

# Bacteria, Bach and all that

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## 1. Introduction

While Daniel Dennett's writing always addresses big questions, the reach of *From Bacteria to Bach* is audacious. His goal—to explain the emergence of mind as a biological (and post-biological) phenomenon, beginning from the first principles, i.e., protolife. In this work, Dennett is to be commended for his combination of broad scholarly reach combined with readability. Dennett has no need to awe and obfuscate with neologisms or obscure terminology. A thoughtful high school student could get most of this. While humanists have sneered at his scientism, from this reviewer's point of view, he negotiates the hoary old two-culture problem with generosity and finesse. Throughout, Dennett maintains a (qualified) posthumanist stance. He argues, quite reasonably, for human exceptionalism in terms of our mental capabilities, but human exceptionalist as he is, he is emphatically biologically materialist on the matter of mind and maintains that he is also non-dualist (more in this below).

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Part one is plain sailing (Dennett likes his maritime metaphors and so do I) an easy argument about evolution where he frames up the book, anchoring (heh heh) his argument in the idea of evolution as 'mindless' R + D, searching the design space

of possibilities for local optima. A guiding notion throughout the book is that this evolutionary process creates *competence without comprehension* (refuting creationists along the way). This ‘strange inversion of reason’ in both Darwin and Turing, is a theme to which he returns regularly. Competence without comprehension depends in turn on another key concept ‘free floating rationales’. Dennett expresses some regret at the naming of this idea, and I stumbled on the terminology ‘free floating rationales’ every time, but I get the concept, and I think it is useful. A ‘free floating rationale’ is a ‘reason’ in the logic of evolutionary design that determines a quality or capability of an organism, without the organism knowing it.

## 2. Memes

Part II of the book traces Dennett’s hypothesis regarding the emergence of human culture and its takeover as the post-biological engine of human development—the idea being that memes are to cultural evolution and genes are to biological evolution. Here Dennett as leans heavily on Dawkins, as he did on Darwin in earlier chapters. I see the usefulness of the meme concept, and Dennett really runs with it, but while it fuels his ‘evolution by other means’ argument, in my opinion, Dennett stretches the concept to breaking point. For Dennett, a meme is ‘atomic’, on the analogy of the gene. If a meme is like a gene, it cannot also be a chromosome or a nucleus or an amino acid. Yet, if words are memes—and this is Dennett’s a paradigm case—then ‘uh huh’ is a meme and ‘democracy’ is a meme. But uh-huh is vacuous, and libraries of books have been written about democracy, each composed of nested memes—themes, chapters, paragraphs, sentences, words (more on this below).

The idea that human culture has outstripped evolution as the machinery of ‘development’ is a familiar one. Where Dennett makes useful inroads is around the perplexing hominid–hominin transition, the ‘sapient paradox’ (Renfrew 1996) and related Sapir–Whorf hypothesis. Dennett consistently rejects creationist ‘you cannot get there from here’ exclamations and provides, in his memetic approach, a plausible bottom-up mechanism for the emergence of language. His hypothesis is that memes (in his exegesis, always words) play a role in human cultural

development the way viruses parasitise hosts to reproduce and propagate to other hosts. Here, he leverages his ‘competence without comprehension’ theme and the related idea of ‘free floating rationales’ to permit that memes might propagate via hosts, without the awareness of the host, and without semantic value. Like, yknow, the kinda words and, umm, grunts that get into spoken sentences which have no, like, semantic function, do you get me? Memetic infection, according to Dennett, permits the stocking of human brains with empty signifiers. And as chance favors the prepared mind, so a mind stocked with empty memes—ready to have semantics poured in and grammar attached—was the primordial soup of language. While Dennett is on record as refuting mind/body dualism, this empty meme idea is a form/content dualism, and it arouses my suspicion—can a meme ever be empty? Clearly, the sequence of letters ‘d-o-g’ in English *could* mean anything, but it does not. ‘c-o-s-q-a-z’ is a sequence of letters in English that (afaik) does not mean anything. Is it a meme if it is empty?

Dennett takes the word as his paradigm case of the meme. This affiliation of memes with words is just a bit too easy for me. The symbolic abstraction of written words maps smoothly onto the register of dematerialised symbolic abstraction of the meme. But the very notion of a meme as an informational abstraction (on the analogy of the gene) makes understanding skills and embodied practices as memes quite challenging. And since human culture is more than words, more than abstract symbolic representation, Dennett’s explanation of culture in terms of his version of memes seems incomplete. Dennett, though, in his big picture, purports only to explain ‘mind’ and since ‘mind’ is all abstraction all the way down, he neatly sidesteps (as so many philosophers have before him) messing with the messiness of performance, of action in the world. This defines his gamut.

### 3. Part III

Dennett then elaborates on how language permits the growth of comprehension, via reflection, self-interrogation and the ability to refer to phenomena distant in space or time—the development of top-down conscious design processes. This is the way he gets us from bacteria (competence without comprehension) to Bach

(comprehension driving competence). Dennett changes gears in part III, firing up the philosophical turbo in chapter 14, where he wades into some deep water concerning selfhood, qualia and such. Passages here demand two and three readings. A few years ago I came across a quote attributed to Dennett “*With so many idiots working on the problem, no wonder consciousness is still a mystery.*” This curmudgeonly remark warmed my curmudgeonly heart. In a similar spirit, I found Dennett’s short rant in this book about the non-existence of qualia similarly refreshingly iconoclastic. I have had my doubts about qualia for long and was glad to see someone articulate a version of it. (Dennett also poo-pooes the hard problem, somewhat obliquely, without precisely pointing the finger at Chalmers.)

## 4. Manifest image

Reading *From Bacteria to Bach* was a gliding and stumbling process for me, such as skiing on thin snow and hitting gravel. One of the key motifs in the book is Sellars’s idea of the Manifest Image, which means something like: “the conceptual framework through which our experiences in the world are made meaningful”, Dennett seems to use this term of his teacher quite faithfully. Perhaps then I should take this up with Sellars, but being trained in the arts, I rattle at such metaphorical deployment of the term ‘image’, but my trouble with ‘*manifest image*’ is more specifically philosophical—it reinforces assumptions about (quasi-visual) mental representations and the Cartesian theater. Given Dennett’s staunch rejection of the Cartesian theater, his use of this term seems double edged. Ethologists and phenomenologists and psychologists, from von Uexküll to Merleau Ponty to Gibson, have provided clear, and to my mind more useful, terminology, from *umwelt*, to *lifeworld* to *ambient optic array*. Dennett uses the term *umwelt*, but obliquely, in support of his explications of manifest image.

## 5. Affordance

Dennett makes repeated reference to Gibson’s concept of ‘Affordance’. It is a complex idea inextricably tied to externalist-leaning conceptions of cognition. I had an increasing sense of unease around his use of the term. When he first uses the affordance (p101) he gets it right—“animals, plants and even microorganisms are equipped with competences that equip them to deal appropriately with the

affordances of their environments”. On p119, he refers to a concept of ‘useful information’ as “a descendant of J. J. Gibson’s concept of affordances...”

This signals the beginning of what appears to be a slippery slope: “Evolution has endowed all living things with the wherewithal to respond to their particular affordances, detecting and shunning the bad, detecting and obtaining the good..”(p336). Suddenly, affordances belong to the animal, but in what way are they ‘their’ affordances? To a Gibsonian fundamentalist, organisms do not *have* affordances; the environment has affordances for organisms. As an only partially rehabilitated internalist, Dennett belies the *brain first, cogitation first, symbol first* bias of the Anglo-American Analytic tradition. By p356, affordances seem to have migrated into the brain entirely—“Hierarchical Bayesian predictions (are) generating affordances galore”: now the brain creates affordances! By p388, the transformation is complete: “...Bayesian networks are excellent at teasing out the statistical regularities that matter to the organism—its affordances”.

Gibson famously says—“The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill.” (An Ecological Approach to Visual Perception, Gibson, 1979). Affordances, to Gibson, are innately and automatically ‘picked up’ by the animal, they are (presumably) genetically encoded. They are not generated in the mind, and do not exist explicitly in the conscious mind. In Chemero’s terms, they are relational. Gibson’s neologism has been debated and re-interpreted by phenomenologists and post-cognitivists, and has been ontologically undermined in HCI circles, thanks largely to the (and later recanted) interpretation of Donald Norman. Dreyfus and others expanded on the notion to permit cultural affordances—a mailbox affords mailing letters, but only if you know what it is and have a general understanding of postal services. Admittedly, this does already stretch Gibson’s notion, but Gibson also admitted that his theory was at a loss to explain pictures, and this extends to other aspects of human culture.

In his recuperation of affordance to an internalist conception of cognition, Dennett does raise a crucial question—even if we embrace an idea of cognition as composed of sensorimotor loops in an heterogenous brain/body/world system, it is

still incumbent on us to describe what happens in the brain. Gibson, famously, sidestepped the issue, but we cannot, and with the remarkable advances in neuroscientific experimental techniques, we ought not. Dennett recognizes that this is a question that demands addressing, and he does so in “How do brains pick up affordances” (p165). Like many in the contemporary cognitive neuroscience community, Dennett expresses some enthusiasm for Bayesian predictive coding in explaining what the brain is doing—vis-a-vis affordances, and in other ways. I concur that Bayesian predictive coding provides a tantalizing possibility of a middle way between representationalism and enactivism, but some externalists reject Bayesian predictive coding as a viable explanation of neurocognitive processes. This is a complex and emerging field, and Dennett’s treatment of the matter is just a sketch, and—as an hypothesis regarding process—it is (like so many other such hypotheses) open to more and also less representationalist interpretations.

## 6. Bend it \*

In my opinion, *From Bacteria to Bach* is an excellent book, full of thought provoking ideas, presented clearly in non-specialist language. Yet upon reflection I am troubled by an accumulation of cases of semantic drift which I suspect may not be entirely innocent. Dennett deploys terminology from the world of computer science to good effect—*recursion*, *ontology* (in its debased CS sense), and others. But in his use of *meme*, and of *affordance*, original concepts are ‘extended’ to the point that original meaning is distorted. Speaking of extension, on p331 he cites Clark and Chalmers Extended Mind hypothesis (1998) “...the practice of putting marks in the environment to take a load off personal memory, one of the first forays of the “extended mind” Marks then evolved into number systems and written languages, which enhance the idea of discursive teaching...” I do not wish to quibble, but this passage is quite inconsistent with Clark and Chalmers original hypothesis, which explicitly concerns only *private* cognitive extensions that are accessible and meaningful only to the specific individual (the paradigm example being Otto’s notebook). In Clark and Chalmers’s original formulation, Extended Mind is private. Marks in the environment, if they are publicly accessible, do not count. The kinds of cultural inscriptions Dennett refer to here are much more

consistent with Merlin Donald's *exograms*. (Indeed, the exogram concept can do much of the work Dennett expects of the meme, without the complications of the biological analogy, but then the 'culture as evolution by other means' conceit which structures the book would be lost.). Admittedly, subsequent scholarship has broadened the original concept of Extended Mind to a notion of Extended Cognition, which usefully replaces the 'parity' requirement of the original hypothesis with complementarity, thus hugely expanding the kinds of artifacts and phenomena that might be discussed in extended terms. I do not wish to offend Dr Dennett, in some cases in this book, it seems to me that Dennett's implicit partial redefinition of key terms of art might undermine confidence in his argument.

## 7. Necktop (!?!)

When Dennett feels the need to neologise, he tends towards the folksy as opposed to the abstrusely academic (intersectionality anyone?). But "necktop" (analogy to desktop, as in downloading apps to your necktop) sends waves of revulsion through me, speaking as it does so clearly of Dennett's computationalism. Metaphors are great until they are not, and the computationalist analogy has, in my opinion, well and truly run its race and should be put to rest. Intelligence is not reasoning, information is not knowledge, thinking is not programs, memory is not storage and human communication is not the error-free transmissions of bits. "Our thinking is enabled by the installation of a virtual machine made of virtual machines made of virtual machines." (p341). What work is this talk of virtual machines doing? Yes, we can call an idea or a learned lesson a meme and then call that meme an app for our brain. But why would we want to do that?

## 8. Having dualist cake, and eating it

My critique of *From Bacteria to Bach* has centered on Dennett's dubious deployment of terms such as manifest image, affordance and meme. All this has to do with the underlying conceptions of internalism, and information. While Bayesian Predictive Coding may get us out of the Cartesian theater, we still seem to be in the lobby. Genetic evolution and memetic 'evolution' are discussed entirely in terms of information. Dennett disabuses us of any thought that his approach is dualist, yet I got the sense on several occasions that he is having his

cake and eating it. For Dennett, the existence and propagation of information seems sufficient, there is not a word about how information becomes action in the world. As noted, Dennett's quarry is 'mind', and conventionally, such a conversation is defined in internalist terms.

Philip Agre captured the circularity of Dennett's word = meme equation when he wisely observed that computational fields "*concentrate on the aspects of representation that writing normally captures. As a result, theories will naturally tend to lean on distinctions that writing captures and not on the many distinctions that it doesn't*" (2003, 290). Similar can be said of analytic philosophers: if one's stock in trade is ideas—expressed as words—then taking the word as prime example of the meme seems as circular as claiming that intelligence is logical reasoning then building a machine that can play chess and claiming it is evidence of artificial intelligence.

My misgiving here is that the meme resides exclusively (for Dennett) in the realm of the informational, that neo-Cartesian realm unsullied by materiality. The entire embodied and performative realm of human existence seems peripheral to his project. Nowhere in the book does he seriously engage the possibility that cognition might extend beyond the confines of an internalist explanation rooted in mental representation. People or animals actually doing (non-linguistic) things in the world get scarcely a mention in the entire book. Distributed, situated, embodied and enactive paradigms of cognition get no discussion. This begs a question Dennett does not address—whether a notion of mind as immaterial thought-stuff is even philosophically tenable any more, after 30 years of embodied, enactive and extended paradigms of cognition.

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## References

The title of the hit song by Dave Dee, Dozy, Beaky, Mick and Tich (1967)  
<https://www.youtube.com/watch?v=o99K-HaAzQc>



