

Kripke on Mind-Body Identity

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I. Contingency, Aposteriority, and Mind-Body Identity

The argument against mind-body identity theory in *Naming and Necessity* is directed against a theory advocated in Place (1956), Smart (1963), Lewis (1966), and Armstrong (1968). Their psycho-physical identity theory attempted to vindicate the reality of mental processes by identifying pains, sensations, and consciousness itself with brain states and processes. It arose in reaction to phenomenalism and behaviorism, the latter in both its scientific form, illustrated by B.F. Skinner, and its philosophical or “logical” form, illustrated by Gilbert Ryle. Early versions didn’t specify *which brain states and processes* were identical with pain states, sensation states, or consciousness. That was a job for neuroscientists. The philosophical job was to defeat conceptual objections to the possibility that any such identification could be correct and to articulate the explanatory advantages of incorporating the mental into physical science.

According to these theorists, identifying a mental type, say pain, with a neuro-chemical type – call it “C-fiber stimulation” – is conceptually no more problematic than identifying lightning with a type of electrical discharge, heat with mean molecular kinetic energy, or water with H₂O. Psycho-physical identity theorists took all these identities to be contingent aposteriori truths. Kripke argued they were wrong, both about the already established identities and about the alleged psycho-physical identities.

2. R Rigidity, Necessity, and Identity

His argument arose from views about necessity and rigid designation. A necessary truth was, for him, one that would have been true no matter what possible state the world were in. Although some necessary truths are knowable apriori and some are expressed by analytic sentences, others are neither. If I say, of my dog Lilly, "She is an animal," what I assert is true, and couldn't have been false (provided she existed), since Lilly – not something similar in appearance, but Lilly herself – couldn't have existed without being an animal. Nevertheless, this truth is neither knowable apriori nor expressed by an analytic sentence.

Rigid designation is defined as follows in intensional semantics.

Rigid Designation (for singular terms)

A singular term t is a rigid designator with respect to a context C and assignment A of values to variables iff there is an object o such that (i) t refers to o with respect to C , A , and the world state w_C of C , and (ii) for all possible world-states w in which o exists, t refers to o with respect to C , A , and w , and (iii) t never refers to anything else with respect to C , A , and any world-state w^* .

Proper names, simple indexicals ('I', 'she', 'it', 'that', etc.), and individual variables are rigid in this sense, while some complex singular terms -- e.g. the Fregean singular definite description 'the greatest student of Plato' -- aren't rigid. Let t be a singular term, S be the sentence [t liked dogs], and A be the person designated by one's use of t at a context of utterance C . Let p be the proposition expressed by one's use of S in C . If t is rigid, then A is the one whose liking dogs, at any world-state w , is necessary and sufficient for p to be true at w ; if t isn't rigid, this needn't be so. So, if t is '*Aristotle*', or the demonstrative '*he*' is used to refer to Aristotle, or a variable ' x ' is assigned Aristotle as value, then one individual, the same for every world-state w , must like dogs at w in order for p be true at w . So these terms are rigid. When t is '*the greatest student of Plato*',

either p can be true at different world-states w by virtue of different dog lovers being Plato's greatest student at w , or p can be false at w in even if Aristotle likes dogs at w , or both. Thus the description isn't rigid. Here is a useful test. A term t is rigid iff a use of the following sentence containing t is true "*the individual that is/was actually t couldn't have existed without being t , and nothing other than that individual could have been t .*"

When a and b are rigid singular terms, $[If\ a = b,\ then\ necessarily\ a = b]$ is always true.¹ So, Hesperus is necessarily Phosphorus, I am necessarily Scott Soames, and x is necessarily identical with y , whenever x is identical with y . Suppose I name my current headache 'H' and a neuro-scientist names the stimulation of a certain C-fiber of mine 'C-Stim'. If H is C-Stim, then necessarily H is C-Stim.

What about (1) and (2), which contain the general terms 'pain' and 'C-fiber stimulation'?

1. Pain is C-fiber stimulation (i.e., $Pain = C\text{-fiber stimulation}$)
2. Pains are C-fiber stimulations ($\forall x [x \text{ is a pain iff } x \text{ is a C-fiber stimulation}]$)

The definition of rigidity for general terms parallels the definition for singular terms.²

Rigid Designation (for general terms)

A general term t is a rigid designator iff t designates a property or kind P_K at the actual world-state, and for all possible world-states w in which P_K exists, t designates P_K at w , and t never designates anything else.

Consider 'blue' and 'the color of a cloudless sky at noon', which, when understood as general terms, can combine with the copula to form a predicate.

- 3a. Mary's eyes are blue.
- b. Mary's eyes are the color of a cloudless sky at noon.

¹ For simplicity I here suppress complications about what to say when a or b doesn't exist at a possible world-state.

² This definition is simplified by not relativizing designation to contexts and assignments of values to variables. We can afford to do this because all the general terms we will consider will either be single words or phrases that do not contain indexicals or variables.

‘Blue’ is rigid because the color Mary’s eyes must be at a world-state in order for the proposition expressed by (3a) to be true at that state doesn’t change from one state to the next. Since the same can’t be said about the proposition expressed by (3b), ‘the color of a cloudless sky at noon’ isn’t rigid.

Because the general terms ‘pain’ and ‘C-fiber stimulation’ are nouns, they appear with an article when they combine with the copula to form a predicate.

- 4a. The sensation I felt a minute ago was a pain.
- b. The neurological event that just occurred was a C-fiber stimulation.

Kripke takes it for granted that both ‘pain’ and ‘C-fiber stimulation’ are rigid. Though it’s not, I think, entirely obvious that ‘pain’ is rigid, Kripke’s claim to the contrary is not unreasonable. Thus I will hold off questioning the rigidity of ‘pain’ until later.

Nevertheless, rigidity isn’t the distinguishing feature of Kripke’s account of natural-kind terms like ‘water’, ‘light’, ‘heat’, ‘red’. These general terms are rigid, but so are the non-natural kind terms ‘square’, ‘automobile’, ‘philosopher’, ‘physician’, and ‘bachelor’. It is hard to find a single-word general term that isn’t. The distinguishing feature of Kripkean natural kind terms is a certain kind of non-descriptiveness. Like names, they aren’t synonymous with descriptions associated with them by speakers. They are also like names in the way in which their reference is fixed. Just as names are often introduced by stipulating they are to refer to individuals with which one is already acquainted, natural-kind terms are often introduced by stipulating they are to designate kinds with which one is acquainted through their instances. Imagine ‘water’ being introduced by the following stipulation,

The term ‘water’ is to designate the property possession of which explains the most salient features of nearly all samples we have encountered – e.g. the fact that they boil and freeze at certain temperatures, that they are clear, potable, and necessary to life.

If ‘water’ were so introduced, its instances at a world-state would be quantities with the property that explains the salient features of (nearly) all actually encountered *water*-samples. The stipulation is, of course, idealized. ‘Water’ behaves pretty much as if it had been introduced by such a stipulation, but presumably it wasn’t. It was enough for speakers to start calling certain quantities ‘water’, intending it to apply to whatever shared the properties explaining their most important observational characteristics. Once introduced, a natural kind term is passed from speaker to speaker, just as names are.³

Since these terms are rigid, the natural kinds they designate don’t change from one world-state to another. But the extensions of predicates formed from them do. Whereas ‘water’ rigidly designates the kind, which is its extension at every world-state, the extension of ‘is water’ at *w* is the set of instances of water at *w*. Since different quantities of water are found at different world-states, the predicate ‘is water’ is non-rigid. The same can be said for other natural kind terms and the predicates arising from them.

Now consider (5), in which (b) and (c) are different ways of understanding (a).⁴

- 5a. Water is H_2O .
- b. Water = H_2O .
- c. $\forall x$ (x is (a quantity of) water iff x is (a quantity of) H_2O).

Because the terms are rigid, (5b) is necessary if true. Of course, if (5b) is true, then (5c) is also necessary. But, if we haven’t established (5b), we can’t get from the

³ See Soames (2007b).

⁴ (5a) can also be understood as a universally quantified conditional, as ‘Ice is H_2O ’ is. See chapter 11 of Soames (2002).

truth of (5c) to *its* necessity. If we also know that *being water* and *being H₂O* are *essential* properties of any quantity that has them, we can move from (5c) to (5d).

5d. $\forall x \Box (x \text{ is a quantity of water iff } x \text{ is a quantity of H}_2\text{O}).$

But this doesn't guarantee the necessity of (5c). Similar remarks apply to (6), though there is no chance of moving from (6c) to (6d) because it is not always so that when x is hotter than y , it is *essential* to x, y that the former is hotter than the latter.

- 6a. Heat is mean molecular kinetic energy.
- b. Heat = mean molecular kinetic energy
- c. $\forall x, y (x \text{ is hotter than } y \text{ iff the mean molecular kinetic energy of } x \text{ is greater than that of } y)$
- d. $\forall x, y \Box (x \text{ is hotter than } y \text{ iff the mean molecular kinetic energy of } x \text{ is greater than that of } y).$

These results establish the falsity of early identity theorists' claims that empirically established identities like (5b) and (6b), are *contingent*. As Kripke has shown, these statements are *necessary*, if true. So is (1) – *Pain = C-fiber stimulation* – *provided that* 'pain' and 'C-fiber stimulation' are rigid designators. Although (2) -- $\forall x (x \text{ is a pain iff } x \text{ is a C-fiber stimulation})$ -- might be contingent (as long as pain isn't identified with C-fiber stimulation), (2*)

2*. $\forall x \Box [x \text{ is a pain iff } x \text{ is a C-fiber stimulation}]$

must be true, provided that *being a pain* is essential to everything that is a pain. Whether or not 'pain' does rigidly designate a property that is essential to its instances will be examined later.

3. Kripke's Main Argument Against Identifying Pain with C-Fiber Stimulation

Kripke's argument contrasts (1) with (6b).

- 1. Pain = C-fiber stimulation
- 6b. Heat = mean molecular kinetic energy

Although both seem, on first consideration, to be contingently true, or contingently false, (6b) is necessary if true. How then is its apparent contingency explained? It was an empirical discovery that how hot something is depends on how fast its molecules are moving. Since we couldn't have known this apriori, evidence was needed to rule out conceivable scenarios in which it isn't so. So, if one wrongly identified *real possibilities* with *conceivable scenarios* that we can't know apriori not to be actual, one would wrongly take (6b) to be contingent. If we don't fall prey to this confusion, we won't take the *necessity* of (6b) to threaten its *aposteriority*. Might a psycho-physical identity theorist who agreed with Kripke about the rigidity of 'pain' and 'C-fiber stimulation' say the same about (1)? Kripke thinks not.

He finds the illusion that (6b) is contingent to be rooted in the fact that we identify heat indirectly, by the sensations it causes in us. Because of this he says that we associate 'heat' with *the reference-fixing description* 'the cause of a certain sensation S' (of heat). Taking this sensation to be part of "our concept of heat," we confuse the description with a synonym for 'heat', and the necessary truth (6b) with the contingent truth (7).

7. The cause of sensation S = mean molecular kinetic energy

Rightly recognizing possible world states at which (7) is false, we wrongly take them to be world-states at which (6b) is false.⁵ This is a mistake. We all recognize possible world-states at which many things are hot, even though there are no

⁵ Ibid, pp. 150-51.

sentient beings capable of having any sensations. Thus 'heat' isn't synonymous with 'the causes of sensation S'.⁶

Kripke argues that same strategy can't be used to dismiss the impression that there are possible world-states at which (1) is false. Unlike heat, we designate pain directly. We don't say, "What a horrible sensation! Let's use 'pain' to rigidly designate it's cause." Nor do we define its referent as the bearer of an other properties we can conceive of something other than pain as bearing. Since there is no descriptive reference-fixer to confuse with a synonym for 'pain' and no contingent truth to confuse with (1), the impression that (1) is contingent, if true, *isn't* an illusion. The conceivable scenarios in which pain isn't C-fiber stimulation are possible world-states in which (1) is false. Since in fact, (1) is necessary if true, it follows that (1) is false.

4. The Weakness of the Argument

Kripke's argument depends on a questionable contrast between how we identify heat and pain. Although there is a contrast, it's not, I think, the one he suggests. The most fundamental contrast is that whereas heat is something perceived, pain is our perception of something. Our *sensation of heat* is our perception of heat; it is a special kind of perceptual experience that reliably, but fallibly, detects heat. Similarly, so our *pain sensation* is our perception of injury; it is a special kind of perceptual experience that reliably, but fallibly, detects injury. The

⁶ 'Heat' is also not synonymous with 'the x: Actually (x caused sensation S'. For explanation see chapter 2 of Soames (2002), Soames (2007a), and chapters 4 and 6 of Soames (2010).

reason there is no pain without “an experience of pain” is that pains are a special type of perceptual experience.

Contra Kripke, we *don't* identify heat by first perceiving a sensation S, and then using it to talk about the *know-not-what* that caused S. The sensation *is* our perception of heat, just as a visual experience of my dog Lilly *is* a perception her. Lilly does cause my visual experience, but when I identify her I do so directly, by perceiving her, not indirectly, by making my perceptual experience of her the object of my attention, and defining her as its cause. If I ask myself, “To what do I use ‘Lilly’ to refer?” I look at her and answer “To her.” If I ask myself, to “To what do I use ‘heat’ to refer?” I move close to the fire, or the stove, and answer “To that.” Since there is no “reference-fixing description,” I don’t take either term to be synonymous with a description. Nor do I confuse scenarios involving Lilly, or heat, with scenarios in which other things cause my experiences.

In short, when I say I can conceive of heat not being molecular motion, or of Lilly being, not an animal, I am *not* misdescribing *some other possibility* that I am *really* conceiving. I am *not really* thinking of sensation S being caused by something other than heat, or of my Lilly-perceptions being caused by a robotic facsimile. I am simply thinking of heat, or Lilly, as lacking an essential property P. Because P is essential, the claim that x has P, if x exists, is necessary. Because I can’t know apriori that x has P, knowledge of the necessary truth requires empirical evidence to rule out conceivable disconfirming scenarios that can’t be eliminated apriori.

The same can be said about self predications. Let P be a property -- e.g. *having a body made up of molecules*, or *being a human being* -- that I couldn’t have existed

without having, but which I can't know I have without empirical evidence. My remark "If I exist, then have P" will then express a necessary truth. Although this truth *might* wrongly *seem* contingent, this *isn't* because I wrongly take the 1st-person singular pronoun to be synonymous with a reference-fixing description. There is no such description. When I use the pronoun, I don't identify myself as the creature, whoever it might be, designated by a privileged description. Thus, when I say I am conceiving a scenario in which *I lack P*, I am *not* confusing myself with some other creature, *Mistaken-Me*, who, in fact, is designated by my reference-fixing description -- thereby misdescribing a different possibility in which he lacks P.

The lesson is the same in all our cases. Whether it is heat and *mean molecular kinetic energy*, Lilly and *being sentient*, or me and *being human* the mistake of wrongly taking a proposition to be contingent that, in fact, must be necessary if true is due to the fact that establishing its truth requires empirical evidence ruling out scenarios in which it is false. In some cases, there may be other sources of confusion, too. Perhaps some philosophers have confused heat with the sensation of heat, as Kripke says. But that isn't the main reason it was surprising that the *empirical* discovery that heat is mean molecular kinetic energy turned out to be necessary.

What was surprising was that the reason empirical evidence is needed to establish the kinetic theory *isn't* to rule out disconfirming *possibilities*; it is to rule out disconfirming *impossibilities* we can't know apriori not to be actual. This is the core insight behind the Kripkean necessary aposteriori. When T rigidly designates an individual o, or kind k, when F expresses an essential property of o, or k, and when knowledge of o, or k, that it has this property requires empirical evidence, the

proposition expressed by [If T exists, then T is F] is necessary but knowable only aposteriori. The surprise was that knowledge of actuality is sometimes required to give us knowledge what is, and what isn't, *possible*.⁷

Kripke's insight requires distinguishing ways things could conceivably be from ways they could really be. According to him, when p is necessary but knowable only aposteriori, *it is knowable apriori that if p is true, then it is necessary*.⁸ Since one can't know p apriori, world-states in which p is false are coherently conceivable, and so epistemically possible. When one does learn that p is true, one learns that none of these world-states could have been actual.⁹ In short, one learns empirically that certain epistemically possible world-states are metaphysically impossible.

For the Kripkean, metaphysically possible world-states are maximally complete properties the universe could have had. Epistemically possible states are maximally complete properties the universe can be conceived as having which we can't know apriori it doesn't have. The former set of properties is a proper subset of the latter.¹⁰ We all know that there are properties that ordinary things could have had and others they couldn't have had. The same is true of the universe; there are maximally complete properties it could have had – metaphysically possible world-states – and others it couldn't have had – metaphysically impossible states. We can all coherently

⁷ See Stalnaker (1979, 1984) for an influential model of inquiry in which the function of empirical evidence is always to rule out genuine possibilities that could have been actual. See Soames (2006b) for a detailed critique.

⁸ Kripke (1971), 152-53.

⁹ To say that a world-state is, or could have been actual is to say that the world is, or could have been, in that state. This use of 'actual' contrasts with the use of 'actual' as a rigidifier modeled by David Kaplan's actuality operator. See Soames (2007a) for explanation of the relation between the two uses.

¹⁰ See Soames (2007a) and chapters 5 and 6 of Soames (2010).

conceive of ordinary objects having some properties they couldn't have had. The same is true of the universe. We can all coherently conceive of it having some maximal properties it couldn't have had. These are *epistemically* but not *metaphysically* possible world-states. The reason empirical evidence is needed for knowledge of necessary aposteriori truths to rule out metaphysically impossible, but epistemically possible, world-states at which they are false.

With this we return to Kripke's claim that the apparent falsity of (6b) – *heat = mean molecular kinetic energy* – at certain possible world-states can be explained away as an illusion, but the apparent falsity of (1) -- *pain = C-fiber stimulation* – at certain possible world-states can't be explained away. Kripke's argument for this claim fails, *even if 'pain' is a rigid designator*. In both cases, it is open to the defender of the identity theory to argue that the appearance of contingency arises from confusing epistemic possibility with metaphysical possibility. Since the identity statements (1) and (6b) can't be known apriori, empirical evidence ruling out epistemically possible world-states at which they are false is needed if they are to be known at all. Since this doesn't establish the existence of metaphysically possible world-states in which the identities fail, Kripke needs another argument.

5. A Second Kripkean Argument Against Pain – Brain-State Identity

He has one, which can be reconstructed from the following passage.

What about 'pain' and 'C-fiber stimulation'? It should be clear from the previous discussion that 'pain' is a *rigid designator* of the type, or phenomenon, it designates: *if something is a pain it is essentially so*, and it seems absurd to suppose that pain could have been some phenomenon other than the one it is. The same holds for the term C-fiber stimulation, provided

that 'C-fibers' is a rigid designator, which I will suppose here... Thus, the identity of pain with the stimulation of C-fibers, if true, must be necessary.¹¹

Here Kripke confuses the claim that 'pain' is rigid with the claim that it designates a property essential to its instances. The difference between these claims is illustrated by the general terms 'blue' and 'hot'. Although both are rigid, the properties they designate aren't essential properties of their instances. Thus, *the assumption that the terms, 'pain' and 'C-fiber stimulation' designate properties that are essential to their instances* doesn't follow from the claim that they are rigid.

Given this essentialist assumption, one can show (2) to be false by showing (2*) to be false, leading to the conclusion that (1) is also false, if 'pain' is rigid.¹²

2*. $\forall x \Box [x \text{ is a pain iff } x \text{ is a C-fiber stimulation}]$

(2*) does appear to be false. Consider, the headache I had this morning. Could it – that very sensation -- have existed without being a pain, because the experience was either pleasurable, or unnoticeable? Although it is natural to think that the actual C-fiber stimulations responsible for my headache could have existed without my experiencing pain, it is less clear that my pain sensation could have existed without being a pain. Suppose at world-state w , I exist with all my C-fibers, but my brain is different from the way it is at the actual world-state – either because the evolutionary path leading to me at w is different from the one at the actual world-state, or because at w some genetically designed D-fibers that counteract the effects of C-fiber stimulation have been surgically added. At w , the same C-fibers fire in my brain that actually caused my headache, but at w I experience pleasure. My C-fiber stimulation exists at w , without being a pain at w . If

¹¹ Kripke (1980), pp. 148-49, my emphasis.

¹² Here and throughout I assume that 'C-fiber stimulation' rigidly designates a property essential to its instances.

this is metaphysically possible, then (2*) is false. If, in addition, *being a pain* is an essential property of its instances, then (2) is also false, in which case (1) is too. But is *being a pain* really an essential property of anything that has it?

6. Reassessing Rigidity and Essentiality

How do I identify pains? Since they are conscious experiences, I am aware of my own pains in something like the way I am aware of my other conscious experiences (e.g. my visual or auditory experiences). Knowing that my pain experiences are caused by certain kinds of events, which then modify my thoughts, motivations, and actions in characteristic ways, I come identify pain in others by observing their verbal and non-verbal responses to events similar to those that cause pain in me. This pre-theoretic picture anticipates more sophisticated functionalist conceptions of mind according to the mental states of an organism are internal states that causally interact in systematic ways to mediate sensory inputs and behavioral outputs.¹³ On such conceptions, sensory inputs interact with existing beliefs, desires, and preferences to change one's beliefs, desires, and preferences, which result in instructions being sent to the muscles. Different mental states play different causal roles. Preferences assign high priority to certain outcomes. Believing that *p* typically leads to behavior that brings about highly-valued outcomes in situations in which it is true that *p*. Desiring that *p* often leads to actions one believes will bring it about that *p*.¹⁴ On this picture pain is a kind of *internal perception of injury* to the body that an agent has a high preference for

¹³ See Putnam (1967).

¹⁴ The symbol 'p' is used here as a schematic sentential letter.

avoiding. Normally, this perception leads to actions intended to minimize the injury, and intentions to avoid similar injury in the future.

On this picture, a datable event or state of an organism is a pain iff it is an internal state of detecting injury instances of which play a certain functional role. In the interest of avoiding false precision, let us call it “the pain role.” The state designated by the term ‘pain’ is then *the internal perceptual state of an organism o the function of which is to detect injury to o, instances of which typically play the pain role in o*. The predicate ‘is a pain’ is true of all and only instances of that state – i.e. of all and only instances of the internal perceptual state that plays that role in an organism. It is possible that very different physiological states count as pain in different individual organisms, and types of organisms. If we can imagine non-physical beings inhabiting bodies, it is not even ruled out that they too have pains. What all these beings have in common is an internal perceptual state, the function of which is to detect certain kinds of bodily injury, and to trigger changes in their current motivational structure that normally lead to actions intended to end or minimize the current injury, and to form or reinforce of desires to avoid similar injury in the future.

Suppose ‘pain’ designates a property of this sort. If it does, then (1*) is both true and necessary.

- 1*. Pain in an organism o is the state in o that plays *the pain role*.
(Pain in an organism = the state that plays the pain role.)

What about the following particularized versions of (1_H), (2_H), and (2_H*)?

- 1_H. Pain (in humans) is C-fiber stimulation (in humans)
(Human pain = human C-fiber stimulation)
- 2_H. Pains (in humans) are C-fiber stimulations (in humans)

$(\forall x [x \text{ is a human pain iff } x \text{ is a human C-fiber stimulation}])$

$2_H^*. \forall x \Box [x \text{ is a human pain iff } x \text{ is a human C-fiber stimulation}]$

Suppose further that empirical investigation were to give us good reason to believe that for every pain in a human being there was a corresponding C-fiber stimulation, and conversely. Would that justify taking either (1_H) or (2_H) to be true? Not if the truth of (1_H) required its necessity for, presumably, evolution could have gone differently enough to bring it about that instances of something slightly different from C-fiber stimulations – call them B-fiber stimulations – played the pain role. In that case human pain would be B-fiber stimulation at w . On this picture, ‘pain’ *isn’t* a rigid designator after all.

A slight variation in the case would allow the continued existence of human C-fibers, even though stimulation of them wouldn’t play the pain role, because, at the world-state w^* , C-fibers interact with other new neural systems not present in human brains at the actual world-state. On this picture, nothing obviously rules out particular C-fiber stimulations that are pains at the actual world state from existing at w^* without being pains at w^* . The “possibilities” alluded to here are, of course, speculative. It could turn out that they aren’t genuine metaphysical possibilities. But nothing I know of points in that direction, and nothing I can find in *Naming and Necessity* makes a strong case against it. Thus, it seems that Kripke’s objections to the versions of mind-body identity we have been considering don’t succeed.

7. But is Kripke’s Conclusion False?

That doesn’t mean that he was wrong to be skeptical of attempts to identify pain with a physical state. Although I have tried to give defensible functionalist sketch of

“the pain role,” my sketch contains two wild cards. First, the pain state is required to be the internal state of an *organism*. In order to be capable of feeling pain, it is not enough that some arbitrary physical system – constructed out of any materials whatsoever – can be given an interpretation in which its changes of state correspond 1-1 to the changes in the internal state of an organism that perceptually detects injury, changes beliefs, preferences, and desires, and initiates actions. There is more involved in being an internal state of an *organism* that does these things than what is captured by a merely abstract mapping. What this something more is remains an open question.

Second, I characterized pain as a kind of *perception* of bodily injury, without saying what kind. I suspect that not just any kind will do. Consider a being otherwise like us except for detecting pain in a way that is qualitatively similar to our hearing of pleasant musical sounds of varying intensities, corresponding to our pains of varying intensities. Suppose other modifications of the sound gave the location of the perceived injury. The scenario is one in which these pseudo-pains -- which are caused by the same external events that cause our pains -- lead to internal changes of mental states, resulting in behavioral changes, in much the way our pains do. Do these imagined agents really feel pain? I’m not confident they do. If the musical qualia are pleasant, how could they feel pain? Since I don’t know what to think about this case, I conclude, not that Kripke was wrong to reject psychophysical identity theories, but only that his arguments against them are inconclusive.

7. Addendum: Necessary Aposteriori Identities

In section 4, I traced the failure of Kripke's main argument against the identification of pain with C-fiber stimulation to failing to respect his own insight involving properties we know apriori to be essential to anything that has them, but which we can know an entity to possess only empirically. As shown in Soames (2011), all Kripkean instances of the necessary of the necessary aposteriori, save one type, clearly fit this pattern. In all these cases empirical investigation is needed to rule out epistemologically possible, but metaphysically impossible, world-states.

The one class of apparent exception involves statements like (8) in which the identity predicate is flanked by simple Millian terms, the representational contents of which are their referents.¹⁵

8. Water = H₂O

If each term is genuinely Millian, the proposition (8) is used to express identifies the kind K_{water} with itself. Since Kripke rejected descriptive analyses of these terms, he was hard pressed to explain why empirical evidence is needed to reject this identification. I have said it is to rule out epistemically possible but metaphysically impossible world states. Which states are they? Since world-states are properties of making-true certain sets of basic propositions that tell complete world-stories, the question is answered by identifying those sets of propositions.¹⁶ Now that we have a conception of propositions that allows us to distinguish representationally

¹⁵ For special cases like 'Water = the substance molecules of which are composed of two hydrogen atoms and one oxygen atom' in which one term is a simple Millian expression and the other is a rigid, but non-Millian semantically compound expression, see Soames (2007a).

¹⁶ See chapters 5 and 6 of Soames (2010).

identical but cognitive distinct propositions we can do that.¹⁷ In each case the key proposition *p* in the set is the cognitive proposition that predicates *non-identity* of a pair of arguments the first of which, K_{water} , is cognized via the term 'water', and the second of which, K_{water} , is cognized via 'H₂O'.¹⁸ Since knowledge of $\sim p$ requires empirical evidence that the terms are co-designative, $\sim p$ can't be known apriori. This means that the world-states thereby defined can't be known apriori not to be actual. Hence, the world-states that $\sim p$ is used to define are epistemically, but not metaphysically, possible. Without cognitive propositions, Kripke had no way of seeing this.

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¹⁷ See Soames (2015), particularly chapter 4.

¹⁸ Since complete world-stories are required only to be representationally complete, no other propositions with the representational content of *p*, or with the representational content of $\sim p$, need be included, along with *p*, as basic world-state defining propositions.

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