

## *Tharp's third theorem*

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Perhaps reality fundamentally consists entirely of an arrangement of very small things that come in a few large classes of exact duplicates. Perhaps it also includes fields which assign some number, vector or tensor to every point of space-time. Perhaps it even includes irreducible non-physical qualia. All else supervenes upon the way reality fundamentally is. But manifest reality contains many things not yet mentioned: pain, water, cats, cults, furniture, footy. All these supervene upon fundamental reality. How? We may fear that we cannot locate manifest things within fundamental reality by means of a priori conceptual analysis – exactly how must the very small things be arranged in order for Essendon to be winning? We don't know, and still less do we know it a priori. Or so it certainly seems. It would be over-hasty to conclude that such things cannot possibly be known a priori, but that is at least our first impression.

Kripke's discovery of a posteriori necessity therefore looks like a godsend. Necessary bridge laws locate manifest reality within fundamental reality, even though we cannot know them a priori (so it's no wonder if we don't know them at all). Because the bridge laws are necessary, our credentials as materialists – if fundamental reality is indeed physical – cannot be challenged; because they are a posteriori, we are free from the burden of trying to locate manifest things within fundamental reality by means of conceptual analysis.<sup>1</sup>

Frank Jackson (1998: 56–86) argues that this godsend is illusory. The necessary a posteriori bridge laws must follow a priori from contingent a posteriori premisses that are made true by the fundamental way the world is. To illustrate the deductive pattern:<sup>2</sup>

<sup>1</sup> I take these necessary a posteriori bridge laws to be sentences, not propositions. It clearly makes sense to classify some sentences as necessary a posteriori. It's not so clear that it makes sense to apply the same classification to the propositions these sentences express, and my own opinion is that it does not. Likewise in the case of the contingent a priori.

<sup>2</sup> I pretend for the sake of the example that the standard view of 'water' as a rigid designator of the watery stuff is correct. My real opinion is that we would be equally within our linguistic rights in using 'water' as a *non*-rigid designator of the watery stuff, so that what they have on Twin Earth (whether it's a remote planet or another possible world) is water with a different chemical structure. If so, it's analytic that the

the watery stuff is H <sub>2</sub> O	(contingent a posteriori),
the watery stuff is water	(a priori),
therefore water is H <sub>2</sub> O	(necessary a posteriori).

In this way, Jackson argues (1998: 57) that ‘physicalists, qua holders of a metaphysical view, are committed to the logical thesis of the a priori deducibility of the psychological way things are from the physical way things are’.<sup>3</sup> To generalize: *all* of us are committed to the a priori deducibility of the manifest way things are from the fundamental way things are (whatever that may be). Conceptual analysis, to provide the a priori premiss of the deduction, is after all an indispensable part of the solution to the location problem.

We need a way to get from contingent truths, supervenient on the fundamental way things are, to the necessary a posteriori bridge laws. What it takes to do the job, or so it seems, is a general result that every necessary a posteriori truth is a priori deducible from a contingent truth. That was proved long ago. Indeed something stronger was proved: Tharp’s third ‘theorem of metaphysics’, which states that every truth is a priori equivalent to a contingent truth. The proof is simple. It makes no use of the contentious apparatus of A-intensions versus C-intensions (also known as diagonal versus horizontal intensions, Stalnaker 1978; or primary versus secondary intensions, Chalmers 1996: 56–65).

It’s no wonder that Tharp’s third theorem is little known. When first proved, it was announced only in an abstract in a mathematics journal (Tharp 1974). Only fifteen years later was it published in full, posthumously, in a philosophy journal (Tharp 1989: 212). What’s more, when at last it was published, the proof was garbled by a pair of confusing typographical errors.<sup>4</sup>

Here is the proof. (I simplify: Tharp’s proof also covered the a priori equivalence of any falsehood to a contingent falsehood.) First, pick once

watery stuff is water; ‘Water is H<sub>2</sub>O’ and ‘The watery stuff is H<sub>2</sub>O’ come out as analytically equivalent contingent a posteriori truths. I note also that being ‘watery’ is not just a matter of being colourless, tasteless, liquid, life-supporting etc.; it is also a matter of being abundant hereabouts, being an object of our acquaintance, and being the causal source of our tokens of ‘water’. Finally, I ignore qualifications to the contingent a posteriori premiss: some watery stuff is very impure H<sub>2</sub>O; sometimes the hydrogen is deuterium or tritium; and some H<sub>2</sub>O, such as ice or steam, is not altogether watery.

<sup>3</sup> Contraposing the same argument, anyone committed to denying the a priori deducibility of the psychological way things are from the physical way things are is thereby committed to denying physicalism (Chalmers 1996: 56–65, 131–34, 166).

<sup>4</sup> Page 212, line 14-up: the biconditional should be ‘ $\phi$  iff  $\pi$ ’. Line 12-up should be ‘...  $\psi$  is contingent ...’.

and for all some arbitrarily chosen contingent a priori truth. Let it be  $M$ : 'the metre bar is one metre long'. Let  $\varphi$  be any truth: necessary or contingent, a priori or a posteriori. Case 1:  $\varphi$  is contingent. Then it is a priori equivalent to a contingent truth, namely itself. Case 2:  $\varphi$  is necessary. Consider the biconditional ' $\varphi$  iff  $M$ '. Since  $M$  is contingent and  $\varphi$  is necessary, the biconditional is contingent. Since  $M$  and  $\varphi$  are both true, the biconditional is true. Since  $M$  is a priori,  $\varphi$  is a priori equivalent to the biconditional. In either case,  $\varphi$  is a priori equivalent to a contingent truth. QED. We may note as well that if  $\varphi$  is a posteriori, then so is the biconditional.

Shall we conclude that Jackson proved his point in a needlessly difficult way, with needless recourse to contentious apparatus? Not at all! The real lesson is that what Jackson needs, and what he gives us, goes beyond the a priori deducibility of necessary a priori bridge laws from contingent premisses. What Tharp offers as the contingent truth that is a priori equivalent to 'Water is  $H_2O$ ' is 'Water is  $H_2O$  iff the metre bar is one metre long'. Contingent, sure enough; and a posteriori as well. But in no way does it help us locate water within fundamental reality. What Jackson offers is 'The watery stuff is  $H_2O$ '. That solves the location problem for the watery stuff, which is only a short a priori step away from solving the location problem for water. Jackson has supplemented Tharp's third theorem with a result that has far more bearing on the location problem: *every a posteriori truth is a priori equivalent to a contingent a posteriori truth whose C-intension is the same at all worlds, and hence is the same as its A-intension.*<sup>5</sup>

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<sup>5</sup> I thank Karen Bennett, David Chalmers and Frank Jackson for valuable comments.