

# BOOK REVIEW

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## Consciousness\*

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Hill was a central-state materialist who kicked qualia upstairs into the brain. In this important and engaging book, he converts to externalist representationalism, kicking qualia downstairs into the extracranial world where they seem to reside. All awareness 'constitutively involves representations' (69); and 'the phenomenal character of an experience is the set of qualia that the experience represents as instantiated by objects of awareness' (148). Like others, Hill views representationalism as providing a route to reducing experience. He reduces qualia to physical properties of external objects and bodily regions. Without providing a detailed reductive theory of representation, he sometimes assumes that experiences represent such properties by having the function of causally co-varying with them (149, n. 16; 179–80).

Let me say at the outset that Hill provides one of the most impressive defences of externalist representationalism to date. He breaks new ground on too many issues to address in a short review. I will focus on his case for representationalism and his representationalist views on the perception of space and pain, leaving to the side his interesting (and often convincing) discussions of introspection, emotion and the explanatory gap.

Hill's primary argument for representationalism is that it alone comports with cognitive science, which has it that perception involves the manipulation of inner (perhaps subpersonal) 'representations' (70). But he doesn't explain why anti-representationalists (central-state materialists, Peacocke-style sensationists, disjunctivists) cannot agree with cognitive science. Indeed, in principle, why couldn't they agree with Hill that awareness of external objects supervenes on and 'constitutively involves' the right kind of causal adjustment between the representations and the external objects? However, Hill raises forceful additional arguments against anti-representationalist views. For instance, against adverbialism, he says that the characteristics constituting phenomenology 'belong to the [external] objects of awareness', not internal states (86). Presumably, this Harman-style transparency intuition partly explains his conversion from central-state materialism to representationalism.

Hill's discussion of spatial perception takes the discussion to a new level. He aims to account for the fact that the apparent size and shape of a penny (for instance) vary with distance and orientation. He rejects the view (defended by Peacocke and Lycan) that at some level a tilted penny is simply presented as elliptical. In effect he objects that it falsely predicts that we should believe it to be elliptical (143). I wondered why the proponent could not reply that we rarely attend to this level of content (along the lines of Hill himself at 157). Hill also (rightly, I think) rejects as unmotivated the view

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(analogous to ‘relational’ views of colour) that apparent sizes and shapes have the form: causing postreceptoral perceptual-neural state *S*. (Hill (forthcoming) also persuasively argues that it cannot satisfactorily explain how actual sizes and shapes are computed.) Finally, he rejects the view that they are visual angle properties. His objection is that, as distance and orientation vary, apparent size and shape vary more slowly than angular properties, owing to internal constancy transformations (164). Hill ultimately identifies apparent sizes and shapes with properties of objects he calls *Thouless properties*: ‘the values that are obtained when certain computable functions [constancy transformations] are applied to angular properties (together with various other quantities)’ (165). This is intriguing but somewhat unclear. Wouldn’t the ‘values’ be numbers? But properties cannot be numbers. Also, how do experiences represent Thouless properties (however explained)? The following case illustrates the difficulty. Twin Percy’s visual system achieves better size constancy than Percy’s under the same objective conditions. On viewing a distant object, they exhibit behavioural differences that only make sense on the assumption that they enjoy different size phenomenology. Given Hill’s transparency thesis and his equation of phenomenology with the ‘set’ of represented properties, their experiences must represent externally instantiated Thouless properties,  $T_1$  and  $T_2$ , that are somehow distinct – perhaps in the functions they involve. (Yet presumably, the represented properties are also co-extensive, given that the experiences optimally co-vary with the same external conditions.) But, given the sameness in co-variance facts, what explains the representational difference? Hill might invoke the *internal-computational* differences between Percy and Twin Percy, but it is unclear how. Hill says representing Thouless properties would be useful (166), but this is not to provide a reductive account of it.

Hill develops a sophisticated, empirically informed representationalist view of pain. Pain involves a cortical ‘D-representation’ which represents a bodily ‘D-state’ involving some degree of ‘actual or potential damage’ (224). A worry I had is that some pains (e.g. mild thermal pain, mild shock, the pain of heavy exertion, back-pain) don’t involve even potential damage.

Hill addresses a semantic-conceptual puzzle. The hypothesis that our term ‘pain’ refers to the cortical D-representations (experience vehicles) accommodates the *percipi* intuition that pain cannot occur without pain experience but violates the intuition that pains are located in the body. The hypothesis that ‘pain’ instead refers to bodily D-states accommodates the location intuition but violates the *percipi* intuition (think of D-states in a cadaver). In response Hill sometimes (189, 224) apparently favours the *indeterminacy view* that ‘pain’ partially denotes both candidates, sometimes (224) the startling *no reference view* which ‘denies that there is such a thing’. Hill might have considered more tame responses: the *ambiguity view* that ‘pain’ simply has two meanings, and the *complex univocal view* on which ‘pain’ always refers to real or apparent D-states but only in the context of being represented by a D-representation (thereby partially accommodating the *percipi* intuition).

Hill briefly addresses another problem. To illustrate, consider a schematic case. Maxwell first undergoes disturbance  $D_1$  in his arm and then  $D_2$  in his leg. By any natural measure  $D_2$  is much less than twice greater than  $D_1$ . But, using a visual analogue scale (VAS), he judges his leg-pain to be roughly twice greater than his arm-pain in intensity. This is because of response expansion: even though  $D_2$  is not twice greater than  $D_1$ ,  $D_2$  produces a firing rate in his primary somatosensory cortex (S1) neurons roughly twice greater than that produced by  $D_1$ ; and such firing rates are

‘linearly related to subjects’ perceived pain intensity’ (Coghill et al. 1999, 1936). Hill handles this type of case by positing misrepresentation (178). On his view, maybe Maxwell accurately represents his arm as undergoing  $D_1$ , but misrepresents his leg as undergoing  $D_{2+}$ , where  $D_{2+}$  is somehow greater than the actual disturbance  $D_2$ . I had two worries. First, such misrepresentation might be naturalistically explicable if interfering (e.g. top-down) agencies were present. But the usual causes of response expansion (e.g. temporal/spatial summation) aren’t interfering; they are part of *normal* function. And some instances (e.g. electric shock) don’t involve any external ‘agencies’ at all. Further, the problem is *general*. Perceived loudness and pitch increase *more slowly* than their external physical correlates, amplitude and pitch, due to *response compression*. Would Hill posit misrepresentation here too, holding we constantly misrepresent loudness and pitch (perhaps simply identified with amplitude and frequency)? But here there are certainly no interfering agencies to naturalistically explain the alleged misrepresentation. Second, Maxwell’s *introspective* judgment – that his leg-pain is *apparently* twice greater than his arm-pain – is presumably accurate. Presumably, on Hill’s externalist view, it is accurate exactly if the *represented* disturbances,  $D_{2+}$  and  $D_1$ , stand in this relation. But suppose  $D_{2+}$  and  $D_1$  are lesions, or shock intensities. In what sense might  $D_{2+}$  be *twice greater* than  $D_1$ ? In the degree to which they jeopardize the organism? But when is one ‘degree of jeopardy’ twice greater than another? Hill’s former central-state materialism avoids these problems. The pains are identical not with the bodily D-states but with the cortical S1 neural activations, and (granting linear correlation) the second one is in a straightforward sense twice greater than the first one – viz., in firing rate.

Hill addresses the worry that intuition supports internalist verdicts on Swampman and spectrum inversion, contrary to externalist representationalism (148ff.). Hill simply rejects intuition. However, Hill neglects an empirically motivated objection in the vicinity. As noted, even under optimal conditions, phenomenology is much better correlated with internal factors than external factors. This supports *internal dependence*: internal factors at least partially determine phenomenology. A hypothetical case illustrates the problem for Hill’s externalist representationalism. Mild and Severe belong to separate species. They undergo cortical states that have the *function of co-varying with* the same leg lesion  $D$  (involving the same afferent neural activity). However, due to airborne bacteria endemic to Severe’s environment, the lesion is more dangerous for Severe than for Mild. So, Severe’s cortical state involves much higher S1 firing rates than Mild’s; and Severe is innately disposed to react to  $D$  with greater urgency than Mild. In general, their internal intensity metrics for the same bodily disturbances differ. The S1 differences (linearly correlated in our own case with sensory intensity) and the innate behavioural differences provide *empirical* support for the verdict of different pain experiences. But Hill’s representationalism apparently entails that they have the same pain experience, despite the internal and behavioural differences. For, on the co-variance theory he sometimes assumes, their cortical states, though different, *represent* the same bodily disturbance  $D$ .

So, the *external directedness* of experience suggests Hill’s representationalism. But it apparently violates *internal dependence*. In contrast, Hill’s former central-state materialism obviously accommodates internal dependence but cannot explain external directedness (e.g. apparent pain location). How might Hill’s representationalism accommodate internal dependence as well as external directedness? This is a puzzle, because our best theories of representation (co-variance theories, etc.) are externalist.

Here are two options. (i) Hill (180) says that the function of the pain system is to prevent *harm*. He might say that, even though Mild and Severe's legs undergo the same lesion *D*, it has different 'harm levels' for Mild and Severe, determined by the degree to which they jeopardize the organism. Further, their pains differ in intensity because they somehow *represent* these different harm levels, despite the fact that they causally co-vary with the same bodily disturbance, *D*. But 'degree of jeopardy' is unclear. (It couldn't be probability of causing death.) Further, some intense pains don't jeopardize the organism at all. And how do Mild and Severe's states manage to represent 'harm levels'? Many say representation requires causation. But their states are both caused by *D*; the different (highly relational) harm levels aren't causally efficacious. Finally, consider a twist on the case: Mild and Severe evolve to respond differently to *D*, not because *D* jeopardizes Severe more than Mild, but because of fluke evolutionary differences. The 'different harm level' gambit cannot apply here. (ii) A second idea is that phenomenology is partly determined by the non-semantic properties of the cortical content vehicles, partly by their representational contents. (Hill already says (108) that certain sophisticated *beliefs* – including the belief that qualia are simple – are determined by non-semantic properties.) In the Mild–Severe case, the representational contents (represented properties) are admittedly *the same*; but the internal non-semantic properties differ, accounting for the phenomenological difference. But this two-factor view of phenomenology violates Hill's transparency thesis (86) and consequent one-factor view that phenomenology is nothing but the 'set of *represented* properties' (148).

But no view is wrinkle-free. Hill's book is excellent. One of its many unique features is that it addresses an overlooked puzzle: how might externalist representationism accommodate the empirically determined role of internal factors (e.g. constancy transformations, cortical pain processing) in configuring phenomenology? It will contribute to setting the agenda for future research.

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