



OTHER MINDS: THE OCTOPUS AND THE EVOLUTION OF INTELLIGENT LIFE

PETER GODFREY-SMITH

Reviewed by Thomas W. Polger

Other Minds: The Octopus and the Evolution of Intelligent Life

Peter Godfrey-Smith

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'Peter Godfrey-Smith is besotted with cephalopods', begins a review of *Other Minds* in the *Los Angeles Times*. And so he is. Popular media discussions of Godfrey-Smith's book have tended to focus on his enthusiasm, on his anecdotes, and on the perceived novelty of a philosopher who is also a scuba diver—perhaps, of a philosopher who leaves his office at all. They also seem impressed by the breadth of empirical knowledge that he brings to the subject—'Godfrey-Smith is not a scientist but a philosopher', notes the *Washington Post*, as though surprised. I am not myself surprised that there are knowledgeable philosophers who get out from behind their desks, though Godfrey-Smith's stories are particularly impressive. Here I will focus my attention on two additional aspects of Godfrey-Smith's *Other Minds*: first, his contribution to the methodological question of how to approach the eponymous puzzle of other minds; second, the implications of his conclusions for my own cause célèbre, the phenomenon of multiple realization.^[1]

Other Minds emphasizes Godfrey-Smith's first-hand experience observing and interacting with cephalopods, especially octopuses and cuttlefish. For the general reader this first-hand experience establishes his expertise, and also allows him a certain kind of intimacy with his subject that invites the reader on his journey. That journey also provides the book with a narrative thread, from his initial encounter with octopuses, into his growing fascination with them, and then on to his study and theorizing about the inner lives of cephalopods. For philosophers and cognitive scientists, this same

narrative intimacy will immediately raise red flags. Has Godfrey-Smith turned into one of those animal minds kooks (or pet owners) whose evident affection for their subjects robs them of critical distance? 'The plural of anecdote is not data', some will say.

But these concerns miss their mark. Godfrey-Smith does not enumerate his methodology in this book as he might in an academic monograph; yet from his discussion we can distill a view. Rather than arguing for his approach on theoretical grounds, he demonstrates it in action. If we must put a label on it, then we can say that Godfrey-Smith's approach to the problem of other minds is a version of inference to the best explanation. But that characterization robs his view of its nuance and fails to distinguish it from some competing approaches, notably that of Michael Tye in his contribution to this discussion, *Tense Bees and Shell-Shocked Crabs* ([2016]). Tye explicitly endorses the principle that similar effects have similar causes, a Newtonian 'rule' drawn from mechanical physics. He then puts this principle to work to argue that various animal behaviours justify the inference that many animals have conscious mental states. Although the Newtonian reasoning is also a version of inference to the best explanation, Tye's approach is the inverse of Godfrey-Smith's: Tye begins with a principle of inference that he takes to be independently justified, and then carries it about the animal kingdom—indeed, a wide swath of the animal kingdom—to apply it as a measure to various creatures. In contrast, Godfrey-Smith begins with the particular, with the peculiarities of some creatures in a small corner of the animal kingdom, and builds up his reasoning and evidence through a series of detailed comparisons with other creatures. He often finds that similar effects have different causes, and appears to rely on the inverse of the Newtonian principle, namely, that similar causes will have similar effects. But the similarities and differences that occupy Godfrey-Smith are not only or mainly by comparison with humans or mammals. His story is as much about how octopuses and cuttlefish differ from other mollusks and from their common ancestors as about how they behave in ways commonly associated with vertebrates.

Consider, for example, Godfrey-Smith's discussion of the paradoxical fact that cephalopods 'invest' in big bodies and big brains despite having relatively short life spans. 'What is all the brainpower doing if an octopus is dead in less than two years after hatching from the egg?', he asks (p. 160). The answer, according to *Other Minds*, is that when cephalopods abandoned the constraints of living in shells like other mollusks, they became susceptible to their environments but also opened up possibilities for bodily sensitivity, motion, and control that provided selection pressures for bigger and more elaborate bodies and for more complex nervous systems to control them. Godfrey-Smith's reasoning does not infer similar cause from similar effect. He does not conclude that complex behavioural abilities must be produced by brains or minds like ours—in fact, as I will return to below, the octopus belies that inference pattern. Rather, Godfrey-Smith lays out a complicated story about the evolution of cephalopods from unicellular organisms and Ediacaran animals, with attention to alternative forms that have evolved in parallel, those that have survived with little change, and those that are extinct. He attends to changing evolutionary environments. And he is circumspect about describing both behavioural and physical traits of cephalopods as being the same as those of other animals, without being outright sceptical of such attributions. There is no bridge or leap across the explanatory gap—no decisive argument by analogy, analysis, or Newtonian rule.^[2] The strategy is the gradual accumulation of evidence that cephalopods are in some ways like and in other ways unlike mammals. Godfrey-Smith's approach, especially on the issue of sensation, is closest to what Owen Flanagan and I once called the 'structure of consciousness' argument (Polger and Flanagan [1999]; Polger and Sufka [2006]). The idea is to try to 'match' up brain, nervous, and bodily structures, on the one hand, with reported (in the case of humans) or inferred (in the cases of non-verbal animals) structures of lived perceptual and sensory experiences. Some of these matchings will have to do with similar effects, others with similar causes, others with similar histories, and so on. Most will be a messy combination, difficult to sort out. But that is why science and scientific philosophy are hard work. And *Other Minds* does much to remind philosophers that understanding often comes gradually from a detailed examination of and theorizing about the world around us rather than in great rational leaps.

Let me now consider whether Godfrey-Smith's view of octopuses and other cephalopods has any implications for the question of the multiple realization of psychological processes. Multiple realization is the phenomenon that some states or processes in the world can be 'made', 'built', or 'implemented' by a wide variety of physically diverse 'realizers'. The phenomenon came to attention with respect to the computational sciences, with the idea that a bit of computational

software can be 'implemented' in or 'realized' by physical (or non-physical!) systems of indefinite or infinite varieties of composition.

Hilary Putnam famously advanced an argument against the mind-brain identity theory based on the phenomenon of multiple realization. In Putnam's wilder moments he claimed that just about anything at all could have a mind. But his considered view is bold enough, for he took it to be obvious that a wide variety of creatures can experience sensations of pain and hunger. Indeed, Putnam ([1975], p. 436) singled out octopuses specifically, saying that identifying psychological processes with brain processes would require that each relevant brain process 'be a possible state of a mammalian brain, a reptilian brain, a mollusc's brain (octopuses are mollusca, and certainly feel pain), etc.'. Putnam plainly doubts that this is the situation, and thus expresses confidence that pain is differently realized in humans and octopuses. Yet at the same time, he admits: 'Even though octopus and mammals are examples of parallel (rather than sequential) evolution, for example, virtually identical structures (physically speaking) have evolved in the eye of the octopus and in the eye of the mammal, notwithstanding the fact that this organ has evolved from different kinds of cells in the two cases' ([1975], p. 436).

Now in recent years there has been mounting criticism of the validity of, evidence for, and consequences of multiple realization arguments. Larry Shapiro and I ([2016]), in particular, have argued that the evidence for both actual multiple realization and possible multiple realizability is much less convincing than has been widely supposed. Does *Other Minds* lend support to our critique? I think it does. As noted above, Godfrey-Smith while plainly admiring the abilities of cephalopods, also emphasizes the ways in which they differ from both human beings and other mollusks, not to mention from one another. Cephalopod camera eyes and cordate camera eyes are structurally similar, but Putnam's claim that they are made of different kinds of cells is misleading. Light-sensitive cells were parts of our common ancestor. More interestingly, as Godfrey-Smith points out, is that 'the nervous systems beneath those eyes are organized very differently' (p. 51). But rather than concluding that visual sensations or perceptual-representational processes are multiply realized in human beings and octopuses, he proposes, 'the way to work out how smart octopuses are is to look at what they can do' (p. 51; emphasis original). This line of thinking leads Godfrey-Smith to carefully catalogue commonalities and differences between octopuses and similarly sized mammals: octopuses learn from their environments (namely, they act different after reward and punishment), they play (for example, they manipulate non-food objects), and they have 'something like sleep' (p. 73). Some of these features seem to owe, at least in part, to features of our common ancestors, however primordial. The ability of cells to modulate their future responses as a function to past stimuli (a.k.a. learning and memory) appears to be a very basic molecular feature, more ancient than neurons themselves. Yet, although they exhibit fascinating abilities—especially in the wild and outside experimental confines—octopus bodies and environments are very different from those of medium-sized land animals. An octopus is an 'intelligent alien' (p. 9) says Godfrey-Smith, going as far as to suggest that 'The octopus lives outside the usual body/brain divide' (p. 76). This is a far cry from suggesting that octopuses differ from us merely by having alternative 'realizers' for the very same sensory and psychological processes that we humans enjoy and value. 'Do bacteria *really* perceive their environment? Do bees *really remember* what has happened? These are not questions that have good yes-or-no answers', says Godfrey-Smith (p. 77; emphasis original). Advocates of multiple realization claim that there are creatures that are definitely just like us psychologically but physically different—in a slogan, same-but-different.

That is not the picture we get from *Other Minds*. Instead, Godfrey-Smith argues that 'when we take an evolutionary and gradualist perspective, this takes us to strange places. How can the fact of life feeling like something slowly creep into being? How can an animal be halfway to having it feel like something to be that animal? I aim to make progress on those problems here' (p. 78). He does make progress, bringing together elements of embodied, communicative, global workspace, and higher-order theories of consciousness among others. He paints a picture according to which various cephalopods, to various extents and degrees, exhibit some of the elements of internal and behavioural features predicted by what he takes to be the best available overall theory of consciousness. In short, octopuses are not same-but-different. They are kind-of-the-same, and kind-of-different.

So on the question of multiple realization, as with the question of other minds itself, Godfrey-Smith's book seems to guide us toward caution and away from easy answers; toward careful attention to particulars and details, rather than general rules or principles. Octopus minds like octopus bodies are both similar to and alien from our own.

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References

Crist, M. [2017]: 'Exploring the Origins of Consciousness, Cephalopod and Human, with Peter Godfrey-Smith in *Other Minds*', *The Los Angeles Times*, 2 December 2016.

Hoare, P. [2017]: '[The Octopus as Intelligent Alien](#)', *The Guardian*, 15 March 2017.

Hunt, E. [2017]: '[Alien Intelligence: The Extraordinary Minds of Octopuses and Other Cephalopods](#)', *The Guardian*, 28 March 2017.

Polger, T. and Sufka, K. [2006]: 'Closing the Gap on Pain: Mechanism, Theory, and Fit', in M. Aydede (ed.), *New Essays on the Nature of Pain and the Methodology of Its Study*, Cambridge, MA: MIT Press.

Polger, T. and Shapiro, L. [2016]: *The Multiple Realization Book*, Oxford: Oxford University Press.

Polger, T. and Flanagan, O. [1999]: 'Natural Answers to Natural Questions', in V. Hardcastle (ed.), *Where Biology Meets Psychology: Philosophical Essays*, Cambridge, MA: MIT Press.

Putnam, H. [1975]: 'The Nature of Mental States', in his *Mind, Language, and Reality: Philosophical Papers*, Volume 2, New York: Cambridge University Press.

Roberts, C. [2017]: '[Just How Smart Is an Octopus?](#)', *The Washington Post*, 6 January 2017.

Tye, M. [2016]: *Tense Bees and Shell-Shocked Crabs: Are Animals Conscious?* Oxford: Oxford University Press.

Notes

[1] See also two nice articles about this book in *The Guardian* by [Elle Hunt](#) and [Philip Hoare](#), respectively.

[2] In fact, Tye ([2016]) does not ignore such factors himself, but repeatedly brings them to bear on questions of whether there are 'defeaters' for particular applications of the Newtonian rule. But there is no rule for what counts as a defeater, and in considering defeaters, Tye's reasoning looks more like Godfrey-Smith's. So the inferential heavy lifting for Tye is done by inference to the best explanation in general, after all, rather than by the Newtonian rule specifically.

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