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Zoë Schlanger. *The Light Eaters: How the Unseen World of Plant Intelligence Offers a New Understanding of Life on Earth*

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lant volatiles are the chemicals plants use to communicate or share information. In 2012, James Blande described the biochemical synthesis of volatiles as a 'language' consisting of precise 'sentences' made from a 'vocabulary' of complex compounds (p. 153). Environmental scientist Heidi Appel states that certain plants release their own pesticidal defensive compounds after particular sound cues. Scientists like Blande and Appel imagine noisy ecosystems, full of chemical-based plant chatter that humans cannot hear. If scientific disbelief initially hampered the study of echolocation in bats and dolphins, Zoë Schlanger asks if the same could also be true for plants (p. 113–14). Do plants communicate in ways that alter how we define communication? Can pollution and climate crises change how plants communicate? In a dangerous feedback loop, Schlanger notes how industrial pesticide use has left us with less than Silent Springs without birdsong (a reference to Rachel Carson's 1962 classic); pollution has also created 'silent fields … mute in their moment of danger' (p. 156).

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Zoë Schlanger transitioned to writing about plant life from climate journalism with a bang, which, unlike plant communication, is audible to all. *The Light Eaters: How the Unseen World of Plant Intelligence Offers a New Understanding of Life of Earth* is a bold and blaring book that lives up to its name. Using a 'system that lets journalists see the latest research before it's available to the public', Schlanger went from investigating climate papers to botany journals (p. 9). She quickly realised that new observation technologies, such as volatile chemical readers, were fundamentally changing what scientists think constitutes a plant, plant life and plant intelligence (pp. 5, 247). What results from her inquiry is a careful ethnography of plant scientists in turmoil over the questions of plant intelligence – such as does plant intelligence exist, how do we know, and what does it look like? *The Light Eaters* is a stunning glimpse into the humbling and buzzing world of plant science that is actively reevaluating our understanding of lived concepts like intention, memory and communication.

Interpretations change. We tend to associate hearing with ears, sight with eyes and thinking with brains. However, most people do not associate all brains with thinking in the same way they imagine all ears hear and all eyes see, albeit in different ways on different registers. Since plants do not have ears, eyes or brains, people usually imagine them as living beings without hearing, sight or thoughts. Plant scientists, in particular, have historically refused to refer to plant behaviour in such anthropomorphising terms. However, scientists are changing. Some plant scientists are growing more comfortable using words like communication and intelligence instead of behaviour and senses. This is not because they believe plant intelligence is comparable to human intelligence; instead, they suggest that humans do not have a monopoly on what constitutes intelligence in the kingdoms of fauna, flora or funga (p. 22).

Language matters. Plant scientists choose their words carefully because it has implications for funding and questions of legitimacy. Schlanger convincingly shows how the New-Age style definitions and renditions of plant intelligence in *The Secret Life of Plants* (1973) effectively foreclosed plant-behaviour research for two generations.[1] *The*

1 Peter Tompkins and Christopher Bird, *The Secret Life of Plants: A Fascinating Account of the Physical, Emotional, and Spiritual Relations between Plants and Duman* (New York: Harper Row, 1973).

Secret Life was a 'beautiful collection of myths' that captured popular 'imagination on a global scale'. However, according to botanists at the time, it also caused irreparable harm to the field of plant sciences. According to those botanists, the 'twin gatekeepers of science funding boards and peer review boards' were always conservative and began to flag any study that alluded to plant behaviour (p. 15). Fearing censorship, plant scientists developed a new language to circumvent anthropomorphic terms, such as seeing, hearing, remembering and thinking.

The renaissance in plant intelligence studies began to mount in 2006 when formerly marginalised scholars of plant behaviour formed the Society of Plant Neurobiology. This group did not establish a consensus on language, but it offered brave, pioneering and well-positioned scientists a community to share their research on how plants see, hear, remember and think.

Schlanger has an infectious knack for introducing these researchers and detailing their experiments. Each researcher introduction comes with a re-introduction to an ostensibly familiar concept. The author goes to great lengths to present scientists as people who carry doubts, fears and curiosity into their work. Like a great ethnographer, Schlanger details more than Susan Sultan's ideas on evolutionary plant ecology. She also illustrates how Sultan presents the information, noting the pauses they may take to 'select the best word' (p. 220). That does not mean Sultan, a History and Philosophy of Science major, believes that the best word is always the best. Words and contexts change. Even words as simple as the 'environment' can be complicated by the Sultan's interpretation that control environments do not exist because an 'organism shapes its environment while its environment shapes it' (p. 226).

When Schlanger introduces ecologist Consuelo De Moraes, you meet a complex person who uses wonder as a primary research method but will not share anything that could not pass peer review. De Moraes discovered how certain plants signal wasps to attack leaf-eating caterpillars in the late 1990s, and she continued investigating 'biocommunication' for two decades without necessarily using that word (pp. 138–39). Precaution and downright fear were ubiquitous. As plant evolutionary ecologist Susan Dudley was making the discovery that plants have enough social intelligence to know who their siblings are, she admitted that her controversial result 'was satisfying and also kind of scary' (pp. 196, 198).

Schlanger blends ethnography with memoir to introduce her plant experiences and thoughts. After investigating how plants listen, feel, touch and exchange information, Schlanger provocatively asks: What good is all that sensation without the ability to remember it? (p. 120) Diving into plant memory started with scientific studies of the memory flower (*Nasa poissoniana*). However, it ended with her experiences growing garlic, which needs to remember the winter to sprout. For garlic, as well as tulips and daffodils, vernalisation is a 'memory of winter', a kind of climatic scarification or weakening of a seed's coating to encourage germination. For Schlanger, these plants are instructive and comforting; they 'know how to wait, how to endure the inhospitable, knowing their time has not yet come but will' (p. 126).

The Light Eaters is full of other powerful takeaways and insights. Most notably, Schlanger shows that ecologists, entomologists and zoologists have made significant contributions to plant science by viewing plants from the perspective of animals, insects and other plants (p. 49). Relatedly, she notes that intentionality is difficult to discern in plant intelligence and communication because 'we don't know what it's like to be a plant' (p. 57). These takeaways bring up another axiomatic statement: all biology is ecology, which is a critical reminder that the 'ecosystem dynamics that ecologists study apply just as easily to single plants' (p. 228). According to Laura Maurglis, for instance a single organism might appear to be one thing, but after closer examination, it becomes more apparent that many are composite organisms comprised of an ecosystem of organisms (p. 188).

Finally, through Schlanger's demonstration that plants are animate creatures that feel, remember and process information, she argues that our moral attention to living things is not finite. Our laws and legal systems need to expand alongside our expanding laws of chemistry and biology (p. 256). Similar to how political revolutions altered laws and measurements of progress (i.e. the French Revolution and the Metre), Schlanger insists that scientific revolutions in the understanding of plant life need to change how we imagine, value and attempt to govern life in general.[2]

What of the new technologies of observation shaping this revolution in plant science? Are they accessible? Does placing technological

2 Ken Alder, *The Measure of All Things: The Seven-Year Odyssey and Hidden Error That Transformed the World* (New York, NY: The Free Press, 2002).

'eyes' and 'ears' in the field reinforce our anthropomorphic framing of plant sensing as seeing and hearing?[3] With the number of women pioneering research into plant intelligence, the reader might wonder how hetero-patriarchal thinking and gender binaries have historically limited knowledge production.[4] Readers might also question how positionality (race, gender, geography and privilege) informed how individual researchers framed their work, made claims and fitted words to describe plant activity. Is it possible that only some scientists have, or think they have, the privilege to fully endorse the poetic latitudes of plant life?

Anyone who has spent time outside with botanists will recognise the wide-eyed, child-like wonderment that Schlanger describes scientists having as they ask better questions, travel into denser jungles or, on rare occasions, make new conclusions. There are few things as wholesome as watching a botanist stare at the plant *in situ* with unadulterated admiration and astonishment, and *The Light Eaters* manages to capture that light in every chapter.

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3 On new technologies of observations, such as infrared cameras, drones, night vision equipment, computed tomography and DNA analysis as 'new "eyes" in the field', see Jennifer Ackerman, *What An Owl Knows: The New Science of the World's Most Enigmatic Birds* (New York, NY: Penguin Books, 2024).

4 Schlanger indicates how Plato and Aristotle influenced the hierarchical thinking that placed plants as inferior to humans and how Theophrastus, Aristotle's pupil and successor, rejected these notions and even coined the term *heartwood,* which drew parallels between human and tree anatomy (p. 37–38).