

## Hegel, Nature, and Ethics

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### Introduction

In this essay I introduce Hegel's Philosophy of Nature and explore its implications regarding the ethics of human relations with the non-human natural world.<sup>1</sup> In Section I, I explain how the Philosophy of Nature fits into Hegel's mature philosophical system and how he approaches the relation between philosophy and empirical science: namely, he constructs his account of nature by first learning from the empirical sciences then reconstructing on *a priori* grounds how the various natural forms identified by scientists fit together into an ordered whole. In Section II, I

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<sup>1</sup> Other accounts of Hegel's philosophy of nature include those in Stephen Houlgate, ed., *Hegel and the Philosophy of Nature* (Albany, NY: SUNY Press, 1998) and those of Sebastian Rand, 'The Importance and Relevance of Hegel's *Philosophy of Nature*', in *Review of Metaphysics* Vol. 61, No. 2 (Dec. 2007), pp. 379-400; and Alison Stone, *Petrified Intelligence: Nature in Hegel's Philosophy* (Albany, NY: SUNY Press, 2004). The bearing of Hegel's philosophy of nature on the ethics of human-nature relations was for a long time a topic rather neglected by scholars (as, indeed, was Hegel's philosophy of nature as a whole). But recently there has been growing attention to the former issue: e.g., Nicholas Mowad, 'The Natural World of Spirit: Hegel on the Value of Nature', in *Environmental Philosophy* Volume 9, Issue 2 (Fall 2012), pp. 47-66; Wendell Kisner, 'A Species-Based Environmental Ethic in Hegel's Logic of Life,' in *The Owl of Minerva*, Vol. 40, part 1 (2009), pp. 1-68; and Jennifer Ann Bates, 'Hegel and the Concept of Extinction', *Philosophy Compass* Volume 9, Issue 4, (Apr 2014), pp. 238-252.

reconstruct Hegel's actual account of the ordered whole of nature: he treats its component forms as a hierarchy progressing from the most mechanical kinds of entity to the most organic. For Hegel, this is equally a progression in which the material parts of natural entities become increasingly organised by their conceptual forms. Even the most mechanical entities, though, exhibit self-organisation to a minimal degree for Hegel: nature's hierarchy is one of increasing self-organisation, eventually reaching up to the level of free self-determination that characterises human agents.

With this theoretical background established, I turn in Section III to the ethical questions. We might expect that because Hegel regards all natural beings as being self-organising to at least some degree, he would conclude that we should give these beings moral consideration on that account, just as, he believes, we should respect other human agents on account of their capacity for self-determination. Yet Hegel instead maintains in his political philosophy that human agents can and indeed should transform natural beings at will, in the context of appropriating these beings as private property, an institution that Hegel considers to be necessary to realise human freedom. I argue that Hegel is inconsistent here. Regarding other human agents he holds that we must learn to respect their freedom alongside our own, a respect that limits and complicates the initial setting of unbridled appropriation. Consistently, he should say something similar of nature: that we should learn to temper our interest in realising our own freedom in view of the self-organising powers of natural beings and processes. Indeed, Hegel had ample scope to accommodate such an ethical position within the structure of his socio-political theory as presented in the *Elements of the Philosophy of Right*. He failed to develop the intellectual resources provided by his own philosophy; fortunately, however, those resources remain available to us today.

## I. Nature, Science, and Philosophy of Nature

The Philosophy of Nature is the second part of Hegel's mature system of philosophy, which he published in outline form as the *Encyclopaedia of the Philosophical Sciences*, initially in 1817 and then in revised versions in 1827 and 1830. The treatment of nature lies between the system's first part, the *Logic*, and its final part, the *Philosophy of Mind*. Hegel's *Philosophy of Nature* is the part of his system that has received least discussion from Hegel scholars, as well as incurring a good deal of criticism from many readers.<sup>2</sup> Some of those critical readers have thought – wrongly – that Hegel was trying to produce his own theory of nature to rival or replace empirical scientific knowledge. Actually, Hegel's theory of nature is heavily informed by the empirical science of his own time – science that he assesses, reinterprets, and reconstructs. Unfortunately, in the process Hegel sometimes rejects particular scientific hypotheses that have since become well established, such as evolutionary theory; and he sometimes defends hypotheses that have been discredited, such as Goethe's anti-Newtonian account of colour. Ultimately, though, these details of Hegel's approach to nature do not matter. What matters is the overall *metaphysics* of nature in light of which Hegel reconstructs and reinterprets scientific hypotheses. And it is on the level of this metaphysics that Hegel's view of nature acquires ethical implications that make his view relevant in light of the imminent environmental crisis.

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<sup>2</sup> As John J. Compton points out, 'hallowed misunderstandings ... have Hegel either totally *ignoring* empirical facts and regularities or else claiming somehow to *derive* them deductively from the notion of nature' (Compton, 'A Comment on Buchdahl's "Conceptual Analysis and Scientific Theory in Hegel's Philosophy of Nature"', in *Hegel and the Sciences*, ed. Robert S. Cohen and Marx W. Wartofsky, Dordrecht, NL: Reidel, 1984, p. 37).

Introducing his philosophy of nature, Hegel writes that ‘to determine what the Philosophy of Nature is, our best method is to separate it off from the subject-matter with which it is contrasted; ... natural science in general’ (EN 2).<sup>3</sup> What features ‘separate’ philosophy of nature from natural science? Hegel tells us:

Physics and natural history are called empirical sciences *par excellence*, and they profess to belong entirely to the sphere of perception and experience, and

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<sup>3</sup> When citing Hegel’s works (in English translation) I use the following abbreviations, all these works being cited by page number as well as paragraph number when the latter applies:

EN = *Philosophy of Nature*, trans. A. V. Miller, Oxford: Clarendon Press, 1970.

EM = *Philosophy of Mind*, trans. W. Wallace, Oxford: Clarendon Press, 1971.

PhG = *Phenomenology of Spirit*, trans. A. V. Miller, Oxford: Clarendon Press, 1971.

RH = *Lectures on the Philosophy of World History: Introduction: Reason in History*, trans. H. B. Nisbet, Cambridge: Cambridge University Press, 1975.

EL = *Encyclopedia Logic*, trans. T. F. Geraets, W. A. Suchting and H. S. Harris, Indianapolis, IN: Hackett, 1991.

PR = *Elements of the Philosophy of Right*, trans. H B Nisbet, Cambridge: Cambridge University Press, 1991.

LHP = *Lectures on the History of Philosophy*, trans. E. S. Haldane, 3 vols., Lincoln, NB: University of Nebraska Press, 1995.

LNR = *Lectures on Natural Right and Political Science: The First Philosophy of Right, Heidelberg 1817-1819, with Additions from the Lectures of 1818-1819*, trans. J. Michael Stewart and P. C. Hodgson, Berkeley, CA: University of California Press, 1996.

In all cases Hegel’s ‘remarks’ to paragraphs are indicated ‘R’, ‘additions’ ‘A’.

in this way to be opposed to the Philosophy of Nature, i.e. to a knowledge of nature from thought. (3)

We note that here Hegel is telling us how physics and natural history, and the natural sciences in general, were widely regarded in his time: namely, that they were seen as purely empirical disciplines. That is, their methods were thought to be those of observation and experiment and of gathering, collating, and comparing data about what had been observed.

Hegel does not endorse this view. He objects that natural scientific inquiry is *not* purely empirical: it does not remain with the collection of endless observed facts. Rather, he says, scientists draw general conclusions from their data, generalising from repeated occurrences to universal laws and classifying phenomena under natural kinds (EN 3). Hegel therefore says that science involves thought – about universals – as well as observation. Sometimes, though, it seems that for Hegel science involves thought insofar as scientists *derive* generalisations *from* observations – presumably by induction and/or inference to the laws that best explain the observed facts. In saying this, Hegel seems to accept that the scientific method is to make observations then to generalise from them by induction. Yet elsewhere he maintains that theoretical understanding always precedes observation. In the ‘sense-certainty’ chapter of his *Phenomenology of Spirit*, he argues that sense-perception is always informed by categories of thought (PhG 58-66). To be consistent, in his *Philosophy of Nature* Hegel should have said that science involves thought in that theories and theoretical categories always inform the observations that scientists make and the experiments they conduct. Nonetheless, he should have said, science remains empirical because it tests these theories and categories against observations and experimental results.

Still, it is the *empirical* dimension of science that for Hegel distinguishes science from philosophy of nature. Hegel explains that philosophers of nature start by taking up each ‘universal’ that scientists have already identified and conceptualised. That is, philosophers take up the laws and natural kinds that scientists have identified. Philosophers then reconstruct on rational grounds how each of these ‘universals’ – laws, kinds, forces, etc. – derives from the others and fits together with them into an organised whole. So, Hegel says, in its *origin and formation* philosophy of nature depends on empirical science, but it then *reconstructs* scientific findings on a new basis. This basis is ‘the necessity of the concept’:

The Philosophy of Nature takes up the material which physics has prepared for it empirically, at the point to which physics has brought it, and reconstitutes it, so that experience is not its final warrant and base. Physics must therefore work into the hands of philosophy, in order that the latter may translate into the Notion the abstract universal transmitted to it, by showing how this universal, as an intrinsically necessary whole, proceeds from the Notion. (EN 10, §246A)

An example may help to explain what Hegel means by saying that philosophers ‘translate’ the universals provided by scientists into ‘the Notion’, or, more accurately, ‘the concept’. Hegel begins his Philosophy of Nature by discussing space and time. He takes up accounts of space and time given by scientists and, drawing on these accounts, Hegel tries to show space and time fit together by tracing how time derives from space. In this case, though, the ‘scientists’ in question include Euclid and Aristotle, and we might be surprised to think of them under this heading. But we should remember that it is only in the modern period that a firm divide between science and philosophy has emerged. Consequently when Hegel draws on

accounts of natural phenomena provided by pre-modern thinkers, those thinkers will not necessarily be ‘scientists’ in the narrower modern-day sense. As to how Hegel traces the derivation of time from space, he does this by identifying a contradiction within the structure of space as scientists have understood it. Space is divisible into a manifold of points. As such space is *partes extra partes* – it consists of parts outside other parts. Yet these parts of space have no qualities by which they can be individuated from one another. There is nothing to differentiate these parts from one another, and so they prove after all to be identical with each other. Space is self-contradictory: it is pure difference *and* pure lack of difference.

For Hegel, time embodies a step towards resolving this contradiction within space. Basing his account of time on that of Aristotle, Hegel maintains that time consists of a series of moments – an unending stream of ‘nows’, each existing only momentarily. As each ‘now’ momentarily stands out into existence, it divides the past from the future (EN 33–34, §257). Yet each moment disappears immediately it has come into existence. Hegel concludes that temporal moments are nothing more than a manifestation of negating force, a power to negate the past and future. Once that negation is done, there is nothing more to the moment and it disappears. Nonetheless, moments differ from one another more fully than spatial points do. For moments at least set themselves *against* everything else, albeit only momentarily. For Hegel, then, time embodies an advance towards resolution of the contradiction within space.

Peculiar as this view of space and time may seem, we can now clarify what method Hegel has followed in constructing it. He began by taking up accounts of space and time given by Euclid, Aristotle, and others. On the basis of these accounts, Hegel then finds a way to understand time as deriving from space. In doing this, Hegel is reconstructing how time derives from space on an *a priori* basis. And by

reconstructing along the same lines how each natural form derives from another, Hegel assembles all these forms into a chain in which each resolves contradictions within the forms that precede it.

As the example of space and time shows, in reconstructing how natural forms derive from one another, Hegel regularly *reinterprets* these forms. He starts from scientific accounts of these forms, but he then modifies those accounts, for instance by reinterpreting temporal moments in terms of negating force. As he puts it, the philosopher

introduces, into these [scientific] categories, other ones, and gives them validity .... it preserves the same forms of thought, laws, and objects, but at the same time it gives them further formation and reshapes them with further categories. (EL 33, §9R)

Hegel also *excludes* some scientific accounts when he cannot integrate the entities with which they deal into his chain of natural forms. This is why he rejects Newton's account of light and colour in favour of Goethe's – Hegel cannot incorporate Newton's account into his philosophy of nature as he can with Goethe's. In such cases, a particular scientific account fails to find any place in the philosophy of nature, and so Hegel rejects it. By thus finding ways in which each natural form derives from the others, the Hegelian philosopher of nature builds up an overall theory of the natural world. Let me now introduce this theory.

## II. The Hierarchy of Nature: Mechanics, Physics, Organics

Hegel connects and re-interprets scientific accounts so as to build up a particular conception of the natural world. On this conception, nature is the realm in which matter gradually comes to be shaped and organised by what Hegel calls 'the concept'.

Nature advances in this way through a ‘series of stages consisting of many moments, the exposition of which constitutes the philosophy of nature’ (EM 13, §381A). What, according to Hegel, are these stages?

In its first stages, nature exists in the shape of units of matter with little or no unifying organisation to tie them together. Hegel examines these stages in the first part of his Philosophy of Nature, the ‘Mechanics’. In this mechanical region of nature, all that exists is ‘singular individual’ entities. They have ‘the determination’ – that is, the defining attribute – of ‘asunderness or mutual outsideness’ (*Außereinander*): being-outside-one-another (EN 25, §252). This is the realm of matter as bare *partes extra partes*.

At first, these parts-outside-parts exist as space. Here, as we have seen, Hegel believes that spatial parts both differ and fail to differ from one another. Temporal moments also fail, insofar as they only attain differentiated existence for fleeting moments. After space and time Hegel discusses material bodies, in the subsection ‘Finite Mechanics’. Each material body achieves a level of difference from all other material bodies, by having a particular mass that distinguishes it. This mass is comprised of a particular quantity of spatial parts. So, Hegel writes: ‘Matter [now] has ... a *quantitative* difference, and is particularized into different quanta or *masses*’ (EN 47, §263).

However, Hegel continues, material bodies are still not adequately differentiated from one another. This is because the units of space that bodies possess so as to achieve difference remain self-contradictory entities that are not genuinely different from one another. Bodies, as it were, are attempting to achieve difference by using lower-level entities – spatial parts – that are not themselves differentiated, and this cannot work. The contradiction of space instead infects material bodies. As a

result, Hegel claims, these bodies collapse back into identity with one another. That is, the tendency of material bodies to collapse together takes the form of their being attracted towards one another. “The separated parts ... are only a One [*Eins*], many Ones [*Eins*]; each is what the other is. The One [*Eins*] repels itself only from itself; this is the sublating [i.e. overcoming] of the separation of what is for itself: attraction” (EN 46, §262A). Broadly, this is how Hegel reinterprets Newton’s account of the subjection of material bodies to gravity. As Hegel puts matters in his philosophy of history: ‘Matter possesses gravity in so far as the drive towards a middle point is in it; it is essentially composite, and consists of sheer singular parts which all strive for the middle point .... [it] seeks its unity’ (RH 47-48).

Insofar as material bodies nonetheless have achieved a level of difference – albeit imperfectly so – these bodies do not simply coalesce together but also repel one another. And in turn, in that bodies are therefore subject to *both* attraction and repulsion, they revolve around a centre into which they strive to, but cannot, unite. This gives us the solar system as a system of bodies organised in motion around their centre the sun, which Hegel discusses in the ‘Absolute Mechanics’, the final subsection of the ‘Mechanics’.

Hegel now moves on to the second main natural stage, that of ‘Physical Nature’ (as he calls it). Here nature has the form of material items that are partly, but still only incompletely, integrated together in systematic relations to one another. We have already seen in the solar system a first such case. Here we have material bodies (the planets) integrated into a system by their shared orientation around a centre (the sun). The transition to the solar system had therefore already brought us to the cusp of the next stage of nature. As this Physical stage now unfolds, we encounter sets of material items that become integrated together at increasingly deep levels.

We begin with what Hegel calls ‘immediate physical qualities’ – light and darkness, density and cohesion, sound, and heat. What unites these phenomena is that they exist insofar as the mass of material bodies acquires particular qualities (of density, degree of heat, etc.), through which these bodies become more firmly differentiated from one another. Why does this happen? Hegel’s initial thought is that within the solar system, different bodies acquire different qualities because of their places within that system. Location within a system causes bodies to occupy distinct roles within that system, and their matter acquires corresponding qualities (for instance, that of pure light in the case of the sun, Hegel maintains). The same applies to material bodies *within* the earth, for by being integrated as a planet the earth is now the system of all the material bodies that comprise it. These bodies, then, begin to acquire distinct qualities too.

Hegel now proceeds to three kinds of relational process amongst bodies: magnetism, electricity, and chemistry. In all these processes, different bodies are drawn to coalesce together. For they have acquired distinct qualities, and yet these qualifications are imposed on the more basic quantities of mass that bodies possess. These differences of mass, as we saw, are unstable and not fully established. To that extent, bodies are still not properly differentiated from one another, and they coalesce together. Once again, however, bodies do not entirely lack difference, so they not only coalesce but also repel one another, and regenerate their differences after having combined.

The paradigm of that dynamic is the chemical process, in which two substances (two bodies with different qualities) react together (combine) to produce new substances as a result (difference is regenerated). However, this process has an important result. Through it, what emerges is a set of bodies with different qualities,

bodies that have assumed these qualities that differentiate them *through* their interaction, their uniting and then separating. The bodies have taken up their different qualities *in relation* to one another. That is, body A has acquired quality C and body B has acquired quality D because A and B have been subjected together to a chemical process within which they have come to occupy different roles. In effect, these bodies have come to be differentiated by virtue of occupying distinct places within an organised system.<sup>4</sup>

This brings us to the third and final main sphere of nature, that of organic life, described by Hegel in the section ‘Organic Physics’. According to him, this sphere contains organic beings – plants and animals – the material parts of which are completely pervaded and organised by the forms that unify them. As a result, the material parts of these beings are completely integrated together with one another. Hegel is relying on the hugely influential account of organisms that Kant had given in his *Critique of Judgment*, first published in 1790. Here Kant argues that living organisms must be regarded as having two distinguishing characteristics. First, within any organism all its parts are reciprocally means and ends for one another: each organ functions in ways that enable the others to function, those in turn enabling the first organ as well as one another to function. Second, in enabling each other to exist and operate in this way, the parts belong within an organised system that effectively assigns roles to each of them, so that the whole has organising power with respect to

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<sup>4</sup> My formulation is indebted to Goethe’s 1809 novel *Elective Affinities* (*Die Wahlverwandtschaften*) in which the married couple Eduard (A) and Charlotte (B) as an experiment invite Otilie (C) and the Captain (D) to visit them; the result is that Eduard and Otilie form a relationship as do Charlotte and the Captain. See Goethe, *Elective Affinities*, trans. David Constantine (Oxford: Oxford University Press, 2008).

its parts.<sup>5</sup> However, for Kant, we must *understand* and approach organisms in this way, but we cannot know whether this is their real nature. Hegel drops this restriction on knowledge: for him, organisms really do organise all their parts, and we can know this.<sup>6</sup>

In an organism, then, each part is as it is because of its place within the whole – so Hegel takes it. Its place completely shapes the part’s character, so that if removed from the whole it would cease to exist:

The single members of the body are what they are only through their unity and in relation to it. So, for instance, a hand that has been hewn from the body is a

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<sup>5</sup> See Kant, *Critique of Judgement*, trans. Werner S. Pluhar (Indianapolis, IN: Hackett, 1987), §65.

<sup>6</sup> For a good reconstruction of Kant’s reasons for imposing this restriction upon our knowledge, see Daniel Dahlstrom, ‘Hegel’s Appropriation of Kant’s Account of Teleology in Nature’ (in Stephen Houlgate, ed., *Hegel and the Philosophy of Nature*, Albany, NY: SUNY Press, 1998). In rejecting the restriction, Hegel followed a path first carved out by his erstwhile collaborator Schelling; see Alison Stone, ‘Philosophy of Nature’ (in *The Oxford Handbook of Nineteenth-Century German Philosophy*, eds. Kristin Gjesdal and Michael Forster, Oxford: Oxford University Press, 2015). In brief, Schelling argued that human freedom is real and can be explained only if there is real self-organisation in natural organisms, of which human freedom is a further development. Kant had held that human freedom can only be assumed to obtain, not known, but Schelling replied that to explain moral action and knowledge human freedom must really exist, and we can know that it exists because moral action and knowledge exist also.

hand in name only, but not in actual fact, as Aristotle has already remarked. (EL 291, §216A)

Indeed, this means that the parts of a living body are not rightly described *as* mere parts; their character is rather that of limbs and organs, fully integrated members of an organised system.

Having said this, Hegel believes that only animal organisms fully realise this character of living wholes. But the first organic form that he considers is the earth as an integrated totality of magnetically, electrically, and chemically interacting constituents. Yet the earth is not alive properly speaking: rather, it has brought us to the brink of life. The second organic form, plants, *are* genuinely alive, yet they are deficient in that their organs can, if cut from the whole, assume new functions and thereby generate new plants (as happens when we take cuttings). Thus the organs of a plant are still not so fully governed by the whole as those of an animal. The animal, then, brings the chain of natural progression to its summit and completion.

To sum up: for Hegel, nature has the initial form of matter that is not organised by any unifying form but comprises mere *partes extra partes*. Nature then advances to the form of material bodies that are located in systems of relations to one another, and yet still retain an aspect of bare mass, bare material parts-outside-parts. Finally, nature progresses to the form of the organic body, the material parts of which are completely shaped by their places in the whole. Matter has gone from being unshaped by any form, to being partially shaped by organising form, to being completely shaped by organic form.

What does Hegel mean by claiming that nature *progresses* through these stages? He interprets nature as a *hierarchy*: its most advanced forms, the organic ones, are the most perfect. This indicates the nature of the progression: the most perfect

natural forms are so because they best succeed at resolving the contradictions that (Hegel thinks) obtained in nature in its earliest stages. In turn, those earliest stages are the earliest in the chain of natural progression because they are least perfect: least successful at resolving those same contradictions.

Take space, the very first natural form. As we saw, for Hegel space embodies a contradiction between difference and lack of difference. Time is more advanced – more perfect – than space, since time advances towards resolving this contradiction, in that temporal moments achieve greater difference from one another than spatial parts did. But the improvement made here is small, since temporal moments are only transitory. In the rest of mechanical nature, the parts of matter cohere into material bodies that achieve greater difference from one another by virtue of their distinguishing quantities of mass. Here we see an advance towards resolution of the contradiction from which space initially suffered. The further we advance towards complete resolution of the contradiction, the more perfect are the kinds of natural form that we get. Nature does not progress temporally, then, but in what Hegel calls a ‘logical’ sense, under which natural forms count as more advanced the less internally contradictory they are. (Moreover, the contradictions in question really exist in the natural world, for Hegel. Space as it really exists has antithetical features, so that it is objectively internally contradictory.)<sup>7</sup>

Hegel also regards nature as progressing from pure matter to its final existence as matter fully organised by ‘the concept’ (*der Begriff*). While the concept is also a

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<sup>7</sup> Hegel’s idea that natural entities contain real contradictions is puzzling because it is not clear how something that is internally contradictory can possibly exist. One solution is to interpret Hegel as often speaking of ‘contradiction’ to mean merely tension or conflict.

technical term in Hegel's Logic, in the context of his Philosophy of Nature he understands the concept as follows. This concept is not an idea in the mind; it is something existing, external to our minds, really embodied in the material natural world. Its character can best be understood with reference to living organisms. As we have seen, for Hegel, the parts of an organism are shaped by the whole and its purposes. For Hegel these are above all the purposes of sensation, irritability (the power to react to external stimulants), and reproduction. The whole and its purposes are not directly material entities, but they shape how the matter of an organism develops. They organise matter and are embodied in it, but they are not material themselves. Insofar as the whole and its purposes are not material, they can be described instead as conceptual. In the same way, for Hegel, whatever shapes and organises a whole set of material items counts as conceptual, or as a concept. Thus as nature advances to forms of matter that are more and more systematically organised and integrated, its matter is becoming more and more pervaded by 'the concept'.

Overall, then, Hegel conceives of nature as the realm in which matter gradually becomes shaped and organised by the concept, becoming organic in the process. We can now turn to the ethical implications of this account.

### III. Hegel and the Ethics of Human-Nature Relations

What remains of interest in Hegel's theory of nature, plausibly, is not the substantial details of his accounts of various particular natural phenomena. Rather, what remains of interest is twofold: (a) His overall interpretation of what nature essentially is, an interpretation that cuts across all the specific details of his theory; and (b) the ethical consequences that flow out of this interpretation.

In Hegel's interpretation, nature is a hierarchical order of forms ranging from most to least contradictory, and from the most purely material through to the most organic and conceptually organised. This bears on the environmental crisis, if we take it that one causal factor behind this crisis is the new way of thinking about nature that took hold during the scientific revolution in the seventeenth century.<sup>8</sup> This was the mechanistic view of nature – pioneered by Descartes amongst others – as a set of units of matter interacting causally with one another. On this view, no natural beings have any real inner purposes or life; even complex forms such as organisms can be reduced to sets of mechanical interactions. This is why, infamously, Descartes found vivisection morally unproblematic: after all, for him, animals are mere mechanisms. This case exemplifies how the mechanistic view of nature has tended to support and fuel human efforts to control interactions within nature for our own benefit. For if natural beings have no real purposes of their own, then we human beings need not disregard or restrict our own needs and purposes for the sake of allowing natural beings to fulfil their purposes: after all, they don't have any.

The mechanistic assumptions that informed the scientific revolution, then, contributed to making the use of nature for human benefit into an entrenched part of modern life. To be sure, few scientists today would straightforwardly accept a mechanistic view of nature in the particular way that that was construed in the seventeenth century. Yet the broader idea that the behaviour of natural beings is to be understood in terms of interactions amongst their smallest-level component parts

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<sup>8</sup> Of course I am not the first to make this connection; for a classic account of the negative ecological impact of the mechanistic revolution in early-modern science see Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (New York: Harper and Row, 1980).

remains widespread – as when the behaviour of biological organisms is explained reductively in terms of their genes, for example. Likewise the use of nature for human purposes, without regard to any purposes that nature itself may have, remains fundamental to industrialised society, which – at least as it has existed so far – depends upon the ruthless exploitation of natural resources. In these respects the mechanistic view remains embedded in our form of social life.

Hegel's view of nature challenges the mechanistic one. For him, only the lowest-level aspects of nature operate in purely mechanical ways. Living organisms of all kinds are not mere mechanisms; they have their own guiding purposes. Even chemical, electrical, and magnetic processes are not merely mechanical; they already have a level of systematic self-organisation that places them mid-way between organism and mechanism. To understand nature properly, Hegel believes, we must recognise that virtually all the concrete natural bodies and processes that surround us have at least some aspects of purposive self-organisation. And even those natural beings that come the closest to being mechanical – bodies with mass in gravitational relations to one another – still in fact have to be understood in relation to other more self-organised natural forms of which they are a precursor. Bare mechanism is the minimum case of self-organisation, rather than self-organisation being reducible to bare mechanism.

What follows from this view, ethically? Well, we might think: surely it follows from Hegel's view that we ought to *act* towards natural bodies and processes in ways that recognise their self-organising aspects. That is not to say that we should always put the purposes of natural beings above our own. But we should take their purposes *into consideration* in deciding what to do and how to live. In many cases, this will mean finding trade-offs between our own purposes and those of other natural

beings. This conclusion – that the purposes of natural beings merit consideration – properly follows from Hegel’s interpretation of nature, or so we might readily conclude.

Matters are complicated, though, by the fact that Hegel draws no such conclusion himself. In his *Philosophy of Nature* he doesn’t say anything explicit about our treatment of natural beings from an ethical point of view, but he does talk about this in his *Elements of the Philosophy of Right*, originally published in 1821 – the work in which he outlines his social and political philosophy. Hegel discusses human treatment of natural beings within his account of private property which is near the start of the *Philosophy of Right*, after Hegel has introduced free will at the very beginning of the text. Hegel remarks here that free will is a datum that is familiar to each of us from our own experience (PR 37, §4). But what does ‘free will’ mean? Schematically, Hegel claims that free will can be initially taken to be the ability to choose which to pursue from the set of one’s individual desires or of the available courses of action (PR 45, §11). Ultimately, Hegel will argue across the course of the *Philosophy of Right* that this is an inadequate understanding of free will, to which he proposes successive revisions and refinements. Nonetheless, these refinements incorporate the initial understanding of free will rather than rejecting it absolutely. Thus, for Hegel, free will in the sense of free choice remains a necessary aspect of freedom, although only an aspect that should not be mistakenly equated with the whole.

Now, the condition of an individual’s exercising this ability to choose amongst her desires or possible courses of action, for Hegel, is that she own private property – enjoying rights over a range of material objects with respect to which she can embody and realise her freedom of choice. I need to be surrounded by a domain of objects that

provide tangible evidence of my freedom and in which ‘I regard myself as free’ (LNR §18, 224). My ownership of these objects means that I can mould, use, and mark them in ways that I freely choose, so that these objects then give me back signs of the freedom that I have exercised with respect to them. But property-ownership is only possible if different individuals recognise and respect one another’s property (PR §71, 102). In turn, this mutual recognition and respect amongst property-owners can only reliably be achieved if they respect one another not merely when it benefits them to do so but out of genuine respect for the rights of others – this being necessary to avert the otherwise ever-imminent prospect of crime. That step takes Hegel from property (or ‘abstract right’) to morality, and from there he will move on to morality made concrete in ethical life.

Nature figures into ‘abstract right’ because Hegel maintains that private property requires that individuals exercise and realise their freedom by taking possession of *natural* objects and then using, marking, and transforming them. By transforming something I put my will into it – I make it into something that manifests my freedom in that it is visibly the way it is because of my free actions upon it. And this manifestation of my will within the thing, Hegel says, ‘occurs through my conferring upon the thing a purpose other than that which it immediately possessed ... a soul other than that which it previously had’ (PR §44A, 76). In place of the object’s own ‘soul’, my soul is implanted into it. Hegel specifies that it is wrong to treat other human individuals in this way – as objects that I treat as my private property. This wrong has been committed at times – notably in the institution of slavery – but that occurred in times, as Hegel puts it, when a wrong was still regarded as being right (PR §57A, 88). Basically, Hegel takes it along broadly Kantian lines, human agents are ends in themselves: their free agency deserves to be recognised and respected.

This is not the case, Hegel believes, for natural beings. Indeed, for Hegel, it's not merely the case that we are free to transform natural beings as we please; more strongly, we *ought* to so transform them in order to give reality to our freedom, and because we are under this obligation, we must have the right to act so as to fulfil it. Hence the 'absolute *right of appropriation* which human beings have over all things' (PR §44, 75).

We might think that these claims of Hegel's are in tension with the implications of his theory of nature. For on that theory all natural beings exhibit at least some level of self-organisation, i.e. they shape themselves in light of their own purposes. It is this same self-shaping capacity which ultimately becomes developed to a higher and fuller degree in human self-determination – as Hegel portrays matters in the *Philosophy of Mind*, in which he treats human agency as a higher-level development of the approximations to that agency that already exist in the natural world. The human capacity for self-determination is so important, Hegel takes it, that each of us not only can but also ought to transform natural beings so as to realise this capacity. But if self-determination has this importance in human beings, then mustn't its approximate natural form as self-organisation *also* have a level of importance, such that the purposes of natural beings deserve to receive at least some moral consideration?

Hegel doesn't draw that conclusion. Here there is a marked difference from what he says about the necessity of each individual property-owner coming to recognise and respect other human agents. Initially, he maintains, we are liable in the name of realising our own individual freedom to try to steal other agents' property, the things that they have already appropriated for their own. But we must come to recognise that such behaviour is wrong – not merely on the grounds that I need others

to recognise *my* property, which they can only do if I recognise *them* to be property-owners in turn. That is *part* of the story for Hegel, but only part; if I remained at that standpoint I would still be recognising others only as an indirect way of furthering my individual self-interest. I need to come to recognise that others in their own right deserve to own property – hence Hegel proceeds from property to a treatment of morality in a fairly Kantian sense, as involving amongst other things the recognition of other human agents as ends in themselves. Although he subsequently maintains that this Kantian kind of standpoint too has limitations and must be superseded, it isn't abandoned, but rather incorporated into the higher level of 'ethical life'. Hegel sums up this difference in the respective standpoints that we should take towards human agents and natural beings by saying that nature does not 'have the end in itself in such a way that we have to respect it, as the individual human has this end in himself and hence is to be respected' (LHP vol. 3, 185).

When it comes to natural beings, then, Hegel *could* have said that we start off with an inadequate standpoint in which we try to use and transform natural things so as to manifest our individual freedom in them. But, his reasoning might have continued, actually those things have purposes of their own, and we need to come to recognise the validity of these things pursuing their purposes. We therefore need to learn to limit our pursuit of our own individual freedom, he could have concluded, and to balance our concern for this freedom with recognition of the independent purposes of natural beings. And then – Hegel could have said in turn – our coming to learn this lesson requires us to be situated within social institutions that educate us in this lesson and in acting in the ways that embody and instil it. That would be parallel to the way that we must be situated within the institutions of ethical life so that we can be educated in acting morally towards other human individuals – so that moral action

becomes second nature to us and does not remain a burdensome imposition. Hegel did not say any of these things. But his *Philosophy of Right* provides a framework within which he could have been made these claims, by unfolding a series of arguments regarding human-nature relations which parallel those that he does in fact advance regarding inter-human relations. Moreover, he *should* have unfolded those arguments, to be faithful to the implications of his own account of nature.