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ARTICLE

A New Leaf: Is It Time to De-objectify Plants in Private Law?

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Abstract
In civil law jurisdictions, plants have traditionally been classified as 'objects' (or 'things') under private law, reflecting an age-old tendency, certainly in the Western world, to underestimate and undervalue plants. Recent legal debates increasingly acknowledge the special nature of plants. Perhaps the most eye-catching debate in this context is the one on Rights of Nature, which have much potential but pose some practical and conceptual challenges. We propose an additional way of acknowledging the special nature of plants in a legal context: de-objectifying plants in private law and thereby explicating that they are not mere objects. Numerous civil codes already separate animals from objects, often – though not exclusively – based on the sentience of animals. Recent scientific research suggests that plants may be sentient, too. We aim to open the debate on the de-objectification of plants, based on their sentience, in civil codes as a feasible and unobtrusive way to acknowledge in law that plants are living beings, and more than mere things.

Keywords: Plant rights; Plant sentience; Civil Codes; Rights of Nature; De-objectification; Private law

1. Introduction

> Plants can see. They can count and communicate with one another. They are able to react to the slightest touch and to estimate with extraordinary precision. Such statements, put baldly, seem almost fanciful not to say exaggerated to the point of falsity. Yet while some of these abilities have only recently been identified by botanists, the evidence for others is known to anyone who has the slightest acquaintance with plants– and that must surely mean almost everyone.
> *David Attenborough*[1]

Many would agree that plants – such as trees, shrubs, grasses, ferns, flowers, mosses – are more than just 'objects' or 'things',[2] in the common sense of those

[1] D. Attenborough, *The Private Life of Plants: A Natural History of Plant Behaviour* (Princeton University Press, 1995), p. 7.

[2] Or 'mere things', or 'corporeal objects'. In the remainder of this article, with an eye on the term 'de-objectification', we will use 'object', although some laws and authors we cite use 'thing'.

words.[3] Yet, in private law, in many – if not most – civil law jurisdictions,[4] this is not the case. Within private law, the word 'object' commonly does not only refer to inanimate objects, such as scissors, screenplays, stairs, skyscrapers, and satellites. Plants, too, together with animals and other non-human lifeforms, have long been 'objects' in private law.[5]

To be sure, across the world and throughout history, different societies and communities have (had) different views regarding plants. For example, 'Eastern' religions have been considerate of plant life 'for millennia', Marder indicates;[6] and, as Calvo and Lawrence write, '[a]nimistic societies in pre-Christian Europe or in different parts of the world today' regard plants as 'entities with potency and meaning', and various Indigenous cultures – such as the Māori, certain Native American groups, Indigenous Amazonians, the Inuit, and Indigenous peoples of subarctic Canada – view plants as, for instance, 'kin with a shared heritage' or '"persons" with souls of equal standing'.[7]

The private law distinction between humans and objects, common in many, if not most, civil-law countries, is particularly sharp in European civil law societies.[8] While a sharp distinction between a human being and an inanimate object still seems perfectly understandable, such a sharp distinction between a human being and other living beings – including plants – is arguably less defensible today. The division between humans on the one hand, and all other beings on the other, stems from the age-old idea, prominent in the history of Western thought,[9] that humans are separate from 'the external, natural world',[10] which exists for humans to appropriate;[11] as well as from the idea that humans – endowed with (supposedly) uniquely human

[3] Following the *Concise Oxford English Dictionary*, we consider a plant to be 'a living organism of the kind exemplified by trees, shrubs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through the roots, and synthesizing nutrients in the leaves by photosynthesis using the green pigment chlorophyll': *Concise Oxford English Dictionary* (Oxford University Press, 2001), p. 1093.

[4] In the rest of this article, we will use 'private law' as a shorthand for 'private law in civil law jurisdictions'.

[5] See, e.g., E. Bernet Kempers, 'Neither Persons Nor Things: The Changing Status of Animals in Private Law' (2021) 29(1) *European Review of Private Law*, pp. 39–70; E. Eskens, 'Dieren', in A. Ellian & B. Rijpkema (eds), *Een Nieuw Commentaar op de Grondwet* (Boom, 2022), pp. 61–77.

[6] M. Marder, 'Should Plants Have Rights?' (2013) 62(3) *The Philosopher's Magazine*, pp. 46–50, at 49.

[7] P. Calvo & N. Lawrence, *Planta Sapiens: Unmasking Plant Intelligence* (The Bridge Street Press, 2022), pp. 31, 189. See also I.D.V. Roncancio, 'Plants and the Law: Vegetal Ontologies and the Rights of Nature. A Perspective from Latin America' (2017) 43(1) *Australian Feminist Law Journal*, pp. 67–87.

[8] See Bernet Kempers, n. 5 above, p. 39.

[9] Although in Western thought, too, there have been various important thinkers who viewed other living beings quite differently: Democritus, Plato, Linnaeus, and Darwin, to name a few, all took plants quite seriously. See S. Mancuso & A. Viola, *Brilliant Green: The Surprising History and Science of Plant Intelligence* (Island Press, 2015), p. 2. Calvo and Lawrence give examples of the 18th century French philosopher Julien Offray de La Mettrie and the 19th century English science writer John Ellor Taylor, writing about 'plant minds' and plant intelligence, respectively: Calvo & Lawrence, n. 7 above, p. 189.

[10] Bernet Kempers, n. 5 above, p. 42.

[11] The idea of humans being separate from nature is not uniquely Western. Kauffman and Martin write that '[t]he invention of agriculture and domestication of animals' – which is not Western per se – first prompted this shift in some societies: C.M. Kauffman & P.L. Martin, *The Politics of Rights of Nature: Strategies for Building a More Sustainable Future* (The MIT Press, 2021), p. 9.

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characteristics such as intelligence, language, and reason – are the only lifeforms that can be granted legal subjectivity.[12]

However, as a result of scientific discoveries such as the theory of evolution by natural selection, the supposed uniqueness of humans has been challenged more and more convincingly. It has become common scientific knowledge that humans are more related to, as well as more similar to, other animals, and even to plants, than had long been assumed, and, furthermore, that humans are far more dependent on the web of nature than was previously known.

Law, commonly changing in the wake of scientific discovery,[13] has followed suit. There are several interesting and important legal debates that are relevant to the question of the legal status of plants. The animal rights debate is one, and the more recent debate on Rights of Nature (RoN) is another. Since the adoption of the first RoN law in the United States (US) in 2006,[14] this approach has become more and more popular. As Kurki writes, '[i]t is increasingly taken for granted that rivers and other natural entities can be legal persons and right holders'.[15] While we sympathize with the RoN movement, given its attempts to incorporate 'Nature's rights … into a broader rights framework for governing the planet sustainably',[16] we are also conscious of the (possible) drawbacks to this approach.[17] These vary from 'conceptual deficiencies'[18] to the contention that, say, a tulip tree (*Liriodendron tulipifera*) can never reciprocally recognize the rights of others or have legal responsibilities.[19] Furthermore, RoN requires many advocates, in both the 'nature's rights' model ('anyone can speak for nature, but is not obliged to'), as well as the 'legal personhood' model ('specific guardians are obliged to represent the ecosystem at all times').[20] In the courts there have hitherto been some 'arbitrary' results, 'ungrounded in any meaningful criteria'.[21] Also, there may be serious political hurdles to clear in certain jurisdictions when it comes to bestowing

[12] Eskens, n. 5 above, p. 62.

[13] To paraphrase Judge Barbara Jaffe in C. Hegedus & D.A. Pennebaker (dir.), *Unlocking the Cage* (First Run Features, 2016).

[14] Kauffman & Martin, n. 11 above, p. 14.

[15] V.A.J. Kurki, 'Can Nature Hold Rights? It's Not as Easy as You Think' (2022) 11(3) *Transnational Environmental Law*, pp. 525–52, at 526.

[16] Kauffman & Martin, n. 11 above, p. 8. This, to be clear, is but one of the two main connotations of the term 'Rights of Nature', namely the 'RoN norm'. The other connotation to 'Rights of Nature' is the legal philosophy of earth jurisprudence, which 'aims to fundamentally transform legal, socioeconomic, and governance systems', to realize a new 'paradigm that prioritizes sustaining ecosystem functioning in accordance with the laws of nature'; see Kauffman & Martin, n. 11 above, pp. 4, 6, 8.

[17] See, e.g., P. Burdon & C. Williams, 'Rights of Nature: A Critique', in D. Fisher (ed.), *Research Handbook on Fundamental Concepts of Environmental Law* (Edward Elgar, 2022), pp. 164–82; J. Bétaille, 'Rights of Nature: Why it Might Not Save the Entire World' (2019) 16(1) *Journal for European Environmental & Planning Law*, pp. 35–64; P. Baard, 'Fundamental Challenges for Rights of Nature', in D. Corrigan & M. Oksanen (eds), *Rights of Nature: A Re-examination* (Routledge, 2021), pp. 156–75; Kurki, n. 15 above.

[18] M. Guim & M.A. Livermore, 'Where Nature's Rights Go Wrong' (2021) 107(7) *Virginia Law Review*, pp. 1347–419, at 1352.

[19] Burdon & Williams, n. 17 above, pp. 171–2.

[20] Kauffman & Martin, n. 11 above, p. 15.

[21] Guim & Livermore, n. 18 above, p. 1354.

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something as lofty as rights on non-human organisms such as plants. The above does not suggest that efforts to extend RoN to non-human organisms should be abandoned, rather, that additional approaches are worth exploring.

In this article we suggest an additional approach to a changing legal status for plants, one that confronts the aforementioned designating of plants as 'objects' in private law. We build this approach on another recent legal development pertaining to animal welfare and biodiversity protection: the de-objectification of the animal in private law.[22] In recent years, the long-standing and sharply drawn private law distinction between humans and non-human beings has become blurred in several jurisdictions. Over a dozen European countries have amended their civil codes either to state explicitly or to imply that animals are, in fact, quite different from objects.[23] Bernet Kempers explains that a new private law category has now emerged, 'that lies somewhere in between the person and the thing'.[24]

Some scholars have argued that the placing of animals in such an in-between category is purely symbolic, in that it does not readily appear to have material legal effects on animals.[25] However, Bernet Kempers cautions that:

> the possible implications of the development should not be underestimated. Even though it is certain that the provisions that differentiate between animals and legal things do not vest the animal with legal personality, the new status may influence the way animals are being addressed in various areas of private law and can possibly be construed as a limit to the rights of persons.[26]

Furthermore, as Burdon and Williams have noted, in the context of RoN, bestowing rights not only provides governmental protection but also visibility, changes in consciousness regarding the something or someone that has been given rights, and increased respect for that same something or someone.[27] The same could well be argued with regard to de-objectifying living beings in private law.

In this article we want to open the debate on de-objectifying plants. Based, inter alia, on recent scientific discoveries on plant sentience, what are some of the most important arguments for the de-objectification of plants in (civil law) private law? Plant sentience is relevant because sentience in some (or all) animals has been invoked in several jurisdictions as an important argument in favour of de-objectifying animals.[28] Other or additional arguments to support the de-objectification of animals have also been

[22] In this article we employ the terms 'de-objectification' and 'to de-objectify'. However, the less often used terms 'de-thinging' or 'to de-thing' could also be used interchangeably, especially in cases in which the law uses (a term that is closely related to) the word 'thing'.

[23] See Section 2.

[24] Bernet Kempers, n. 5 above, p. 70.

[25] See J.E. Jansen, 'Over de Ontzakelijking van Dieren en de Grenzen van het Zaaksbegrip' (2011) 172(5) *Rechtsgeleerd Magazijn Themis*, pp. 187–201, at 200 (cited in Eskens, n. 5 above, p. 69); see also Bernet Kempers, n. 5 above, p. 40. See Section 2.1 for elaboration.

[26] Bernet Kempers, n. 5 above, pp. 40–1.

[27] Burdon & Williams, n. 17 above, p. 171.

[28] 'Sentience' can be understood in various ways; see Section 3.3.

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put forward: an animal's intrinsic value, or its dignity, or the fact that an animal is a fellow living being.[29]

Plants, like animals, are different from inanimate objects. Yet, there appears to be no noteworthy consideration of that fact in private law. Academic legal scholarship appears to be incomplete on this issue;[30] to our knowledge there is no academic literature that considers the de-objectification of plants in private law from a policy-based approach – let alone any realization of such policy. We believe that, compared with the rights-based approach, which can in some ways be more consequential but also more controversial, the de-objectification of plants in civil codes presents a more accessible opportunity that is both meaningful as well as politically and legislatively feasible. It could influence the way in which plants are addressed in private law and protected by public law,[31] limit the rights of persons vis-à-vis plants, and increase the visibility of and respect for plants in the eyes of citizens. Subsequently, these developments might lead to better protection for plants on the grounds of their instrumental value to humans, and/or on the grounds of their own sentience, value, dignity, aliveness, and so forth.

To firmly root our argument, this article branches out as follows. Firstly, we discuss the de-objectification of animals in private law by considering several civil codes that distinguish animals from objects. This section is more doctrinal in nature, looking at black-letter law, parliamentary deliberations, jurisprudence, and legal scholarship.[32] Secondly, we present a brief overview of findings in scientific research on plant sentience in order to substantiate the argument that plants may also be said to possess sentience. This 'auxiliary' interdisciplinary use of the natural sciences, more specifically plant science, is relevant because it provides a scientific foundation for the policy and legal debates we hope to instigate.[33] Thirdly, we address some of the different ways in which the legal position of plants is currently discussed, in both academic legal literature and other relevant sources. Finally, we conclude by arguing that it is high time to seriously consider de-objectifying plants in civil codes,[34] based on the recognition of some degree of sentience in plants, as well as on other rationales.

2. De-objectifying Animals in Law

Before we consider the de-objectification of plants, we will look at its quite recent precursor: the de-objectification of animals in several European jurisdictions.

[29] Bernet Kempers, n. 5 above, pp. 44–50. See Section 3.5 for a consideration of these and additional rationales in the context of plants.

[30] G. van Dijck, M.V.R. Snel & T. van Golen, *Methoden van Rechtswetenschappelijk Onderzoek* (Boom Juridisch, 2018), pp. 49–50.

[31] Bernet Kempers, n. 5 above, p. 66.

[32] H. Tijssen, *De Juridische Dissertatie onder de Loep: De Verantwoording van Methodologische Keuzes in Juridische Dissertaties* (Boom Juridisch, 2009), p. 73.

[33] S. Taekema & B. van Klink, 'On the Border: Limits and Possibilities of Interdisciplinary Research', in B. van Klink & S. Taekema (eds), *Law and Method: Interdisciplinary Research into Law* (Mohr Siebeck, 2011), pp. 7–32, at 11.

[34] See the 'designing' (*ontwerpen*) research objective in Van Dijck, Snel & Van Golen, n. 30 above, pp. 60–1.

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Bernet Kempers explains that for animals a new 'category that lies in between' (human) persons and mere corporeal objects has materialized in private law.[35]

As mentioned, this de-objectification is a clear break with long-standing Western legal tradition, in which a sharp distinction exists between 'human culture and the external, natural world'.[36] In this tradition, only by appropriating animals and plants does a human bring those animals and plants 'into the legal sphere', where they subsequently become objects of property rights.[37] Presently and generally, Bernet Kempers writes, an animal in the eyes of private law 'is entirely defined by its status as property'.[38] Burdon and Williams also summarize that 'Western legal systems treat the environment and non-human animals as property that can be bought, sold and used by humans'.[39] Eskens notes that since antiquity, 'pretty much all philosophers, theologians, legal scholars and politicians' have adhered to the idea that humans are 'the only creatures to which a State could have obligations', as humans supposedly are unique beings, endowed with uniquely human characteristics such as intelligence, language, and reason.[40]

Bernet Kempers writes that the relegation of animals (and, we might add, plants) to the status of things to be exploited is arguably one of the causes of the current climate and biodiversity crises.[41] The centuries-long reduction of animals and plants to mere objects in private law could thus be viewed as one of the noteworthy factors behind the materialization of the Anthropocene.

2.1. Legal Consequences of De-objectifying Animals in Private Law

The new in-between category that de-objectifies animals in private law is interesting for legislators, as it can acknowledge both the special nature of animals – because of their sentience, their dignity, their intrinsic value, or other reasons[42] – as well as the needs of sectors that require the use of animals as objects (including buying and selling them), such as agriculture, biomedicine, and the pet industry.

Acknowledging in private law that animals are different from mere corporeal objects is not the same as vesting animals with legal personality and rights. Despite no longer being considered objects, animals can still be, and still are, legally exploited by humans. It has been argued, therefore, that de-objectifying animals in private law is merely a symbolic act. Jansen, for instance, refers to Article 3:2a of the Dutch Civil Code (DCC), which has de-objectified animals in Dutch private law since 2013.[43] Article 3:2a DCC states that 'animals are not things', but then immediately adds that 'provisions relating to things are applicable to animals'.[44] In other words, according

[35] Bernet Kempers, n. 5 above, p. 39.
[36] Ibid., p. 42.
[37] Ibid.
[38] Ibid. See also Kauffman & Martin n. 11 above, p. 5.
[39] Burdon & Williams, n. 17 above, pp. 165–6.
[40] Eskens, n. 5 above, p. 62 (authors' translation).
[41] Bernet Kempers, n. 5 above, p. 43.
[42] See Section 3.5.
[43] Jansen, n. 25 above, p. 200 (cited in Eskens, n. 5 above, p. 69).
[44] Burgerlijk Wetboek [Dutch Civil Code], Art. 3:2a(1) (authors' translation).

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to Dutch law, animals are more than mere objects but, legally, they can be considered as if they are objects.[45] Jansen argues that the Dutch legislator thus immediately 'takes away … what he gives', and that such an in-between category, therefore, has 'zero legal consequences'.[46] Similar objections have been voiced regarding the French de-objectification of animals.[47]

Yet, it could also be argued that this new in-between category is, in fact, more than merely symbolic. Burdon and Williams' arguments in a different context (bestowing actual rights) are, as mentioned earlier, also applicable to de-objectifying an animal or plant in private law; de-objectification could not only (help to) provide governmental protection but also visibility, changes in consciousness regarding the living being that has been de-objectified, and increased respect for that same living being.[48] As mentioned, Bernet Kempers states that de-objectifying animals in private law is not as meaningless as it might appear, for it can affect the position of animals within private law and function as a 'limit to the rights of persons'.[49]

In some divorce cases, for instance (such as in France and Belgium), animals have been considered separately from the other objects in a household based on the affectionate bonds humans can have with them.[50] In other divorce cases (such as in Germany and the Netherlands) animals have been considered separately from other objects in a household because of the animal's own interests – to assess, for instance, whether a party is equipped to properly care for the animal.[51] De-objectifying animals can also play a role in determining the compensation for 'damage', as well as in the context of executing seizure for debts.[52] Although many of these cases predate the establishment of an in-between category in the applicable civil code,[53] Bernet Kempers argues that creating such an in-between category in civil codes 'might better be regarded as a consequence; a way to make a trend explicit that is already going on'.[54]

2.2. Rationales for De-objectifying Animals in Private Law

Several European civil codes grant a special position to animals. The civil codes of Germany, Austria, Switzerland, the Netherlands, and the Czech Republic state explicitly that animals are not objects.[55] Civil codes of various other European countries

[45] Kamerstukken II, 2009/2010, 26 Nov. 2009, 31389, Nr. 68.
[46] Cited in Eskens, n. 5 above, p. 69 (authors' translation).
[47] Bernet Kempers, n. 5 above, pp. 47–8.
[48] Burdon & Williams, n. 17 above, p. 171.
[49] Bernet Kempers, n. 5 above, pp. 40–1.
[50] Cour d'appel Dijon [Court of Appeal Dijon] (France), 15 June 2006, *Gazette du Palais* 2006 No. 234, p. 13; Hof van Beroep Antwerpen [Court of Appeal Antwerp] (Belgium), 29 Apr. 2019, No. 2019/FA/46.
[51] Oberlandesgericht Stuttgart [Higher Regional Court Stuttgart] (Germany), 7 Apr. 2014, No. 18 UF 62/14, ECLI:DE:OLGSTUT:2014:0407.18UF62.14.0A; Rechtbank Noord-Holland [District Court of North-Holland] (The Netherlands), 15 Feb. 2022, ECLI:NL:RBNHO:2022:1305.
[52] Bernet Kempers, n. 5 above, p. 57.
[53] Ibid.
[54] Ibid.
[55] Bürgerliches Gesetzbuch [German Civil Code], §90–90a; Allgemeines bürgerliches Gesetzbuch [Austrian Civil Code], §285–285a; Schweizerisches Zivilgesetzbuch [Swiss Civil Code], Arts 641–641a; Burgerlijk Wetboek [Dutch Civil Code], Art. 3:2a(1); Občanský zákoník [Czech Civil Code], s. 494.

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(Lithuania, Hungary, France, Estonia, and Romania) more implicitly suggest a special position for animals.[56]

The underlying reasoning varies across the different jurisdictions. The Portuguese Civil Code states that animals 'are living beings endowed with sensitivity and subject to legal protection by virtue of their nature'.[57] In several other civil codes the sentience of animals is used as a rationale for de-objectification. The Belgian Civil Code states that animals have sentience (*gevoelsvermogen*) and biological needs.[58] In France, too, the Civil Code explicates animal sentience (*sensibilité*).[59] However, sentience is not always the rationale for conferring a special status on animals. The German Civil Code, for example, simply considers animals to be non-objects, without acknowledging any special capacities,[60] although the German Animal Protection Act does state that animals are our 'fellow beings'.[61]

With regard to the possible de-objectification of plants, the Dutch parliamentary debate on the de-objectification of animals is particularly noteworthy. In 2013, the DCC took inspiration from the German Civil Code for the addition of Article 3:2a DCC, according to which '[a]nimals are not things'.[62] The intrinsic value of animals, first recognized in the Netherlands in 1981, is the basis for this amendment.[63] During the parliamentary deliberations on the amendment, Gerda Verburg, who at the time was the Dutch Minister of Agriculture, Nature and Food Quality, received a question from sceptical members of the conservative-liberal People's Party for Freedom and Democracy (VVD). In an attempt at a *reductio ad absurdum* reminiscent of Thomas Taylor's *Vindication of the Rights of Brutes*,[64] they cynically asked whether perhaps a similar amendment should also be introduced for plants, while they were at it.[65] Verburg nipped this discussion in the bud by responding that 'plants are living things, too. They are, however, not living beings with sentience. Plants should, therefore, not be equaled to animals'.[66]

[56] See, e.g., Lietuvos Respublikos civilinis kodeksas [Lithuanian Civil Code], Arts 4(38), 4(41); Polgári törvénykönyv [Hungarian Civil Code], Art. 5(14); Codul Civil [Romanian Civil Code], Arts 1375–1377; Tsiviilkoodeks [Estonian Civil Code], §49; Code civil des Français [French Civil Code], Art. 528.

[57] Código civil [Portuguese Civil Code], Art. 201B. Original text: 'Os animais são seres vivos dotados de sensibilidade e objeto de proteção jurídica em virtude da sua natureza' (authors' translation).

[58] Burgerlijk Wetboek [Belgian Civil Code], Art. 3(39).

[59] Code civil des Français [French Civil Code], Art. 515–14. See also Bernet Kempers, n. 5 above, p. 47.

[60] Bernet Kempers, n. 5 above, p. 45.

[61] Ibid., p. 44.

[62] Burgerlijk Wetboek [Dutch Civil Code], Art. 3:2a(1) (authors' translation).

[63] Bernet Kempers, n. 5 above, pp. 45–6.

[64] T. Taylor, *A Vindication of the Rights of Brutes* (Edward Jeffery, 1792). This was a 1792 pamphlet in which Taylor disingenuously argued for animal rights, satirizing Mary Wollestonecraft's watershed *Vindication of the Rights of Women*, published earlier that year.

[65] Kamerstukken I, 2009/2010, 1 June 2010, 31389, B, p. 6.

[66] Kamerstukken I, 2009/2010, 30 Aug. 2010, 31389, C, para. 2.3 (authors' translation). Original text: 'Op de vraag van deze leden of een dergelijke voorziening dan niet ook in het BW zou moeten worden opgenomen voor planten, merk ik op dat planten weliswaar ook levende zaken zijn. Het zijn echter geen levende wezens met gevoel. Planten zijn dan ook niet gelijk te stellen met dieren'. '*Gevoel*' could also be translated as 'feeling'. However, since in the Minister's answer animals were categorically attributed with '*gevoel*' – so not just orangutans but also sea urchins or woodworms, technically – 'sentience' is a more appropriate translation.

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We submit that this position needs to be reconsidered. In the next section we argue that scientific discoveries, especially in recent years, have convincingly called into question the assumption that plants are not sentient beings. If sentience is one of the main arguments for de-objectifying animals in private law, then the de-objectification of plants would not be so absurd at all.

3. Rationales for De-objectifying Plants in Private Law

A number of recent findings in plant science require us to take the idea of plant sentience seriously. This section gives an overview of such findings and other relevant considerations. Firstly, we briefly discuss how crucial plants are for human life and wellbeing, that is, their instrumental value.[67] Secondly, we address 'plant blindness', a common characteristic of human beings. Thirdly, we present some scientific findings on a variety of behavioural expressions of plants that may be interpreted as expressions of plant sentience. Fourthly, we consider speculations on whether plants could possess their own form of intelligence. Finally, we briefly introduce alternative rationales for de-objectifying plants, should acknowledging plant sentience (let alone, plant intelligence) be considered a bridge too far.

3.1. The Instrumental Value of Plants

According to the botanist Timiryazev, plants are 'the intermediary between … energy in the organic world and the sun, the universal source of energy', facilitating animal life through the photosynthetic creation of oxygen and through 'the energy of the sun stored up by the plant' being consumed directly or indirectly by animals.[68] Plants have provided energy (fossil or 'fresh') ever since humans first learned to control fire.[69] They are the foundation of the entire food chain, and they are the source of many essential medicines.[70] The vertical growth of plants has been foundational for the 'evolution of the brains and particularly the neocortices of our [arboreal] ancestors', and therefore ultimately of human intelligence.[71] Plants increase the human attention span, reduce stress in humans, and aid humans in recovering from illness.[72]

[67] This is not to say that plants cannot have negative connotations. Like animals, plants can have 'disvalue' too; among many other things, they can be poisonous, parasitic, and deadly. See also H. Rolston III, 'Disvalues in Nature' (1992) 75(2) *The Monist*, pp. 250–78.

[68] K. Timiryazev, *The Life of the Plant* (Foreign Languages Publishing, 1958), p. 187.

[69] J.G. Pausas & J.E. Keeley, 'A Burning Story: The Role of Fire in the History of Life' (2009) 59(7) *BioScience*, pp. 593–601, at 593.

[70] J.R. Peralta-Videa et al., 'The Biochemistry of Environmental Heavy Metal Uptake by Plants: Implications for the Food Chain' (2009) 41(8–9) *The International Journal of Biochemistry & Cell Biology*, pp. 1665–77; B.-E. van Wyk & M. Wink, *Medicinal Plants of the World: An Illustrated Scientific Guide to Important Medicinal Plants and Their Uses* (CABI, 2nd edn, 2017).

[71] C. Sagan, *The Dragons of Eden: Speculations on the Evolution of Human Intelligence* (Coronet, 1978), p. 83.

[72] On plants and the human attention span see, e.g., C.M. Tennessen & B. Cimprich, 'Views to Nature: Effects on Attention' (1995) 15(1) *Journal of Environmental Psychology*, pp. 77–85; B. Jiang, R. Schmillen & W.C. Sullivan, 'How to Waste a Break: Using Portable Electronic Devices Substantially Counteracts Attention Enhancement Effects of Green Spaces' (2019) 51(9–10)

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Traffic accidents occur less in streets that have trees, and suicide and violent crime occur less in urban environments with ample green spaces.[73] Many important scientific discoveries that became famous only after their application on humans or other animals were actually first made by experimenting on plants (such as genetics, cellular biology, and ribonucleic acid (RNA) interference).[74] Plants also absorb pollutants.[75] Some plants can even accumulate such high amounts of heavy metals, like nickel and lithium, that 'agromining' might have a bright future: plants as 'hyperaccumulators' could be used either to restore polluted soil or to harvest metal.[76] Last, but certainly not least, their capacity to remove carbon dioxide (CO_2) from the atmosphere makes plants crucially important for humans (and other forms of life) in the Anthropocene.

Even though these and other arguments would support – and have already supported – certain forms of legal protection for plants on the basis of instrumentality alone, humans still tend to ignore the importance as well as the abilities of plants. This ignorance is so remarkable, considering the facts, as to warrant being called 'plant blindness'.[77]

3.2. 'Plant Blindness'

Discoveries in plant science indicate that humans are not as justified as many (though certainly not all)[78] may think in placing themselves above plants in the grand scheme of things. Author and journalist Pollan writes that 'only human arrogance … keeps us

Environment and Behavior, pp. 1133–60. On plants and stress relief and recovery from illness see, e.g., R. Aerts, O. Honnay & A. Van Nieuwenhuyse, 'Biodiversity and Human Health: Mechanisms and Evidence of the Positive Health Effects of Diversity in Nature and Green Spaces' (2018) 127(1) *British Medical Bulletin*, pp. 5–22; L. Deng & Q. Deng, 'The Basic Roles of Indoor Plants in Human Health and Comfort' (2018) 25(36) *Environmental Science and Pollution Research*, pp. 36087–101.

[73] On the correlation between trees and accidents see, e.g., M. Zhu, N.N. Sze & S. Newnam, 'Effect of Urban Street Trees on Pedestrian Safety: A Micro-Level Pedestrian Casualty Model Using Multivariate Bayesian Spatial Approach' (2022) 176 *Accident Analysis & Prevention*, article 106818. On the correlation between green spaces and suicide mortality see, e.g., W. Jiang, A. Stickley & M. Ueda, 'Green Space and Suicide Mortality in Japan: An Ecological Study' (2021) 282 *Social Science & Medicine*, article 114137; H. Mendoza et al., 'Urban Green Spaces and Suicide Mortality in Belgium (2001–2011): A Census-Based Longitudinal Study' (2023) 216(1) *Environmental Research*, article 114517. On the correlation between green spaces and violent crime see, e.g., M. Shepley et al., 'The Impact of Green Space on Violent Crime in Urban Environments: An Evidence Synthesis' (2019) 16(24) *International Journal of Environmental Research and Public Health*, article 5119.

[74] Mancuso & Viola, n. 9 above, pp. 24–5.

[75] F. Brilli et al., 'Plants for Sustainable Improvement of Indoor Air Quality' (2018) 23(6) *Trends in Plant Science*, pp. 507–12; D. Baldocchi & J. Penuelas, 'The Physics and Ecology of Mining Carbon Dioxide from the Atmosphere by Ecosystems' (2019) 25(4) *Global Change Biology*, pp. 1191–7.

[76] J. Bridle, *Ways of Being: Beyond Human Intelligence* (Allen Lane, 2022), pp. 308–11. See also D.L. Callahan et al., 'Elemental and Metabolite Profiling of Nickel Hyperaccumulators from New Caledonia' (2012) 81 *Phytochemistry*, pp. 80–9; L. Jiang et al., 'Apocynum Venetum: A Newly Found Lithium Accumulator' (2014) 209(5–6) *Flora*, pp. 285–9.

[77] S. Grosscurt, 'Waarom Mensen Massaal "Plantenblind" Zijn: "Ze Geven Enorm Veel Informatie, Maar Het Boeit Mensen Niet"', *NRC Handelsblad*, 3 Aug. 2023, available at: https://www.nrc.nl/nieuws/2023/08/03/planten-zijn-decorstukken-ze-staan-onderaan-in-de-hierarchie-van-de-waarneming-a4171081.

[78] See Section 1.

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from appreciating [the] intelligence [of plants]'.[79] Mancuso and Viola also emphasize, in their book *Brilliant Green*,[80] the ways in which humans have for millennia looked down upon the plant world as being somehow less evolved. For example, Noah in the biblical tale did not find it necessary to take plants with him on the Ark;[81] Aristotle classified plants – which he considered to be 'deficient animals'[82] – as having a 'low-level soul', which acknowledged the ability of plants to reproduce but not much more;[83] and Islamic religious art largely avoids the representation of sentient living beings, yet frequently features plants and flowers.[84] Even Linnaeus and other scientists of his time, when observing the carnivorous behaviour of certain plants such as the Venus flytrap (*Dionaea muscipula*), refused to acknowledge that such plants actually lured, trapped and ate animals, preferring instead a host of peculiar explanations such as that 'the insects didn't die at all, … they chose to remain inside the plant of their own volition and for their own convenience',[85] or that when trapped animals 'didn't free themselves, it was because they were old or had chosen to die'.[86] Calvo and Lawrence write that '[u]ntil the nineteenth century, many scholars vehemently denied that plants were sexual organisms at all'. They furthermore refer to a 1981 study from New Zealand that 'found that many children did not even consider an organism to be a "plant" unless it had flowers',[87] something that, we believe, might also be apparent in the commonly used term 'flora' for plants both with and without flowers.[88]

Constitutional law scholar Tribe writes that '[n]o one should suppose that this bias is a shallow one or that it can readily be eliminated' as its 'roots lie deep within the

[79] Michael Pollan, 'Foreword', in Mancuso & Viola, n. 9 above, pp. xi–ii.

[80] Mancuso & Viola, n. 9 above. We use *Brilliant Green* as a significant plant-scientific source, both citing it and using it as the starting point for finding other plant-scientific sources ourselves. Many other relevant popular scientific books on plants and trees have been published in recent years; see, e.g., Attenborough, n. 1 above; Calvo & Lawrence, n. 7 above; S. Mancuso, *The Revolutionary Genius of Plants: A New Understanding of Plant Intelligence and Behavior* (Atria Books, 2017); D.G. Haskell, *The Songs of Trees: Stories from Nature's Great Connectors* (Viking, 2017); M. Gagliano, *Thus Spoke the Plant: A Remarkable Journey of Groundbreaking Scientific Discoveries and Personal Encounters with Plants* (North Atlantic Books, 2018); V. Trouet, *Tree Story: The History of the World Written in Rings* (Johns Hopkins University Press, 2020); S. Mancuso, *The Incredible Journey of Plants* (Other Press, 2020); S. Simard, *Finding the Mother Tree: Uncovering the Wisdom and Intelligence of the Forest* (Allen Lane, 2021); B. Rawlence, *The Treeline: The Last Forest and the Future of Life on Earth* (Vintage Books, 2023). For relevant documentaries on plants and trees see, e.g., Neil Lucas (dir.), *The Private Life of Plants* (BBC, 1995); Paul Williams et al. (dir.), *The Green Planet* (BBC, 2022); M. Williams (dir.), *Kingdom of Plants 3D* (Sky 3D, 2012); E. Buffie (dir.), *What Plants Talk About* (Merit Motion Pictures 2013); J. Adolph (dir.), *The Hidden Life of Trees* (Constantin Film, 2020).

[81] Mancuso & Viola, n. 9 above, p. 9. However, some have pointed out that Noah brought seeds for the growing of crops.

[82] M. Marder, 'Plant Intentionality and the Phenomenological Framework of Plant Intelligence' (2012) 7(11) *Plant Signaling & Behavior*, pp. 1365–72, at 1366.

[83] Mancuso & Viola, n. 9 above, pp. 12–3. See also Marder, ibid., p. 1366.

[84] Mancuso & Viola, n. 9 above, p. 10.

[85] Ibid., p. 15.

[86] Ibid., pp. 61–2.

[87] Calvo & Lawrence, n. 7 above, p. 36.

[88] Etymologically, the word 'flora' stems from the Roman goddess of flowers; see D. Berrens, 'The Meaning of Flora' (2019) 68(1) *Humanistica Lovaniensia*, pp. 237–49.

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Western philosophical and theological tradition',[89] and philosopher Marder writes that '[d]eep psychological resistance prompts us to dismiss the mounting scientific evidence that challenges readymade conceptual molds, into which plants have been slotted thus far, in favor of the inertia of habit and the comfort of "common sense"'.[90]

Botanists have long had a name for this common attitude that humans have towards plants: 'plant blindness'.[91] Botanists Wandersee and Schussler, Grosscurt writes, 'concluded [that there is] a human incompetence, a blindness to vegetation that is comparable to color blindness'.[92] Darwin himself was already aware of this widespread plant blindness in humans. Although he thought highly of plants, finding them 'the most extraordinary living things he had ever encountered',[93] he was nonetheless reluctant to introduce his thoughts on the abilities of plants because he had already bruised the human ego with his theory of evolution by natural selection.[94]

This tendency in humans is unsurprising given the fundamentally different evolutionary paths that plants took from animals (including humans). When comparing the earliest plant and animal cells, Mancuso and Viola write, one finds that those were 'really very similar'.[95] Yet, generally, plants went on to lead lives rooted in the ground on a fixed location (becoming so-called 'sessile' organisms), while animals went on to lead 'nomadic' lives, moving around ('motile' organisms).[96] Thus, animals needed to be able to carry all their organs with them while plants evolved a modular body without 'central, irreplaceable organs', which is fundamentally different from the human and non-human animal body.[97] Also, because of their rootedness, as well as their relatively slow tempo of movement, plants appear to human perception to be almost completely immobile and thus inanimate – although sped-up visual recordings of plants clearly undermine that supposition.[98] These and other fundamental differences from animals help to explain why humans exhibit plant blindness.

On our planet, which probably began to turn green around 500 million years ago,[99] plants are still overwhelmingly dominant, growing on 'every terrestrial environment',[100]

[89] L.H. Tribe, 'Ways Not To Think about Plastic Trees: New Foundations for Environmental Law' (1974) 83(7) *Yale Law Journal*, pp. 1315–48, at 1332.
[90] Marder, n. 6 above, p. 47.
[91] Grosscurt, n. 77 above. See also Calvo & Lawrence, n. 7 above, pp. 25–42.
[92] Grosscurt, n. 77 above.
[93] Mancuso & Viola, n. 9 above, p. 19.
[94] Ibid., p. 21. Darwin's son, Francis, took up the mantle and promoted the idea that plants were actually intelligent in a lecture in 1908. See also 'Plants as Animals', *The New York Times*, 3 Sept. 1908, available at: https://www.nytimes.com/1908/09/03/archives/plants-as-animals-son-of-charles-darwin-says-they-have-memory.html; 'Do Plants Really Possess the Power of Thinking?', *The New York Times*, 28 Feb. 1909, available at: https://www.nytimes.com/1909/02/28/archives/do-plants-really-possess-the-power-of-thinking-dr-francis-darwins.html.
[95] Mancuso & Viola, n. 9 above, p. 29.
[96] Ibid., p. 32.
[97] Bridle, n. 76 above, p. 76; see also ibid., pp. 141–2.
[98] Marder, n. 82 above, p. 1367.
[99] J.L. Morris et al., 'The Timescale of Early Land Plant Evolution' (2018) 115(10) *PNAS*, pp. E2274–83.
[100] Mancuso & Viola, n. 9 above, p. xii.

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and composing approximately 80% of the biomass on Earth.[101] This dominance indicates great adaptability and thus in certain ways a 'superior problem-solving ability'.[102]

In the next paragraph we sum up several of the most important arguments that plant biology offers in support of plant sentience. This supports our conclusion that because plants may possess sentience, there should at least be a serious parliamentary deliberation on whether plants should be distinguished from mere objects in private law, in the same way that animals in some jurisdictions have already been distinguished.

3.3. Plant Sentience

A phrase like 'sentience of plants' may seem to belong less in an academic legal text and more in a work of science-fiction, such as *The Thing from Another World* (1951)[103] about an extraterrestrial vegetable lifeform bent on world domination; or *The Happening* (2008)[104] about plants conspiring to induce millions of people worldwide to take their own lives and, in doing so, alleviate the pressure humans exert on the natural environment. However, it is science proper, and not science fiction, that allows for the sentience of plants to be seriously considered by legal scholars, as is increasingly the case.[105] This influence of scientific discovery on legal thought makes sense, since – as Judge Barbara Jaffe said in court when she presided over a US case involving the grant of habeas corpus to chimpanzees (in that they are highly intelligent, self-aware, and empathic animals) – 'the law evolves according to scientific discovery'.[106]

In this subsection we will refer to a variety of scientific findings on plant behaviour. Whether the (intentional) behaviour of plants proves sentience is yet to be agreed. This was affirmed in a recent special issue of the journal *Animal Sentience* on plant sentience.[107] In this source Segundo-Ortin and Calvo argue that 'there is still much to be discussed before it can be accepted that plants feel, but we would disagree with those who would rather deny the possibility of plant sentience altogether'.[108] The 29 commentary articles in the special issue demonstrate that whether plant sentience is accepted depends largely on how 'sentience' is defined and studied; for as long as

[101] Y. Bar-On, R. Phillips & R. Milo, 'The Biomass Distribution on Earth' (2018) 115(25) *PNAS*, pp. 6506–11, at 6506.

[102] Mancuso & Viola, n. 9 above, pp. 123–4. See also Sagan, n. 71 above, p. 230 ('The entire evolutionary record … illustrates a progressive tendency toward intelligence. … smart organisms by and large survive better and leave more offspring than stupid Ones').

[103] C. Nyby & H. Hawks (dir.), *The Thing from Another World* (Winchester Pictures Corporation/RKO Radio Pictures, 1951).

[104] M.N. Shyamalan (dir.), *The Happening* (20th Century Fox, 2008).

[105] A. Pelizzon & M. Gagliano, 'The Sentience of Plants: Animal Rights and Rights of Nature Intersecting' (2015) 11 *Australian Animal Protection Law Journal*, pp. 5–14, at 7. See also, e.g., Roncancio, n. 7 above.

[106] Hegedus & Pennebaker, n. 13 above.

[107] See (2023) 8 *Animal Sentience*, available at: https://www.wellbeingintlstudiesrepository.org/animsent/vol8.

[108] M. Segundo-Ortin & P. Calvo, 'Plant Sentience? Between Romanticism and Denial: Science' (2023) 8 *Animal Sentience*, article 1, p. 3.

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methods of studying animal sentience dictate studies on plant sentience, the results will be dismissive.[109] Accepting the plausibility of plant sentience requires accepting the possibility that sentience does not necessarily require typical animal properties such as a central nervous system.[110] We concur with Segundo-Ortin and Calvo and acknowledge that there is a degree of uncertainty over plant sentience. Still, given recent findings in plant science, we consider that one should take seriously the possibility of plant sentience and its implications for private law.

Plants appear to have all five senses, just like humans, albeit in their own particular way.[111] On top of these familiar senses, plants have 'at least fifteen' other senses, such as the ability to 'calculate gravity, electromagnetic fields, and humidity' and the ability to 'analyze numerous chemical gradients'.[112] When those chemical gradients indicate a pollutant, the plant roots 'distance themselves as soon as possible'.[113] Certain plants such as *Mimosa pudica* (better known as the Shameplant, the Sensitive plant, or the Touch-me-not plant), can even react to being touched,[114] and in doing so 'distinguish among different stimuli, and even change its behavior, no longer remaining closed once it learns that a stimulus isn't dangerous'.[115]

This assertion that plants can learn was already supported by experiments in the 19th century with *Mimosa pudica*. At first, the plants closed in reaction to the heavy shaking that occurred when the cart in which they were transported was pulled along over the cobblestones in Paris, but after some time they remained open. Having learned that they were not in any danger, they no longer wasted energy 'by pointlessly closing their leaves'.[116] Many plants can 'acquire learned behaviors … in a matter of seconds' and can 'remember what has been learned for several weeks'.[117] Birch trees can even remember something they learned for up to five years.[118] Plants can recognize attacks

[109] Hence the rejection of plant sentience by some. See, e.g., P.C. Struik, 'Plants Detect and Adapt, but Do Not Feel' (2023) 8 *Animal Sentience*, article 3; D.G. Robinson et al., 'Plants Lack the Functional Neurotransmitters and Signaling Pathways Required for Sentience in Animals' (2023) 8 *Animal Sentience*, article 7; D.M. Broom, 'Limits to Sentience' (2023) 8 *Animal Sentience*, article 26.

[110] J. Birch, 'Disentangling Sentience from Developmental Plasticity' (2023) 8 *Animal Sentience*, article 20; N. Rouleau & M. Levin, 'Multiple Ways to Implement and Infer Sentience' (2023) 8 *Animal Sentience*, article 30. However, this may lead to much more radical attributions of sentience, e.g., to absolutely everything; see J.E. Burgos & G.M. Castañeda, 'Crazier Hypotheses: Panpsychism' (2023) 8 *Animal Sentience*, article 28.

[111] See, e.g., D. Chamovitz, *What a Plant Knows: A Field Guide to the Senses of Your Garden – and Beyond* (Oneworld, 2012).

[112] Mancuso & Viola, n. 9 above, pp. 3–4.

[113] Ibid., p. 78.

[114] M. Gagliano et al., 'Experience Teaches Plants to Learn Faster and Forget Slower in Environments Where It Matters' (2014) 175(1) *Oecologia*, pp. 63–72; M. Gagliano, C.I. Abramson & M. Depczynski, 'Plants Learn and Remember: Let's Get Used to It' (2018) 186(1) *Oecologia*, pp. 29–31.

[115] Mancuso & Viola, n. 9 above, p. 68.

[116] Ibid., pp. 67–9. See also C.I. Abramson & A.M. Chicas-Mosier, 'Learning in Plants: Lessons from Mimosa Pudica' (2016) 7 *Frontiers in Psychology*, article 417, p. 2.

[117] Pelizzon & Gagliano, n. 105 above, pp. 5–6.

[118] T. Ruuhola et al., 'Immunological Memory of Mountain Birches: Effects of Phenolics on Performance of the Autumnal Moth Depend on Herbivory History of Trees' (2007) 33(6) *Journal of Chemical Ecology*, pp. 1160–76.

by herbivores and react accordingly, for example, by 'making their leaves indigestible or even poisonous to the insect aggressor'.[119]

Plants sleep; the leaves of many plants fold inwards at night to reduce their nocturnal activity.[120] In fact, the correlation between the sleep movements of plants and darkness has invoked the suggestion that plants possess 'an internal mechanism for measuring time'.[121]

Many experiments in molecular biology are carried out by growing plants in transparent gels. This leads to the roots being constantly exposed to bright light (as opposed to the darkness of soil). The plant arguably becomes stressed, rapidly growing its roots in a vain attempt to reach darkness.[122]

Plants can also recognize their own kin and take caution not to frustrate one of their own as they would other plants in the struggle for sunlight, water, and soil nutrients.[123] Examples include not overgrowing the roots of a related plant or, in a phenomenon called 'crown shyness', not interfering with their sunlight.[124] Through underground mycorrhizal networks,[125] stronger fir trees have been observed helping carbon-deprived kindreds by supplying them with carbon.[126]

Plants communicate via a language, using chemical compounds: 'each compound transmits precise information, such as warnings of imminent danger, or messages of attraction or repulsion, or something else'.[127] Calvo and Lawrence write that more than '1,700 different volatile cocktails' in the plant language 'lexicon' have been

[119] Mancuso & Viola, n. 9 above, p. 56. See also A. Mithöfer & W. Boland, 'Plant Defense Against Herbivores: Chemical Aspects' (2012) 63 *Annual Review of Plant Biology*, pp. 431–50.

[120] C.R. Darwin, *The Power of Movement in Plants* (John Murray, 1880), pp. 317–417; C.R. Darwin, 'The Movements of Leaves' (1881) 23 *Nature*, pp. 603–4; A. Zlinszky, B. Molnár & A.S. Barfod, 'Not All Trees Sleep the Same: High Temporal Resolution Terrestrial Laser Scanning Show Differences in Nocturnal Plant Movement' (2017) 8 *Frontiers in Plant Science*, article 1814.

[121] E. Puttonen et al., 'Quantification of Overnight Movement of Birch (Betula pendula) Branches and Foliage with Short Interval Terrestrial Laser Scanning' (2017) 7 *Frontiers in Plant Science*, article 222, p. 2.

[122] Mancuso & Viola, n. 9 above, pp. 49–50.

[123] S.A. Dudley, G.P. Murphy & A.L. File, 'Kin Recognition and Competition in Plants' (2013) 27(4) *Functional Ecology*, pp. 898–906; Bridle, n. 76 above, p. 60.

[124] F.E. Putz, G.G. Parker & R.M. Archibald, 'Mechanical Abrasion and Intercrown Spacing' (1984) 112(1) *The American Midland Naturalist*, pp. 24–8; J. van der Zee, A. Lau & A. Shenkin, 'Understanding Crown Shyness from a 3-D Perspective' (2021) 128(6) *Annals of Botany*, pp. 725–35.

[125] The term 'mycorrhizal network' refers to the underground interactions between plant roots and fungi. Fungi provide the plant with nutrients, receiving carbohydrates in return. Because the majority of plant species on Earth are involved in this mutualistic symbiosis, mycorrhizal networks make a significant contribution to global nutrient cycling; see M.G.A. van der Heijden et al., 'Mycorrhizal Ecology and Evolution: The Past, the Present, and the Future' (2015) 205(4) *The New Phytologist*, pp. 1406–23.

[126] Bridle, n. 76 above, p. 80. See also S.W. Simard et al., 'Net Transfer of Carbon between Ectomycorrhizal Tree Species in the Field' (1997) 388(6642) *Nature*, pp. 579–82; M.A. Bingham & S. Simard, 'Ectomycorrhizal Networks of Pseudotsuga menziesii var. glauca Trees Facilitate Establishment of Conspecific Seedlings under Drought' (2012) 15 *Ecosystems*, pp. 188–99; S.W. Simard et al., 'Mycorrhizal Networks: Mechanisms, Ecology and Modelling' (2012) 26(1) *Fungal Biology Reviews*, pp. 39–60.

[127] Mancuso & Viola, n. 9 above, p. 54. See also M. Šimpraga, J. Takabayashi & J.K. Holopainen, 'Language of Plants: Where is the Word?' (2016) 58(4) *Journal of Integrative Plant Biology*, pp. 343–9.

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identified, and that the behaviour of plants 'can change dramatically as a result of the messages being exchanged'.[128]

Recently, Khait and co-authors found that plants emit ultrasonic sounds, resulting in the first sound recording of tomato and tobacco plants.[129] The significance of these sounds, however, is still very much open for debate. Possibly, they are the equivalent of 'bodily' sounds one can also hear inside animals, such as bowel sounds, heartbeats, and flowing air.[130] What has been demonstrated is that plants can register sounds from their environment. When playing a recording of sounds emitted by leaf-nibbling caterpillars, Thale cress (*Arabidopsis thaliana*) responded by activating its chemical defence mechanism.[131] Recordings of wind and insect song did not cause this reaction, which suggests selective responses to sound.[132]

Through their ability to communicate with other plants,[133] as well as with animals,[134] plants form partnerships with both plants and animals.[135] These partnerships may be mutually beneficial. For example, parasitoid wasps are attracted by chemical compounds that plants emit when attacked by herbivores.[136] Furthermore, some ants defend plants in return for nectar.[137] One may even entertain the thought that humans are in a partnership with plants that they take care of because they find those plants beautiful, delicious or otherwise useful.[138] As Attenborough phrases it, plants like soy, wheat, and rice 'persuaded us to eliminate their competitors, cure their diseases, poison their enemies, and keep them well-watered even when other species faced drought'.[139] Benton writes that '[f]lowers, as has often been said, are the plant's way of enslaving bees, moths, bats, and other pollinating animals'.[140]

[128] Calvo & Lawrence, n. 7 above, p. 84.
[129] I. Khait et al., 'Sounds Emitted by Plants under Stress are Airborne and Informative' (2023) 186(7) *Cell*, pp. 1328–36.
[130] K. Knip, 'Tomatengeluid en Maisgevoel: Hebben de Klanken van Planten Betekenis?', *NRC Handelsblad*, 14 June 2023, available at: https://www.nrc.nl/nieuws/2023/06/14/tomatengeluid-en-maisgevoel-hebben-de-klanken-van-planten-betekenis-a4167129.
[131] H.M. Appel & R.B. Cocroft, 'Plants Respond to Leaf Vibrations Caused by Herbivore Chewing' (2014) 175(4) *Oecologia*, pp. 1257–66.
[132] Ibid.
[133] I.T. Baldwin & J.C. Schultz, 'Rapid Changes in Tree Leaf Chemistry Induced by Damage: Evidence for Communication between Plants' (1983) 221(4607) *Science*, pp. 277–9; R. Karban et al., 'Communication between Plants: Induced Resistance in Wild Tobacco Plants Following Clipping of Neighboring Sagebrush' (2000) 125(1) *Oecologia*, pp. 66–71.
[134] H.M. Schaefer, V. Schaefer & D.J. Levey, 'How Plant–Animal Interactions Signal New Insights in Communication' (2004) 19(11) *Trends in Ecology and Evolution*, pp. 577–84; A.S. Leonard & J.S. Francis, 'Plant–Animal Communication: Past, Present and Future' (2017) 31(2) *Evolutionary Ecology*, pp. 143–51.
[135] And fungi; the mycorrhizal networks are a striking example of this; see nn. 125 and 126 above.
[136] T.C.J. Turlings et al., 'How Caterpillar-Damaged Plants Protect Themselves by Attracting Parasitic Wasps' (1995) 92(10) *PNAS*, pp. 4169–74; C.M. de Moraes et al., 'Herbivore-Infested Plants Selectively Attract Parasitoids' (1998) 393(6685) *Nature*, pp. 570–3.
[137] E.S. Calixto et al., 'Optimal Defense Theory in an Ant–Plant Mutualism: Extrafloral Nectar as an Induced Defence Is Maximized in the Most Valuable Plant Structures' (2021) 109(1) *Journal of Ecology*, pp. 167–78.
[138] Mancuso & Viola, n. 9 above, p. 115.
[139] Williams et al., n. 80 above.
[140] M.J. Benton, *The History of Life: A Very Short Introduction* (Oxford University Press, 2008), p. 143.

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Like certain animals, plants too can be deceptive in their partnerships. Orchids, for example, trick male insects into carrying around plant pollen without giving the insect something in return.[141] To be sure, 'mere' evolution by natural selection – as opposed to conscious cognition or active choice – has facilitated many of these phenomena.[142]

It could also be said that plants can make 'plans' for the future by estimating risks and benefits and 'investing' accordingly – such as through the ubiquitous 'escape from shade' behaviour that plants exhibit: they spend a great deal of energy, which is risky, 'expecting' to end up with benefits (sunshine).[143] The philosopher Hegel observed with interest such behaviour in potato sprouts as he watched them 'climb up the wall as if they knew the way, in order to reach the opening where they could enjoy the light'.[144]

In short, as summarized by Mancuso and Viola, 'plants eat without a mouth, breathe without lungs, see, taste, feel, communicate, move, despite lacking sensory organs like the ones we do'.[145] They 'defend themselves from predators by using complex strategies', 'circumvent obstacles, help one another, can hunt or lure animals, move to reach food, light, oxygen'.[146]

As noted earlier, whether all this is 'merely' (intentional) behaviour or actual sentience is still being debated. Then again, animal sentience and even human free will are still being debated. In the light of scientific findings, some of which have been mentioned above, the sentience of plants deserves at least to be considered as a rationale for their de-objectification in private law.

In the next two subsections we discuss other possible rationales for de-objectifying plants: one that goes further than plant sentience (plant intelligence) and some that could be accepted instead of plant sentience – the precautionary principle applied to plant sentience, intrinsic value (or dignity), and plants as fellow beings (or aliveness, or common sense).

3.4. Plant 'Intelligence'

The question of plant 'intelligence' is more contentious than that of plant sentience, and we want to stress that intelligence is not a necessary condition for de-objectifying plants in private law (nor is it for animals, after all). It is nonetheless an interesting potential rationale for de-objectifying plants. Do (some of) the examples of plant sentience also imply intelligence? That depends upon, among other things, how prepared one is to

[141] F.P. Schiestl, 'On the Success of a Swindle: Pollination by Deception in Orchids' (2005) 92(6) *Naturwissenschaften*, pp. 255–64; A.C. Gaskett, 'Orchid Pollination by Sexual Deception: Pollinator Perspectives' (2011) 86(1) *Biological Reviews*, pp. 33–75.

[142] Calvo & Lawrence, n. 7 above, p. 73; Attenborough, n. 1 above, p. 8.

[143] Mancuso & Viola, n. 9 above, pp. 48–9. See also R. Pierik & C. Testerink, 'The Art of Being Flexible: How to Escape from Shade, Salt, and Drought' (2014) 166(1) *Plant Physiology*, pp. 5–22.

[144] G.W.F. Hegel, *Hegel's Philosophy of Nature: Encyclopaedia of the Philosophical Sciences (1830) Part II* (Oxford University Press, 2004) (cited in Marder, n. 82 above, p. 1367).

[145] Mancuso & Viola, n. 9 above, p. 126. With regard to the plant equivalent of seeing see also D.C. Dennett, *From Bacteria to Bach: The Evolution of Minds* (W.W. Norton, 2018), p. 120.

[146] Mancuso & Viola, n. 9 above, pp. 129–30.

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see 'intelligence' in ways that differ from the day-to-day connotation the term has in its human context.

Bridle, in his 2022 book *Ways of Being*, argues that 'many different kinds [of] intelligence … have been here, right in front of us, the whole time – and in many cases have preceded us', and that 'Western science and popular imagination, after centuries of inattention and denial, are only just starting to take them seriously'.[147] Bridle writes that '[i]ntelligence, it seems, is something physical and relational, not a wholly abstract process, but one closely tied to our being and doing',[148] and that 'plant intelligence, whatever it is, is plant-y', something that humans will never be able to fully understand.[149] Marder points to certain authors' 'calls for judging intelligent behavior in non-human organisms based on the capacities of the organism in question' and that, in this spirit, 'plant intelligence refers to what plants can do as well as to their unique perspective, expressed at the cellular, organismic and environmental levels'.[150] He suggests adopting a 'plant point of view' when considering the (supposed) intelligence of plants, for he feels that the field of biology 'must investigate the particular perspectives correlated with each distinct form of life'.[151]

Such an understanding of intelligence – as something that comes in many forms and must be appreciated in the context of a particular species – has also been put forward in writings on animal intelligence. Primatologist De Waal tellingly titled one of his last books *Are We Smart Enough to Know How Smart Animals Are?*[152] Balcombe, writing about sentience and intelligence in fish, relays that '[t]he modern scientific field of cognitive ecology recognizes that intelligence is shaped by the survival requirements that an animal must face during its everyday life';[153] and that one is to heed 'the plurality and contextuality of intelligence, the fact that it is not one general property but rather a suite of abilities that may be expressed along different axes'.[154] Balcombe appreciates the species-specific characteristics of fish precisely because 'they are *not* like us', writing that '[t]heir different ways of being in the world are a source of fascination and admiration, and cause for sympathy'.[155] In the 16th century, Michel de Montaigne pondered: 'The defect that hinders communication betwixt [animals and humans], why may it not be on our part as well as theirs?'[156]

One needs to remain mindful of the possibility that 'intelligence' is projected by humans on processes that could be partially, mostly, or entirely 'mechanistic',[157] and

[147] Bridle, n. 76 above, pp. 10–1.
[148] Ibid., p. 64.
[149] Ibid., pp. 75–6.
[150] Marder, n. 82 above, p. 1365.
[151] Ibid.
[152] F. de Waal, *Are We Smart Enough to Know How Smart Animals Are?* (Granta Books, 2017).
[153] J. Balcombe, *What a Fish Knows: The Inner Lives of Our Underwater Cousins* (Oneworld, 2016), pp. 105–6.
[154] Ibid., p. 130.
[155] Ibid., p. 233.
[156] Cited in Sagan, n. 71 above, p. 107.
[157] It is interesting, however, to reflect on whether all aspects of human consciousness and emotion are completely apart from 'mechanistic' processes. To quote Sagan on the limbic system, or mammalian brain: 'Electrical discharges in the limbic system sometimes result in symptoms similar to those of

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that a more prudent interpretation of plant behaviour should not be cast aside too rapidly.[158] With animals, too, some scientists have been too keen to anthropomorphize their supposed intelligence, Darwin being an important example.[159] Alpi and co-authors express appreciation for the field of 'plant neurobiology' as 'an initial forum for discussions on the mechanisms involved in plant signaling', but warn of 'superficial analogies and questionable extrapolations'.[160] As mentioned earlier, the science into 'plant sounds' in particular is far from settled.[161] Wohlleben was criticized for using language, in *The Hidden Life of Trees*, 'that is strongly anthropomorphic and teleological'.[162] On the other hand, De Waal feels that 'even in the case of [distantly related species], anthropomorphic explanations deserve serious attention'.[163] Calvo and Lawrence caution against 'two extremes: the anthropomorphic tendency to see ourselves in things that are entirely unrelated, and the anthropocentric refusal to acknowledge continuities that exist between ourselves and other forms of life'.[164]

Dennett, who came up with an interesting taxonomy of competences in living beings,[165] is sceptical of the supposed capabilities of plants, stating that plants do indeed have competence and intentional behaviour, yet lack 'comprehension'.[166] He cautions that humans wrongly assume that just because our own 'behavioral competence' comes with comprehension, the intentional behaviour that plants exhibit thus also must come with comprehension.[167] Humans, Dennett posits, are 'anthropomorphizing the plants … in order to understand them'.[168] Dennett, however, is also sceptical of comprehension in non-human animals, even in '"higher" species such as mammals and birds'.[169] This would mean that – to briefly return to considerations on sentience – if animals can be de-objectified on the basis of sentience, as has been done in various civil codes, Dennett's diagnosis that plants are competent but do not comprehend would not necessarily bar plants from being de-objectified.

In 1974, Feinberg argued that 'all are agreed that plants are not the kinds of beings that can have rights' as they have 'no conscious wants or goals' and thus 'cannot know

psychoses or those produced by psychedelic or hallucinogenic drugs. In fact, the sites of action of many psychotropic drugs are in the limbic system. Perhaps it controls exhilaration and awe and a variety of subtle emotions that we sometimes think of as uniquely human': ibid., p. 62.

158 'Historically, scientists' approach to the study of plants has been a mechanistic one; that is, they break them down into a series of actions and reactions, viewing them more like a series of component mechanisms, as a series of tiny, interconnected machines, rather than as whole organisms': Bridle, n. 76 above, p. 71.

159 P.J. Bowler, *Evolution: The History of an Idea* (University of California Press, 2009), pp. 212–3.

160 A. Alpi et al., 'Plant Neurobiology: No Brain, No Gain?' (2007) 12(4) *TRENDS in Plant Science*, pp. 135–6, at 136.

161 Knip, n. 130 above.

162 S.E. Kingsland, 'Book Review: Facts or Fairy Tales? Peter Wohlleben and The Hidden Life of Trees' (2018) 99(4) *The Bulletin of the Ecological Society of America*, article e01443.

163 De Waal, n. 152 above, p. 274.

164 Calvo & Lawrence, n. 7 above, p. 61.

165 Dennett, n. 145 above, p. 99.

166 Ibid., pp. 84–6.

167 Ibid.

168 Ibid.

169 Ibid., pp. 86–7.

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satisfaction or frustration, pleasure or pain'.[170] To be able to have an interest, Feinberg contended, a living being needs to have 'at least rudimentary cognitive equipment'.[171] However, in the decades since Feinberg wrote this, plants (in the form of forests, for instance) have indeed been given rights.[172] Furthermore, one could argue, as Eskens does, that living beings have 'interests' when their behaviour shows effort.[173] Plants do arguably show effort in their behaviour and pursuit of their biological needs. Calvo and Lawrence write that plants exhibit 'adaptive, flexible, anticipatory, goal-directed behaviour',[174] and that they, like animals, 'move through their environments, collecting information as they go',[175] 'deploying their evolved toolkit of sensory abilities and behaviours as they interact with the living and inert world around them'.[176] Plants, they write, 'keep a constant eye on a number of parameters as they fluctuate in real time', and may, '[a]fter judicious cost-benefit analyses', 'triage',[177] and 'decide where to invest their precious metabolic resources'.[178]

As noted earlier, whether one believes that plants might possess intelligence is ultimately not crucial for our argument for de-objectifying plants in private law. After all, sentience could (and does) exist apart from intelligence, and sentience as such would still be ample ground for their de-objectification.

However, should accepting plant sentience prove to be a bridge too far for some legislators, there are still other possible rationales for de-objectifying plants in private law, which we discuss briefly in the next subsection.

3.5. Other Rationales for De-objectifying Plants in Private Law

Firstly, the precautionary principle could be applied to plant sentience. Remarkably, chemicals like histamine, serotonin, dopamine, and gamma-aminobutyric acid (GABA) – all of which function as neurotransmitters in many animals, including humans – are also found in plants, and quite possibly play a significant role in the electrical signalling in plants.[179] Countering the argument that sentience requires certain typical animal features such as a central nervous system or a neocortex, Browning and Birch argue that there is 'no evidence against the possibility that similar subjective experiences can be generated by very different mechanisms'.[180] Our lack of

[170] J. Feinberg, 'The Rights of Animals and Unborn Generations', in W.T. Blackstone (ed.), *Philosophy & Environmental Crisis* (University of Georgia Press, 1974), pp. 43–68, at 51–2.
[171] Ibid.
[172] See Section 4.
[173] Eskens, n. 5 above, p. 75 (authors' translation).
[174] Calvo & Lawrence, n. 7 above, p. 83.
[175] Ibid., p. 150.
[176] Ibid., p. 169.
[177] Ibid., p. 78.
[178] Ibid., p. 85.
[179] Ibid., p. 99.
[180] H. Browning & J. Birch, 'Animal Sentience' (2022) 17(5) *Philosophy Compass*, article e12822, p. 4. As Wells speculated, '[a]ge by age through gulfs of time at which imagination reels, life has been growing from a mere stirring in the intertidal slime towards freedom, power and consciousness': H.G. Wells, *A Short History of the World* (first published 1922, Penguin, 2006), p. 20.

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understanding of this so-called 'multiple realizability' of sentience could support applying the precautionary principle.[181] Without absolute certainty, which will never be attained (not even when it comes to questions on human sentience, consciousness or free will), we should give plants the benefit of the doubt, in line with the precautionary principle.[182] Even while the debate is still raging, the findings from plant science strongly support the idea that plant sentience is a realistic possibility. Are we smart enough to know how sentient plants are?

Secondly, one could consider a plant's intrinsic value or dignity as a ground for distinguishing a plant from a mere object. In 2008, based on the available scientific evidence, a committee of the Swiss Federal Assembly considered the 'dignity' of plants, which, according to Pelizzon and Gagliano, can be regarded as 'the first legislative initiative to mandate "moral consideration of plants for their own sake"'.[183] Mancuso and Viola view the Swiss initiative as one that lays the groundwork for future plant rights; it could then perhaps also serve as groundwork for the future de-objectification of plants.[184] Philosophically, the concept of intrinsic value, which as mentioned is important in the Dutch context, is too complex to do justice to in this article. However, it seems safe to say that, legally, in many jurisdictions, plants are already held to have intrinsic value. The 1979 Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), for example, explicitly refers in its preamble to plants ('flora') as having 'intrinsic value'.[185] The Convention on Biological Diversity (CBD) also considers plants to possess intrinsic value, albeit implicitly.[186] The point of view expressed in the Bern Convention and the CBD, which have been ratified by almost all eligible states, could arguably be grounds for de-objectifying plants in private law.

Thirdly, plants are not objects in the common sense of the word. The German Animal Protection Act, as mentioned, refers to animals as our fellow living beings. Plants surely are our fellow living beings, too. The very fact that plants are alive can thus suffice as a basic rationale for de-objectifying them. Common sense suggests that plants, being alive, are not objects or things. Why not acknowledge this in private law? At the very least, it would codify the expansion of the citizenry's moral circle of empathy and consideration.

4. Expanding the Circle

Singer describes the historical development of human morality as an expanding circle: as (and in so far as) people 'progressed', they kept expanding (although also often

[181] Browning & Birch, n. 180 above, p. 4.
[182] For a similar argument in relation to animal sentience see J. Birch, 'Animal Sentience and the Precautionary Principle' (2017) 16(1) *Animal Sentience*, pp. 1–16.
[183] Pelizzon & Gagliano, n. 105 above, p. 10; Constitution fédérale de la Confédération suisse [Federal Constitution of the Swiss Confederation], Art. 120(2).
[184] Mancuso & Viola, n. 9 above, pp. 158–9, 2.
[185] Bern (Switzerland), 19 Sept. 1979, in force 1 June 1982, Preamble, available at: https://rm.coe.int/1680078aff.
[186] Rio de Janeiro (Brazil), 5 June 1992, in force 29 Dec. 1993, Preamble, available at: http://www.cbd.int/convention.

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retracting) their sense of consideration for and altruism towards people and entities other than their own individual self.[187] Darwin, too, in his *Descent of Man* (1871), wrote that the circle of 'sympathies' around people's own personal self continued to grow as time progressed.[188] Consequently, these developments in morality often translated into law.[189] As it expanded, the circle came to include more and more (groups of) people, human institutions, and animals. Most of the academic legal literature on expanding the circle to cover plants has focused on rights of plants or RoN, which is why some of this literature, as well as other relevant sources, will be discussed in the following paragraphs.

The concept of plant rights, like animal rights, is still in its infancy in Western jurisdictions. As mentioned, Marder writes that 'Eastern' philosophies 'have been at the forefront of protecting plant life for millennia' and might offer ideas for Western debates.[190] In European parliamentary discussions, plant rights have been considered only sporadically. In 1993, a member of parliament for the party GroenLinks (Green Left) in the Netherlands asked: 'Who can defend the rights of plants, animals, and future generations, if not the government that should concern itself with these interests in the light of the common good?'.[191] Tribe wonders if people will want to afford rights to plants as they would to animals.[192] Marder, on the other hand, claims that expanding the circle to plants would not be 'a radical break' with current practices, but 'a relatively minor adjustment', a 'fine-tuning'.[193]

The ability to suffer or experience pain has also been offered in support of the position that (some) rights should be given to plants. Marder writes that 'sentience and the ability to feel pain' was the yardstick that suggested that (certain) animals should have the Arendtian 'right to have rights'.[194] Tribe noted in 1974 that '[s]ome research even suggests that plants exhibit electrical and chemical reactions which are functionally analogous to pain'.[195] This has been suggested in various studies, including the 2023 ultrasonic sound experiment mentioned earlier, in which the sounds of stressed plants (after cutting or drought) appeared to be different from those of healthy plants.[196] Again, it is still uncertain whether those sounds can indeed be likened to utterances of pain.[197] Draguhn, Mallatt and Robinson state that 'plants do not possess the

[187] P. Singer, *The Expanding Circle: Ethics, Evolution, and Moral Progress* (Princeton University Press, 1981).
[188] Referenced in C.D. Stone, 'Should Trees Have Standing? Towards Legal Rights for Natural Objects' (1972) 45(2) *California Law Review*, pp. 450–501.
[189] Ibid., p. 450.
[190] Marder, n. 6 above, p. 49. See also Section 1.
[191] Handelingen I, 1993/94, 5 Oct. 1993, p. 121 (authors' translation).
[192] Tribe, n. 89 above, pp. 1342–4.
[193] Marder, n. 6 above, p. 48.
[194] Ibid.
[195] Tribe, n. 89 above, p. 1344.
[196] Khait et al., n. 129 above. This brings to mind Roald Dahl's 1949 story 'The Sound Machine,' in which an inventor finds a way to listen to plant sounds and hears them screaming 'in the most terrible way' when cut and axed: R. Dahl, 'The Sound Machine', in R. Dahl, *The Best of Roald Dahl* (Vintage Books, 1978), pp. 40–52, at 46.
[197] Knip, n. 130 above.

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molecular and structural machinery for pain generation'.[198] Petruzzello, too, writes that plants 'do not feel pain as we members of the animal kingdom understand it', although she stresses that 'it seems that many plants can perceive and communicate physical stimuli and damage in ways that are more sophisticated than previously thought'.[199]

In a 2023 study, plant signalling responses to injuries were visualized.[200] One consideration mentioned in the (biological) literature about future rights pertains to experimental testing on plants; the suffering induced by experimental testing on animals was, after all, an important factor in the struggle for animal rights.[201] As mentioned earlier, plants possibly experience stress when grown in transparent gels for biological research purposes. Being aware of their possible susceptibility to stress, the important question in relation to plant rights is whether, therefore, plants can be said to 'suffer', and, if so, whether humans care to expand their moral circle of empathy and consideration as a result.

Aside from some trials during the Inquisition where plants like fennel and garlic were believed to be accomplices of witches and therefore put on trial,[202] there have been hardly any instances where the (intrinsic) rights of plants themselves have been considered judicially. However, the rapidly proliferating RoN movement deserves attention in relation to plants. While some cultures and ontologies have a long tradition of recognizing RoN, even Western legal systems, which at first sight seems rather unwelcoming to non-humans, may now expand their circle by the granting of legal personhood, legal standing and/or representation through a board or trust to non-human individuals or collectives.

Despite RoN being far from uncontested,[203] the first examples of RoN (often also covering plants) have now been brought into existence, whether constitutionally,[204] legislatively,[205] or judicially.[206] Attempts to grant legal personhood to individual plants so far have largely been unsuccessful. For example, the Belgian Tribunal de Première Instance Francophone in Brussels denied the admissibility of 82 individual trees as plaintiffs in a climate case.[207] However, wild rice (*Zizania palustris*),

[198] A. Draguhn, J.M. Mallatt & D.G. Robinson, 'Anesthetics and Plants: No Pain, No Brain, and Therefore No Consciousness' (2021) 258(2) *Protoplasma*, pp. 239–48.

[199] M. Petruzzello, 'Do Plants Feel Pain?', in *Encyclopedia Britannica.com*, 31 May 2019, available at: https://www.britannica.com/story/do-plants-feel-pain.

[200] K. Patel, 'How Plants Communicate with Each Other when in Danger', *The Washington Post*, 21 Oct. 2023, available at: https://www.washingtonpost.com/climate-environment/2023/10/21/plants-talk-warning-danger.

[201] Marder, n. 6 above, p. 48.

[202] Mancuso & Viola, n. 9 above, p. 11.

[203] See Section 1.

[204] See, e.g., Constitucion de la Republica del Ecuador 2008 [Constitution of the Republic of Ecuador], Art. 71.

[205] See, e.g., Te Urewera Act 2014 (New Zealand), Art. 11.

[206] See, e.g., Corte Supreme de Justicia [Supreme Court of Justice] (Colombia) (2018) STC4360-2018, para. 14.

[207] Tribunal de première instance francophone de Bruxelles [First Instance Court of Brussels] (Belgium) (2021) 2015/4585/A, available at: https://prismic-io.s3.amazonaws.com/affaireclimat/18f9910f-cd55-4c3b-bc9b-9e0e393681a8_167-4-2021.pdf. For the original intervention see https://affaireclimat.cdn.

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'*manoomin*' in the Indigenous Ojibwe language, was granted 'inherent rights to exist, flourish, regenerate, and evolve' in a 2019 tribal law of the White Earth Nation in the state of Minnesota.[208] This law protects the wild rice itself, its 'freshwater resources', as well as the 'habitat of the rice'.[209] When the rights of the wild rice are violated, a lawsuit can be brought, with *manoomin* being the 'the real party of interest'.[210]

However, with far-reaching rights, such as the right to habeas corpus for chimpanzees mentioned earlier, it is difficult, if not impossible, to form an analogy between animals and plants: chimpanzees are highly self-aware and autonomous creatures, which have a 'theory of mind'.[211] They have a notion of time and know that when they are imprisoned today, they will or can still be imprisoned tomorrow, which leads to suffering.[212] These characteristics, which were put forward as legal arguments in the court cases regarding chimpanzee standing, are not proven to be common in all animals, and also do not appear to be present in that way in plants.[213]

Several authors, mindful of the 'slippery slope' argument, stress that the discussion of the rights of plants need not frighten people into thinking that someone who picks a flower could someday be charged with a criminal offence. Biochemist Koechlin says that we can keep eating and using plants, but that humanity merely has 'some' responsibility towards plants.[214] People, according to Koechlin, violate plant dignity in certain specific circumstances, such as genetically manipulating plants to be sterile so corporations can keep selling new specimens, or patenting plants.[215] Also, Koechlin believes, 'plants should have some degree of independence regarding their adaptation and propagation, as well as the survival of their own species'.[216] Koechlin and co-authors furthermore have proposed 'the Rights of Plants' in several theses – known as the 'Rheinauer Theses' – which form the most elaborate proposal for rights of plants that we have come across.[217] They vary from the right not to be baselessly subjected to '[m]ethods and strategies that cause sterility', to the right to survival as a species, to the right not to be patented.[218]

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prismic.io/affaireclimat/c3d1883d-ed4d-43e6-ae4c-0e6fd2eac902_tussenkomst_bomen+%281%29.pdf.

208 L. Burgers & J. den Outer, *Rights of Nature: Case Studies from Six Continents (Compendium #1)* (Embassy of the North Sea, 2021), pp. 17–8.

209 Ibid., p. 18.

210 Ibid., p. 18.

211 Hegedus & Pennebaker, n. 13 above; D. Premack & G. Woodruff, 'Does a Chimpanzee Have a Theory of Mind?' (1978) 1(4) *The Behavioral and Brain Sciences*, pp. 515–26; J. Call & M. Tomasello, 'Does the Chimpanzee Have a Theory of Mind? 30 Years Later' (2008) 12(5) *Trends in Cognitive Sciences*, pp. 187–92. On the rights of chimpanzees see also K. Andrews et al., *Chimpanzee Rights: The Philosopher's Brief* (Routledge, 2018).

212 Hegedus & Pennebaker, n. 13 above.

213 Ibid.

214 F. Koechlin et al., 'Rediscovering Plants: Rheinauer Theses on the Rights of Plants' (2008), available at: https://www.gmo-free-regions.org/fileadmin/files/gmo-free-regions/Food_and_Democracy/Rheinauer_Theses_englisch.pdf.

215 F. Koechlin, 'Tomatoes Talk, Birch Trees Learn: Do Plants Have Dignity?', *TEDx Talks*, 11 Jan. 2016, available at: https://www.youtube.com/watch?v=i8YnvMpcrVI.

216 Ibid.

217 Koechlin et al., n. 214 above.

218 Ibid., para. I.

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Koechlin and co-authors state that '[p]lants are not objects';[219] they 'are living beings'.[220] We agree with these two theses, as has hopefully become clear. Yet, unlike Koechlin and co-authors and other voices mentioned in this section, we do not argue for rights of plants, but for de-objectifying them in private law.

5. Conclusion

Plants are fascinating organisms. Their instrumental value alone is immense, since they facilitate most animal life on Earth, form the basis of our food and energy chains, absorb CO_2 and certain pollutants, and ameliorate our daily lives in myriad ways. For eons now, plants have existed on this planet in a manner that is foreign to animals in general and humans in particular, and we should thus be mindful not to anthropomorphize them. Nonetheless, there is ample indication that humans have underestimated and undervalued plants for a long time and in many ways, and that their value goes beyond just the instrumental.

In the more than 150 years since *On the Origin of Species* was first published, public perception of animals has undeniably changed. We now know that humans, animals, and plants share the same 'lowly origin'.[221] This realization eventually trickled down more and more into law. Since 2004, over 1,000 animal protection laws have come into force in the US alone, 'a number that rivals all of the animal protection laws enacted in American history prior to 2000'.[222]

As we have argued, scientific discoveries about the various abilities of plants are causing our perception of plants to change, too. Another expansion of our moral circle could therefore include plants, by de-objectifying them in private law. Acknowledging that plants are living organisms – either with or without sentience and/or intrinsic value and dignity – rather than mere objects/things, would not necessarily lead to the bestowing of rights on plants. As mentioned above, de-objectifying animals in civil codes never necessitated fundamental changes to animal exploitation. There is no reason to believe that de-objectifying plants would be a legal Trojan horse that would make gardeners unemployed or force violin makers to continue their practice underground.

However, it would not be a dead letter either. From jurisprudence, it follows that the upgraded position of animals in civil codes causes judges to pay more attention to the wellbeing of the animal at stake. Equivalent to what Burdon and Williams write regarding bestowing actual rights, one could well say that de-objectifying plants in private law could not only (help to) provide governmental protection, but also an increased visibility and awareness of and respect for plants.[223] Bernet Kempers points to the noteworthy implications of de-objectifying animals in private law, such as influencing the way in which private law addresses animals, as well as regulating

[219] Ibid., para. II.
[220] Ibid., Preamble, para. 1.
[221] C.R. Darwin, *The Descent of Man* (first published 1871, Penguin Classics, 2004), p. 689.
[222] Balcombe, n. 153 above, pp. 231–2.
[223] Burdon & Williams, n. 17 above, p. 171.

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what human persons may or may not do with (certain) animals.[224] Similarly, this could serve numerous instrumental purposes for plants. Possibly, the legal de-objectification of plants could lead to, for instance, better protection of specific individual plants,[225] wider impact across entire plant species or even ecosystems, perhaps through the germination of a Plant Act as an equivalent to the various pieces of animal-related legislation.[226] Furthermore, the acknowledgement in private law for plants would contribute to the broader spirit that also feeds the calls for plant rights and Rights of Plants.

As such, for those who argue for meaningful steps towards incorporating non-human life into law, putting plants in the 'in-between category' could serve both as an inspiration and as a potential building block for later developments around plant rights and RoN in a broader sense. It could open up the conversation and broaden the legislative and political horizon. For those who are more sceptical of actual plant rights and RoN, the de-objectification of plants in private law could serve as a middle road. After all, amending a provision in the civil code is a feasible step to take, as the path for such an amendment has already been paved by the process of de-objectifying animals. Placing plants in the 'in-between category' in private law would not be scientifically, politically, or legally radical; and it would create possibilities without obligating anything. It would merely plant a seed, which then might blossom into something fruitful, or wither in infertile soil.

Considering the arguments for plant sentience mentioned above, it is peculiar that plants are still commonly seen as practically inanimate phenomena – not much more indeed than the '(corporeal) objects' central to property law – that are not worthy of our consideration. Acknowledging in private law that plants are different from mere objects (or things) would to us seem to be in concurrence with science, and it would at least symbolically reflect an evolved and grown-up understanding, on the part of the citizenry, of the special worth of vegetable forms of non-human life – forms of life, incidentally, that make it possible for us to be alive in the first place and with which we share a common ancestor.

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[224] Bernet Kempers, n. 5 above, pp. 40–1. One might, e.g., explore whether property rights regarding plants could be changed to something akin to the 'ecological property' described in P.D. Szigeti, 'A Sketch of Ecological Property: Toward a Law of Biogeochemical Cycles' (2021) 51(1) *Environmental Law*, pp. 41–87.

[225] Examples that come to mind are the Llangernyw yew in Wales as the oldest tree in Europe and the chestnut tree in Amsterdam (the Netherlands), about which Anne Frank wrote in her diary.

[226] We thank Jonathan Verschuuren for this idea.

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