



On Hegel's

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Abstract:

Climate change is not just about rising sea levels and greenhouse gases. It is also an intensive process of real-time terraforming without any obvious subject verbing the process. This is most visibly underway at the ablation zone of the Earth's cryosphere. Is it reasonable to situate our understanding of ecological crisis at this new ground? What would it mean to take anthropogenic climate change as the ground for reason amid the ecological crises careening toward the present? This essay returns to the second half of part one of Hegel's *The Science of Logic* – the culmination of the Objective Spirit – where something appears from nothing, and it does so in and as “Ground.” I argue that recent conceptual basins of attraction in climate and earth sciences – namely, the feedback loop and the tipping point – intimate a return to elemental philosophy, and that the dialectic of nonidentity that marks Hegel's philosophy of nature interfaces with the form-matter-content triad thrumming at the culmination of the Objective Spirit. The nonidentity of the earth has been unearthed.

Keywords:

Ground, climate change, elemental philosophy, principle of noncontradiction, Greenland Ice Sheet, Intergovernmental Panel on Climate Change

The wealth of natural forms, in all their infinitely manifold configuration, is impoverished by the all-pervading power of thought, their vernal life and glowing colours die and fade away. The rustle of Nature's life is silenced in the stillness of thought; her abundant life, wearing a thousand wonderful and delightful shapes, shrivels into arid forms and shapeless generalities resembling a murky northern fog.

G. W. F. Hegel, *Philosophy of Nature*

This essay seeks to answer a rather simple question: What would it mean to take anthropogenic climate change as the ground for reason amid the ecological crises careening toward the present? This might seem like a strange question to pose since the very ubiquitous notion of anthropogenic climate change, both across Western university faculties as well as public discourse and policy, would appear to confirm that it has already become the ground of thought today. But as many of the leading philosophies of the earth have insisted over the past two decades, the grounding of reason in the terrain of anthropogenesis poses a number of insurmountable paradoxes, not least of which is the nagging antinomy between what Michael Marder (2020: 64) calls earth's "nonidentity" on the one hand, and the categories we bring to understand its actuality, on the other. Recognizing earth systems' dynamic sensitivity to human industry is not the same as grounding reason in earth systems' asymmetrical reciprocity to the forms brought to bear upon it. The answer I seek to establish will involve treating ground as a dynamic pressure posed to the philosophy of form, and in turn letting philosophy *be treated by ground*, letting it trouble the way we term and relate to the earth. And my argument is that a dialectical concept of ground developed in Hegel's *The Science of Logic* (2010) already provides *the grounds for Ground*, as it were, even if much recent effort across rationalist philosophies have sought a metaphorical concept of ground instead of a materialist one.

One exception to this anti-materialist tendency is Dieter Henrich's (1976: 214) notion of autonomous negation in the activity of *Ground*, in which the subject of reason incorporates but can never fully identify reflexively with its own ground since to do so would be to treat itself as an object of its own reason. Rasmus Uglit (2016: 205) extends this notion of ground against the rationalist reading by noting the autonomous negation of ground's activity expressed

in the excess that spills out from quantity to quality and in turn internalizes self-contradiction both into objects and our concepts of them. I want to go one step further and suggest that the nonidentity of the essence/ground relation in the *Logic* in fact promises an internal contradiction to the subject for whom climate change might become the literal and epistemological ground for understanding. When Hegel (2004: 233) speaks of ground, he is making reference to “the earth” at the same time as he is referring to the self-reflective contingency of reason itself — that is, the reflection and refraction of subjectivity through its own reasoning. By asking for a sensitivity to the dialectical force of ground, I am also suggesting that the emergent geophilosophy that this journal tasks itself with detailing might unfold in direct engagement with the concepts that travel between the humanities and the newly invigorated (and hyper-politicized) earth sciences.

Certainly, it would seem as though the very grammar of the Anthropocene thesis promises the beginnings, if not the outright ends, of a fully fledged form of Absolute Knowing, since to term the human as “a major geologic force” on earth involves implicit acknowledgment that the human is capable in turn of *knowing* the whole of its condition and creation (Crutzen and Stormer 2000: 18). To be clear, anthropogenesis and the epistemology of its acknowledgment, that is, comprehension of the planet’s historicity, is not the same as solving what Hegel (1974: 199) calls the riddle of nature, at long last. This riddle names the great crisis portended by the interactive cascade of global warming, ecological crisis, ocean acidification, and mass species die-offs: both that they unfold at a scale beyond the more manageable profile of their cause — the fossil-fueled industrialization of commodity and agricultural production writ large — and that we are cursed to bear witness to it. If this abstract category of “the human” has become the primary “geologic force” on earth, then it would seem as though the ground from which the essence of spirit self-determines as the phenomenal world’s form and content is also a newly encountered ground for understanding in the strictest Hegelian sense: an adequation of thought to the underlying forces responsible for a phenomena. If the earth’s nonidentity formed the ground for reason at the end of the Holocene, it would indeed involve the internalization of nonidentity into the category of Understanding, and, in turn, a geophilosophy of non-reciprocity, or what Hegel (1974: 208) calls the “diamantine identity” of a universality that “contains difference.” This could mean a number of things for how philosophy terms the animate materiality of its ground. Prioritizing the force of nonidentity in the epistemic cultures arising in sync with global

warming is a necessary starting point. Necessarily (but perhaps not yet philosophically), the collated consensus of the earth sciences at present already concedes the earth's "diamantine identity."

I

Nobody would accuse the Intergovernmental Panel on Climate Change (IPCC) of engaging in either good or bad philosophy, but that does not mean that its purview is beyond or below the philosophy of nature. Quite the opposite. Since the fifth assessment report (AR5) was published in 2014 (IPCC 2014), the IPCC has gone on to release two supplementary reports, both of which stretch the descriptive bounds of the panel's *modus operandi*. Where once the IPCC's task was to gather the best science from across peer-reviewed literature in the service of informed climate policy (IPCC 1989), it has since gone on to congeal with precision the *metalepsis* of anthropogenic climate change, both through the futurities impinging on our sense of the present, and across the radically uneven (though intimately entangled) ecosystems that amplify, modulate, and focalize global warming *in situ*. This is not to say that AR5 and the two supplements to follow are especially thrilling reads. Their measured and qualified rhetoric is a necessary feature of their function for policy. And yet, the speculative thrust of this new phase of the assessment cycle comes as a consequence, I will argue here, of the shifting ground the IPCC have taken upon themselves to detail, inasmuch as their speculative exercises ground their focal object (the past, present, and future tenses of climate) at the interface of earth system dynamics we might have called (if this was 500 BC) the elements as such. The first supplement, "Global Warming of 1.5° C," focalizes climate change through the coastal communities most immediately impacted by rising sea levels, a report that its authors admit was occasioned by Pacific Island leaders' sustained agitation, but that was long ignored by both the research fields collected in the assessment reports and the bad universalism of the panel's concept of the human as such. And with the 2019 "Special Report on the Ocean and Cryosphere in a Changing Climate," the IPCC shifts the climate's *dispositif* from atmospheric respiration to the dynamic (and largely unpredictable) interplay between two of the earth's most vital spheres: its frozen and aqueous layers. As concern for climate begins to take on more and more material specificity — no longer is it just about the thermal effects of CO₂ concentration in the earth's atmosphere, but now also including the interactive reciprocity of the biosphere, lithosphere, atmosphere, hydrosphere, and cryosphere — the IPCC also (perhaps

unwittingly) takes a foot out of the earth sciences and places it cautiously in the realm of natural philosophy.

The animacy of the planet on which we live and breathe was once the concern of witches, heretics, and the figure of the Other against which the rational, Western subject of post-Cartesian science aggregated stable self and ground. And yet the very concepts of feedback loops, compound hazards, cascading intensity, and tipping points require even the most seasoned scientist to admit a degree of trepidation when faced with our ecological futures' epistemological limits. Not just because they will almost certainly be bad (even in the most optimistic Representative Concentration Pathway [RCP] 2.6 scenario, we barely keep global mean temperature below 2° C by 2100) (IPCC 2019). But because the recalcitrance of scientific object — the planetary spheres' interactive dynamics — becomes more and more unknowable, the closer we get to a sense of its simultaneous independence from the human and its intimate reactivity to the fossil-fueled era, the wake of which we are firmly placed today. Global warming's event horizon is no longer simply the twin rise of average temperature and extreme sea level, but a whole range of compounding (and interactive) intensities that cannot be fully plotted. "Extreme wave heights," "marine heatwaves," and "trade wind intensification" disfigure the future beyond recognition or epistemic certainty: Uncertainty might still take the measure of sound grammar, but its consequence for the import of disciplines gathered under the heading of the IPCC signals nothing less than a revolution for the grounds of science and society: "Extreme change in the trade wind system and its impacts on global variability, biogeochemistry, ecosystems and society have not been adequately understood and represent significant knowledge gaps" (IPCC 2019: TS.6.6). The grounds for reason are shifting from beneath our feet — its chemistry, volatility, temperature, and elemental force under rapid revision — both as future ecologies distort beyond recognition and those same futures refigure the present. This is what I mean by metalepsis: a narratological loss of certainty as to where one stands diegetically. And with the IPCC's most recent turn in narrative voice, our most trusted narrator of future ecologies to date, the shaky epistemic ground is made shakier by the play of compounding, elemental forces.

Has the IPCC been hosting clandestine reading groups on the pre-Socratics? Have Empedocles' four elements finally come home to roost on the tomb of Aristotle's Principle of Noncontradiction? Is Vico's fundament of history — to wit, the structures and artifacts built by man are those that man comes to know because they, and not the

static background of nature, make history — capsized into the sea? Leave it to the World Meteorological Organization to convene the jury of human history at the interface of ice, water, air, and earth: the concept of anthropogenic climate change texturing the assessment reports and policy it informs names the philosophical dilemma already, and it is a dilemma I want to argue here that occasions any geophilosophy after climate change: If *Anthropos* made this mess, then perhaps it is not the flipping of foreground and background that occasions the climate of history, as Dipesh Chakrabarty and Bruno Latour would have it, but the murky ground from which one would measure the difference to begin with. But then, what category and concept must we think with or against from the philosophy of nature in light of recent work in environmental philosophy and the earth sciences alike that points to new ground unleashed by anthropogenic climate change? No doubt more than one. Including the liveliness of matter and the nonhuman detailed by feminist philosophers of science such as Karen Barad and Isabelle Stengers, or, on a different scale, the framing debates about the Anthropocene by Dipesh Chakrabarty (2009: 206), whose intervention is to admit the shifting relationship between geophysical ground and the historicity of the human — or, in short, the unique (and catastrophic) “geological agency” of the human presumed by anthropogenesis. Here, however, I want to return us to the ground as such, since it is at the interface of air, earth, water, and fire that the ground gets determined as ground, and the vocation to speculate ecologically has come to unsettle the IPCCs descriptive domain. If we are fast approaching the point of no return — somewhere around 2030, according to the 2018 supplement on “Global Warming of 1.5° C” — it is because we will have lost the ability to know where we stand, beyond which tired readings of ground as metaphor for reason’s *base* will look increasingly outdated, if not outright obnoxious. But it is not the first time in the history and philosophy of nature that we have stumbled on new ground. And for this reason, I offer here a reading of Hegel’s formative chapter on “Ground” drawn from the *Science of Logic* (2010), first formulated and drafted at the time of his writing the *Phenomenology of Spirit* (1977 [1807]), which is to say at the threshold of one world dying and another one bourn on horseback.

II

In seeking to take Ground seriously on the terms of its own operations, and by extension the trouble it poses to an anthropocentric form of reasoning with climate change, I am also writing in the wake

of the great elemental philosopher John Sallis’s insistence that “the earth cannot <...> be properly considered to be of the same order ontologically as things. Neither can the earth in its self-enclosure be regarded as ontologically homogenous with the open space configured on its surface” (2015: 11). This distinction between the ontology of things and earth is posed as a logical conundrum even for Plato, who Sallis goes on to explain already introduced a three-fold distinction into what we might today refer to as a landscape, in which the *kinds* of differences assembled into a landscape — “things (primarily of nature), space (and the shaping of space), and the earth (in its self-showing)” (Ibid.) — demand equally differentiated modes of thinking beyond bad empiricism bent always on reducing force to form. An active concept of ground is needed, lest one homogenizing category come to occlude precisely the threefold (or manifold) nature of nature, as it were. In Sallis’s philosophy of the elemental, this active concept occasions and is satisfied by an imagination that is in large part already *imagined for us* by earth’s materialization in and through landscape, but I am arguing here that the interaction of things, space, and ground is also a lead for where we might orient our thinking in light of the more troubling conceit of anthropogenic climate change: not that humans caused this, but that humans will be subsumed, and thus negated by that to which *anthropogenesis* gives credit.



Ilulissat Icefjord, June 2019. Photo by Author.

But my point here is also that Hegel's dialectical treatment of the figure-ground distinction in the *Logic* already recognizes ground's restlessness, and hence a concept of ground that carries with it a critical rejoinder to any position bent on simply reading ground as a metaphor for the "grounds of reason." The question I am attempting to answer here is: To which categories must we refer to make the internal and hidden dynamics of climate intelligible? To begin an account of, for instance, the geological debris left in the wake of the receding Greenland Ice Sheet, the replenishing of Chilean agriculture with that same geological substance, or the refashioning of the Port of Fujairah — the second largest bulk diesel terminal on earth — into an Arctic oasis sustained by icebergs towed from Antarctica.¹ In the fields of feminist materialism, elemental philosophy, and environmental humanities, we have gained a stronger understanding of why the very concept of "anthropogenic climate change" poses profound dilemmas that occasion a return to the core problems animating Western philosophy. Stacey Alaimo's (2008: 238) concept of "trans-corporeality," for instance, troubles the ecological boundaries between Subject and Object, while David Macauley's (2010) return to the fourfold of Western philosophy helps to rejuvenate an analytic of *force* in relation to the forms to which experience attaches concepts. And from Chakrabarty's (2009) landmark "The Climate of History" comes the challenge of rethinking the historicity of nature as such, so troubling to classical historiography precisely because of the logical glitch embedded in any claim that nature has a history, if by history we mean the wrenching of freedom from the realm of necessity. For Hegel, this conceit that nature has a history at the same time that it marks the membrane of history is why it "confronts us as a riddle and a problem" (2004: 199). The riddle, in short, confronts thought's still laboratory with what cannot be understood without immersion in the milieu of nature's many forms: "the rustle of Nature's life is silenced in the stillness of thought; her abundant life, wearing a thousand wonderful and delightful shapes, shrivels into arid forms and shapeless generalities resembling a murky northern fog" (Ibid.: 203). Epistemic clarity settles in as a fog forestalling Understanding from the thing's entanglement with its ecology, or what in evolutionary biology is termed the "reciprocity" of organism and environment over time (Reznick 2013). Anticipating an ecological version of the uncertainty principle by at least a century, the point here is that the categories of thought render the "singularity" of natural bodies into

¹For a more elaborate analysis of the connection between these two sites, see Boetzkes and Diamanti (2020).

universals, which in turn alienates the thing from its own contingent ecology (it instead gets grafted onto logic) and hence, too, understanding from its object (since it is now *made* to appear). The riddle, however, ought not to lead to stoicism — the “significant knowledge gaps” of future ecologies, no reason to throw up one’s hands in defeat “of a metaphysics prevalent today which maintains we cannot know things because they are absolutely shut to us, it might be said that even the animals are not so stupid as the metaphysicians; for they go after things, seize and consume them” (Ibid.: 205). Let us not collapse into stoicism or skepticism, then, or resort to less-than-animal stupidity, and instead ask after the category of ground as it shifts beneath our feet. Because my wager is that underwriting all of these ecological retrofits to philosophy’s foundational oppositions is the shakiness of ground unleashed amidst epochal shifts, historical or otherwise. And for this reason, the category of ground needs to be treated as both a functional category in a larger system of logic, and a material dynamic that *places* that logic in a relation of ecological deixis.

III

At stake in Hegel’s chapter on Ground, first drafted alongside the *Phenomenology of Spirit* during his time with Schelling at Jena, is the relationship between material forces and the forms they take in objects we consider for various branches of understanding. With this chapter, we are dropped in medias res between the Objective Logic (part one of the Logic) and the Subjective Logic (part two), which involves a careful detailing of the shift from “the becoming of essence” to, eventually, its actualization as substance in the world without yet taking on identity. The chapter on Ground thus both sets and *is* the stage between nothing and something in the Logic, the result of which will include a definition of “substance, as this identity of the reflective shining” of essence, which “is the totality of the whole and embraces accidentality in itself, and accidentality is the whole substance itself” (Hegel 2010: 491, II.395). This particular way out of the Objective Logic and into the Subjective matters for what the unsettling category of Ground does to reason, because this central concept of accidentality at the objective and subjective logic interface is a mode of essence imagining itself and it will carry the kernel of nonidentity into the Subjective (which it discovers, belatedly, in the Objective). In “The Absolute Relation,” (2010: 489–507) which precedes the shift into part two, Hegel puts substance this way: “*That simple being is the formless substance of*

the imagination for which the shine has not determined itself as shine, but which holds on, as on an absolute, to this indeterminate identity that has no truth but only is the determinateness of *immediate* actuality, or equally so of *in-itselfness* or possibility — form determinations that fall into accidentality. —” (2010: 491, II.395). So what distinguishes between form determinations that fall into accidentality — the substance whose essence *became* first and foremost as its own ground — from form determinations that fall into self-positing actuality, or a holding of the play of forces to a form with content and matter? What, to use an example from the Greenland Ice Sheet moraine, is the difference between the boulder heaved out from beneath receding ice and the play of forces *receding into* the melting cryosphere, if the former is an actualization — a big rock — and the latter are still form determinations that fall into accidentality? Across both parts of the *Logic* is a sustained effort to track the identity and difference of the first of many triangles that Hegel will introduce to carry contradiction through to the play of forces animating provisional resolution, and it is the tripartite process through which The Absolute realizes itself as Being, Nothing, and Becoming — what J. N. Findlay calls “only the abstract nonsense whose clearing away allows the system to begin” (1974: x) — that leads us from Essence to the Ground of essence in this chapter.

It is important to note that the *Science of Logic* was imagined by Hegel to serve as one of the three branches of his larger philosophical framework, the other two being a philosophy of nature and a philosophy of spirit. These are the branches he had in mind as he began drafting the *Logic* while at Jena during the first decade of the nineteenth century amid the Napoleonic wars. And because Hegel returned to and revised the *Logic* for publication no less than three times before his death in 1831, commentators such as George Di Giovanni (2010: xiv) have repeatedly claimed that this is Hegel’s least complete work — that, in short, the *Logic* has an unsettled relation to metaphysics, or that the ground from which a logic and a metaphysics can get conjointly worked through (Hegel’s stated ambition in this text) is unsettled.

Of interest to us here is not so much to determine whether Hegel ultimately succeeded in finding a common ground for the various branches of his philosophy, but instead to keep in mind the struggle he evidently endured while returning across the thirty years of his academic tenure, from Jena through Nuremburg, Heidelberg, and finally Berlin, to the very problem of stable ground. A struggle marked, most poignantly, by Napoleon’s invasion of Jena on 13 October 1806, as Hegel writes to a friend on that day:

I saw the Emperor — this world-soul — riding out of the city on reconnaissance. It is indeed a wonderful sensation to see such an individual, who, concentrated here at a single point, astride a horse, reaches out over the world and masters it. (Hegel to Niethammer October 13, 1806, cited in Butler and Seiler 1985: 114)

Given Hegel's other major writing project at Jena — namely, his most accomplished and unified *Phenomenology of Spirit* where he lays out most systematically his dialectical system relating self-consciousness to the absolute — his chance encounter with “this world-soul” on horseback is fortuitous, for a world-soul or spirit in the flesh is the very embodiment of what shifts the ground of history. More plainly we should note here, then, as do later commentators invested primarily in Hegel's philosophy of history such as Karl Marx, Walter Benjamin, Alexander Kojève, Jacques Derrida, and Susan Buck-Morss, that Hegel's forced departure from Jena is felt and narrated as an encounter with epochal emergence: a new organizing principle of history, “astride a horse,” or in our terms today: the spirit of history creating new ground in situ.

The resonance with our own historical moment is striking as new ground is unleashed amidst climate change, except that we lack a stable figure to pin it on, our Napoleon on horseback. In part because planetary feedback loops are carrying us into new, unpredictable terrain. But also because, as Catherine Malabou puts it, “man cannot *appear* to itself as a geological force, because being a geological force is a mode of disappearance” (2017: 41) — a neutralization of thoughts (since *geos* is without thought) until the brain registers its own metabolic contiguity with its environment. But then it would be *Anthropos* as such on horseback (or perhaps an oil tanker) and there is good reason to cringe at the sleight concealing the asymmetries and inequalities embedded in “*Anthropos* as such.”

Ground, then, appears in the first instance to paradoxically mean something other than the static backdrop to history. It is rather, in this striking opening to the *Logic's* third chapter, where “Essence determines itself as ground” (2010: 386, II.291). In this phrasing, ground is the self-positing of essence — as such: a whole range of interactive forces through which the earth *takes* and *gives* shape — without taking on an identity (and hence, *not* yet negating the nonidentity of essence). On these terms alone, ground would appear to warrant serious consideration in light of the climate crisis, since it names a necessary process in the worlding of the world without yet extinguishing or suspending force into form. Ground, Hegel surmises, is lively: unsettled and unsettling. It will take the remainder of the

chapter for Hegel to unpack this deceptively simple assertion. Unlike Hegel's other major text from these years, the primary locus around which concepts unfold is not a self-conscious subject. What in this opening formulation marks the scene of ground, in other words, is the absence of a subject. But we are nevertheless always in the middle of things in Hegel — encountering a world that preexists our encounter with it, animated and dynamic and unfolding, and it is no different here at our first encounter with ground.

Essence precedes ground, but, in the grammar of this opening declarative determines itself (that is, without a subject) *as* ground. From the outset then we have an opposition — essence and ground — that are held together by the self-determining character of the former in the necessity of the latter. If essence never found its ground it would remain spectral and there would be no thing from which to confer a logic of essence at all. In the previous chapter on “Shine” (2010: 341–52), we discovered that the Essence (of Being) is only ever active in its shimmering out through the world it draws into itself as it vibrates between nothing (a thing without externality, reference, alterity: pure being without qualification) and becoming (its self-actualization in relation to the matter and form of the world at hand). This is another way of saying that you cannot point to the essence of, say, a carrot (orange! But what about purple carrots?), since the carrot's external skin is all you encounter, and even if you slice it and dice it you are still encountering surfaces, and those surfaces now have a form contingent on your knife — not the same carrot — getting you no closer to its essence. Essence, rather, *shimmers* out through the carrot's every fiber, its taste and presence on your cutting board, and the mineralogical life it lives well after being plucked from the ground. But then, *all* things — all things — come from the ground, borrowing their materiality and energy from the stuff of the earth, which is another way of saying that all things have a relation to both their own and to the planet's ground. In the language amplified by Marder above, this would also mean that all things carry the nonidentity of the earth into them, which is why all things in Hegel are time-sensitive too: finite and destined to return to the ground from which they spring.

This dynamic plays itself out repeatedly across this chapter and resonates with what in the *Phenomenology* Hegel calls the “play of forces” animating the “inverted world” — that is the world hiding beneath and behind appearances (Gadamer 1976: 38). A dialectic he will there call the phenomenal unity of force in and as form. But we do not yet have “forms” in this demonstration. All we have is ground, which we already discovered was the self-determining

process of essence becoming some thing. Imagine we are after the essence of climate, and we are standing in front of the most studied object of climate science on earth: the Greenland Ice Sheet. To what might we refer in order to see the provisional unity of essence and ground explode into forms? Let's wait for it to emerge on the scene.

At the resolution of the chapter that precedes "Ground," we have the contradictory nature of appearance named directly *in nature*, put very literally as the death knell haunting finite things:

A thing, a subject, a concept, is then precisely this negative unity. It is something inherently self-contradictory, but it is no less the *resolved contradiction*; it is the *ground* which contains the determinations it bears. The thing, the subject, or the concept, each as reflected into itself within its sphere, is their contradiction resolved; but the whole sphere of each is in turn *determinate, diverse*, and therefore finite, and this means *contradictory* <...> Finite things, in their indifferent variety, are therefore just this: to be contradictory, *internally fractured and bound to return to their ground*. (Hegel 2010: 384–85, II.289)

In the run-up to this section, Hegel notes the "usual horror which ordinary (not speculative) thought has of contradiction" (Ibid.), since the provisional unity of things is undermined by the self-determining essence of ground from which they come and to which they will return. Think of your teeth. Or your bones. Or the carbon in your DNA and cell membranes. And now imagine them at the end of the slow carbon cycle, one to two hundred thousand years in the future. The finitude of things is their analeptic and proleptic intimacy and identity with the earth — that is, identical with the irrigation of nonidentity. Now we can begin to see with more clarity why essence has a necessary (and self-reflexive) relation to ground. The forms that will emerge on the scene in a moment will be bound up with the leap from essence in and as ground to the earth-bound drama of the grounded.

IV

I will return to Hegel in a moment, but at this point it is worth asking what he has in mind when he characterizes the horror attached to contradiction in the philosophical tradition to which he is referring. While Kant is no doubt lurking just around the corner of most sleights in Hegel, I want to consider the chapter on ground's framing in relation to the law of noncontradiction in Aristotle. Recall that Aristotle's consideration of pre-Socratic elemental philosophy

in light of the law of noncontradiction: a thing cannot be both what it is and its opposite at the same time. Here we see how *time* is again the only distinguishing factor in what Aristotle calls a refutation of the law of noncontradiction versus a demonstration of its nullity. In the setting up of ground, Hegel is refuting the law of noncontradiction: the appearance of “a thing, a subject, a concept” is conditioned by that which it is not *internal* to itself, a contradiction that will, in time, return that thing, subject, concept back to *ground*.

Aristotle’s intrigue with the elemental and his disdain for what it would do to logic is a version of the same problem that Hegel is here naming as the horror of contradiction. In the *Metaphysics* (1998 [1971]), Aristotle is trying to make the elements fit into the scheme of logic, but it is going to take some heavy lifting in Book IV to make the *stoicheia* fit the categories of thought. Engaging with Empedocles, Plato, Democritus, and more, Aristotle establishes that they hold some version of the argument that would then come back for Hegel (contra Kant), which is that the negative and positive are composites of one another — that is, a thing is what it is not as much as it is what it is. At least to the extent that a thing’s “substance” matters most of all, and substance is always in some measure recursive to the grounding of a thing as wet or dry, hot or cold: “the simple bodies (earth, fire, water, and everything like that) and in general bodies and the things composed from them (animals and divine things and their parts). All of these things are said to be substances because they are not said of a subject, but the other things are said of them” (Ibid.: 41, 1017b). Aristotle (via Empedocles) anticipates the modern concept of states in physics here by about two millennia (solid/earth, liquid/water, gas/air, fire/plasma), but there is more at stake than a physics of matter. Instead, we are in pursuit of a metaphysics of matter, carrying with it the question of what to do with these simple bodies — earth, fire, air, water — that always seem to settle in things as combinations, and only ever provisionally so. What Aristotle is ultimately after in the elements (what a thing’s substance is) are the contrarieties that bend a thing this way or that (wet, cold, solid, liquid) which is nicely plotted in figure 1.

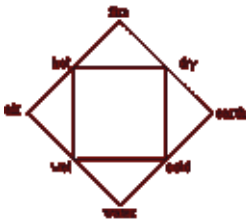


Fig. 1. Elemental Contrarieties

He goes on: “By being present in things that are not said of a subject, is the cause of their being — for instance, the soul of an animal — is called substance” (Ibid.), that is, you can’t point to the element of water in a cocktail (because “water” in elemental philosophy is not the same as “H₂O” ; it is what *bonds* the H to the O). What makes a chair a chair is not reducible to a particular property in the chair (its arc, the wood, etc.). The soul of a thing is *prior* to the thing, and therefore not fully reducible to the thing. Elsewhere he will explain this using different terms: what the pre-Socratics miss about the logic of being is that the *real* ontology of the thing is what *made it* or what *made it move*. And what made it or made it move is not there to be seen in the thing itself. It is prior. This is important, he says, because it is the missing category in the first philosophies that try to develop a logic of being. Things are not static or still. Motion appears and disappears amid the appearance of the thing. But what moves the elements — the contrarities that settle into material properties of things?

Hence we reach something of a deadlock, and it is here that we get Aristotle’s famous sleight against the irrational opponent (a joke, in other words, about arguing with plants):

But even this [a refutation of the Principle of Noncontradiction] can be demonstrated to be impossible. In the manner of a refutation, if only the disputant says something. If he says nothing, it is ridiculous to look for a statement in response to one who has a statement of nothing, in so far as he has not; such a person, in so far as he is such, is similar to a vegetable. (Ibid.: 8, 1006a)

So, you cannot disprove the Principle of Noncontradiction if you try to *demonstrate* the refutation through a particular thing. But you can if you simply stick to refutation (two different logical modes, for Aristotle). Easy to refute, impossible to demonstrate.

And so too with Hegel’s horrified opponents to whom our peculiar opening to chapter three of the *Logic* makes reference, where essence is about to determine itself as ground, which is another way of saying that ground is not the beginning or base of things but instead a moment with activity on either side: the thrum of things, or what shines and shimmers through them.

So the question we have to watch Hegel answer next is then: How does some *thing* emerge from this self-determining ground if “essence, in thus being determined as self-sublating, does not proceed from an other but is, in its negativity, identical with itself” (2010: 386, II. 291)? How does something come from this ostensible

nothing, and what will become of ground as essence *becomes* further up (or in) the world of appearance?

It will turn out the dynamic of essence determining *itself* takes a shape — that ground is not an abstract concept at all, but instead a real, material ground, and it will consist of three new terms:

The ground is, first, absolute ground — one in which the essence is first of all the general substrate for the ground-connection. It then further determines itself as form and matter and gives itself content. (Hegel 2010: 386, II.291)

Notice here that ground breaks in two the moment that Form, Matter, and Content get introduced to play the scene out further, namely “absolute ground,” which is the substrate or depth of ground, and second, the phenomenal appearance not yet of objects but that which conditions their concrete qualities: Form, Matter, Content. Ground thus breaks not into a simple opposition, but an asymmetrical one: on the side of the absolute is one — substrate — while on the side of determined ground emerges three: form, matter, content. The asymmetry here is important for helping us to understand the asymmetries that mark Hegel’s dialectic more generally, and why the materialism he helps initiate is not reducible to the determinations of matter as such — what it is not, in other words, a *matterism*. The oppositions are always off-kilter, making it impossible to turn back the clock. As an example, consider thermodynamics: a theory of energy contemporaneously mapped and consummated by Hermann von Helmholtz during the years of Hegel’s redrafting of the *Logic*. While the first law says that energy is a consistent across conversion and transformation, the second law states that entropy is the third term that marks a difference in time despite the *consistency* of energy on either side of a transformation. Time puts the energy of matter off-kilter. You cannot rewind or reverse transformation without shift from quantity to quality.

V

So now that we have a new set of terms and a sense of where they come from, let us see where they are leading us. In the summarizing “Remark” (2010: 388) to this opening section, Hegel relates the demonstration he just walked us through to the canonical “principle of sufficient reason” so favored by Aristotle, Aquinas, through to one of Hegel’s more frequent interlocutors, Leibniz.

Ground, like all the other determinations of reflection, is expressed in a principle: “Everything has sufficient ground or reason.” — In general, this means nothing but this: Anything which is, is to be considered *to exist* not as an *immediate*, but as a *posited*; there is no stopping at immediate existence but a return must rather be made from it back into its ground, and in this reflection it is a sublated being and is in and for itself. What is expressed by the principle of sufficient reason is, therefore, the essentiality of immanent reflection as against mere being. — That the *ground or reason* must be sufficient is strictly speaking a totally superfluous addition, for it goes without saying; a thing without sufficient ground would have no ground, yet everything ought to have a ground. (Hegel 2010: 388, II.293)

In this section Hegel goes on to point out that sufficient reason is not meant to be understood mechanically — that, in other words, the mechanical cause of a thing’s existence is not sufficient to explain its being, since mechanics by definition require a concept of discrete entities related only by force, as in Newtonian physics. Mechanical reason, in short, does not include the negative in its explanation of phenomena, and hence has an underdeveloped notion of ground to begin with. In other words, “[m]echanical causes are not sufficient for this unity, for they do not have as their ground the purpose which is the unity of the determinations” (Ibid.).

Absolute Ground is itself split in three subsections: Form and Essence; Form and Matter; Form and Content. We pick up the story with a new distinction, one that takes us back to the beginning of the chapter but with a split in the determinateness of essence: what essence *becomes* as it moves from itself into a posited ground. We get, in short, “determinateness of the ground and of the *grounded*” (Ibid.: 388, II.294). Important to note here is the sublation of ground into that which it grounds, the grounded, and the name Hegel offers for the grounded is not yet *things or subjects or concepts*, but Form.

But how can we have a *form* without any content or thing to which *form* gives or determines shape and character?

Well, Hegel says, you are right, but just because form is always taken up does not mean that there is no distinction between the form of a thing and the thing itself. The difference matters enormously, since we see here in this new stage of development that form is still on the side of essence self-positing itself, and therefore on the side of essence’s determinateness. The essence of a thing will come to matter, quite literally; it will take on matter, but only once it has a form into which matter can get *informed*. And here it is: the logical kernel of this chapter, and the core opposition I am arguing we can

see made newly available for thought amid the shifting ground made murky by earth systems co-creating future ecologies in the present. The *grounded* is actually two things at once: one the form to which identity will take shape, and the other

matter, “the simple identity, void of distinction, that essence is. With the determination that it is the other of form. Hence it is the proper base or substrate of form, since it constitutes the immanent reflection of the determinations of form, or the self-subsistent term, to which such determinations refer as to their positive subsistence.” (Ibid.: 392, II.297)

But how can this be? How can there be form in the world without matter, and matter in the world without form, roving around ground as self-positing essence but not yet introduced to one another. Well, Hegel says, you would do well to remember that every new term introduced to track the triad of Being, Nothing, and Becoming introduced at the outset of the *Logic* brings with it a new tension to be teased out. And this new tension is contemporaneous with each sublated determination, as is the case here with the essence of ground and grounded. Hence, matter and form presuppose one another, not just logically, but materially. But while they presuppose one another, it is up and into the formal contours of things that matter will matter most. Matter, in short, shapes worlds not of its own accord, but *in* accord with form. I want to end on this point before concluding because this is where we finally get the knot that marks the lively materialism — and the materialist account of form — in Hegel’s philosophy, and the one through which we can account for the epochal shift unleashed by global warming today.

Hegel offers a startling answer to the question of how, in this scene where no things yet exist — only ground, form, and matter — do we find ourselves eventually immersed in *difference*: neither matter nor form as such can be wrenched free of one another, and he provides an uncharacteristic aside to make the case: “if abstraction is made from every determination, from every form of a something, matter is what is left over. Matter is the absolutely abstract. (One cannot see, feel, etc. matter; what one sees or feels is a determinate matter, that is a unity of matter and form)” (Ibid.: 392, II.298). This would seem strange for materialism’s foundations, since one would expect the concrete, instead of the abstract, to inhere in what is ready to hand. But the paradox is actually a feature of what makes matter other to what is at hand and the “one” that does the seeing, the feeling, the sensing: “hence matter must be informed, and form must materi-

alize itself; it must give itself self-identity or subsistence in matter” (Ibid.: 393, II.298) — that is, matter and form sublimate one another as the passive and active passage of moments of unity — they vibrate between one another, never fully absorbed into the other (they can be wrenched apart but only in a new unity — a new informed matter, or materialized form). We might think of this vibration between matter and form — their identity and difference — as an aesthetic knot since it *appears* and withdraws from appearance in the same gesture. There is a kind of energy to this active and passive passage back and forth between matter and form, the chiasmus (informed matter, materialized form) as the inexhaustible (or, elemental) energy animating the phenomenal world *grounded* in the self-positing activity of essence in and through ground. Ground, in this concept of matter, is not posited by the subject in order to make good sense, but is instead the earthly nonidentity *from which the subject finds itself posited* (recall that all this thinking on Ground for Hegel takes place before there is subject on the scene). But what happens when that Ground is forced reactively into the non-linear dynamics of the tipping point?

VI

Hegel lacks a concept of energy here because he is writing on the cusp of when von Helmholtz, Clausius, Lord Kelvin and others would lay claim to the first and second laws of thermodynamics. But he nevertheless inherits *vis viva* or Living Force from Leibniz and a very young Kant.² And in asking the question “how does the self-identity of essence move from nothing to an entire world in which we are situated?” Hegel is also demonstrating the paradox of what later in the Logic (and in a central chapter in the *Phenomenology of Spirit* [1977 (1807): 95] what he will call “play of forces”). The ground is not a static backdrop to reason — a still and consistent world of dead matter. It is on the move. And it is through the dynamic of force, form, and matter that we are able to ecologize our account of climate change, which is to say work our way back to the ground vibrating beneath our feet. But it also helps us understand why a work of art will in Theodor Adorno’s dialectical reading, crackle

² It is worth recalling that Kant’s very first publication, *Gedanken von der wahren Schätzung der lebendigen Kräfte* (2012 [1749]) prepares German philosophy for a critical engagement with what will nearly a century later get called *arbeitskraft* by Helmholtz, Liebig, and the young Karl Marx (see Anson Rabinbach’s seminal *The Human Motor* [1992] and Bellamy and Diamanti’s *Materialism and the Critique of Energy* [2018]).

with energy — what in a lovely turn of phrase he calls the energy of the artwork: “the parts are not something given, as which analysis almost inevitably mistakes them: rather, they are centers of energy that strain toward the whole on the basis of a necessity that they equally preform. The vortex of this dialectic ultimately consumes the concept of meaning” (1997 [1970]: 178). What then “crackles in artworks is the sound of the friction of the antagonistic elements that the artwork seeks to unify” (Ibid.: 177) but the point, in opposition to an account of form that imagines it as still beauty, is that this unity is foresworn internal to the artwork — that, in other words, it is an artwork in the measure that its energy is held suspended rather than resolved.

This also helps us refine our thinking about the interactive nature of form and essence, or put differently, why the labor brought to ground happens not against a static backdrop of nature but is actually itself a potential modification to Ground — either as localized terra forming or, at the other extreme, anthropogenic climate change. Climate change from this demonstration *verifies* the interaction between form and essence, the two active terms meeting halfway as *informed matter* or the mediation of Ground and grounded. Content carries the identity of Ground, Hegel says, through the mediations of form and matter: content comes to sublimate, in short, the mediations from the ground up, since content “is therefore also the formal unity or the ground-connection as such” (2010: 396, II.301). The stakes here are wide ranging. For one, it suggests that form is both historical and material, and that the modalities of world making inhering in and as ground are neither fully determined or absolutely contingent. Resource prospecting, subsistence hunting, environmental concern, atmospheric modeling, nonhuman sensing, and many other *forms* are drawn to the ground made anew by the recession of ice in Greenland. The possible, actual, and necessary are form determined, in Hegel’s account, because the essence of ecological dynamics (in our example here) is multiply bound up with the play of forces holding and unfolding matter in and as form. Otherwise we would be back to what in the *Philosophy of Nature* gets termed the “murky northern fog” (Hegel 2004: 203) silencing the rustle of nature into thought. Hegel calls this rustle in the *Phenomenology* the “the play of Force itself” (1977 [1807]: 90), by which he means that the appearance of differentiation — or “flux” — settles only provisionally what is universally unsettled in the medium of “universal difference” (Ibid.).

Take for instance the interactive dynamics of the melting cryosphere and the circulatory systems that animate the hydrosphere. The

melt water running off of the Greenland Ice Sheet is both altering the chemistry and temperature of its Arctic and North Atlantic surrounds, at the same time that the humidity of the Arctic and North Atlantic is forced atmospherically back onto the windswept deserts of the ice in a feedback loop, or reciprocal relation. These feedback loops that, scaled up, intensify the planet's regional climates beyond the realm of probability are *improbable* in the measure that the absolute reciprocity of the play of forces troubles the still and arid *forms* brought to understand them. New Ground is the place where worlds are actualized, made possible, and necessary. It is really no surprise that the IPCC is both drawn to this new ground, and troubled by the epistemology it asks of us. My argument here has been that the mixing of fossil-fueled, human history into the very grounds of the planet's interactivity (and the scientific apparatus marshaled to understand it) paradoxically makes the earth's nonidentity a foundational category lodged at the heart of environmental ethics, policy, politics, and philosophy. This was already true for Hegel's phenomenology, but the fiction of the earth's static backdrop to human history (among other fictions told by the white, sovereign subject of enlightenment reason) rendered ground into a metaphor for reason's base: sound reason on solid grounds. The dialectical twist (and perhaps too, tragedy) is that the elemental force unearthed by the planet's reactive whirl into feedback loops and tipping points means that the "ground" upon which we stand doubles as the grounds for reason after the Holocene. To which degree that category of "ground" fully internalizes a concept of reciprocity inclusive of the earth's nonidentity with itself remains to be established.

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