



Review of “Planta Sapiens: Unmasking plant intelligence”, by Paco Calvo, with Natalie Lawrence. (2022). Bridge Street Press.

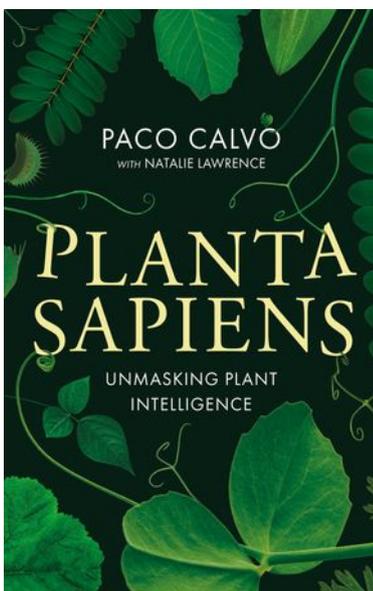
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Paco Calvo’s (2022) book “Planta Sapiens” offers a bold examination of plant intelligence and behaviour. It covers an array of topics at the intersection of botany and cognitive science, from the nervous system-like organisation of plants to the role of plants in inspiring a new paradigm in robotics. The author is ultimately concerned with the possibility of plant sentience, and “what it is like” to be a plant. In turn, Calvo considers the ethical implications of plant consciousness. The book leaves plenty of room for scepticism, especially regarding the basis for attributing sentience to plants. Nevertheless, it is an exciting invitation to explore the plant kingdom from a fresh perspective, rooted equally in scientific research and philosophical curiosity.



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Those who lived through the 1970s might have the misfortune of associating “plant sentience” with the book “The Secret Life of Plants”—a commercially successful but largely pseudoscientific exploration of the emotional lives of plants, who are suggested to originate from a realm inhabited by other “cosmic beings” such as elves and gnomes. In recent times, however, a growing area of research at the intersection of botany and cognitive science has gradually reclaimed the credibility of studying plant intelligence and behaviour, with roots in work by luminaries like Charles Darwin and Jagadish Chandra Bose—a less well-known but equally accomplished pioneer. In “Planta Sapiens”, Paco Calvo pushes the implications of this work to its limits, inviting readers to explore a perspective-changing world where plants learn, anticipate and maybe even experience in their own, idiosyncratic ways.

Whilst accessible books on such topics already exist (such as Daniel Chamovitz’s “What a Plant Knows” and Stefano Mancuso & Alessandra Viola’s “Brilliant Green”), Calvo’s “Planta Sapiens” presents perhaps the most far-reaching and philosophically inflected introduction. Over nine

chapters, split into three parts, the author reviews multidisciplinary research that reveals a range of plant abilities previously considered the sole domain of animals (in orthodox science, anyway). Plants are sensitive to the same anaesthetics that put us to sleep, and produce their own when wounded. Young sunflowers not only react to the direction of the sun but anticipate its movement. Plants appear to achieve much of their behaviour, from learning to memory and more, in part through electrical signalling systems that involve ‘action potentials’ (the same electrical impulses that transport signals around your body). This is just a small sample of the findings surveyed.

The book has a remarkable range given its relative brevity. Beyond the science of plant intelligence and behaviour, Calvo unpacks the implications for how we view plants and their place in nature. The central argument is that we should take seriously the possibility that plants are sentient (roughly speaking conscious), and through emerging scientific research and philosophical care, we might begin to imagine “what it is like” to be a plant. The ethical ramifications of plant sentience are also discussed (a neglected topic but one debated by ancient philosophers, such as Theophrastus). So is the influence of plant behaviour on a new era of robotics, in the guise of “growbots”, which replace the metal carapaces and hydraulic joints characteristic of animal-inspired robots with “soft” modular bodies that grow through space.

Of course, any sweeping treatment is bound to be exposed to healthy scepticism. Concepts like intelligence, cognition and consciousness are individually fraught with ambiguity, and mapping their relationships with one another is even murkier. One might, for instance, buy that plants retrieve, store and process information in ways not unlike animals, facilitating flexible interactions with their environments, without being sold on plant consciousness. Much here turns on our account of consciousness. For instance, Calvo introduces the rather technical “integrated information theory” (IIT) to support the case for plant sentience. IIT holds that consciousness corresponds to the interdependence of a system’s parts, and its irreducibility to those parts. The more interdependence and irreducibility, the more conscious the system. IIT predicts that the brain has high levels of consciousness, but it predicts that photodiodes and atoms are a little conscious too.

If one accepts IIT then there are good grounds to believe in plant consciousness. However, IIT remains controversial, even by the fractious standards of the consciousness debate. This isn’t to say that IIT provides the only means for defending plant consciousness, but we do need some basis for inferring sentience from what we know about plant biology. Rival accounts, such as those collectively known as “higher order thought theories” (HOT), for instance, postulate that consciousness requires a system to generate “higher-order representations”. In turn, this is often associated with more complex forms of cognition, not evident in plants. The feasibility of plant consciousness thus hinges on wider, highly contentious issues about the nature of consciousness. (My own suspicion, for what it’s worth, is that ‘consciousness’ is deeply vague and captures several, distinct phenomena, or at least one very complex phenomenon; theories like IIT and HOT may both be partially right, capturing different aspects of what we ordinarily lump together into “consciousness”).

Calvo’s discussion of plant consciousness also warns against animal-based biases towards plants based on our inability to appreciate their dynamism. This is due to the different temporal scales on which plants operate. Plants move (principally by growing rather than locomotion) but do so at a slower rate than animals. This makes it challenging for us to recognise their behaviour as behaviour—a bias somewhat tempered by timelapse photography, as viewers of the recent BBC documentary “Green Planet” can confirm. “Planta Sapiens” thus forces us to consider how human priorities might prejudice our conception of plants.

This is evident again in the discussion on plant ethics. As Calvo indicates, the moral status of plants may strike us as extraordinarily inconvenient; we struggle enough to acknowledge animal suffering when making dietary decisions, imagine if we had to consider plant wellbeing too! But something is true whether it’s agreeable or not; in philosophy, we remain vigilant of the fallacy called “the argument from incredulity”. And yet, bad arguments for an idea don’t mean there aren’t also good arguments for the same idea. One may be unconvinced by the moral status of plants, perhaps because one remains justifiably sceptical about plant



consciousness. Regardless, the possibility that “Planta Sapiens” and the research it reviews will spark informed (if fiery) debate over such issues is a testament to its intellectual value.

Part of the job of philosophy is to push our imaginative limits using good arguments. In the epilogue, Calvo quotes from the late Ken Robinson’s famous TED talk (“Do Schools Kill Creativity”): “if you’re not prepared to be wrong, you’ll never come up with anything original”. Whether or not one is willing to accept the book’s central thesis it undoubtedly takes the reader on a thrilling journey. Plant sentience may seem “bananas” to some, but *Planta Sapiens* shows we should at least take it seriously.

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