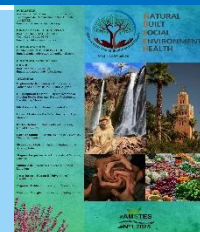


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Planta Sapiens: Unmasking Plant Intelligence, by Paco Calvo with Natalie Lawrence, London, The Bridge Street Press, 2022, 304 pp., £22 (hbk), ISBN: 978-0-34912-845-0.

According to Paco Calvo, professor of philosophy of science, plants are intelligent or rather sentient beings making choices just as animals (even the most primitive and unicellular). Plants of the genus *Lavatera* (Cornish mallow) turn after the sun, and they can hold information about what direction the sun will appear from for several days, even in the absence of sunlight. Mimosas seem to have long-term memory, their defensive folding up of the leaves being a variable habituation that could last for up to 28 days. Cognitive behaviour is by definition adaptive, anticipatory, goal-directed and flexible, and Calvo finds it hard to deny these capabilities in plants.

Plants have “many, nuanced ways of selecting information and using it to guide what they do.” They demonstrate self-recognition and territory-guarding, and they can make internal maps of their surroundings to guide root growth. Like animals, they have “proprioception” or sense where all their body parts are in space. And after “judicious cost-benefit analyses, plants decide where to invest their precious metabolic resources.” There are “IQ” differences between wild and domesticated varieties of plants, some vines are the lapdogs of the plant world, trained to survive only in sanitized environments, whereas the wild varieties are much better in finding climbing supports, protecting their leaves from being eaten etc. There is even variation in individual capabilities of plants which indicates that they have individual personalities.

And like Pavlov’s dogs which salivate by the sound of a bell when they have been trained to hear a bell each time they get food, a plant will turn towards the wind from a fan when trained to associate the wind with light. The *Arabidopsis* plant seems to use the unique wavelength profiles of the light reflected by its neighbours to tell whether they are relatives or not. Grown together with kin these plants will produce more seed than when growing with strangers. Individual strawberry plants can learn during their lifetime, improving their ability to choose between suitable conditions for their roots. The parasitic dodder can discover when it grows towards an unsuitable host plant and then change direction and choose another one, and another species of climbing plant can choose between climbing differently coloured poles. Just a few examples of the abilities of plants.

Calvo points out that though plants do not have a nervous system, many of the chemicals active in the transmission of signals in the body are the same in animals and in plants. But of course a question is whether an organism really needs a nervous system as known from animals to have cognitive abilities. It has just been a common assumption. As Calvo says in his plea for thinking outside the box, blindly subscribing to the dominant ideas of the past is dangerous. He has been aggressively criticized by reputable plant scientists, but on the other hand he can refer to Darwin himself.

Some would perhaps downplay the disagreements as being mostly a war of words. According to Calvo we need to view plants “as information processors with complex algorithms that turn sensory data into representations of the outside world” (like animals). Evidently he stretches many definitions as far as possible to make his point. Taken literally it would certainly be an inconvenient truth, not the least for vegetarians who will see the moral reasons for distinguishing between plant and animal food undermined. And many tasks would be complicated when taking due regard to the feelings of plants.

Calvo gives the example of Sir J. C. Bose who in the early twentieth century would minimize the stress endured by trees about to be transplanted. He performed anaesthesia on them, even very large individuals, by creating a tent to cover the whole tree and filled it with chloroform to put the tree to sleep (remarkable in itself that the same anaesthesia works on animals and plants). Calvo envisages the practical problems in treating plants as sentient beings. He is in fact also more realistic than this account may suggest. He just hopes that his view will contribute to a more respectful treatment of all of nature’s creatures.

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