$.

As said: they are interpreted *rigidly*.]

Negation and Quantifiers (GAMUT, p. 54/60)

- Negation appears to be easy.
- (ii) $M, w, g \models \neg\phi$ iff $M, w, g \not\models \phi$
 $M, w, g \not\models \neg\phi$ iff $M, w, g \models \phi$
- Sentential Connectives are Weak Kleene.
- (iii) $M, w, g \models (\phi \wedge \psi)$ iff [classical]
 $M, w, g \not\models (\phi \wedge \psi)$ iff [classical] — [undefined iff one of them is]
- Quantifiers appear to be easy, too. (But there is a subtlety.)
- (v) $M, w, g \models \forall x\phi$ iff $M, w, g[x/d] \models \phi$ for every $d \in D_w$.
 $M, w, g \not\models \forall x\phi$ iff $M, w, g[x/d] \not\models \phi$ for some $d \in D_w$.
- so $M, w, g \models \exists x\phi$ iff $M, w, g[x/d] \models \phi$ for some $d \in D_w$.
 $M, w, g \not\models \exists x\phi$ iff $M, w, g[x/d] \not\models \phi$ for every $d \in D_w$.

Modal Operators (iv, ‘Hard’)

- The *obvious* definition runs as follows.

(iv) $M, w, g \models \Box\phi$ iff for all w' such that wRw' , $M, w', g \models \phi$.
 $M, w, g \models \Diamond\phi$ iff for some w' such that wRw' , $M, w', g \models \phi$.

- GAMUT is unhappy with this.

Because then $\not\models \Box(a = a)$ and $\not\models \Box(Fa \rightarrow Fa)$.

This is said to be “too stringent” (p. 55).

- We therefore call it the ‘Hard’ modality.
 [Mind the labels in what follows.]

Modal Operator (iv' , ‘Friendly’)

- *Unhappy*, GAMUT suggests a *Fix*, a ‘friendly’ modality.

(iv') $M, w, g \models \Box\phi$ iff for all w' such that wRw' , $M, w', g \models \phi$ if defined.

- “[N]ew [complications] rush in”. (GAMUT p. 55)

$$\begin{array}{lll}
 D_u = \{I(a)\} \neq D_v = \{I(c)\} & & M, u, g \models \Box(Fa \wedge Fc), \\
 \textcircled{C} u \longrightarrow v & & M, u, g \not\models \Box Fa, \\
 I_u(F) = \emptyset & I_v(F) = \emptyset & M, u, g \not\models \Box Fc.
 \end{array}$$

(!) D (distribution) is no longer valid.

$$M, u, g \not\models (\Box(\neg Fa \rightarrow Fc) \rightarrow (\Box\neg Fa \rightarrow \Box Fc))$$

Validity ('Strict')

- Perhaps the problem isn't due to the strict interpretation of \Box .
Perhaps it is due to a strict notion of entailment (and validity).

A set of formulas Γ STRICTLY ENTAILS a formula ψ , $\Gamma \models_s \psi$, iff for all M, g, w : if $M, g, w \models \gamma$ for all $\gamma \in \Gamma$, then $M, g, w \models \psi$.

[Whenever all formulas in Γ are true, then ψ is true.]

[A formula ϕ is *strictly valid* on a frame $F = \langle W, R, D \rangle$ iff for all $I, w \in W, g$: $\langle W, R, D, I \rangle, w, g \models \phi$.]

- Formulas with individual terms are never valid.
- The deduction theorem fails.
[$Fa \models_s Fa$ but $\not\models_s (Fa \rightarrow Fa)$.]

Validity ('Tolerant')

- An alternative, tolerant, notion of validity may also save the day.

A set of formulas Γ **TOLERANTLY ENTAILS** a formula ψ , $\Gamma \models_t \psi$, iff whenever all formulas in Γ are true, also ψ is true **IF DEFINED**.

[I.e. iff for no M, g, w : $M, g, w \models \gamma$ for all $\gamma \in \Gamma$, and $M, g, w \neq \psi$.]

[A formula ϕ is *tolerantly valid* on a frame $F = \langle W, R, D \rangle$ iff

for all $I, w \in W, g : \langle W, R, D, I \rangle, w, g \models \phi$ if defined.]

[I.e., iff for no $I, w \in W, g : \langle W, R, D, I \rangle, w, g \neq \phi$.]

Some Results

	\models_s	\Box_h	\Box_f	\models_t	\Box_h	\Box_f
$\models (a = a)$ OR $\models (Fa \rightarrow Fa)$		×	×	✓	✓	✓
$\models \Box(a = a)$ OR $\models \Box(Fa \rightarrow Fa)$		×	✓	✓	✓	✓
$\forall xFx \models Fa$		×	×	✓	✓	✓
$\Box Fa \models \Box \exists xFx$		✓	×	✓	✓	×
$\models \Box(Fa \rightarrow Fb) \rightarrow (\Box Fa \rightarrow \Box Fb)$		×	×	✓	✓	×
$\Box(Fa \rightarrow Fb) \models (\Box Fa \rightarrow \Box Fb)$		✓	×	✓	✓	×
		×	✓	✓	✓	×

This year we choose to adopt **strict entailment** (\models_s) and **friendly modality** (\Box_f) [That appears to be GAMUT's choice, too.]

THIS WAS ALL FOR TODAY, THANK YOU!⁵
ANY QUESTIONS?

⁵Many thanks to Paul Dekker for sharing his slides from last year, which have been adapted for this presentation.

The Essence of *Life* and *Love*

- The intuition of (iv') (i.e., \Box_f) is that such a friendly modality comes with an implicit condition of existence.

$\Box Fa$ really means that some thing (a) necessarily has the property F and does not imply that some such thing necessarily exists. ($\Diamond \neg \exists x Fx$)

- Thus, Aristotle may necessarily have a truly Aristotelean property, while that property is not necessarily instantiated.
- Likewise, Romeo and Juliette may necessarily be in love ($\Box Lrj$) — it is part of their nature, while Romeo need not necessarily love someone ($\Diamond \neg \exists y Lry$) — in a possibility in which Juliet does not exist.

Modal Logic ... *With Quantifiers*

[I]f we do not propose to quantify across the necessity operator, the use of that operator ceases to have any clear advantage over merely quoting a sentence and saying that it is analytic.

[W.V.O. Quine, 1953, *Reference and Modality*, p. 30–31]

(When) [C]an we say, for $C \in \{\forall, \exists\}$ and $\Delta \in \{\Box, \Diamond\}$, that:

$Cx\Delta\phi \rightarrow \Delta Cx\phi$ (or its inverse) is valid?

[Note: $(Cx\Delta\phi \rightarrow \Delta Cx\phi)$ and $(\mathcal{O}x\nabla\phi \leftarrow \nabla\mathcal{O}x\phi)$ are schematically equivalent, if C and \mathcal{O} are duals (e.g., \forall and \exists) and Δ and ∇ are duals, too (e.g., \Box and \Diamond).]

Non-Valid Principles

$$(65) \forall x \Diamond Fx \rightarrow \Diamond \forall x Fx$$

This principle is not valid.

If everybody can win the game, then it is possible that all win???

$$(61) \Box \exists x Fx \rightarrow \exists x \Box Fx$$

This is the dual of (65), equally unlikely.

If on all outcomes of the lottery somebody wins the jackpot, then there is somebody who, on all outcomes, will win the jackpot???

Increasing Domains

$$(66) \Diamond \forall x Fx \rightarrow \forall x \Diamond Fx$$

“Plausible,” but “practically amounts to accepting the increasing domains requirement.” (GAMUT, p. 62)

A model satisfies the increasing domains requirement iff

$$\forall w, w': \text{if } wRw' \text{ then } D_w \subseteq D_{w'}.$$

- This is to say that (66) is not strictly valid, and not even tolerantly valid, on the friendly interpretation of \Box . Counterexample:

Someone may have the unfortunate property of necessarily being unhappy, but, happily for the others, he need not necessarily exist. So this does not exclude the possibility of everybody being happy.

Necessary Existence

$$(62) \exists x \Box Fx \rightarrow \Box \exists x Fx$$

The *dual* of (66) indeed expresses necessary existence.

If someone has some inalienable property, then necessarily someone has it. This can only be guaranteed if any such someone necessarily exists.

[Note: on the hard \Box_h interpretation, (62) and (66) are unconditionally valid, but *only tolerantly*, not strictly!]

Seemingly Valid

$$(59) \quad \Box \forall x Fx \rightarrow \forall x \Box Fx$$

A principle that “would seem to be valid.” (GAMUT p. 61)

*If some property is a necessary condition for existence,
then it is an essential property of everyone.*

(Even if all of you may fail it!)

[Doesn't this assume that individuals *here* must be *there*, too?

No, it doesn't, on the friendly modality reading \Box_f (59) is valid.]

[On the hard modality reading \Box_h it requires increasing domains.]

Apparently Valid

$$(63) \exists x \diamond Fx \rightarrow \diamond \exists x Fx$$

This is the DUAL of (59) and this one is also intuitively valid.

[Now why is (63) so obvious and (59) apparently not? Well:

$\exists x \diamond Fx$ does *strictly* entail $\diamond \exists x Fx$, while

$\Box \forall x Fx$ does *not strictly* entail $\forall x \Box Fx$,

on the hard box interpretation \Box_h .]

[Even so, *neither* (59) *nor* (63) are strictly valid on \Box_h .]

[(59) and (63) are also known as the “Converse Barcan Formulas”]

The (Ruth) Barcan (Marcus) Formula

$$(60) \forall x \Box Fx \rightarrow \Box \forall x Fx$$

This one figures as the “Barcan Formula” in textbooks.

It relates to a *decreasing* domain assumption.

A model satisfies the decreasing domains requirement iff

$$\forall w, w': \text{if } wRw' \text{ then } D_w \supseteq D_{w'}$$

[Obviously, (60) is *valid* on a frame with decreasing domains.]

[Obviously it is *not* on a frame with properly increasing domains.]

[But this leaves some things undecided yet . . .]

Decreasing Domains

$$(64) \diamond \exists x Fx \rightarrow \exists x \diamond Fx$$

This is the dual of (60) and indeed *seems* hard to digest.

*If possibly there is something which is Pegasus,
then there is something which is possibly Pegasus???*

*I might have had a twin brother and therefore
there is something that could have been my twin???*

[Quine, among many totally others, renders this plain nonsense.]

[Many others still think of it as not at all too bad.]

[Why? Because, if we can refer to something, even as only a possibility, it must in some or other way be there.]

Funny or Annoying?

One day my friend Wyman told me that there was a passage on page 253 of Volume IV of Meinong's Collected Works in which Meinong admitted that his theory of objects was inconsistent. Four hours later, after considerable fruitless searching, I stamped into Wyman's study and informed him with some heat that there was no such passage. "Ah", said Wyman, "you're wrong. There is such a passage. After all, you were looking for it: there is something you were looking for. I think I can explain your error; although there IS such a passage, it doesn't EXIST. Your error lay in your failure to appreciate this distinction".

[Peter van Inwagen, 1998, "Meta-Ontology", in *Erkenntnis* 48, p. 236.]

THE FOOL'S GOLDEN AGE

“Golden Age of Pure Semantics”

During the Golden Age of Pure Semantics we were developing a nice homogeneous theory, with language, meanings, and entities of the world each properly segregated and related one to another in rather smooth and comfortable ways. (...) Each designator has both an intension and an extension. (...) The intension of a compound is a function of the intensions of the parts and similarly the extension (except when intensional operators appear).

[David Kaplan, “Dthat”, in Peter Cole (ed.), *Syntax and Semantics 9: Pragmatics*, AP, New York, pp. 223]



“THERE IS GREAT BEAUTY AND POWER IN THIS THEORY.”

(still David Kaplan)

The Golden Age of Descriptivism

- A logic for perfectly general platonic propositions. *No worldly casualties, no psychological blurs, no political incorrectness.*
- Historical figures.
*How can we refer to Sir Walter Scott?
He is the author of Waverley.*
- Contingent identity statements.
*Scott, the author of Waverley,
is also the author of Ivanhoe.*

Fiction

- It may also be informative to learn:

Sherlock Holmes (...) is a fictional detective created by Scottish author and physician Sir Arthur Conan Doyle. A brilliant London-based “consulting detective”, Holmes is famous for his astute logical reasoning, his ability to take almost any disguise, and his forensic science skills to solve difficult cases. [Wikipedia]

- Also informative: *He* does not exist.

“Descriptivism”

- The meaning of a name, “according to the classical conception”, is given by a description specifying the necessary and sufficient conditions for being the referent of the name.

E.g., Frege := the person who invented predicate logic.

- That a name has a reference is informative and it is an empirical issue to find out what the reference is. **Nice.**
- **However**, the sentence “Frege invented predicate logic.” would be
 - a priori,
 - it follows from the definition of “Frege”.
 - and necessary,
 - the sentence attributes to Frege an essential property,
- **Nice?**

Kripke Strikes Twice

Frege invented predicate logic.

- Such a statement is not necessary.

He might not have done it.

- This is strike one.

[The MODAL ARGUMENT.]

- Such a statement is not a priori.

It is something you could have been unable to know.

- This is strike two.

[The EPISTEMIC ARGUMENT.]

The Third Strike

- Suppose that, after all, it was Charles Sanders Peirce who invented predicate logic really.
- According to the classical conception
 - “Frege wrote the Begriffsschrift.” which is read as
 - “The person who invented PL wrote the Begriffsschrift.”would be about Peirce, and not about Frege—and hence be false.

Quod Non!

- This is strike three.

[The COUNTERFACTUAL ARGUMENT.]

Three Strikes is Out

Three strikes is *Out*.

» This conception of the meaning of names is just wrong.

Kripke's Strawmen in 6 Theses (NaN, p. 71)

- (1) *To every name or designating expression 'X', there corresponds a cluster of properties, namely the family of properties ϕ such that A believes ' ϕX '.*
 - (2) *One of the properties, or some conjointly, are believed by A to pick out some individual uniquely.*
 - (3) *If most, or a weighted most, of the ϕ 's are satisfied by one unique object y, then y is the referent of 'X'.*
 - (4) *If the vote yields no unique object, 'X' does not refer.*
 - (5) *The statement, 'If X exists, then X has most of the ϕ 's' is known a priori by the speaker.*
 - (6) *The statement, 'If X exists, then X has most of the ϕ 's' expresses a necessary truth (in the ideolect of the speaker).*
- (C) (...) the account must not be circular. (...)

As Against Thesis 2

- (2) *One of the properties, or some conjointly, are believed by A to pick out some individual uniquely.*

In fact, most people, when they think of Cicero, just think of a famous Roman orator, without any pretension to think either that there was only one famous Roman orator or that one must know something else about Cicero to have a referent for the name. (p. 81)

Consider Richard Feynman, to whom many of us are able to refer. He is a leading contemporary theoretical physicist. ... However, the man in the street (...) may still use the name 'Feynman'. When asked he will say: well he's a physicist or something. (p. 81)

- We can competently use names without having a full, uniquely identifying, description available. Thesis (2) is false.

As Against Thesis 3 (and 4)

(3&4) *If most, or a weighted most, of the ϕ 's are satisfied by one unique object y , then y is the referent of 'X'. [Otherwise,] 'X' does not refer.*

In the case of Gödel that's practically the only thing many people have heard about him—that he discovered the incompleteness of arithmetic. Does it follow that whoever discovered the incompleteness of arithmetic is the referent of 'Gödel'? (p. 83)

What do we know about Peano? What many people in this room may 'know' about Peano is that he was the discoverer of certain axioms which characterize the sequence of natural numbers, the so-called 'Peano axioms'. (...) So on the theory in question the term 'Peano', as we use it, really refers to—now that you've heard it you see that you were really all the time talking about—Dedekind. But you were not. (p. 85)

- The properties associated with a name may identify something else than its referent. Thesis (3) is false.

As Against Theses 5 and 6

- (5&6) *'If X exists, then X has most of the ϕ 's' is known a priori by the speaker & expresses a necessary truth (in the ideolect of the speaker).*

I think that my belief about Gödel [that he discovered the incompleteness of arithmetic] IS in fact correct and that [the story that someone else called Schmidt did] is just fantasy. But the belief hardly constitutes a priori knowledge. (p. 87)

- The competent use of names yields no a priori truths.
- No necessity follows from the use of the name 'Gödel' either, let alone that this necessary truth is known a priorily.

Kripke's Summary

[Thesis (1)] is true, because it can just be a definition. [p. 64]

[W]e must cross off Thesis (6) as incorrect. (...) Theses (2), (3), and (4) turn out to have a large class of counterexamples. Even when Theses (2)–(4) are true, Thesis (5) is usually false; the truth of Theses (3) and (4) is an empirical ‘accident’, which the speaker hardly knows a priori. (p. 78)

- (2–4) That Frege is the referent of “Frege” is independent of the fact that Frege satisfies a certain description. (That was Strike 3.)
- (5) We do not know a priorily that he has the associated properties. (S. 2.)
- (6) And surely they are no essential, necessary, properties. (S. 1.)

Paradise Lost



We're out of Eden. But then, what about these:

- Reference to individuals we cannot point at?
- Talk about fictional characters? Or historical figures?
- (Non-)existence claims?
- Significance of identity statements?

REAL OBJECTS

The Causal “Theory” of Reference

- Along the lines of Chastain, Kripke, Putnam, . . . , amo.
- Reference starts with baptism, and is transmitted in causal-intentional chains of communication.
- This holds for individuals, named by proper names, but equally for sorts and substances, labeled by sortal nouns or mass nouns.
- There is a social (and historical) division of linguistic labour.
- It’s a ‘story’ about how things may go, not a ‘theory’. (Kripke)

Re-Solution of Descriptivist ‘Solutions’

- Reference to historical figures is possible through historical chains.
- ‘Reference’ to fictive figures can be modeled as in a play, playing under the pretense that some baptism *has* taken place.
- Saying that ‘So-and-so’ doesn’t exist really amounts to saying that the chain of using the term ‘So-and-so’ is corrupted.
- Saying that *a* might —contrary to fact— not have been *b*, really is saying that ‘*a*’ or ‘*b*’ might not have named *a*, i.e., *b*.

Names of Substances

- General terms, those for natural kinds, may behave likewise.
 - Species names ('cat', 'tiger', ...),
mass terms ('water', 'gold', 'iron pyrites' or 'fool's gold')
nouns for natural phenomena ('heat', 'light', 'sound', 'lightning'),
corresponding adjectivals ('hot', 'loud', 'red').
- Such "substance is defined as the kind instantiated by (almost all of) a given sample."

(...) statements representing scientific discoveries about what this stuff is are not contingent but necessary truths in the strictest possible sense.

[Kripke, *NaN*, p. 136/125]

Theoretical Identifications

[We find] *that light is a stream of photons, that water is H_2O , that lightning is an electrical discharge, that gold is the element with the atomic number 79. (...) Heat is the motion of molecules.*

[Kripke, *NaN*, p. 116/129]

Since we have found out that tigers do indeed, as we suspected, form a single kind, then something not of this kind is not a tiger.

[Kripke, *NaN*, p. 121]

- Since such identifications are identifications of referents (kinds), they are, therefore, *a posteriori* and *necessary*.

[Not *contingent* and not *a priori*, mind you!]

Hilary Putnam (1926—2016), Social Realism

In fact, once we have discovered the nature of water, nothing counts as a possible world in which water doesn't have that nature. (p. 709)

It is beyond question that scientists (...) talk as if later theories in a mature science were, in general, better descriptions of the SAME entities that earlier theories referred to. (...) we use the name RIGIDLY to refer to whatever things share the NATURE that things satisfying the description normally possess. (p. 237-8)

[Hilary Putnam, 1973, "Meaning and Reference", *The Journal of Philosophy*
Hilary Putnam, 1975, "The Meaning of 'Meaning'", *Mind, Language and Reality*]

Non-Existence is Pertinent

So it is said that though we have all found out that there are no unicorns, of course there might have been unicorns. Under certain circumstances there would have been unicorns.

And this is an example of something I think is not the case.

What substance is being discussed must be determined as in the case of proper names: by the historical connection of the story with a certain substance.

[Kripke, *NaN*, p. 24/157]

Suppose for example the statement is SHERLOCK HOLMES DOES NOT EXIST. Then the proposition will be necessarily true (...) since the domain of no possible world contains the actual person WE call Sherlock Holmes.

[For: Aristotle does not exist “is false in possible worlds whose domain contain the person WE call Aristotle and true in possible worlds whose domains do not contain that person.”]

[Robert Stalnaker, 1978, “Assertion”, p. 93]

Non-Existence is Necessary

If our use of the term ‘Sherlock Holmes’, or ‘Unicorn’, does not belong to a causal-intentional chain that is initiated by the original baptism of a certain person or kind, then there surely can be no possible world that contains a person or kind from which our use of the terms actually originates.

➤ *So, to say that unicorns don’t exist is, if true, necessarily true.*

?? But isn’t it possible that something exists that does not actually exist?

How can we be saying actually **what** here?

POSSIBLE OBJECTS ARE IMPOSSIBLE

Willard Van Orman Quine (1908—2000)

- Kripke and Stalnaker appear to agree that there is nothing of which you can say that it does not exist.
- Haven't we heard that before?
 - W.V.O. Quine, 1948, "On What There Is".

Suppose McX maintains there is something which I maintain there is not. McX can, quite consistently with his own point of view, describe our difference of opinion by saying that I refuse to recognize certain entities. I should protest, of course (...)

But protest how? You ask What There Is? Everything!

Philosophical Nonsense

This is the old Platonic riddle of nonbeing. Nonbeing must in some sense be, otherwise what is it that there is not?

If Pegasus were not, it would be nonsense to say he is not; so you cannot coherently say he is not, so we must live with the fact that he is.

[O]ne of those philosophers who have united in ruining the good old word ‘exist’ [i.e., Wyman, PD] (...) in an ill-conceived effort to appear agreeable, genially grants us the non-existence of Pegasus and then, contrary to what we meant by nonexistence of Pegasus, insists that Pegasus is.

[Quine, OWTI, p. 3]

Ontological Nonsense

Wyman's overpopulated universe is in many ways unlovely. It offends the aesthetic sense of us who have a taste for desert landscapes, but this is not the worst of it. Wyman's slum of possibles is a breeding ground for disorderly elements. Take, for instance, the possible fat man in that doorway; and, again, the possible bald man in that doorway. Are they the same possible man? How do we decide? How many possible men are there in that doorway? Are there more possible thin ones than fat ones? How many of them are alike? Or would their being alike make them one? Are no two possible things alike? Is this the same as saying that it is impossible for two things to be alike? Or, finally, is the concept of identity simply inapplicable to unactualized possibles? But what sense can be found in talking of entities which can not be meaningfully be said to be identical with themselves and distinct from one another? These elements are well nigh incorrigible. By a Fregean therapy of individual concepts, some effort might be made at rehabilitation; but I feel we'd do better do simply to clear Wyman's slum and be done with it.

[Willard V.O. Quine, 1948, "On What There Is", p. 4]

Logical Nonsense

[I]f to a referentially opaque context of a variable we apply a quantifier, with the intention that it govern that variable from outside the referentially opaque context, then what we commonly end up with is unintended sense or nonsense of the type (26)–(31).

- (4) *‘Cicero’ contains six letters.*
- (26) $(\exists x)(\text{‘}x\text{’ contains six letters}).$
- (27) *There is something such that ‘it’ contains six letters.*
[Quine, 1953, “Reference and Modality”]

In modal contexts:

- !! Possibly Pegasus lives and flies.
- » The sentence “Pegasus lives and flies” is consistent.
- ?? There is something such that “It lives and flies” is consistent.

Names Explained Away

Whatever we say with the help of names can be said in a language which shuns names altogether. To be assumed as an entity is, purely and simply, to be reckoned as the value of a variable.

[A] theory is committed to those and only those entities to which the bound variables of the theory must be capable of referring in order that the affirmations made in the theory be true. [Quine, OWTI, p. 13]

- Names may be taken to refer to anything that they apply to.
- They may apply to nothing, and hence fail to refer.
- Enter Russell's 1905 theory of definite descriptions.

$$\text{THE}(A)(B) := \exists x(\forall y(Ay \leftrightarrow x=y) \wedge Bx)$$

The Pegasizer

The ‘name’ “Pegasus” can be associated with the

EX HYPOTHESI *unanalyzable, irreducible attribute of BEING PEGASUS, adopting, for its expression, the verb ‘is-Pegasus’, or ‘pegasizes’.*

Any use of the term can be interpreted by means of a Russellian expansion into “the pegasizer”.

- *Pegasus flies* is rendered as *The pegasizer flies*, i.e., as
Something is the one and only pegasizer and it flies.
- *Pegasus exists* is rendered as *The pegasizer exists*, i.e., as
Something is the one and only pegasizer [and it is].
- *Pegasus does not exist* is rendered as *Not the pegasizer is*, i.e., as
*Nothing is the one and only pegasizer, i.e.,
There is no such thing.*

The General Problem and Solution

- There is nothing of which we can say that it is not.
- But we want to say something of the following kind.
 - “It is possible that a certain thing exists but actually ...”
...but actually *what*?
 - “(...) actually *it* does not exist?”
Actually *What* does not exist?
- This does not work. Quine’s ‘solution’:
 - “It is possible that *a certain thing* exists ...
but actually there is no *such thing*.”
- Is this satisfactory? Open Question!

POSSIBLE OBJECTS ARE POSSIBLE

An Egalitarian Attitude

Suppose we agree that individuals exist and might not have existed. We believe in possibilities where individuals actually existing are not.

Isn't it unfair to not believe in possibilities accommodating objects which are not actually existing?

And, if we, the Architects of the Models, allow ourselves to generalize over possible objects, why should the citizens of these models be rendered unable to do so?

- Let quantifiers range over the whole domain $\mathcal{D} = \bigcup_{w \in W} D_w$, and let predicates freely apply to all possible objects, actually existent or not.
- No further design choices! (GAMUT, §3.3.4)

One Domain; A Transparent Logic

- One domain. Bi-valence restored. The included third excluded again. No weak and strong Kleene tables. No hard and friendly \Box 's. No strict and tolerant validity.

$$M, w, g \models Rt_1 \dots t_n \text{ iff } \langle [t_1]_{M,g}, \dots, [t_n]_{M,g} \rangle \in I_w(R);$$

$$M, w, g \models \neg\phi \quad \text{iff } M, w, g \not\models \phi;$$

$$M, w, g \models (\phi \wedge \psi) \quad \text{iff } M, w, g \models \phi \text{ and } M, w, g \models \psi;$$

$$M, w, g \models \forall x\phi \quad \text{iff } M, w, g[x/d] \models \phi \text{ for every } d \in D;$$

$$M, w, g \models \Box\phi \quad \text{iff } M, w', g \models \phi \text{ for every } w': wRw'.$$

- Among the possible individuals, some are taken to exist. Existence is denoted by a predicate (E), intuitively, $I_w(E) = D_w$.

Where The H*** Did Our Problems Go?

John is talking about Mary-Ann and about Pegasus. Not about Santaclaus. And he is not beaten up by Pegasus.

$$Tjm \wedge Tjp \wedge \neg Tjs \wedge \neg Bpj \quad \wedge \quad Ej \wedge Em \wedge \neg Ep \wedge \neg Es$$

Pegasus is not flying.

$$\neg Fp \quad / \quad (Ep \wedge \neg Fp) \quad / \quad \neg(Ep \wedge Fp)$$

Obviously now: $\Box \forall x Fx \Leftrightarrow \forall x \Box Fx$ $\Diamond \exists x Fx \Leftrightarrow \exists x \Diamond Fx$.

Barcan-style formulas reappear undisguised.

$$\Box \forall x (Ex \rightarrow Fx) \Leftrightarrow \forall x \Box (Ex \rightarrow Fx) \not\Leftrightarrow \forall x (Ex \rightarrow \Box Fx);$$

$$\Diamond \exists x (Ex \wedge Fx) \Leftrightarrow \exists x \Diamond (Ex \wedge Fx) \not\Leftrightarrow \exists x (Ex \wedge \Diamond Fx).$$

- The problems have gone: away.

Possible Objects? Really?

It is quite possible to find philosophical objections to a domain containing all possible individuals, or to analyze existence as a predicate. But as we pointed out (...), philosophical considerations may not be allowed to have the last say if our aim is the application of logical methods in the description of natural language. [GAMUT, the *Instrumentalist*, p. 64]

« Kripke, Stalnaker: such is practically intractable.

» Quine: such is methodologically objectionable.

[!!] Hintikka, Lewis: such is systematically inescapable.
But not in the GAMUT way!

[Perhaps look at it this way. A possible world is just a possibility, and the actual world is (identity 'is', not predicative 'is') just a possibility that is real. Actual objects are really merely possible objects, but for the fact that they happen to be actually real, not 'instantiated', or something of the kind.]

Jaakko Hintikka (1929—2015), *Methods of Individuation*

With what right do we speak of individuals in the different possible worlds as being identical? [Hintikka, 1969, p. 33.]

Since variables bound to quantifiers range over individuals, a method of individuation is an indispensable prerequisite of all quantification into modal contexts. A quantifier that binds (from the outside) a variable occurring in a modal context does not make any sense without such a method of individuation, and its meaning is relative to this method.

[Jaakko Hintikka, 1967/9, “On the logic of perception,” in: *Models for Modalities*, Reidel Dordrecht, p. 169/70.]

Logical Point of View

The apparent simplicity of our idea of an ‘ordinary’ individual, safe as it may seem in its solid commonplace reality, is thus seen to be merely a reflection of the familiarity and relatively deep customary entrenchment of one particular method of cross-identification, which sub specie aeternitatis (i.e., sub specie logicae) nevertheless enjoys but a relative privilege as against a host of others.

[Jaakko Hintikka, 1969, “Semantics for Propositional Attitudes,” in: *Philosophical Logic*, J.W. Davis et al. (eds.), Reidel, p. 36/42.]

[Recent work along these lines by Jelle Gerbrandy, Maria Aloni and myself.]

David Lewis (1941—2001), Counterpart Theory

Within any one world, things of every category are individuated just as they are in the actual world; things in different worlds are never identical (...).

Carnap, Kanger, Hintikka, Kripke, Montague, and others have proposed interpretations of quantified modal logic on which one thing is allowed to be in several worlds. (...) Our difference is not just verbal, for I enjoy a generality he [“a reader of this persuasion”] cannot match. The counterpart relation will not, in general, be an equivalence relation.

[David Lewis, 1968, “Counterpart Theory and Quantified Modal Logic”, *Journal of Philosophy* 65, pp. 114/5]

It need not be transitive or symmetric.

It need not be functional either.

‘Individuals’ can ‘split’ and ‘merge’ and appear and disappear in all our modal talk and thought.

[Recent work along these line by Dilip Ninan and Andrew Bacon.]