FROM "PLANT BLINDNESS" TO THE "PLANT REVOLUTION"

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Abstract

The essay examines the dynamics currently at work within Western culture that are enabling, both at scientific and philosophical levels, a potential end to what might be termed a "plant blindness", and that could pave the way for a genuine "plant revolution". After outlining this blindness from multiple perspectives – ontological, epistemological, phenomenological, historical-cultural, and ethical – the essay shows a careful interpretation of recent research findings may foster a more nuanced understanding of the vegetal world. Such an understanding could challenge prevailing anthropocentric, hierarchical, and zoocentric frameworks that persist, often in the form of implicit biases.

Keywords: Plant Blindness; Vegetal Ethics; Vertebrate Bias; Martha Nussbaum; Stefano Mancuso.

1. *Plant blindness and the paradox of flourishing*

Among the most compelling themes in contemporary philosophical discourse is the attempt to rescue the vegetal world from the silence and neglect into which it has quietly receded. Western culture, in this regard, would seem to reveal a profound indifference toward the plant world – an indifference it is now seeking to redress. Indeed, the absence of plants as objects of philosophical inquiry has been so conspicuous that scholars have begun to speak of a veritable "plant blindness", which has prevented philosophy from seeing what has always lain directly before its gaze. The philosophical eye has long remained blind to greenery – suffering from a broader blindness, in truth, that could be extended, at various points in time, to animals, women, ethnicities, and so forth, thus vastly expanding the perceived inadequacy of modern philosophy. The list, upon closer inspection, could be extended even further, legitimising a frontal critique of a form of philosophy held responsible for its blindness to an excess of

content that was incompatible with its own premises and assumptions. In other words, a philosophy that has abdicated its fundamental vocation: the exercise of critical thought[1].

The term *plant blindness*, introduced by James Wandersee and Elisabeth Schussler in the 1990s[2], has since become a foundational theoretical premise explicitly or implicitly embraced by many of the leading scholars engaged with these questions. Paco Calvo, Michael Marder, Emanuele Coccia, Stefano Mancuso, František Baluška, Fritjof Capra, Monica Gagliano, Matthew Hall, and Anthony Trewavas[3], to name but a few, share a common goal: to bring an end – both scientifically and philosophically – to this state of erasure. Yet the origins and causes of such an occlusion require further clarification. The hypothesis that this blindness is in some way intrinsic to the trajectory of Western history should be considered alongside the notion that it was modernity, in particular, which accelerated this tendency decisively. In the former case, one might invoke a long-standing tradition stretching back to the sacred texts of the Old Testament, where the role

1 C. Pelluchon, *Les Lumières à l'âge du vivant*, Èditions du Seuil, 2021; tr. it. di A. Ciappa, *L'età del vivente. Per un nuovo Illuminismo*, Donzelli, Roma 2023.

2 J. Wandersee, E. Schussler, *Preventing Plant Blindness*, in "American Biology Teacher", 61, 1999, pp. 82-86; Id., *Towards a Theory of Plant Blindness*, in "Plant Science Bullettin", 47, 2001, pp. 2-9.

3 P. Calvo, N. Lawrence, Planta sapiens. *Unmasking Plant Intelligence*, The Bridge Street Press, UK 2022; tr. it. di A. Panini, Planta Sapiens. *Perché il mondo vegetale ci assomiglia più di quanto crediamo*, il Saggiatore, Milano 2022; E, Coccia, *La Vie des plantes. Une Métaphisique du mélange*, Bibliothèque Rivages 2016; tr. it. di S. Prearo, *La vita delle piante. Metafisica della mescolanza*, il Mulino, Bologna 2018; M. Marder, *Plant-Thinking. A Philosophy of Vegetal Life*, Columbia University Press, New York 2013; F. Baluska, S. Mancuso, D. Volkmann (a cura di), *Communication in Plants: Neuronal Aspects of Plant Life*, Springer, Berlin-Heidelberg-New York 2006; S. Mancuso, *La nazione delle piante*, Laterza, Roma-Bari 2019; Id., Plant Revolution. *Le piante hanno già inventato il nostro futuro*, Giunti, Firenze 2023[2]; M. Gagliano, *Thus Spoke the Plant: A Remarkable Journey of Groundbreaking Scientific Discoveries and Personal Encounters with Plants*, North Atlantic Books 2018; tr. it. di A. Castellazzi, *Così parlò la pianta. Un viaggio straordinario tra scoperte scientifiche e incontri personali con le piante*, Nottetempo, Milano 2022; F. Capra, S. Mancuso, *Discorso sulle erbe*, Aboca, Sansepolcro 2021[2]; M. Hall, *Plants as Persons. A Philosophical Botany*, SUNY Press, Albany 2011; A. Trawevas, *Plant Behavior and Intelligence*, Oxford University Press, Oxford 2014; A. Kallhoff, M. Di Paola, M. Schörgenhumer (a cura di), *Plant Ethics. Concepts and Applications*, Routledge, London-New York 2018; Q. Hiernaux, *From Plant Behavior to Plant Intelligence*, Éditions Quæ, Versailles 2023; F. Hallé, *Éloge de la plante. Pour une novelle biologie*, Seuil, Paris 1999.

and treatment of the vegetal world appear negligible – indeed, even more marginal than that accorded to animals[4].

Plants – though occasionally invested with rich symbolic value, as in the case of the olive tree or the vine[5] – are rarely mentioned and are, for the most part, assimilated to quasi-inorganic entities, barely distinguishable from inanimate, non-living objects. In this respect, the sensibility of the monotheistic traditions appears markedly inferior when compared not only to the animistic cosmologies of Amerindian[6] peoples but also to Mahāyāna Buddhism, Hinduism, and in particular to the Jain tradition – an unorthodox form of Brahmanical and Vedic religiosity that emerged in India in the 6th century BCE[7]. Likewise, the philosophical tradition – presocratic thinkers aside[8] – appears, according to this line of interpretation, to be largely estranged from any attentive or adequate consideration of the vegetal world.

This is evident not only in the famous remark attributed to Plato's Socrates in the *Phaedrus*[9], which contrasts the inertia of the countryside and the natural world with the vitality of the *polis*, but also in the recurring temptation to define plants *in terms of lack*[10]. There appears to be a persistent difficulty in recognising the vegetal realm as an object on its own right – which instead is interpreted through the lens of an ontology in which the human and the animal serve as standards of adequacy. Thus, even when the plant is acknowledged as a living being – as in Aristotle[11], for example – and thereby distinguished from inert matter or the mute inanimateness of the object, it is still defined positively only through contrast with the animal, and therefore *by deficiency*.

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4 Cfr. S. Mancuso, A. Viola, *Verde brillante. Sensibilità e intelligenza del mondo vegetale*, Giunti, Firenze 2015; C. Pelluchon, *L'età del vivente*, cit., p. 220; Conversely, see S. Mickey, *Without Why: Useless Plants in Daoism and Christianity*, in "Theology and Religious Studies", 10(1), 65, 2019 https://doi.org/10.3390/rel10010065.

5 Cfr. J. Brosse, Mythologie des arbres, Éditions Plon, Paris 1989.

6 Cfr. E. Kohn, *How Forests Think: Toward an Anthropology Beyond the Human*, University of California Press, Berkeley 2013; P. Descola, *Par-delà nature et culture*, Éditions Gallimard, Paris 2005; B. Albert, D. Kopenawa, *Yanomami, l'esprit de la forêt*, Actes Sud, Arles 2022.

7 G. Pellegrino, M. Di Paola, *Etica e politica delle piante*, Deriveapprodi, Roma 2019.

8 Cfr. ivi, pp. 23 ss. e L. Repici, *Uomini capovolti. Le piante nel pensiero dei Greci*, Edizioni della Normale, Pisa 2020, pp. 103-126.

9 "I am fond of learning, but country places and trees – they won't teach me anything, whereas I learn from the men in the city", Platone, Fedro 229a-b, in *Plato in twelve volumes*, vol. 9, Harvard University Press, Cambridge (MA)-London 1925.

10 M. Gagliano, *Thus Spoke the Plant*, cit.; tr. it., p. 101.

11 Cfr. L. Repici, *Uomini capovolti*, cit., pp. 13-63.

Plants are regarded as lacking beings, defective animals: impassive, insensible, incapable of locomotion, devoid of eyes, awareness, or volition – "inverted men". As Aristotle states in *De Anima*: "plants seem to live, though they do not share in movement or sensation"[12], and thus they live *despite* lacking those characteristics deemed indispensable to life. In some respects, plants represent a mystery – an ambiguous threshold between the living and the non-living – possessing a set of features that render their classification problematic. In the *De Plantis*, attributed to Pseudo-Aristotle[13], the plant is even considered an ontologically defective, undecided being, caught between the metaphysical categories of "thing" and "animal," belonging fully to neither. Despite its apparent lack of life, the plant appears as "a thing that exceeds the boundaries of thinghood"[14], and yet lacks the strength to ascend to the next level – remaining, therefore, a thing with pretensions to animality. A paradoxical contradiction thus seems to arise within the philosophical tradition, which inaugurates its inquiry under the sign of *physis*, of nature's praise, whose characteristics are essentially linked to blossoming, exuberance, luxuriance, growth, and the uncontrolled proliferation, the flourishing vitality typical of the vegetal world – only to subsequently expel the vegetal from the very notion of nature. *Flourishing*, for instance, becomes a central notion in Aristotelian ethics, the emblem of an ideal fulfilment for both humans and other living beings. One therefore hopes that humans and animals may flourish; yet this flourishing is denied to the very being to whom it would be properly belong – namely the flower, the plant. The one being that literally blooms is excluded from the register of the living to the point that "vegetating" acquires an unequivocally negative connotation – associated with lack or deficiency – thereby obscuring the generative value of its origins and emphasising only its deficit in comparison to the human.

The *paradox of flourishing* – whereby everything flourishes except the flower itself – marks the ambiguous position of philosophy, which from the very beginning appears torn between *a celebration of life in bloom and the exclusion from life of that which blooms*. As Michael Marder puts it, "with few notable exceptions, the exuberance of vegetal life has remained largely unacknowledged in Western philosophy"[15].

12 Aristotele, *De anima*, 410b23-24, in *The works of Aristotle*, vol. 1, Clarendon Press, Oxford 1907.

13 Pseudo-Aristotle, *On Plants*, 3rd century BCE.

14 M. Marder, *Plant-Thinking. A Philosophy of Vegetal Life*, Columbia University Press, New York 2013, pp. 23-24.

15 Ivi, p. 23. One exception is that represented by psychologist Gustav Theodor Fechner: *Nanna oder über das Seelenleben der Pflanzen*, Leopold Voß, Leipzig 1848; tr. it. ed. by G. Moretti, *Nanna o L'anima delle piante*, Adelphi, Milan 2008.

2. *Forms of plant blindness*

Plant blindness, understood as our *inability or unwillingness to regard plants as living beings worthy of attention, respect, or consideration*, manifests itself as the tendency to relegate the vegetal world to the background. Greenery appears merely as scenery – the backdrop against which the true protagonists of history emerge and enact their noteworthy deeds. The agents, the actors that matter and move centre stage, require a theatrical setting, a background whose principal function seems to be that of enabling these feats to stand out against something vague and indistinct – something that, by its very nature, evades the *principium individuationis*. Rather than as individual plants, greenery emerges as a flat vegetal world, a two-dimensional scenography in which humans can move without paying it much attention.

As Michel Serres notes in *The Natural Contract*,

> In these spectacles, which we hope are now a thing of the past, the adversaries most often fight to the death in an abstract space, where they struggle alone, without marsh or river. Take away the world around the battles, keep only conflicts or debates, thick with humanity and purified of things, and you obtain stage theater, most of our narratives and philosophies, history, and all of social science: the interesting spectacle they call cultural. Does anyone ever say where the master and slave fight it out? Our culture abhors the world.[16]

Western culture has pushed the vegetal world into the background, condemning it to the role of an extra, assigning it the specific task of vanishing. History has remained essentially "blind to nature"[17].

There are, however, several distinct ways in which humans have shown themselves to be blind to plants – incapable or unwilling to see them – ultimately relegating them to the background as anomalous subjects. We may thus speak, at the very least, of ontological, epistemological, phenomenological, sociocultural, and ethical forms of plant blindness. *Ontological plant blindness* has a long tradition, characterised by the difficulty in conceiving of plants as fully fledged beings, endowed with a legitimate and autonomous mode of existence. They are perceived as ontologically irrelevant and are placed at the lowest rung of the great chain of being. Both in

16 M. Serres, *Le contrat naturel*, Editions François Bourin, Paris 1990, Engl. transl., *The Natural Contract*, by E. MacArthur and W. Paulson, The University of Michigan Press, Michigan 1995, p. 3.

17 Ivi, p. 16. Cfr. M. Benasayag, T. Cohen, *L'epoca della tranquillità. Lettere alle nuove generazioni*, Vita e Pensiero, Milano 2023, pp. 54-55.

Aristotle and in Thomas Aquinas[18], plants are said to possess a vegetative soul, which relegates them to the lowest level of a scale culminating in the rational human being. The idea of a hierarchical order of being – culminating in a supreme form of life, namely the human, characterised by vitality, existence, sensation, and intellect (as in Charles de Bovelles's *scala naturae*)[19] – drives a comparative framework that precludes recognition of other, equally complete forms of life. This sustains the notion that plants are intrinsically devoid of value and exist only as means for human survival. When humankind is the reference point, the vegetal version can only appear deficient and defective.

Epistemological blindness, by contrast, refers to the inability or refusal to know the vegetal world – or, at least, to acknowledge it as a worthy object of independent investigation and understanding. This blindness should not be seen merely as the result of the "*contretemps*"[20] or the urgency of more pressing matters that temporarily push such enquiries aside. Rather, it seems to be the consequence of a structural closure. Not only do we fail to see plants, but we also lack the cognitive and cultural tools to comprehend them as complex living beings. On the one hand, plants are excluded from our field of knowledge because they are perceived as ontologically uninteresting – entities without value, interiority, subjectivity, motion, intelligence, awareness, or communication. On the other hand, it is precisely this epistemological blindness – this refusal to develop adequate tools of knowledge attuned to the vegetal world – that prevents the formulation of a more appropriate ontological valuation. Ontological and epistemological blindness reinforce each other: we do not see plants because we do not know how to think them, and we do not know how to think them because we do not see them. The Platonic primacy of knowledge as the approximation to eternal intelligible forms[21]; the Cartesian reduction of nature – and plants in particular – to a mechanistic model that denies all aspects of *res cogitans* to living beings (even if only for methodological purposes); the

18 Aristotele, *De Anima*; Id., *Parti degli animali*; Tommaso, *Summa Theologica*.

19 C. Bovelles, *Liber de sapiente*, 1509. On the issue of the *scala naturae*, see: E. Rigato, A. Minelli, *The great Chain of being is still here,* in "Evolution: Education and Outreach", 6/18, 2013, pp. 1-6.

20 We could also apply to plants the so-called "*argument du contretemps*", initially employed with regard to women by G. Fraisse in *La sexuation du monde. Réflexions sur l'émancipation*, Presses de Sciences Po, Paris 2016, and later taken up by C. Pelluchon in *L'età del vivente*, *op. cit.,* p. 98, in relation to animals. According to this argument, "there are far too many important matters for us to also attend to women, animals, or plants".

21 Cfr. M. Marder, *Plant-Thinking*, cit., p. 49.

Baconian experimental turn[22] that subjects nature to analysis and objectification for the purposes of domination and subjugation – just to mention a few of the foundational moves within philosophical thought – not only fail to provide a place for plants in the system of knowledge, but would even make it structurally difficult to conceive of such a place.

Phenomenological blindness, on the other hand, denotes an incapacity to relate to plants – not as objects of study or comprehension, but on an emotional or, one might say, existential level. Our way of being-in-the-world seems to preclude, in some way, the possibility of direct, lived, affective, and relational experience with the vegetal world, which remains emotionally in the background: present, but never fully appearing. The entire tradition of contemporary phenomenology – from Husserl to Heidegger, from Merleau-Ponty to Levinas – deserves great credit for safeguarding the singular against monological thought and the generalisations that obscure difference. As Marder argues, this "return to the things themselves" may indeed be helpful, "provided it is capable of accommodating the subjectivity of plants, in its radical alterity"[23]. It is not by chance that phenomenology, alongside deconstruction and "weak thought" (*pensiero debole*), is cited as one of the three philosophical traditions from which a *vegetal-thinking*[24] may be drawn. Nonetheless, its continued reference to a transcendental ego remains problematic[25]. Despite its contributions, plants still do not seem to count as relevant intentional objects; they serve as the backdrop to the *Dasein* capable of Being, but do not possess a face through which to enter into a dialogical – or even ethical – relation[26].

Sociocultural plant blindness, closely tied to the notion of *backgrounding*, draws attention to the fact that such inattention to the vegetal world – and to the disciplines concerned with it – is also the result of a cultural and ideological prejudice. In other words, it reflects historical inequalities of class, gender, and culture that have shaped the social status of those traditionally tasked with the care of living "green". Because the care of plants has historically been the domain of women – in domestic settings,

22 Cfr. C. Merchant, *The Death of Nature. Women, Ecology and the Scientific Revolution*, Harper & Row, New York 1980.

23 M. Marder, *Plant-Thinking*, cit., p. 31.

24 M. Marder, *Vegetal Philosophy: To the Root of Contemporay Thought*, Columbia University Press, New York 2021.

25 M. Marder, *Plant-Thinking*, cit., pp. 74-78.

26 *Ibid*. Cfr. A. Weber, *The Biology of Wonder: Aliveness, Feeling, and the Metamorphosis of Science*, New Society Pub, Gabriola Island 2016; Robert Wall Kimmerer, *The Democracy of Species*, Penguin Books, London 2024.

in gardens, and in the preparation of herbal remedies – or of lower and servile classes, such as farmers (whose labour was typically regarded as ignoble and vulgar), the objects of their care – plants – have likewise been burdened with this stigma[27]. Agriculture, horticulture, and gardening were excluded from the realm of dignified and esteemed activities – thus relegated to the background – precisely because of the subordinate status of those engaged in them. The marginalisation of plants and plant knowledge reflects this association with marginalised agents – both in terms of gender and social standing. The lower strata of society were associated with the lower strata of being. Botanical knowledge itself has suffered systematic forms of ostracism, neglect, and erasure due to its close historical ties to women and popular classes. This has given rise to what has been termed *botanical erosion* – the invisibilisation of traditional plant practices, relegating them to the periphery of academic knowledge.

From a postcolonial perspective, it has further been observed that such blindness is also linked to a colonial hierarchy of knowledge: the supposed inferiority of so-called "primitive" indigenous peoples – despite their refined botanical expertise – contributed to the devaluation of those forms of knowledge, effectively demoting the vegetal world to the level of mere natural background[28]. Botanical blindness is therefore not merely a matter of ignorance, oversight, or error, but rather an "intersectional" phenomenon[29] – an interweaving of multiple forms of discrimination that overlap and reinforce one another.

Scholars such as Sandra Harding, Helen Longino, Londa Schiebinger, and Val Plumwood have demonstrated how even scientific categories are shaped by gendered and racialised assumptions[30], suggesting that the mar-

27 Consider, for example, Dianne Rocheleau, one of the leading figures in the Feminist Political Ecology movement, for whom: "Women, especially those from lowerclass and marginalized groups, are often the primary custodians of local ecological knowledge, yet their voices are frequently excluded or marginalized in decisionmaking processes" (D. Rocheleau, B. Thomas-Slayter, E. Wangari, *Feminist Political Ecology: Global Issuesand Local Experiences*, Routledge, London-New York1996).

28 The devaluation of such knowledge would be followed, conversely, by its expropriation and exploitation – by countries, scientists, and corporations – which is also referred to as 'biopiracy.'

29 The concept of 'intersectionality' was developed by theorist and activist Kimberlé Crenshaw in the late 1980s.

30 "Linnaeus simply brought traditional notions of gender hierarchy wholecloth into science. He read nature through the lens of social relations in such a way that the new language of botany incorporated fundamental aspects of the social world as

ginalisation of plants within Western culture may itself be the result of culturally and socially constructed frameworks. In particular, Val Plumwood, in her seminal work *Feminism and the Mastery of Nature*[31], identifies *backgrounding* as a philosophical and cultural mechanism that binds together nature, women, lower classes, and colonised peoples. It consists in the systematic relegation of various agents to the background, rendering them invisible, despite their fundamental and functional contribution to society. As she writes: "One of the most common forms of the denial of women and nature is what I call backgrounding, the treatment of them as providing a background to a dominant sphere of recognised achievements or causality"[32]. In this way, entire categories of active and productive subjects – despite their essential contributions – are ignored and minimised, silenced and treated as mere supporting elements rather than as autonomous agents possessing their own voice and value.

Plant blindness, therefore, may be understood as a specific instance of backgrounding, particularly linked to the fact that plants do not move, do not speak, and so on. Like peasants, colonised peoples, and nature more broadly, plants are pushed to the background – as if their existence were a given, a naturalised backdrop not deserving of recognition. Their being is perceived as obvious and passive, and thus unworthy of philosophical or cultural attention.

3. *Ethical blindness and the capabilities approach*

It is arguably ethical blindness to plants that appears the most disruptive within our current cultural context. The tendency to exclude plants from moral consideration – at a time when ecological sensitivity is growing in parallel with the urgent need to protect the environment, preserve biodiversity, safeguard ecosystems, defend primary forests from corporate exploitation, confront the climate crisis[33], and protect

much as those of the natural worl" (L. Schiebinger, *Nature's Body: Gender in the Making of Modern Science*, Beacon Press, 1993, p. 17).

31 V. Plumwood, *Feminism and the Mastery of Nature*, Routledge, London-New York 1993.

32 Ivi, p. 41.

33 Cfr. S.M. Gardiner, *A Perfect Moral Storm. The Ethical Tragedy of Climate Change*, Oxford University Press, New York 2011; T. Morton, *Being Ecological*, Penguin Random House, New York 2018; T. Morton, *Hyperobiects*, Minnesota University Press, Minneapolis 2013; W. Behringer, *Storia culturale del clima. Dall'era glaciale al riscaldamento globale*, Bollati Boringhieri, Torino 2016.

Gaia[34], humanity's shared dwelling, from humanity itself – has provoked a counter-reaction. This has led to what is now referred to as a genuine *plant revolution*[35]. This revolution arises from an expansive and circular movement[36] that has gradually extended the sphere of human ethical responsibility to include beings previously excluded from such consideration. As part of this rehabilitation of living subjectivity – traced even in the most elementary life forms – plants have recently become the object of renewed philosophical and scientific interest.

With the publication of *Animal Liberation* (1975)[37], Peter Singer helped emancipate animals from a form of conceptual slavery imposed upon a substantial portion of the living world by the rigid categories of traditional philosophy. Drawing upon Bentham's utilitarian tradition, Singer displaced the typical logocentric questions of Western philosophy with a simpler and more radical inquiry: *"*Can they suffer?" This shift in focus opened the eyes of moral reasoning to all sentient beings, granting them moral standing by virtue of their capacity for suffering.

Once this boundary had been breached, it became inevitable that such a question would eventually be directed towards the vegetal world as well. Over the past three decades particularly we have witnessed a surge of interest in plants – an interest that at times takes the form of a genuine "struggle for liberation". However, such a liberation must go well beyond utilitarian premises – unless it can demonstrate that plants, too, are capable of experiencing pleasure and pain[38]. This is why recent years have seen an intense scientific effort working in tandem with ethical-philosophical inquiry, seeking to determine on what basis plants might be considered moral patients, even though – according to utilitarian criteria – they lack sentience.

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34 J. Lovelock, *Gaia*. *A New Look at Life on Earth*, Oxford University Press, Oxford 1979; Cfr. B. Latour, *Face à Gaïa. Huit conférences sur le nouveau régime climatique*, Éditions La Découverte, Paris 2015.

35 S. Mancuso, Plant Revolution, cit.

36 P. Singer, *The Expanding Circle: Ethics and Sociobiology*, Clarendon, Oxford 1981. Cfr. L. Battaglia, *Un'etica per il mondo vivente. Questioni di bioetica medica, ambientale, animale*, Carocci, Roma 2012, pp. 123-124.

37 P. Singer, *Animal Liberation: A New Ethics for Treatment of Animals*, HarperCollins, New York 1975.

38 Cfr. M. Marder, *Is it Ethical to Eat Plants?,* in "The New York Times", 28 dicembre 2012; P. Calvo *et al.*, *Are Plants Sentient?*, in "Plant, Cell & Environment", 40, n.11, 2017, pp. 2858-2869; M.J. Hansen, *A Critical Review of Plant Sentience: Moving Beyond Traditional Approaches*, in "Biology and Philosophy", 39, 13, 2024 https://doi.org/10.1007/s10539-024-09953-1.

Historically, the extension of moral consideration to previously excluded subjects has always depended on the attribution of certain properties or characteristics deemed essential for moral relevance. These characteristics, initially understood in highly exclusive terms, have over time been recognised as shared by a progressively broader range of non-human animals.

A long-standing tradition, beginning with Aristotle, located this decisive characteristic in human rationality – not coincidentally the "specific difference" of the "proximate genus" of animals, a trait predicable only of human beings. The exclusion of non-humans from the moral sphere, on the basis of reason became even more pronounced in modern philosophy, especially with Descartes. In fact, it is only with Descartes that this exclusion was systematically theorised in such an uncompromising way[39]. His *essentialist dualism*, which allows no degrees or gradations of being, fostered a dichotomous interpretation of reality based on the presence or absence of the *res cogitans*. As Tom Regan has shown, rationality is accompanied, in Cartesian thought, by the possession of consciousness (denied to animals), of an immortal soul, and of language[40]. Since only language guarantees subjectivity, and only subjectivity warrants moral obligation, the entire non-human world is excluded from ethical consideration.

Even with the theory of "indirect duties" put forward by Kant, and later by Rawls[41], the situation does not change substantially. The recognition afforded to animals remains merely derivative of the moral obligation owed to human beings. As Kant writes: "He who is cruel to animals becomes hard also in his dealings with men"[42]. The moral obligation towards humans is justified by the fact that the human being, as a rational agent, is self-legislating, capable of practical action, and therefore rightly counted among "persons", not among "things"[43].

With Bentham's utilitarianism – later articulated by Singer – the circle of beings deemed worthy of moral consideration significantly expands to include all those capable of experiencing pleasure and pain. This shift marks the beginning of animal ethics, framework which identifies sen-

39 S. Pollo, *Umani e animali: questioni di etica*, Carocci, Roma 2021, pp. 27-28.

40 T. Regan, *The Case for Animal Rights*, The Regents of the University of California, Oakland 1983.

41 Cfr. J. Rawls, *A Theory of Justice*, Harvard University Press, Cambridge (MA) 1971. Rawls's position has been critiqued by M. Nussbaum, *Frontiers of Justice. Disability, Nationality, Species Membership*, Belknap Press of Harvard University Press, Cambridge (MA)-London 2006.

42 I. Kant, *Von den Pflichten gegen Tiere und Geister*, in Id., *Immanuel Kants Vorlesungen über Ethik, Felix Meiner, Leipzig 1924.*

43 I. Kant, *Grundlegung zur Metaphisik der Sitten*, J.F. Hartknoch, Riga 1785.

tience – namely the capacity to feel pleasure and pain – as the fundamental criterion. Sentience thus becomes not only a necessary condition for having interests (such as the interest in avoiding pain or continuing to live), but a sufficient one.

With Martha Nussbaum's Capabilities Approach, an important ethical framework emerges within the field of animal ethics – one that may also bear significant implications for the plant world. A shared premise of this approach is that we can no longer proceed as though we were unaware: the knowledge we now possess precludes any continued reliance on a stereotyped and reductive view of living beings, particularly of animals. The intellectual manoeuvres once employed to validate the belief that animals were automata, devoid of culture or incapable of feeling pain, have now been exposed as unfounded.

Even the theory of the "*so-like-us*"[44] – rooted in Stoicism and the Judeo-Christian tradition – upholds a linear conception of nature, one that places "persons" at the top of the scale. And while such persons may, on occasion, include non-human entities, inclusion still depends on similarity to humans – on the possession of properties that render them recognisably akin to us. As Nussbaum observes: "The status of personhood, however broadly expanded, remains unjustifiably anthropocentric"[45]. What is needed now is a shift away from an all-or-nothing framework – one in which full ethical protection is guaranteed only to those "inside" the circle of moral and political citizenship, and none to those outside. In its place, we must adopt a gradualist approach, one which holds that "every sentient creature (capable of having a subjective perspective on the world and of experiencing pleasure and pain) should have the opportunity to flourish in accordance with its own form of life"[46].

Drawing on the utilitarian principle of equal consideration[47], with which Nussbaum agrees, it follows that "like interests should be treated alike". This means that ethical obligations must be calibrated according to the type of interest in question and the specific way in which flourishing manifests in a given species or individual.

Importantly, Nussbaum moves beyond Bentham, and aligns more closely with Aristotle and Mill, in claiming that moral recognition of the right to flourish cannot be reduced merely to pleasure or pain. Once we acknowl-

44 M.C. Nussbaum, *Justice for Animals: Our Collective Responsability*, Simon & Schister, New York 2022.
45 Ivi, p. 38.
46 Ivi, p. 24.
47 Ivi, p. 50.

edge the plurality of qualitatively distinct interests typical of sentient beings, we must think in terms of activities, not just states of satisfaction. As she writes: "Satisfaction alone is not enough for a flourishing life: activity and the specific quality of that activity matter greatly"[48].

This implies that pain is not the sole moral consideration, and that genuine flourishing entails the opportunity to express a set of characteristic activities, inherent to both the species and the individual. One of the most important contributions of the Capabilities Approach is precisely this recognition of a plurality of pleasures and interests, as well as of the freedom to pursue them through appropriate activities.

In principle, this framework does not necessarily exclude the plant world, insofar as plants, too, could be said to strive to flourish in accordance with a life form that is proper to them. The existence of different, simpler types of interests does not preclude the possibility of basic protections, even for plants. Such an interpretation does not seem to conflict with the premises outlined in Nussbaum's recent work, *Justice for Animals: Our Collective Responsibility*. To counter our typical, everyday approach to reality – marked as it is by anthropocentric biases and assumptions – Nussbaum identifies three fundamental ethical emotions. Chief among these is "wonder", which she considers an epistemic emotion oriented toward dignity[49]. According to Nussbaum, wonder arises in response to something mysterious that strikes us deeply and eludes our understanding. Rather than being a hedonistic emotion, aimed at personal wellbeing, wonder appears instead as the discovery of a surprising world of living subjects interacting with one another – a revelation that pushes us beyond ourselves, toward the other, awakening a form of "ethical concern". Calling again upon Aristotle, Nussbaum notes that what most inspires wonder, and moves the human being beyond himself, is the discovery of movement – movements that seem to suggest the presence of something behind them, a form of interiority acting unpredictably. In other words, wonder, which sparks ethical concern, is born of the perception of *meaningful*, non-random *movements* around us – movements that seem to result from *effort*, and that encourage us to imagine the presence of a sentient life[50].

The second emotion, "compassion", leads us to experience pain in response to the suffering of another. This, however, presupposes that, among the many wondrous creatures we encounter, the human being perceives in

48 Ivi, pp. 53.
49 Ivi, p. 12.
50 Ivi, p. 11.

some a similarity or affinity that draws them into his moral world. It is the capacity for imaginative identification that makes compassion possible – and, in turn, gives rise to the third emotion: righteous indignation, or transitional anger[51], which transforms compassion into practical engagement, preparing us for action.

In principle, both wonder and compassion – which then give rise to righteous "indignation", transforming ethical reflection into practical action – might offer a valuable interpretive framework for our relationship with the plant world as well. Thanks to new research, the idea that plants could be an integral part of that *"wondrous"* world – teeming with life and characterised by surprising movements and purposeful efforts – seems plausible, even beyond Nussbaum's own stated intentions. Likewise, new discoveries concerning the communicative, cognitive and cooperative capabilities of plants may facilitate the work of the imagination, making it easier to feel emotional resonance and compassion toward living beings outside the animal kingdom. In other words, Nussbaum's premises could be seen as applying, at least in an initial sense, to all that is alive – everything that displays original movements, goal-directed effort, and modes of flourishing unimaginable just twenty years ago.

However, a crucial limiting factor intervenes, which explicitly rules out the extension of her ethical theory to the plant world. According to Nussbaum, the "great truth" of utilitarianism is that "there exists in nature a dividing line created by sentience, the great unifier of animals"[52]. Justice, then, applies only to those beings who are objects of wonder – but not to life itself. Rather, it applies to sentient life: life capable of experiencing pleasure and pain, of learning from positive and negative experiences, of displaying intentional and flexible behaviour, of making meaningful, individual efforts, and of possessing a subjective perspective on the world. To use her own words: if we observe that a creature "is capable of making efforts and has some sort of, however rudimentary, subjective awareness, then the creature is sentient"[53]. Injustice, understood as an ethical category – namely, as the illegitimate obstruction of a meaningful activity, or the wilful prevention of such activity – can therefore only be suffered by beings who possess this "standard package"[54]. In other words, the wonder we feel when we discover movements and efforts compels us not to hinder them – for fear of committing injustice, more than merely causing harm. To hinder such "wondrous" efforts would be ethically wrong.

51 Ivi, 15.
52 Ivi, p. 138.
53 Ivi, p. 139.
54 Ivi, p. 138.

Plants, although capable of effort, functioning as teleonomic systems that self-maintain and self-propagate, are, according to Nussbaum, characterised by rigid and fixed reactive behaviours. Their conduct is likened to that of a natural law, lacking situational flexibility. Moreover, it is difficult to argue that plants possess intentionality or engage in efforts aimed at living well, nor has it been demonstrated that they exhibit individual variations[55]. Since the subject of ethics is the individual, not the species – and since a plant is not, in Nussbaum's view, a true individual, but rather a "clustered entity, plural rather than singular"[56] – plants fall outside the bounds of moral concern. When we interact with plants, therefore, our approach should not be guided by an "imperative of justice" but rather by an ethical concern comparable to our *solicitude* for ecosystems. As she states: *"*Plants have no rights grounded in justice. They can be harmed, but they cannot suffer an injustice"[57]. Now, it is true that in cases where sentience is uncertain, the precautionary principle should be applied. However, this does not appear to be the case with plants.

In conclusion, for Nussbaum, sentience, individuality, and subjective awareness constitute the minimal threshold for moral inclusion within the sphere of justice. Plants lie clearly below this threshold, insofar as they are not sentient.

4. *Plant blindness and the vertebrate bias*

It is thus necessary to ask whether the various forms of blindness toward plants described thus far are ultimately rooted in a zoocentric bias, which – despite having supported the development of a commendable "extensionist"[58] theory – ultimately prevents the recognition of genuine agency within the 'non-animal' domain. In other words, while humans may be willing to extend ethical concern to beings similar to themselves, such extension tends not to reach across the broader spectrum of life in other kingdoms.

For a long time, even within biology and the philosophy of biology, subjectivity was considered the exclusive property of organisms – particularly those with clear boundaries, human-like dimensions, consciousness, self-centredness, and a well-developed central nervous system. This tendency to take "mesoscopic" organisms as paradigmatic – granting them

55 Ivi, p. 150.
56 Ivi, p. 151.
57 *Ibid*.
58 *Infra*, pp. 219-239.

exemplary status by which to judge the appropriateness of all other life forms – has come to be identified as a true *vertebrate bias* (or organism syndrome)[59]. Biologists, it is argued, have traditionally defined what counts as an "individual" by applying a set of criteria specific to vertebrate mammals: "The error stems precisely from the vertebrate bias, and lies in the unjustified assumption that all biological entities must possess the characteristics of vertebrates in order to be considered 'individuals'"[60].

Corollary to this approach is the widely held belief that only biological individuals qualify as fully living beings. This implies a backward inference: subjectivity requires individuality, and only individuals – defined by vertebrate-like criteria – can be said to possess life in the fullest sense. The primacy of the acting subject is thus reflected in the primacy of life as individualised existence, and of the individual understood as vertebrate. One of the consequences (or perhaps the causes) of this bias is the inability to recognise agency outside oneself, particularly at microscopic levels. And yet, life on Earth for the first three billion years was characterised by the age of bacteria and the dominance of microorganisms. As O'Malley and Dupré point out: "An indefensible focus on macrobes has distorted many aspects of our philosophical perspective on the biological world"[61]. This distortion applies even more strongly to the plant world, which – being "dividual"[62], lacking a centralised subject or nervous system – is often relegated to the *margins of life itself,* to the point of being implicitly excluded from it altogether.

In the 20th century, however, biology began to question its default reference to the *organism* as the fundamental unit of life – conceived as a discrete entity with fixed spatial and temporal boundaries, marked autonomy, and a strong sense of individual subjectivity, clearly distinguished from random aggregates[63]. Life began to be understood instead as a dynamic flow, structured by imperfect "hierarchies". The organism, as traditionally defined, appeared to be only one case among many possible biological individuals[64], whose contours were often ambiguous and whose defining

59 J. Wilson, *Biological Individuality. The Identity and Persistence of Living Entities*, Cambridge University Press, Cambridge 1999; J.W. Pepper, M.D. Herron, *Does Biology Need an Organism Concept?*, in "Biological Review", 83, 2008, pp. 621-627.

60 A. Borghini, E. Casetta, *Filosofia della biologia*, cit., p. 180 (translation by the author).

61 M.A. O'Malley, J. Dupré, *Size Doesn't Matter: Towards a More Inclusive Philosophy of Biology*, in "Biology and Philosophy", 22, 2007, 155-191, p. 156.

62 Cfr. H. Plessner, *Die Stufen des Organischen und der Mensch. Einleitung in die Philosophische Anthropologie*, Walter de Gruyter, Berlin-New York 1975.

63 A. Borghini, E. Casetta, *Filosofia della biologia*, cit., p. 151.

64 Ivi, pp. 173-192; J.W. Pepper, M.D. Herron, *Does Biology Need an Organism Concept?,* in "Biological Review", 83, 2008, pp. 621-627.

traits were far from clear-cut. Even jellyfish, lichens, fungi, sponges, bacteria, parasites, and coral colonies have demonstrated characteristics of individuality, albeit often in composite, plural, and porous forms – raising fundamental questions about identity and individuation[65]. The number of entities that display genuine agency is thus vast, and they rarely coincide with those possessing clearly defined contours or human-scale dimensions.

As the notion that life – in its full sense – requires the presence of discrete, vertebrate-like individuals has gradually been questioned from multiple directions, our concept of life has become increasingly fluid. This shift now allows for the recognition of forms of agency even at the plant or bacterial level[66].

5. *Towards a plant revolution*

In other words, there is a growing recognition – even within biology – that our approach to living beings may be deeply conditioned by a series of *biases* or assumptions which, even if methodologically driven, hinder a proper understanding of life and its complexities. Life is now increasingly perceived in fluid, hybrid, relational, cooperative, active, and interactive terms, and ever less in alignment with traditional categories such as identity, individuality, intelligence, intentionality, and consciousness as classically conceived. The "plant question", on the one hand, benefits from this paradigm shift and, on the other, actively contributes to it – resisting anthropocentric logic and asserting that every living being, by virtue of being alive, represents a unique and specific modality of engaging with the environment and the challenges of survival.

Darwin's evolutionary principle – that all life forms currently existing on Earth are at the apex of their own evolutionary branch – prevents any hierarchical or linear reading of life forms. At the same time, it recognises that each species displays a maximum degree of adaptability and fitness, which may give rise to forms of intelligence, behaviour, and communication particular to its own kingdom[67]. The absence of a neuronal brain in plants, for example,

65 Ivi, p. 191.

66 Cfr. A.R. Damasio, *The Strange Order of Things*. *Life, Feeling, and the Making of Cultures*, Pantheon Books, New York 2017; in particular the paragraph "Humble Beginnings"; D. Haraway, *When Species Meet*, University of Minnesota Press, Minneapolis 2007; B. Latour, *The Pasteurization of France*, A.M. Métaillié, Paris 1988.

67 Cfr. S. Mancuso, A. Viola, *Verde* brillante, cit., pp. 19-20.

does not imply that plants lack other systems capable of performing similar tasks; nor does it justify the assumption that they belong to a lower level of the evolutionary hierarchy. Similarly, the attempt to identify in plants functionally analogous structures – such as the so-called root brain (root apex) – need not be seen as a merely anthropomorphic gesture, rooted in the "so similar to us" logic. In their 1880 treatise *The Power of Movement in Plants*[68], Charles and Francis Darwin investigated the various types of plant movement, particularly in climbing species, recognising in them a peculiar form of intelligence. They observed that, despite being sessile organisms, plants exhibit slow and active movements, not solely attributable to mechanical or physical causes but rather responses to environmental stimuli (touch, light, gravity). These movements were shown to be adaptive behaviours, centrally coordinated by the apical part of the roots, which not only grow downwards due to gravity, but actively respond to a range of external stimuli – such as obstacles, humidity, and chemical substances – thus revealing intelligent behaviour comparable to that of lower animals.

Building on these once-neglected insights, the last few decades have witnessed a genuine *Plant Revolution*, characterised by an intensification of scientific research into the mechanisms by which plants perceive, process, and respond to environmental stimuli. These studies aim to demonstrate that plants are intelligent organisms, capable of communication, of solving complex problems using sophisticated strategies, and of engaging in social life[69] – though not without raising some scepticism.

On the basis of this research, it now appears widely accepted that plants are capable of perception – that is, they acquire and reprocess environmental information and respond accordingly. In some respects, as sessile organisms, they appear even more sensitive than human beings[70]. Plants seem to possess a kind of *taste*, able to "sample" soluble chemical substances in the soil – especially phosphates, nitrates, and potassium – through their roots. They also appear to have a form of *olfaction*, since they can "smell" volatile chemicals[71] through sensory cells distributed across all tissues, including roots and leaves. Although auditory receptors in plants have not yet been identified, there is evidence that *sound* influ-

68 C. Darwin, F. Darwin, *The Power of Movements in Plants*, John Murray, London 1880.
69 Cfr. A. Trawevas, *Plant Behavior and Intelligence*, cit.; D. Chamowitz, *What a Plant Knows: A Field Guide to the Senses*, Straus and Giroux, New York 2012; U. Castiello, *La mente delle piante. Introduzione alla psicologia vegetale*, il Mulino, Bologna 2019, p. 11.
70 Ivi, p. 38.
71 Ivi, pp. 53-6.

ences plant growth by modulating the level of phytohormones and even gene expression. Certain species seem able to distinguish the sound of a caterpillar chewing from that of the wind, or the sound of running water from a recorded version[72] – each with clear adaptive advantages, such as activating defences or directing root growth. In a 2014 study, plants even demonstrated what may be interpreted as "preferences" in musical genres: *Rosa chinensis* seedlings exhibited significant increases in blooming and growth when exposed to sacred chants or Indian classical music, while reacting with aversion or "avoidance" to rock music[73]. If nothing else, it appears that plants are not fond of rock. In addition, plant *touch* sensitivity may be ten times more developed than that of humans[74]. Plants are able to detect the touch of an insect and discriminate – depending on whether it is herbivorous or not – the appropriate defensive or neutral response[75]. Finally, despite lacking eyes, plants seem to possess a form of *vision*. According to Baluska and Mancuso[76], plants are able to decode visual stimuli through specialised cells located on the upper surface of their leaves, and even roots appear to be photosensitive.

Plants appear to be capable not only of perception, but also of movement, memory, learning, communication, decision-making, and even social life. Among the many movements studied, particular attention has been drawn to the "active" movements of both climbing plants and roots. Roots explore the soil, avoid obstacles, and assess which direction is preferable for growth, performing oscillations and deviations that depend on environmental interaction. Even more significant is the phenomenon of circumnutation in climbing plants, which detect a potential support through mechanical impact and subsequently programme their coiling attempts based on the physical characteristics of the support (e.g., width, surface texture)[77].

Plants also seem able to "make decisions" and choose among several alternatives under conditions of uncertainty. This would imply the ability to process available information, assess it, estimate probable outcomes, evaluate costs and benefits, and thus define strategic responses. In some way,

72 H.M. Appel, R.B. Cocroft, *Plats respond to leaf vibrations causeda by insect herbivore chewing*, in "Oecologia", 175, 2014, pp. 1257-1266.

73 V. Chivukula, S. Ramaswamy, *Effect of different types of music on Rosa Chinensis plants*, in "International Journal of Environmental Science and Development", 5(5), 431, 2014.

74 U. Castiello, *La mente delle piante*, cit., p. 48.

75 Ivi, p. 51 ss.

76 Noteworthy are the studies on the mimetic ability of *Boquila trifoliata*: S. Mancuso, *Plant Revolution*, cit., p. 63-71.

77 P. Calvo, Planta Sapiens, cit., pp. 89 ss.

this suggests that plants possess a kind of judgement, especially in relation to two critical decisions: "when to flower", and "when to germinate" – that is, when to end seed dormancy[78].

If memory is defined as "the capacity to store information and retrieve it after a variable amount of time"[79], then it is certain that plants possess memory. Geraniums and acacias, for example, "remember" past attacks and activate faster and more effective defensive responses. Older leaves, which have stored information about the spectral composition of light, are even able to transmit this information to younger leaves[80].

Plants also "communicate" and engage in forms of social life: they communicate through volatile airborne chemicals, as well as through chemical and visual signals. For instance, already-pollinated flowers change colour and shape to signal pollinators not to approach, redirecting them instead toward unpollinated flowers[81]. It has even been hypothesised that plants may communicate through acoustic signals, such as root *clicking*, and that they may modify their behaviour based on the signals received[82]. Perhaps most surprising is subterranean communication, which appears to occur through root and mycelial networks. Roots seem to serve as a means of warning adjacent plants about impending drought, prompting the closure of stomata in the leaves. These root systems form a vast underground network linking the trees in a forest – as clearly shown by Suzanne Simard[83] – likely forming the largest living organisms on Earth. This enables the circulation of not only nutrients but also information, allowing the forest – conceived as a single large entity[84] – to transmit alerts regarding imminent dangers, invasive insects, or fires. Additionally, these root systems frequently create a symbiotic unit – known as a mycorrhiza[85] – with an equally vast network of

78 S.E. Meyer *et al.*, *Indirect effects of an invasive annual grass on seed fates of two native perennial grass psecie*, in "Oecologia", 174(4), 2014, pp. 1401-1413.

79 U. Castiello, *La mente delle* piante, cit., p. 81.

80 Regarding the learning ability of *Mimosa pudica*, reference is made to the well-known experiment conducted by Monica Gagliano, *Thus Spoke the Plant*, cit.; tr. it. pp. 83-103.

81 For the so-called 'flower constancy,' see S. Mancuso, A. Viola, *Verde* brillante, cit., p. 96.

82 M. Gagliano, *Acustic and magnetic communication in plants: is it possible?,* in "Plant Signaling & Behavior", 7(10), 2012.

83 S. Simard, *Finding the Mother Tree, Knopf*, New York 2021; tr. it. di S. Albesano, *L'albero madre*, Mondadori, Milano 2022.

84 See the case of Pando, located in the Fishlake Mountains, Utah: A. Viola, Flower Power. *Le piante e i loro diritti*, Einaudi, Torino 2020, p. 36.

85 Ivi, pp. 77 ss.

fungal filaments: "truffles, cords, and strands, which in turn generate fans of ultrathin hyphae that infiltrate soil pores"[86]. This mutualistic relationship is based on reciprocal benefit: fungal filaments allow trees to access nutrients deep in the soil that roots alone could not reach, and in return the tree repays the fungi with sugars produced through photosynthesis. This collaborative alliance, involving microbial and bacterial communities, likely originated from an ancient evolutionary cooperation, as fungi may have "played a role in grouping trees together in hostile environments to help them achieve a common goal: to thrive"[87]. Especially when a forest's survival is threatened – as is currently the case due to climate change – "trees that live in communities constitute a superorganism whose powers are immeasurable"[88]: they communicate, warn each other of threats, and exchange sugars or defensive molecules through root systems – primarily between related trees or those of the same species, but also across different species. This superorganism, this fungal internet, often referred to as the Wood-Wide Web, reaches inconceivable dimensions. According to Paco Calvo, "the largest living organism on Earth is likely the basidiomycete fungus *Armillaria solidipes*, one specimen of which, growing in the Blue Mountains of Oregon, spans over four kilometres"[89].

Naturally, the existence of communication between plants suggests the possibility of a social life among them. As seen, mutualistic or symbiotic associations – such as mycorrhizae – represent genuine forms of cooperation between individuals of different species, and even different kingdoms – consider, for instance, the flower and its pollinator – that provide mutual advantages. Generally, though not always, such interactions – whether among roots, branches, or canopies – change when kinship is involved. Although we do not yet know how plants recognise such kinship it is clear, that in the presence of sibling plants, competitive tendencies diminish, resource access appears to be coordinated, and canopies, which normally avoid touching one another[90], will do so without issue.

86 S. Simard, *Finding the Mother Tree*, Knopf, New York 2021; tr. it. p. 76. "Per la pianta era più efficace investire nella coltivazione dei funghi che sviluppare più radici […]" (ivi, p. 78).

87 Ivi, p. 81.

88 L. Tillon, Être un chêne. Sous l'écorce de Quercus, Actes Sud Francia, 2021; tr. it. di M. Nartelli, *Essere una quercia*, contrasto, Roma 2021 p. 238.

89 P. Calvo, Planta Sapiens, cit. p. 51; cfr. M. Dittrich *et al.*, *The role of Arabidopsis ABA receptors from the PYR/Pyl/RCAR family in stomatal acclimation and closure signal integration*, in "Nature Plants", 5, 2019, pp. 1002-1011.

90 Regarding the '*timidité des cimes*' see: F. Hallé, *Éloge de la plante. Pour une novelle biologie*, Seuil, Paris 1999; tr. it., p. 40.

6. *Conclusions*

The transition we have described – from a substantial blindness to plants to a plant revolution –represents a profound conceptual shift that challenges the hierarchical and essentialist worldview of Western culture, confronting its anthropocentrism and zoocentrism. While not exclusive, these perspectives have tended to exclude alternative paradigms that are far from marginal[91]. This shift occurs through a rehabilitation of plants, which, instead of being relegated to passive roles as mere background or resources, are recognised as forms of life by no means inferior to animals or humans. Contributions from evolutionary theory, cognitive sciences, plant neurobiology, ecological psychology, and related fields enable the questioning of ancient hierarchies by acknowledging plants' sophisticated forms of communication, intelligence, memory, and adaptation. In particular, by undermining the "dogma of neuronal intelligence," a form of intelligence emerges that challenges traditional definitions of mind and subject, appearing coextensive with life itself[92]. Plants are seen, in every respect, as active agents in the co-construction of the world, essential for life on the planet and not merely decorative objects.

In this way, every species in every kingdom – which are all, in some sense, the pinnacle of their own evolutionary branch – is granted equal dignity, although each species exercises its supremacy through its own organs, supports, and strategies. This does not imply inferiority, but rather "difference". The fact that this difference (between plants and humans) has been used as a source of discrimination and privilege stems from a hierarchical conception that continued to interpret life in pyramidal and teleological terms, recognising rights based on such a pyramid. Recognising differences – as philosophical anthropology had begun to do – is positive in itself, provided that this recognition does not serve biases and thereby function as a tool of discrimination. This also raises a significant linguistic and conceptual problem. It arises from the need to think and define a world of active agents surrounding us (plants, bacteria, etc.) using a language that is predominantly anthropocentric and dualistic, layered over time and hindering a genuine rethinking of the fluid and integrated nexus between different agencies. Language inherently carries an implicit or unexpressed metaphysics that involuntarily obstructs a new understanding of reality. Using

91 *Infra*, pp. 21-15.

92 Cfr. H. Maturana, F. Varela, *Autopoiesis and Cognition: The Realization of the Leaving*, Reidel Publishing Company, Dordrecht 1980.

the same terms for plants as for humans (such as communicate, will, decide, intention, remember) inevitably creates an "anthropomorphic halo," the overcoming of which represents one of the main challenges ahead. This linguistic clarification, connected to what experimental data allow us to understand, opens the way for a profound philosophical rethinking. This is not only because the plant world may serve as a model for energy management, resource use, or human innovation, nor simply because it will inevitably compel us to reconsider the ethical relationship and care owed to plants and their underlying ontology. It confronts us with urgent questions: how to access difference while maintaining our purely human viewpoint; how to accept radical alterity as something worthy of respect in itself; how to conceive of what is other without assimilating it or requiring it to resemble us to have value; how to formulate a decentred thought without evaporating the self; how to imagine a phenomenology of vegetal alterity without relying on the centrality of the subject. Ultimately, it compels us to redefine the image of humanity within a transformed "ecological" context.