

What is it like to be a shrimp?

More tales from the scuba-diving philosopher

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METAZOA

Animal minds and the birth of consciousness

PETER GODFREY-SMITH

336pp. William Collins. £20.

IN 2017 the distinguished Australian-American philosopher Peter Godfrey-Smith had an unexpected bestseller with his *Other Minds: The octopus and the evolution of intelligent life*. The book explored the strange structure of the octopus mind. Octopuses are pretty smart. They have as many neurons as the average dog, and far more than any other animal without a backbone. But their intellect is not like ours. They evolved from shelled creatures like clams or snails, and their neurons are distributed all over their boneless bodies. In Godfrey-Smith's view, encountering an octopus is tantamount to meeting an intelligent alien. Godfrey-Smith is, moreover, an experienced scuba diver. Much of *Other Minds* described his visits to "Octopolis", a diving site on the coast south of his native Sydney, and the behaviour of the octopuses and other sea animals that inhabit it. Alongside the diving anecdotes, though, the book also told a compelling story about the evolution of the octopus mind. Godfrey-Smith's particular philosophical expertise is in the workings of natural selection, and he used his stories to introduce his readers quietly to a range of theoretical insights.

His new book shares the virtues of its predecessor. As before, Godfrey-Smith mixes his theoretical themes with first-hand accounts of often surprising animal behaviour. But this time his canvas has expanded. "Metazoa" is the biological term covering all multi-celled animals, from nerveless sponges to our own sapient selves. As well as reacquainting us with the octopuses, Godfrey-Smith brings on a large cast of other animal characters, including sponges with glass skeletons, hermit crabs that place poisonous anemones on their shells, and blind cave fish that steer by sonar. At the same time, his philosophical target has also expanded. This time he is aiming to understand not just intelligent behaviour, but also consciousness itself.

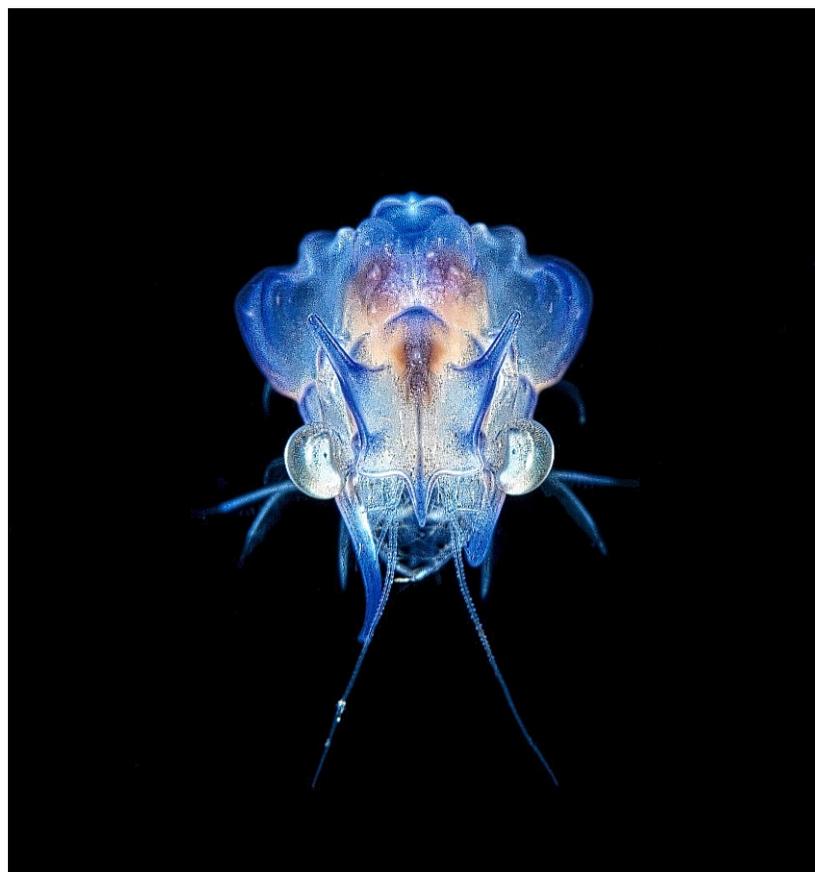
As Godfrey-Smith is all too aware, consciousness is not a straightforward scientific topic. At first pass, the material world delineated by modern science makes no mention of subjective conscious feelings. In Thomas Nagel's memorable phrase, materialism seems to leave out the "what-it's-likeness" of consciousness. Yet at the same time it would seem outlandish to deny on this account that consciousness exists (though it is a testament to the difficulties here that some serious philosophers do deny just this). Godfrey-Smith's response is to approach the issue obliquely. Perhaps, he suggests, the problem will come to seem different once we understand more about the origins of animals. He offers the image of a stubborn piece of land slowly succumbing to a sea of rising knowledge. Maybe we find consciousness puzzling only because our appreciation of animal life is limited.

Godfrey-Smith has no doubts about the truth of materialism. Early in the book he describes a curious

Aristeidae larva (deep water shrimp), Atlantic ocean

incident in which T. H. Huxley - "Darwin's bulldog" - thought that a jelly-like substance raised from the North Atlantic sea floor when the first telegraph cables were laid must be the primordial "protoplasm" essential to all life. Given the state of nineteenth-century biological knowledge, it is understandable that Huxley and others supposed that living systems are made from some special active form of matter. But, as Godfrey-Smith observes, this

“**Consciousness isn't a matter of some supercharged brain processes somehow turning the lights on**”



belief in protoplasm has faded away with the rise of biochemistry. No contemporary scientists doubt that living bodies are made of just the same physical and chemical elements that compose the rest of the universe. (Huxley's jelly turned out to be nothing but a result of sea water reacting with the alcohol used to preserve deep-sea samples.)

Protoplasm might have succumbed to modern materialism, but consciousness is more resistant. It strikes most people as obvious that subjective feelings must be something more than mere physical processes in brains. Still, Godfrey-Smith is suspicious of this intuition. Along with many other contemporary materialists, he views it as a confusion arising from our ability to think about mental states in two ways, first in physical terms, and then in terms of what they feel like. In truth, he holds, the feelings aren't different from the physical brain states. That's just how it is for you when you're in those brain states.

Even so, Godfrey-Smith admits that this orthodox materialist stance remains unsatisfying. In particular, it doesn't tell us where consciousness is to be found in the universe. Which physical processes have the wherewithal to deliver consciousness? Are plants conscious? Insects? Fish? Frogs? In our own human case, it seems that activity in the cortex is necessary for consciousness. But it would seem harsh to deny consciousness for this reason to animals without a cortex, like birds, or insects - or octopuses, for that matter. This conundrum has driven a number of serious contemporary philosophers towards the pansychist view that all matter is in some way conscious. In their view, any division between conscious and non-conscious physical processes can only be arbi-

trary.

Godfrey-Smith holds that we find ourselves in these theoretical tangles only because we are thinking about consciousness in the wrong way. Consciousness isn't a matter of some supercharged brain processes somehow turning the lights on. Rather it hinges on the existence of subjects, integrated beings for whom brain processes provide a perspective on the world. Consciousness doesn't demand any special ingredients. It just needs biological systems that move and act, and so depend on mental systems that distinguish their bodies from their environments and allow opportunities to be explored. Once we appreciate this, suggests Godfrey-Smith, attributions of consciousness need no longer be arbitrary. Whenever there are active animal subjects, consciousness is thrown in for free.

When did subjects first come onto the evolutionary scene? Godfrey-Smith takes us back over half a billion years to a time when primitive animal forms first began to use muscles and nerves to move around and scavenge on the dead. In the natural course of events, scavenging evolved into predation, and created a pressing further need for sense organs, the better to locate things to eat and to avoid being eaten.

The arthropods - the vast phylum that includes crabs, shrimps, spiders and insects - were the first category of animals to take full advantage of these possibilities. Their highly-jointed structures easily allow the emergence of advantageous mutations and the consequent exploitation of evolutionary possibilities. Godfrey-Smith describes a small banded shrimp he met on one of his dives. It had lost one large claw, but it still had five others, four legs, six feelers and a final pair of accessories like extendable combs.

Godfrey-Smith explains how he tried touching one of the feelers on this living Swiss Army knife, and how it responded by looking hard back at him. He writes feelingly about his interactions with this particular shrimp. He returns to the site to see how it is getting on, "implausible as it seemed to be driving three hours up the coast to visit a shrimp". By the time of his last visit the shrimp has lost a second large claw and "looked tired, very much on his own, and probably near the end of his days".

As always in describing his underwater encounters, Godfrey-Smith is careful not to anthropomorphize. He is aware that the subjectivity of distantly related animals cannot be anything like ours, and does not pretend he can get inside their minds. When he does put things from their point of view, he makes it explicit that he is fabulating. (Of another shrimp that kept looking back at him as he pursued it, he says "I imagined it saying 'WHAT? WHAT?' each time".) Yet Godfrey-Smith's efforts to capture animal subjectivity are made all the more persuasive by this fastidiousness. Keeping his distance is itself a way of conveying the distinctive mindsets of our evolutionarily distant cousins.

Consciousness may be a natural upshot of integrated subjects, but it is not to be taken for granted that all animals have a unified psychology. Octopuses, for one, have as many neurons in their wandering eight arms as in their central brains. Godfrey-



Smith wonders whether we should count them as nine subjects rather than one - or perhaps as two, given that the nervous systems in the arms communicate directly with each other.

This issue of divided psychologies does not stop with the octopuses. Human patients with chronic epilepsy sometimes have the bridge between the two hemispheres of the brain surgically severed. People who have undergone this "split-brain" operation can on occasion seem to have two separate minds. In experiments that arrange for the two sides of the brain to be fed different information, the left side literally won't know what the right is doing. Surprisingly, most vertebrate animals seem to be akin to these split-brain patients, lacking the rich connections between brain hemispheres enjoyed by normal humans. Experiments on fish, amphibians, reptiles, birds and even marsupials show how behaviour guided by one side of the brain can be impervious to information available to the other. It is only we placental mammals that seem to enjoy a built-in communication channel between the two halves of the brain.

Godfrey-Smith explores this kind of mental decentralization in detail, but doubts that it has a significant impact on the existence of unified subjects. As he sees it, the different brain parts of animals are

John Kinsella's recent poetry books are *Insomnia, 2018, and* *Brimstone: A book of villanelles, 2020*

normally all guided by the same information, not least because they are interacting with the same external environments and need to control the same body. In some special circumstances, it is true, parts of animal brains work in isolation, and then perhaps we should recognize momentarily distinct centres of subjectivity. But soon enough they switch back into harmony and their overall mental unity is restored.

A related phenomenon is the rhythmic electrical waves that are known to accompany brain activity in most animals. These rhythms, familiar in humans as alpha, beta and gamma waves, add a holistic dimension to the localized signalling of individual neurons. Orthodoxy holds that these waves are of no functional significance, mere by-products of neurons doing their thing. But Godfrey-Smith is not so sure. He suggests that perhaps these electrical rhythms hold the mind together in ways that contribute importantly to the unity of subjects.

A striking feature of Godfrey-Smith's discussion of brain waves is the way he is open to different possibilities. He finds the material both puzzling and suggestive, and uses it to explore options with his readers. In fact, this is a feature that runs through the whole book. Unusually for an academic philosopher, Godfrey-Smith is rarely adamant in his opinions. He draws on a rich body of scientific investigations, but he tends to be cautious about the philosophical morals to be drawn. When there is a clear answer he says so, but as often he is tentative, indicating where his inclinations lie, but without insisting on anything.

This gentle approach won a wide readership for Godfrey-Smith's last book and deserves to do the same for this. But perhaps his exploratory style is well-suited, not just to the general reader, but to the problem of consciousness itself. Contemporary academic discussions of consciousness are increasingly running into sand. The battle lines are set, the moves are familiar, minutiae are pursued to the end, and none of it is very satisfying. Maybe it is time for a new tack. If Godfrey-Smith is right, there is no need to force the issue. Rather, a deeper understanding of the history of animal life will do the work itself. With more knowledge, he says, the problem will "transform and disappear". We shall see. Along with Peter Godfrey-Smith, I'm not inclined to insist on anything. But my own bet is that he is right. ■

Villanelle of Star-Picket-Hopping Red-capped Robin

The water tanker has been and delivered and I can risk
a good spray of the hose on a thirty-seven-degree day –
a red-capped robin plunges into the mist and frisks.

It's not a long burst into the drought garden's bisque-
longing but long enough to offset heat and dry and length of day,
the water tanker has been and delivered and I can take the risk.

And as the water dies from its spectra to form an array of asterisks
that mark moments in soil around aubergine and bok choy,
a red-capped robin emerges from the mist and frisks.

Now perched on the chiasmus of star picket with feather-licks
poking up from its tousled cap bow-dried by breeze through late sunray!
The water tanker has been and delivered and I can enjoy the risk.

All world closes in as we separate off, and the red-capped robin 'risks'
as well by hopping another picket closer, studying me,
a red-capped robin that emerged from the mist of frisks.

I hold out my finger thinking it will bond with my burlesque
of melding inner and outer selves with nature's lai,
as the water tanker has been and delivered and I can risk
a red-capped robin plunging into the mist as I frisk.

JOHN KINSELLA