BRILLANT GREEN

In “Brilliant Green: The Surprising History and Science of Plant Intelligence” (2015), Stefano Mancuso and Alexandra Viola commendably extol the plant world’s many achievements.

But “intelligence”?

As plant physiologist Mancuso writes, should humans disappear, plants would soon smother all our most cherished creations. But should plants die out, humans and all other animals would soon follow, deprived of oxygen and food.

Our relationship to plants is thus “absolute, primordial dependence.”

All life is owed to plants, since single-celled algae learned to photosynthesize and thus to create oxygen. Millions of years later, through photosynthesis, chloroplasts in plants’ leaves continue to mediate between the sun and all living things.

Of earth’s biomass, plants comprise 99.7 percent and animals, including humans, 0.3 percent – a mere trace. And plants are the source of almost all energy – coal, gas, and oil.

Since their physiology is so similar to humans, we frequently use plants in research. We owe 95 percent of our pharmacology to plants, though we’ve identified a mere 5-10 percent of the earth’s species, and doom many to extinction every year.

The presence of plants, studies show, helps lift our moods, reduces stress, increases attention span and speeds recovery from illness or accident. Test scores improve where students see green vistas; with plants, there are fewer accidents, suicides, violent crimes.

Plus, someday we may use plants as models for ecological switchboards – "greenternets" to give us information about clouds, air and soil, potential earthquakes and avalanches. We would know what plants know.

Yet, despite all this, Mancuso notes the persistent popular view that plants are evolutionarily inferior. There were no plants on Noah's ark – though an olive branch miraculously signals life after the flood. Of the three Abrahamic religions, none sees plants as living; Aristotle placed them very near the inanimate. Darwin found both plants and animals fully evolved, simply because they'd adapted – but failed to shift the popular view. Today, Mancuso writes, "the plant world always gets second ranking, even in academia."

His book aims to reverse that, by educating us about the structures and functions of plants and detailing some of the remarkable things they do.

Plants evolved as stationary, animals as mobile - the former self-sufficient, and the latter not. Animals are in-dividuals -- not dividable – whereas plants, structured in repeated modules of

leaves, branches, and roots – are dividable and can withstand heavy browsing without harm.

Mancuso characterizes a plant's millions of root tips as "data processing centers," a network possibly communicating through underground chemical signals. Roots seek nutrients, even traces, by growing toward wherever these occur. Their tips touch, record and adjust direction. The roots occupy as much space as possible, unless they recognize genetically close kin; then they share. They engage in energy exchanges with fungi and can tell friends from foes. Similar exchanges occur with nitrogen-fixing bacteria.

Plants "perceive visual stimuli"; they can intercept and use light, and measure its quality and quantity. Odors are plants' "words" – chemical warnings, invitations and repulsions. Phototropism – growing toward light – involves "calculating risks and estimating benefits." Leaf stomata open and close, producing sugars or conserving water – plants must choose. Many plants catch and eat insects and small animals.

The problem for this reader is that Mancuso sees all these wondrous abilities as examples of "intelligence" from a human perspective. It's as if he lacks the vocabulary to talk about plants without anthropomorphizing them. Plants can "communicate," "recognize," "perceive," "calculate,"

“measure,” “estimate,” “choose”; they are “wily protagonists” in their drama, “capable of subjective impressions.”

I can live with the definition of plant intelligence in one of Mancuso’s sources – “problem solving in recurrent and novel situations” in “competitive foraging for resources.”

But even that has a whiff of humanity.