Floppy Designators
A Modal Comedy of Manners

by Mike Arnautov

Dramatis personae:

Cecil Standish – an amateur philosopher, specialist in philosophy of language, amiable and well-disposed

Martin Mayer – a scientist, genuinely curious about philosophy, aware of his ignorance but not easily satisfied

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“Excuse me… Could I join you here?”

“Er… yes.”

“Yes, I know there are other tables available, Mr Standish, but I understand you are a specialist on Kripke and I…”

“Cecil, please!…”

“Ah, sorry, yes I should have said. Martin. Martin Mayer.”

“Pleased to meet you, Martin! But people do rather overstate things! I am hardly a Kripke expert. Of course, if you have some questions, I would be pleased to do what I can to help. Please do sit down – we can drink our coffees in amicable discussion.”

“Wonderful! You see I am not a philosopher, just a scientist very interested in philosophy. And I was really impressed with the idea of using *possible worlds* as a highly intuitive model of modal logic.”

“Oh, yes, that was indeed a very profound shift in philosophy of modal logic. As you say it makes an excellent intuitive model.”

“Well, quite. So I was eager to learn more of Kripke's work, but I am afraid I seem to need help with *rigid designators.* I wonder…”

“Ah, you are by no means alone. The concept is not as widely understood as it really ought to be. I should be able to help you there.”

“Please – I would be most grateful. Take for example gold…”

“Good! I am glad you have encountered that one. As a scientist, I am sure you will agree that gold is element 79. Kripke's point is that this is necessarily so in all possible worlds, which is what makes it a **rigid** designator. So that…”

“Excuse me, but that's exactly where I get confused. You see, one has to bear in mind the structure of an atom of gold and I cannot see how that is accommodated.”

“Sorry… What do you mean?”

“Well, you see – I am sure this is all well understood – the number 79 refers to the number of protons in the nucleus…”

“Well, yes, that's why isotopes of gold are still gold, they just have a different number of neutrons.”

“Exactly! But properties of gold are all about the electron shell. Electrostatic forces and all that…”

“OK, but it's gold.”

“It is. But if electrons weren't electrons, so to speak, but, let's say, muons…”

“Muons?…”

“Yes. They are just like electrons, only much heavier. So if in some possible world, to use that wonderful modal logic model, muons were to play the role of electrons, gold would have quite different properties. Is Kripke saying it still would be gold?”

“Well, strictly speaking, yes. Phenomenal properties of gold are kind of accidental, what matters is the essence – and that is the atomic number of 79. So yes, in principle muon gold would be gold regardless. But of course, in practice, it would be far too confusing to… hehe… scientists – and everybody else! So in practice I'd say we limit ourselves to worlds in which phenomenal properties do not change significantly.”

“I see. So when Kripke says that rigid designators are valid in all possible worlds, he does not mean **all** possible worlds, but just some appropriate subset? That's kind of what I assumed.”

“No, no! Not at all. I am simply pointing out the difference between *in principle* and *in practice*. It’s like… I don’t know… Something like π being in principle an irrational number, but in practice we always handle it as a rational approximation. Context matters.”

“Fine. But then in practice, how does one decide what subset of possible worlds is appropriate to a given context? It can't be physically possible worlds, because we don't really know what is physically possible. The world of muon gold may not be!”

“No, possible worlds are certainly not limited by science. Strictly speaking they are metaphysically possible worlds.”

“You mean imaginable worlds?”

“By no means! Our imagination may be too limited. But it does not really matter because *in principle* all metaphysically possible worlds do matter. What subset one works with *in practice* is a matter of context.”

“I see… I think. It is a bit confusing. I’ll need to think about this one.”

“Excellent. And, of course, similar considerations apply to another famous example: water being H_2O…”

“But…”

“I know what you are about to say!… We never find pure H_2O in nature. And I suppose you might have questions about H and O on the same lines as with gold…”

“Not at all! I am happy to set the gold issue aside for the moment – and the same goes for hydrogen and oxygen. And impurities are, of course, a distraction. But, it's the matter of structure again…”

“… like ice. Of course! But ice is still water, just in a different phase.”

“Well, ice… Last time I looked, there were 21… or was it 22?… different known structures of ice, each with its own properties. But it is the *composition* of water that's H_2O…”

“I am glad you understand. So water is indeed H_2O…”

“No, that's not what I mean! It's the structure that matters. After all we do not say ‘diamond is carbon’ and just leave it at that – because soot is also carbon.”

“True, but water is H_2O and nothing else is – ice and water vapour aside.”

“In composition, yes. But what gives water as a substance its properties is the … um… dance of ever forming and dissolving polymer-like chain structures. It’s a process, without which water would not even be a liquid at room temperature.”

“Is that so?”

“Absolutely. To understand water as it is, one has to understand it as a process. Can a process be an ‘essence’?”

“That is a very interesting way of putting it. I confess I had not thought of water quite like that. Can a process be a *designatum*? I told you I was no expert – I’ll need to look it up. But I think the point still remains: water is H_2O, process or no process. The process may explain its familiar behaviour under actual conditions, but it does not follow that it fixes the reference.”

“Perhaps not by itself. But ‘H_2O’ is not just a tally of atoms, is it? It belongs to a whole theory of bonding, charge distribution, molecular interaction, phase behaviour and so on. That is what makes me wonder whether the structure is not already present in what we mean by the formula.”

“I am afraid that’s all over my head, but I think you are probably conflating the route by which we identify water with what water is.”

“Hm… I am not sure I can see the difference. I shall have to think about it. So let’s set that one aside for the time being. Now, the other one I find puzzling is somewhat different: the ‘Hesperus is Phosphorus’ one…”

“Yes, that **is** the famous one. And no … hehe … physics angle! It does appear rather paradoxical, doesn’t it? How can Hesperus be Phosphorus when it would be a mistake to point at Hesperus and say ‘Look, Phosphorus!’? The point is that identity here is that of reference. Both refer to Venus. It is an example of *a posteriori necessity* – in itself a major contribution of Kripke’s.”

“That’s familiar enough. Science is in the business of uncovering such necessities. Like electricity and magnetism both being actually the same thing – electromagnetism. But…”

“While you are sort of right there, you are also somewhat missing the point. In science such discoveries are a matter of untangling physical phenomena. Kripke’s target is different – he is pointing out *a posteriori* necessity of reference!”

“Again, I am not sure I can follow the distinction, but in any case, what I was going to say is that surely Hesperus and Phosphorus are not referencing Venus as such. Aren’t they just picking out whatever plays a certain role in a visible Earth-Sun-Venus configuration?”

“Perhaps, but configurations come and go. What is stable is Venus itself. In any such configuration, pointing at Hesperus or Phosphorus, one is pointing at Venus.”

“In all possible worlds?”

“Indeed. What matters is not contingent circumstances. The point is in tracking an individual – Venus, in this case – across all possible worlds.”

“This… seems strange. Let’s see… Suppose a passing black hole – or a cosmic joker, if we are keeping physics out of it – manages to swap Venus and Mars in their respective orbits. Is Venus no longer Venus? Or are Hesperus and Phosphorus now referencing Mars?”

“Absolutely not. Venus is still Venus and both Hesperus and Phosphorus still reference it.”

“Surely, people would still look at the night sky and on seeing Mars would say ‘Hesperus (or Phosphorus, as the case may be) is looking a bit redder these days!’”

“I expect they would. But they would be mistaken.”

“Oh... I rather thought Kripke intended to fix problems of our understanding of language, but this seems to go against normal language use.”

“Why should that surprise you? Scientists produce theories which are completely unlike the world we experience. Likewise, Kripke shows how reference actually works—not necessarily how people think they are using it. If your ‘cosmic joker’ swaps the planets, people calling Mars ‘Hesperus’ would be simply wrong – metaphysically speaking. ”

“Mmm… I see. Or rather I don’t, I am afraid. The way I see it, gold, for example, is element 79 not because ‘element 79’ is in some sense its ‘essence’, but because that relationship is so deeply enmeshed with the rest of science that denying it would bring down most of our scientific edifice. Whereas there is no such enmeshing of Hesperus/Phosphorus. So real-life language use would simply reflect that and treat it as a re-attachable label. And as Quine, I think, said, science is simply a continuation of common sense.”

“Ah, Quine. ‘To be is to be the value of a variable.’ Well, it’s a point of view. But even from that rather scientistic perspective, you must see that

these examples can function, if nothing else, as models of how meanings are fixed in a discourse. As a first step, so to speak."

“I suppose that makes sense. We do that kind of thing in science. Like Einstein stipulating what is meant by 'simultaneous' in Relativity. Is that what you mean?"

“Precisely! Well... sort of. The point is, the term is fixed. And there you are – we have reached an understanding, as is good and proper in a philosophical discussion. And just in time for the next lecture, by the looks of it.”

“’Approaches to Normativity’ . I am really looking forward to that one! But just a quick question… Didn’t Kripke want something more in... what was that title?... Naming and Necessity?”

“Indeed so, but some other time, perhaps. Normativity, here we come!”

“Yes, of course! Thank you for your time. Really appreciated!”

They hastily finish their coffees and walk towards the lecture theatre, both with the same rueful thought in their minds

“Well, that went well…” (Martin, already wondering who else might be worth approaching to help him understand how all this makes sense.)

“Well, that went well…” (Cecil, trying to remember where he had put his well-thumbed copy of Naming and Necessity.)

Author's Postscript

The foregoing dialogue was always intended as a comedy of mild misunderstandings. Martin is not meant to refute Cecil; Cecil is not meant to be foolish. They are two intelligent, well-disposed people talking somewhat past one another – as philosophers and scientists often do. Both could make sharper points and press harder on points they do make, but not under the time and manners constraints of the occasion.

That said, a reader may wonder where the author actually stands. So let me confess: Martin as written reflects my own voice of about fifteen years ago – genuinely puzzled, genuinely curious, but ultimately unconvinced.

Since then I have come to view Kripke's essentialism as an attempt to salvage a conception of language as a mirror of nature (to use Rorty's apt expression), in which reference was taken to be the key to philosophical understanding of language. I no longer find that conception tenable.

Bibliography

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